

MANAGING PBS

1 MAY 2019

VERSION 4

PURPOSE

This document sets out how industry and the NZ Transport Agency could manage an updated set of Performance Based Standards (PBS) for heavy vehicles.

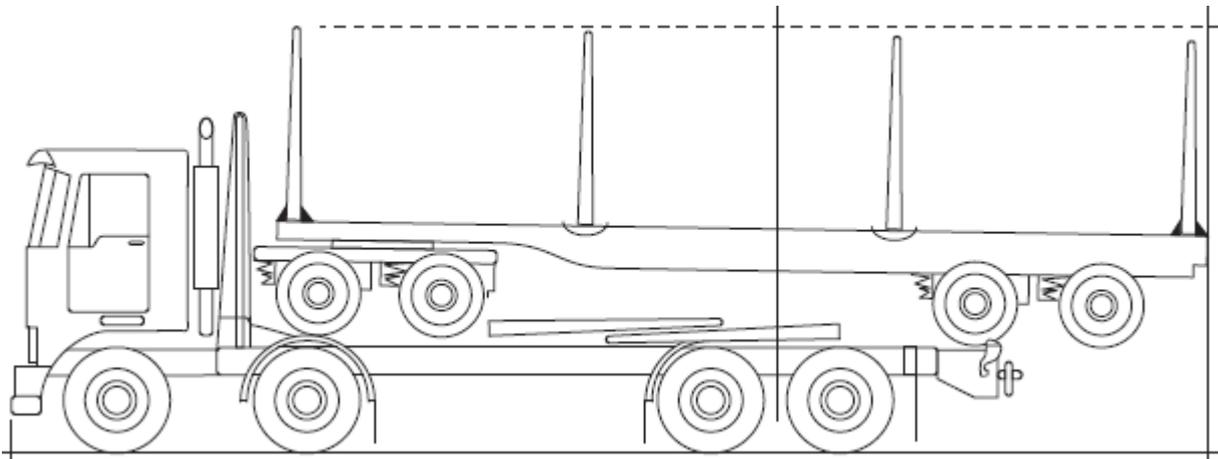


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INTRODUCTION

Effect

The new performance measures are expected to improve the road-keeping characteristics of heavy vehicles, especially those operating on a permit. This will contribute to overall road safety.

The proposals in the paper will change the process of developing proforma designs, and over time existing proformas and related designs will be replaced by new vehicle configurations. The intention is to create a process which encourages the uptake of safer, more consistent, designs.

Existing vehicles will continue to have access to the network – a transition process will ensure that operators are given sufficient notice when proformas are being updated.

Preferred option

An Industry Advisory Group was briefed on three options prepared by the Transport Agency. They agreed that the option presented in this document was the favoured approach and suggested improvements. The (preferred) **Partnership model** is a more formal process than is currently provided.

Under this model, the Transport Agency would work with industry to create and manage a work programme for developing proformas and resolving related issues. This contrasts with the existing process of industry proposing designs that are each treated in isolation.

The model has a strong emphasis on creating new proforma designs that become the industry standard for a variety of general and specialised functions. It also proposes that the option for variations from proformas would be removed.

The principal **benefits** anticipated from this approach are:

- better road-keeping characteristics
- strong incentives for operators to move to (better) vehicle configurations and
- does allow for future bulk permitting (see below for an explanation)

The principal **costs** are:

- Reduced flexibility for designs that are close to proformas, but which do not comply and
- Increased processing time for operators who wish to introduce non-standard vehicle designs.

This option is described below in further detail (starting on page 7).

Other options considered

Modified status quo

Modified status quo continues the relatively informal approach with industry groups and individual operators proposing initiatives (such as new proforma designs).

Benefits

- Creates high flexibility for a range of vehicle designs
- Potentially responsive to industry needs (limited NZTA resource, however)

Costs

- Provides limited incentives for significant change to the heavy vehicle fleet
- Limits future permitting options.

Prescriptive approach

This is closely modelled on the Australian 'blueprint vehicle' approach. Design development is largely the responsibility of the Transport Agency. Proformas are highly constrained and operators must have vehicle(s) certified as meeting an approved design.

