HI-QUALITY WASTE MANAGEMENT VEHICLE COMPARISON

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THE HEAVY VEHICLE INDUSTRY HAS EVOLVED.

The Transport Operators and Council play an important role in determining whether the use of certain heavy vehicles is safe, will cause damage to road infrastructure, or have adverse impacts on the communities involved. The latest Heavy vehicles and design allows heavy vehicle operators to use innovative and optimised vehicle designs to achieve greater productivity and improved safety while making the least possible impact on the environment and road infrastructure. We want to highlight how the industry has evolved over the decade or so and allow the Hi Quality group to use purpose-built combinations to transport products from the Windellama site. High quality needs to be able to access, innovative, newer, and safer vehicles.

Hi Quality would like to access its sophisticated PBS fleet. The PBS scheme is a world-leading program that allows Australia's heavy vehicle industry to match the right vehicles to the right tasks. It gives industry the opportunity to innovate with a vehicle design to improve productivity and achieve safer performance while minimising impacts on the environment and road infrastructure and improving overall safety. PBS vehicles are designed and built to perform their tasks as productively, safely, and sustainably as possible, and to operate on networks that are appropriate for their level of performance. They are assessed against stringent safety and infrastructure standards to ensure they are safe and fit for use on existing road networks. The PBS scheme is voluntary and sits alongside the long-standing prescriptive regulatory system for heavy vehicles. The PBS scheme was incorporated into the Heavy Vehicle National Law (HVNL) and its administration and development is being progressed by the NHVR.

In Australia, over 75% of non-bulk domestic freight is transported by road. With population growth expected to reach 30 million by 2030, the national freight task will continue to grow, placing increased pressure on the freight network. Introducing more productive and efficient vehicles, such as PBS combinations, will help ease this pressure by reducing the number of heavy vehicle movements required to complete the freight task. The challenge for the heavy vehicle supply chain is to ensure goods are transported in the most cost-effective manner, thereby staying competitive. Minimising the cost of the road freight movement per unit, and the cost of the impact on infrastructure resulting from these movements, is an effective way to achieve this. More productive trucks on our roads bring significant safety, productivity, environmental, and infrastructure benefits for the Australian community, as well as direct economic benefits, including increased investment in local communities and employment opportunities.

PBS vehicles are involved in 46% fewer major crashes per kilometre travelled than conventional heavy vehicles 1, and they continue to meet higher safety standards through the use of innovative design and the latest safety technologies. According to Australia's PBS fleet report (NHVR and ARTSA, 2018), PBS vehicles have a median age of just under four years, compared with over 12 years for the entire heavy vehicle fleet. This younger PBS fleet has considerable advantages, including better safety equipment and fewer maintenance demands compared with older vehicles.

Additionally, these more productive PBS combinations have the capacity to transport more freight per trip, therefore reducing the total number of heavy vehicles on our roads. Fewer trucks on our roads mean road users have less exposure to heavy vehicles, reducing the risk of crashes, lowering potential road trauma incidents, and creating safer roads for everyone.

PBS vehicles are designed for the task they need to undertake rather than their conventional counterparts, meaning more freight can be moved in the same number of trips more safely. PBS combinations offer significant productivity benefits, including:

— productivity improvements of 15–30%

— up to 260 million fewer kilometres travelled annually, compared to conventional vehicles.

Travelling fewer kilometres and using generally newer vehicles means less fuel is required for a PBS vehicle to complete the same freight task compared to its prescriptive equivalent. The NHVR estimates that, as of March 2019, the PBS fleet will provide annual savings of:

— 200 million litres of fuel

— 486,000 tonnes of carbon dioxide emissions.

These savings will continue to increase as the PBS fleet size grows.

