

# The PBS handbook

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Said to be one of a kind, Performance Based Standards (PBS) are straining the transport industry's psyche since 2006, when the National Transport Commission's Twice the Task report announced that the land transport task would almost double until 2020. The appalling report concluded, "Doing nothing will result in another 50,000 trucks on Australian roads, with one in four vehicles carrying freight."

As a result, the Council of Australian Governments (COAG) and the Productivity Commission identified PBS as a national reform priority to manage the growing freight task. Ever since, PBS have caused both endorsement and irritation, often attended by hesitation and doubt.

The leading haulage companies were looking for a PBS solution that could provide substantial productivity gains in regions with increased freight traffic, namely, the major urban freight corridors. Yet community concerns and intransigence on the part of the infrastructure bodies have often held back innovative development. Five years after the NTC's stirring report, Trailer Magazine has compiled Australia's first PBS handbook.

## Basics

Performance Based Standards enable transport companies to increase productivity and safety using computer simulation models and real world testing in order to approve innovative vehicle designs. Hence PBS urge the manufacturing industry and road agencies to cooperate in developing vehicles that outperform traditional combinations.

These gains are not available under conventional one-size-fits-all prescriptive mass and dimension rules or the state-based permit system. PBS does not focus on size and length of a vehicle, but on how the vehicle behaves on the road – based on a set of safety, road wear and bridge loading standards. As a result, PBS-approved vehicles are able to carry more freight than the off-the-shelf models they are designed to

replace, reducing both road traffic and emissions.

In a nutshell, PBS govern what a vehicle can do, and not what it is supposed to look like. Therefore, PBS-approved vehicles have been named SMART vehicles.

## **Key players**

Two parties oversee the PBS process – the PBS Review Panel (PRP) and the PBS Secretariat. The formation of the PRP was approved in October 2007 by the Australian Transport Council (ATC), following the completion of an interim trial to refine aspects of the PBS scheme, such as the approval process and performance standards. The Panel consists of an independent Chairperson and Deputy Chairperson and at least one representative from each state and territory and the Commonwealth, commissioned to review each PBS application using a set of pre-defined procedures, including

- assessing applications to ensure they comply with the PBS rules;
- tracking the progress of applications through the approvals process;
- the accreditation of vehicle certifiers;
- the accreditation, audit and maintenance of a database of third party assessors;
- the facilitation of mapping the national PBS road network.

The PBS Secretariat, on the other hand, is deployed by the National Transport Commission (NTC) and supports the Panel. The PBS Secretariat is also assigned to confirm that an application is suitable for consideration by the PRP.

## **Standards**

One key element of the COAG's national reform agenda for transport are minimum vehicle performance standards to ensure trucks are stable on the road and can turn and stop safely. They include a vehicle's longitudinal performance – e.g. the ability to commence forward motion on a specified grade and the total swept width while travelling on a straight path – and the directional performance at low speed – e.g. the maximum width of the swept path in a prescribed 90 degree low speed turn; the maximum steer tyre friction in a prescribed turn; and the rearward amplification, measuring the 'whip crack' effect of a lane change manoeuvre. In addition, the infrastructure related performance will be reviewed, including the degree to which vertical forces are applied to the pavement and the maximum effect on a bridge measured relative to a reference vehicle (see "Weight").

## **Road access**

The PBS classification guidelines encompass four levels of road access. The basic principle is that SMART heavy vehicles seeking wider access to the road network must meet increased safety standards. For example, a Level 2 vehicle must be assessed and approved to safety standards (turning, stability, road space) consistent with Level 2 road characteristics (lane width, traffic volume, etc). \*\*\*Graphic\*\*\*

## **Length**

As long vehicle combinations could increase the risk of failing to clear rail level crossings and road intersections, PBS specify a vehicle's length according to the level of road access. Therefore, the levels are further divided into Access Class A and Access Class B. Applications for operation outside the approved Class A and B network will require an individual route assessment (see "Road access"). \*\*\*Chart\*\*\*

## **Weight**

As the PBS scheme may allow vehicles with more points of articulation and additional axle groups, bridges will be exposed to increased weight. As a result, the PBS Panel will consider a vehicle's axle weight in relation to the condition of the bridges on the requested route, ensuring that it will not damage infrastructure. Unfortunately, Australian bridges vary in design strength and structural condition and are, therefore, often the weak link for heavy vehicles on the road network. "Examining every bridge on a particular road is a time-consuming process," says Marcus Coleman, technical advisor of the PBS Secretariat.

## Mapping

The Panel does not have a role in determining road network access for approved SMART vehicles. Therefore, road agencies and local governments play an important role in classifying the road network to ensure the right SMART trucks operate on the right road. This mapping process is focusing on the migration of the existing road network to the four equivalent PBS levels; largely based on existing prescriptive vehicle lengths. For example, roads approved for a 26 metre B-double combinations translate as the Level 2 network, Access Class A. “A long term goal is the creation of a map showcasing the Australian road network including all access levels,” Marcus says. “Yet some councils just don’t have the capability to undertake road and bridge assessments. In this case, truck operators may need to seek assistance from the road authority, or contract an independent report by qualified engineers.”

## Route compliance

If there is a demonstrable compliance risk, some States and Territories may require the operator to join the Intelligent Access Program (IAP) as a local operating condition. Under this scheme, PBS vehicles are fitted with an in-vehicle-unit to enable monitoring of location, time, speed and self-declared information. An IAP Service Provider provides monitoring services and notifies the road authority if the IAP conditions, such as approved routes, are breached.