Benefits

- Creates certainty over what designs are approved for service
- Rapid move towards highly standardised heavy vehicle fleet
- Allows for both bulk permitting and automated approaches¹ to managing operation of vehicles that carry higher mass
- Makes enforcement simpler

Costs

- Imposes higher costs, in both dollars and time (eg for certification)
- Reduces flexibility – constrains designs to standard vehicles, proformas and a small number of highly specialised combinations

CONTEXT

A replacement PBS has been drafted to better align the current informal² PBS (which is based on Canadian and Australian performance measures) with New Zealand road conditions. While work on approving the draft PBS is proceeding, the Transport Agency must at the same time consider how the PBS will be applied in practice.

What is PBS?

A PBS suite sets out performance measures (such as low-speed tracking) that can be determined for any heavy vehicle and indicate whether it meets the requirement³ for safety performance equivalent to standard vehicles. The majority of PBS assessments are for vehicle combinations.

A PBS is intended to establish a consistent, transparent process for:

- Evaluating and approving (new) proforma designs, and
- Considering approval of individual vehicles that are neither standard nor fit an approved configuration.

¹ **Bulk permitting:** identified prime mover plus any trailer of an appropriate approved type

Automated access: certified combination on approved route at set (higher) mass does not require explicit permit

² PBS is not referenced in the Land Transport Rule: Vehicle Dimensions and Mass 2016 (the VDAM Rule) or tightly described in any formal documents.

³ 5.9(6) in the VDAM Rule.

PBS provides assurance for the Transport Agency (as regulator) that new designs will fit safely on our network, and can be permitted for either general access or constrained routes.

Proforma vehicles are able to access the network and obtain permits if the operator applies for them.

PBS can also create an agreed, rational process for assessing non-standard vehicles before their entry into service.

Current use of PBS

The initial PBS was developed in Canada, and subsequently adopted by Australia and New Zealand. Its use was broadened after the development of *Land Transport Rule: Vehicle Dimensions and Mass 2002* (since replaced by the VDM Rule 2016) to develop proforma designs for vehicles that did not meet the standard dimension limits.

The application of PBS is not currently addressed in the VDM Rule. A linked document (the VDM Permit Manual) includes a range of proforma designs⁴ that have already been assessed and agreed as meeting performance requirements. However, the permit manual is not formally referenced⁵ by the VDM Rule.

Currently, there are three major categories of heavy vehicles in terms of entry and approvals for service on NZ roads:

Standard vehicles	These comply with all the 'normal' dimension requirements set out in the VDM Rule. They must be entry certified but do not require PBS assessment.
Proforma vehicles	Approved designs that vary or exceed some dimensions – clause 5.9(5) of the Rule. Proforma designs must be approved by the Agency after being tested against PBS measures and are made available on our website. The primary application for vehicles that comply with a proforma design is access to permits for over-length HPMV combinations.
Other (non-standard) vehicles	EITHER a variation from an existing proforma (approved by the Agency for a single vehicle) OR a one-off approval OR a proposal to add an additional proforma design to those already in place.

A vehicle that fits the standard dimension limits or is an approved design (such as a proforma) is able to be entry certified and may be eligible for the issue of an HPMV permit. The Rule states, in 5.9(5), that the Transport Agency must approve any vehicle that does not fit the standard dimensions.

Why an updated PBS is necessary

Drafting of an updated and improved PBS has been initiated because the current informal PBS (based on an Australian set of measures) is deficient as an accurate predictor of safe vehicle

⁴ The Vehicle Dimension and Mass Permitting Manual, 2nd Edition, Volume 1. Proforma designs are listed at pages E-4 to E-8. They are also available at <https://www.nzta.govt.nz/commercial-driving/high-productivity/proforma-designs-for-high-productivity-motor-vehicles/>

⁵ Documents given official status by a Rule are described as “incorporated by reference” and must be managed according to the requirements of section 165 of the Land Transport Act 1998 (the Act).

performance within the geometric standards of how roads have been constructed in New Zealand. This was illustrated by a trial of 25 metre combinations where the real-life fit on the network, while consistent with previous modelling, was not seen as adequate for wider use.

The NZ PBS also has to take into account the road geometry that applies here, particularly in relation to the tight corners due to our generally steeper terrain (compared with Australia).