The impact a heavy vehicle has on road infrastructure can be influenced by many different factors including pavement and vehicle type, axle configuration, vehicle length and total combination mass. There is a common concern that the increased mass of PBS vehicles will accelerate pavement wear and result in increased damage to infrastructure. However, PBS vehicles are designed in a way that can minimise these potential impacts. For example:

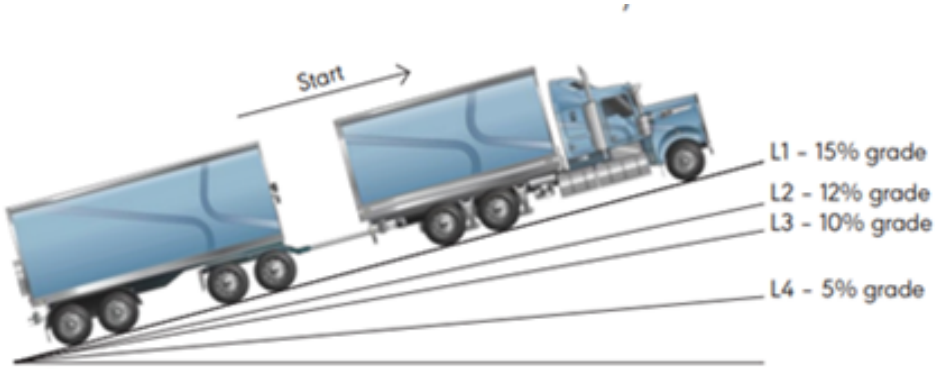
— The increase in vehicle mass of a PBS vehicle is achieved by increasing vehicle length and including additional axle groups. This means the load on a PBS vehicle is distributed among a longer combination and a greater number of axle groups, meaning the pavement effect of each individual axle group is often less or comparable with existing prescriptive combinations.

— PBS vehicles are designed to have increased payload capacity, meaning the same freight task can be completed in fewer trip numbers. This results in less pavement and infrastructure exposure to heavy vehicle movements and may reduce overall infrastructure maintenance costs

SAFETY STANDARDS EXPLAINED.

STARTABILITY

The primary purpose of this standard is to manage safety risks associated with starting on grades by ensuring a PBS vehicle has adequate starting capability on grades. This means that a PBS vehicle has been assessed as capable of starting on the steepest grade it has to negotiate on the nominated route when operating at its maximum allowed gross mass. This is to ensure it does not become a safety risk or inconvenience to other road users.

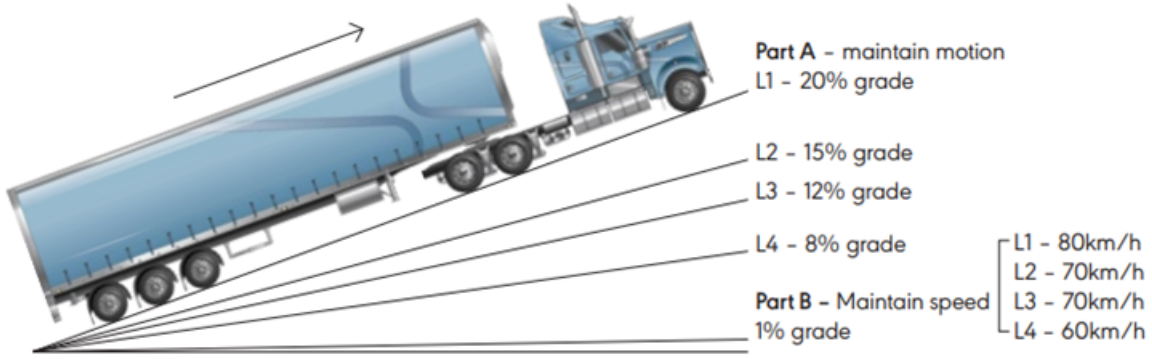


GRADEABILITY (A, B)

Gradeability is the ability of the vehicle to maintain forward motion on a specified upgrade. The primary purpose of this standard is to manage safety risks associated with travel on grades by ensuring a PBS vehicle has the capability to maintain acceptable speeds on upgrades.