“I know the IAP has had a bit of a chequered history so far,” says Queensland Department of Transport and Main Roads General Manager Safety Systems, Bruce Olleston. “But we need some certainty around the subject of where heavy loads are going and route compliance.”

## Application

Applications for SMART vehicles are considered by the PBS Review Panel (PRP) within 20 business days. A preliminary step, however, is to consider what benefits, in terms of productivity and safety, may be achieved through PBS. Those benefits should be assessed against the likely costs and risks of submitting an application. In addition, understanding the level of road network access likely to be granted by road agencies is crucial to assessing the benefits before submitting an application. A road map to approval.

*Initial contact.* “Operators need to understand the role of the road agencies who are in charge of the area where they want to operate,” says Marcus Coleman. “It is important to provide specific information and localise the operational area to simplify the process. Obtain a level of confidence before proceeding with the application.”

*Assessment.* Potential applicants are advised to approach an accredited PBS vehicle assessor to refine the design concept through computer modeling to a point where it complies. “An assessor is like an architect who will conduct the engineering assessment,” Marcus says.

*Planning.* The manufacturing company is a main protagonist in the application process, as it will build the vehicle. “To avoid a rude surprise, opening the line of communication is vital.”

*Application.* Once the design has been assessed as meeting all of the PBS standards for the proposed level of access, an application form should be lodged with the PBS Secretariat. The Secretariat will submit the application to the PBS Review Panel within 10 business days.

*Approval.* If the application is approved, the Panel will inform the applicant and specify any national operating conditions. In the event of an application being rejected, the applicant will be advised in writing of the reasons.

*Building.* “Build the vehicle exactly as per the PBS design approval,” Marcus Coleman says. “Otherwise you will face difficulties as the certifier is authorised to reject the vehicle if variations occur.”

*Testing.* If the approved SMART design is significantly novel in any way, and presents a potential road safety risk, the Panel may require physical testing to confirm the vehicle complies with PBS standards once the vehicle is built.

*Certification.* Certification is required from a road agency to ensure the vehicle is built in accordance with the design specifications approved by the Panel. If the certifier deems the vehicle to be compliant with the approved design, the applicant will be issued with a certificate.

*Final Stage.* “Once a certificate has been issued, the applicant must obtain confirmation of final approval from the PRP Secretariat,” Marcus says. “Normally, this would not need to be re-considered by the Panel.”

*On-road.* “Once the vehicle has been approved and certified, the applicant should formally confirm the level of road network access and apply to register the vehicle in their home state or territory. Road agencies are required to consider access to their networks within 20 business days on a best endeavours basis.”

## **Sticking Points**

Many transport companies use the permit system to innovate outside prescriptive regulations and gain a competitive advantage in the road freight market. However, there is frustration with the time taken to process applications, different local policies for permit vehicles, inconsistent decisions and different operating conditions.

Example 1: In South Australia, authorities use a software package named Heavy Load Route to audit whether a vehicle is able to use a particular road, gauging road condition, vehicle weight and axle spacing. Unfortunately, the system is only available in South Australia. “Establishing a consistent system across the country would be a milestone,” Marcus says. “But to date, copious states like Queensland were not able to collect the information needed to expand the system.”

Example 2: Due to the complexity of a new design, the application process might take time to proceed as it involves up to seven independent institutions. Therefore, the NTC has urged trailer manufacturers to become accredited assessors. “We would like the manufacturing industry to go ahead and expedite self-certification. Being an assessor, a company would be able sign off a PBS vehicle in-house before submitting an application.”

Example 3: Considering an application, the PBS Panel will demand data on components like axles, suspensions, tyres and engines. “Collecting information is a vital part of the process,” Marcus Coleman says. “If it’s missing, the entire process will be slowed down.” Missing numerical information on tyres has been a major issue in the past, disabling the Panel to rate how the vehicle would react in the road. “Without the essential data, assessors can only make an assumption,” Marcus says. “And in consequence, the Panel will take more time to review the application. So please consult with an assessor to ensure the tyres are appropriate before committing to tyre selection.”

## **Future**

According to Marcus Coleman, the Australian economy at large has not quite understood the complexity of road transport as yet. “Infrastructure and transport are vital parts of a consumer society. Therefore, the infrastructure across Australia needs a major upgrade, taking into account the new generation of commercial vehicles. We also need to increase interoperability and think about assessing trailers and prime moves separately.”

The major issue, however, is inconsistency. Because the permit system lacks accountability and national consistency, innovative PBS vehicles are still being denied access to the road network. “We know that transport companies need to rely on a consistent processing scheme around Australia,” says Marcus. “But we also know that states, territories and local governments are interested in cooperating.”

## **The A-double combination**

Two combinations spearheading the PBS development have been developed by Rocklea-based companies Haulmark and O’Phee. Haulmark built an A-double combination using a steerable dolly to connect the two trailers, whilst O’Phee designed a version that does not need to include steering axles on the dolly. The new combinations have been named A-double in order to differentiate them from pocket road trains. It has been an agreed policy to use a vocabulary as far away as possible from words like road train, which have negative connotations for the general public. A-double combinations have been designed to fit into the requirements that comply with the PBS Level 2B network rules and provide a productivity gain of up to 100 percent.