Issues with the existing process

- Current informal process is not always responsive or easily understood
- The addition of new designs and variations has created difficulties for enforcement
- Current process is not easily adapted to bulk permitting or automated access
- Some existing vehicles create separation (between opposing vehicles) and handling issues
- Limited pressure/ incentives for improving the performance of the heavy vehicle fleet.

Potential benefits from an improved PBS

Improved fit to network
Better safety outcomes for heavy vehicles



Leading to improvements in the heavy vehicle fleet as better designs are encouraged

Allowing the process for issuing permits for increased mass to be more flexible/ reducing the administrative process associated with permits.

Further development

The Permit Manual will be updated in the second half of 2019 to reflect new designs and to set out transition requirements. See page 10 for more detail on transition.

The Transport Agency will consult with industry representatives, to agree a programme of priority work on new proforma designs.

PREFERRED OPTION: PARTNERSHIP MODEL

VEHICLE CATEGORIES		
Standard vehicles (conform to Schedule 2 dimensions)	No PBS requirement	NO CHANGE
Vehicle fits approved proforma	Must assure agency that vehicle fits proforma; no requirement for PBS assessment	MINIMAL CHANGE
Vehicle is neither standard dimensions nor complies with proforma	Requires PBS assessment – would have to use 'new' measures and process	MODERATE CHANGE
	Remove option for variation	SIGNIFICANT CHANGE

In this document, we refer to '**one off**' designs as a simple way to describe vehicles that don't conform to either the dimensions list in the VDAM Rule or one of the approved proforma designs.

Developing a proforma design

Initiation

Industry and Agency agree that a proforma is needed:

- common requirement across multiple operators
- undertakes specialised task or needs permit to make full use of the design
- likely to involve high numbers of vehicles over time

OUTCOME: Agreed requirement is added to the Programme

Development

- Driven by annual programme
- Agency facilitates discussion
- Industry proposes one or more designs
- Each design is put through PBS

Appraisal

Selection (assuming choice of designs) is based on:

- must pass all aspects of PBS assessment then
- best road performance
- increased safety (eg improved SRT)

- efficiency (eg carrying capacity)

The design may need to be trialled before final approval.

Route availability

Appraisal also needs to consider if the design is suitable for general access or constrained routes. Not all vehicles that meet PBS measures are suitable for general access (mass limits also have to be considered). HPMV permits (such as 50MAX) are only valid on approved routes, and this practice is expected to continue.

Approval

Agency would grant approval and notify/ publish the designs.

Availability

A proforma design once approved is open to all.

No variations – must either fit published proforma OR gain approval for new proforma OR go through one-off process.

If an additional significant (specialised) use is identified, a new proforma could be considered.

Publication

Designs would be available on the Agency website and included in the Permit Manual.

One-off treatment

A 'one-off' process may be required if a design does not comply with either the standard VDAM Rule dimensions or a published proforma. A vehicle may, for example, be carrying a specialist load that requires a purpose-designed combination. Vehicles approved through this process are likely to be constrained to explicitly defined routes (eg between a port and a nearby container storage site).

The one-off process is **not** designed to cater for vehicles that are suitable for the carriage of general goods or seek access to the wider network. This is better managed through the proforma process.

One-off process in outline

- Operator (or manufacturer) applies for approval of a design
- Agency directs applicant to undergo PBS assessment
- Vehicle must pass all PBS requirements OR vehicle can only be authorised to operate on a short, highly constrained route (see below)
- Transport Agency considers
 - anticipated safety/ performance outcomes
 - whether general or constrained (route) access should apply
 - whether a trial is needed to confirm modelled performance

An approved (specialist) design can be applied to **identical** vehicles that are subject to the same access constraints.

No variations would be permitted. Each application would be treated on its own merits.

(Possible) Publication: Notice on Transport Agency website summarising approval, without describing design details.

Route constraints for one-off designs

For specialised loads, with a vehicle configuration that does not fully meet PBS requirements, the Transport Agency can consider authorising the vehicle only if its operation is restricted to a fully defined (and suitable) route.

Route in this context is more constrained than the network access available to 50MAX and other HPMV vehicles; a vehicle that cannot meet one or more PBS measures will not be authorised for long-distance travel.