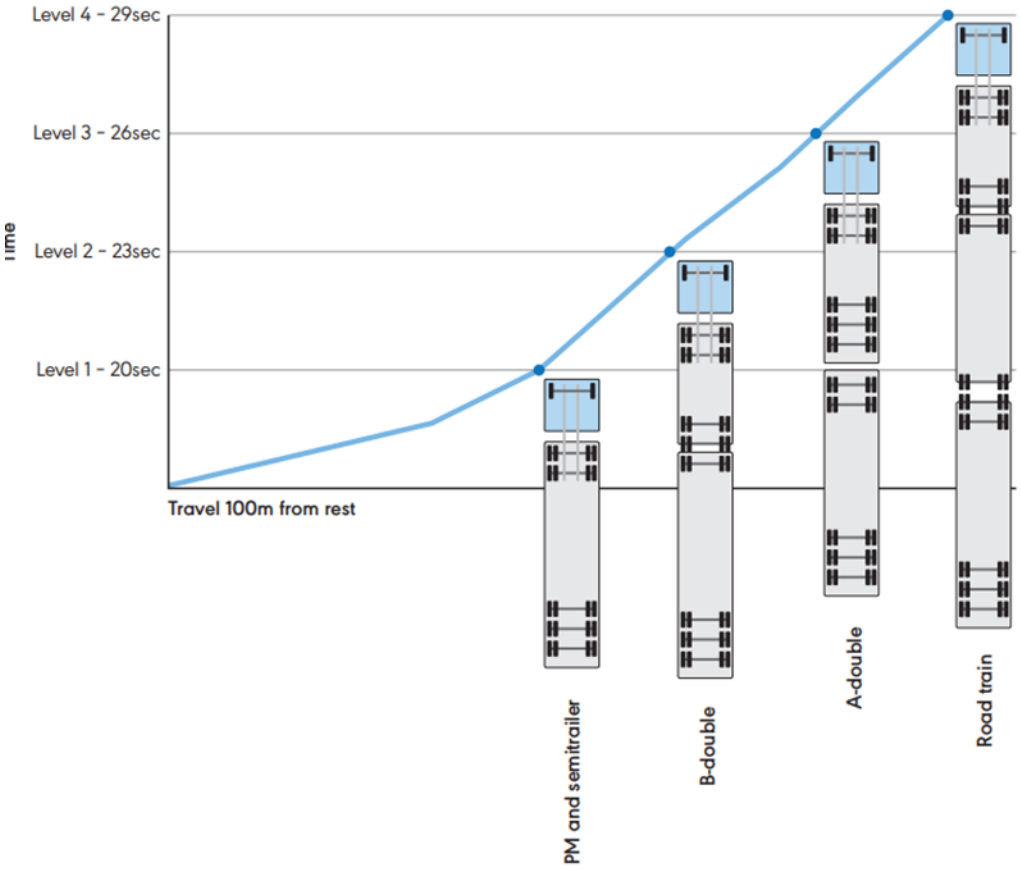
Part A is the ability of a vehicle to maintain forward motion on a specified upgrade.

Part B is the ability of a vehicle to maintain minimum speed on a 1% upgrade.



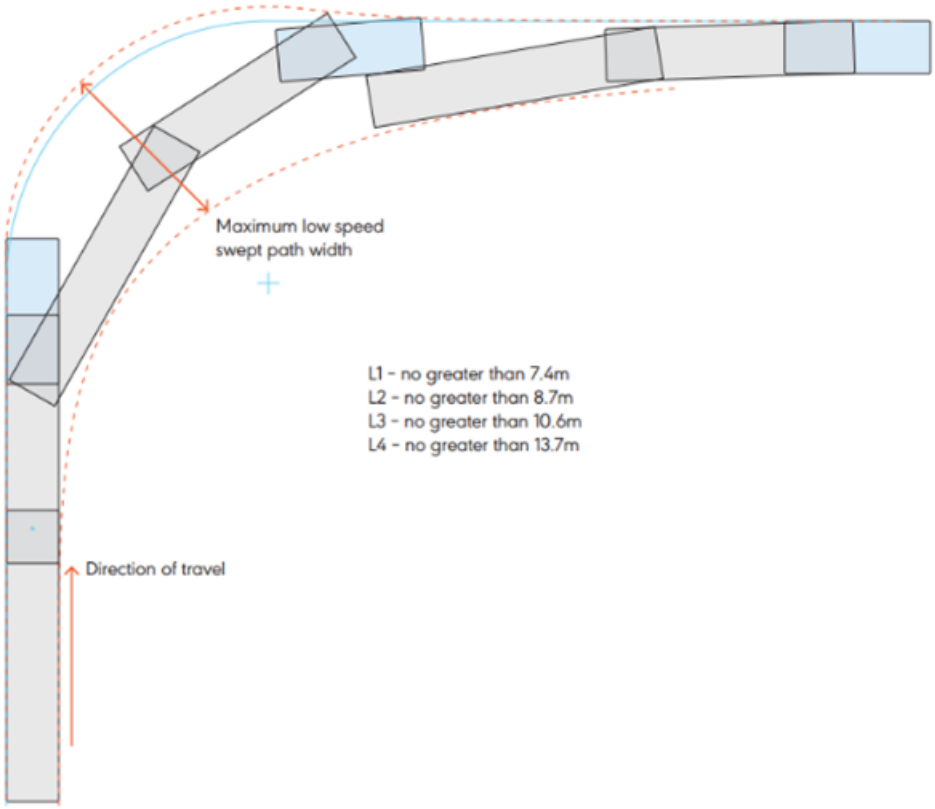
ACCELERATION CAPABILITY

Acceleration Capability is the ability of the vehicle to either accelerate from rest on a road with no grade. The primary purpose of this standard is to manage safety risks associated with travel through intersections and rail crossings by specifying minimum times for a PBS vehicle to accelerate from rest, increase speed and travel specified distances. The PBS vehicle must be able to accelerate from rest and travel 100m on a road with no grade within a specified time.



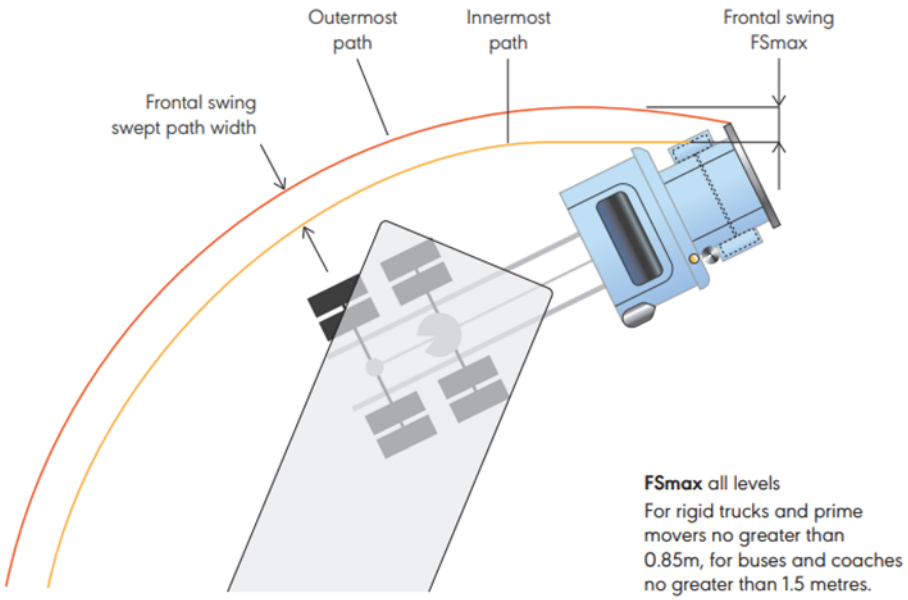
LOW-SPEED SWEPT PATH (LSSP)

LSSP is the maximum width of road space required for a vehicle to complete a 90º low-speed (< 5km/h) turn on a 12.5m radius. When a long vehicle makes a low-speed turn at an intersection, the rear of the vehicle will follow a path that is inside the path taken by the front of the vehicle. Poor LSSP performance may cause the vehicle to encroach into adjacent or opposing lanes, collide with parked or stopped vehicles, damage roadside furniture or endanger pedestrians or its rear wheels may climb the kerb or fall off the edge of the pavement. The primary purpose of this standard is to manage safety risks associated with turns at intersections by limiting the road space required by PBS vehicles making low-speed turns.