Route consideration for a 'one off' design could consider:

- Traffic density
- Road geometry
- Entry and exit to the route (eg adequate turnouts)
- Each intersection along the proposed route
- Signal layouts (etc.)

An existing example of a constrained route, with 25m combinations, is the HPMV permit allowing Pan Pac to transport their products 16 km from their processing plant to the Port of Napier.

Benefits and costs of this option

Benefits

- Creation of a formal, documented process to replace the current informal and variable approach provides:
 - more consistency
 - clearer view of available options for operators and
 - better 'visibility' for operators of approvals.
- Improved data, and a wider pool of consistent analyses, should lead to:
 - Incremental improvements to performance of proforma designs
 - review of existing 'standard' dimensions with a view to having better fit to route vehicles.
 - over time, should encourage operators to move to standard designs for heavy vehicles that are a better/safer 'fit' on NZ roads
 - Moving towards a more standardised heavy vehicle fleet makes the development of 'bulk permitting' and other authorisation for higher mass vehicles more feasible.

Costs

- Less flexible approach: more operators will need to seek approval for 'one off designs' that will incur direct (fees to assessor) and indirect (time for process to complete) costs. These are not

substantially higher than the current approach, but a more formal process will make those costs more transparent than at present.

- Operators and manufacturers who currently use the 'variation' process may incur higher costs (being required to either stick to an approved proforma or apply for one-off approval).

Issues

- Methodology not yet developed⁶ for assuring Agency that the vehicle conforms to:
 - a published proforma, or
 - an authorised ('one off') approval
- As noted below, new proforma approvals should not allow significant variation in dimensions and layout⁷.

ADDITIONAL CONSIDERATIONS

PBS publication

PBS measures are published on the Transport Agency website and available for any qualified person to analyse a vehicle design.

Appointment of assessors

PBS assessment must use a person or organisation approved for the purpose. Section 2 of *Land Transport Rule: Vehicle Standards Compliance 2002* (the VSC Rule) provides the mechanism. The Transport Agency may be required to consider approving additional qualified persons (eg some Australian practitioners).

Constraining proformas

The overlap with the development of bulk permitting options means that proformas should, in the future, be more tightly defined (so we can distinguish those trailers which may be safely used behind a specified prime mover). This might be expressed in lower tolerances for axle placement and spacing (for example). The other implication arising from any move to bulk permitting is that there should be a limited number of approved proforma designs.

Costs

The expectation is that assessing a non-standard vehicle would need considerable staff time. This could be associated with a higher processing fee (not currently available and requires amendment to regulations).

Combinations

Proforma designs, or a one-off vehicle authority, do not allow an operator to swap prime movers if the 'new' combination does not fit the defined vehicle characteristics. The rationale is that altering key characteristics of the prime mover (such as the location of a hitch point) will alter on-road performance.

⁶ For example, one option would be to require measurement of the vehicle at first CoF

⁷ For example, new proforma designs should specify the tyre arrangements on each axle.

Managing trials

A trial of a vehicle may be required in order to:

- Test new technologies and designs
- Match predictions (and claims) to actual on-road behaviour
- Verify modelling or
- Verify PBS measures

The Transport Agency approves all trials, because vehicles that have novel features or technologies are likely to need exemptions to be legally operated on a road.

At the end of a trial, the Transport Agency should produce a report, and a 'determination' – a statement as to whether the vehicle should be able to enter service, and whether it is suitable for general access or only on defined routes.

Transition

A likely outcome of the transition to a new PBS is that some existing designs would not meet the new measures, and that new proforma designs will alter some aspects of vehicle configuration.

The Transport Agency will provide a managed transition. Existing proformas will be included in the Permit Manual, but their application will be limited to vehicles that entered service prior to an agreed date. There will be sufficient time (12 months) from formal notice of the change, to allow vehicles on order or under construction to enter service.

New proforma designs would be available before the change-over date, and after that date all new vehicles would have to meet the new (PBS compliant) designs.

Vehicles that met previously approved designs will continue to have access to permits and the network. Note that 'swapping out' prime movers or trailers, where these have different dimensions or placement of components, may have the effect of creating a combination which does not provide compliance with the previous approval. This may require consultation with the Transport Agency prior to placing the 'new' combination in service.