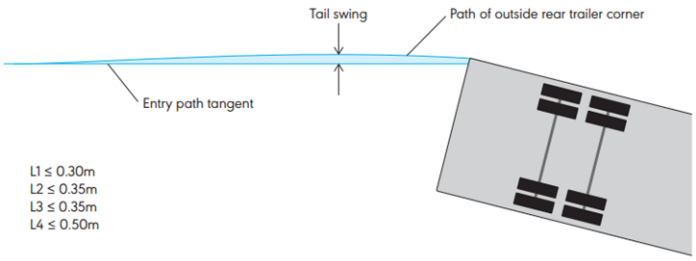
FRONTAL SWING (FS)

FS is the maximum projection of the front overhang of the hauling unit outside the path of the front steering wheel in a prescribed 90º low-speed turn. The primary purpose of this standard is to manage safety risk by limiting the road space required by a PBS vehicle when making a tight turn at low-speed. A large amount of FS is undesirable, as the vehicle might encroach on other lanes, endanger pedestrians or collide with roadside furniture. Maxima of Difference (MoD) and Difference of Maximum (DoM) MoD and DoM relate to the amount by which the front outside corner of a semitrailer swings out beyond that of the path of the hauling unit or preceding semitrailer. MoD is the maximum difference between the swing-out of adjacent vehicle units when performing a low-speed turn. DoM is the difference between the maximum frontal swing-out distances between adjacent vehicle units when performing a low-speed turn.



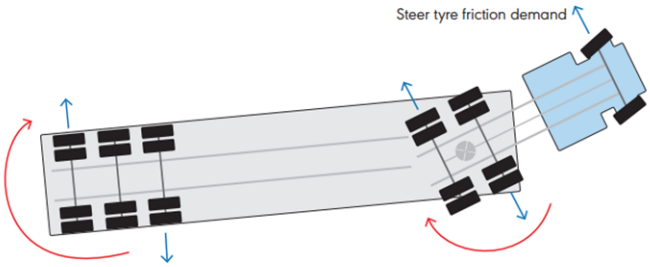
TAIL SWING (TS)

TS is the maximum outward lateral displacement of the outer rearmost point on a vehicle unit during the initial and final stages of a prescribed 90º low-speed turn. TS is typically of more concern in urban areas. Vehicles with significant rear overhang (e.g. route buses or semitrailers) and/or coupling rear overhangs will exhibit significant amounts of tail swing when negotiating tight maneuvers, such as when exiting kerbside pickup areas. The primary purpose of this standard is to manage safety risks by limiting the road space requirement of a PBS vehicle when making a tight turn at low-speed.



STEER TYRE FRICTION DEMAND

Steer Tyre Friction Demand is the proportion of the available friction that is used by the vehicle's steer tyres when performing a low-speed 90° turn. During a small radius turn at low-speed, loss of steering will occur when the available tyre/road friction limit at the steer tyres is exceeded. In this situation, the vehicle will tend to 'plough straight ahead', exhibiting significant heavy understeer and risking low-speed collisions with other vehicles or roadside objects. The primary purpose of this standard is to manage safety risks by limiting the likelihood of a vehicle losing steering control when making a tight turn at low-speed.



CONCLUSION

Comparing Tri Axle Combinations to newer combinations, especially PBS, newer combinations offer several advantages in terms of load distribution, weight distribution, road infrastructure impact, and overall efficiency.

Improved Load Distribution: Newer combinations provide more points of support for the load, distributing weight more evenly across the trailer. This reduces the strain on individual axles and tires, minimizing wear and tear and potentially extending the lifespan of the trailer and road infrastructure.

Enhanced Stability: The additional safety features on newer combinations increase stability, especially when carrying heavy loads. This stability is crucial for PBS applications, where safety is paramount. Reduced sway and improved handling contribute to safer operations on the road.

Reduced Pavement Wear: With the weight distributed across newer suspension units and newer modern equipment, trailers exert less pressure on road surfaces per axle. This can result in reduced pavement wear and tear, leading to lower maintenance costs for road infrastructure over time.

Increased Payload Capacity: Newer combinations can often carry heavier loads compared to tri-axle trailers while still complying with weight regulations. This increased payload capacity can lead to greater efficiency and productivity in PBS applications, where maximizing payload without compromising safety is a priority.

Flexibility in Design: Newer combinations offer greater flexibility in design, allowing for customized configurations to meet the specific needs of different PBS applications. This flexibility enables transportation companies to tailor trailers to suit various cargo types, road conditions, and operational requirements.

Overall, the adoption of newer combinations in PBS applications represents a significant advancement in transportation technology, offering improved stability, efficiency, and compliance with regulatory standards while reducing the environmental impact and preserving road infrastructure.