Submission to: Department of Infrastructure and Transport

Title: Regulation Impact Statement for the National Heavy Vehicle Braking Strategy Phase 1 – Anti-lock Braking Systems

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AUSTRALIAN TRUCKING ASSOCIATION

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1. Introduction

This submission details the views of the members of the Australian Trucking Association's (ATA) Industry Technical Council (ITC) on the proposed changes to the Australian Design Rules (ADR) for Heavy Vehicle Braking Systems released for industry comment.

The ATA is supportive of the general thrust of these changes as they take steps to improve safety that are both sensible and affordable. We have also provided guidance on specific load sensing 'settings' that should be adopted; suggested exemption clauses; and offered detailed comments and recommendations that the ATA believes improves the proposal and strengthens the grounding for taking the next step in the longer term braking strategy. We also provide an updated working draft of the joint industry administrator guide or code that is aimed at supporting these ADR changes (Attachment 1). The ATA is committed to working with governments to improve safety with workable, acceptable and viable solutions.

Anti-lock Brake Systems (ABS), Load Sensing brake systems (LS) and electronic brake systems (EBS) are all currently deployed throughout the trucking industry and the industry is managing resulting complexities. ABS and EBS are often referred to as 'smart' braking systems. Traditional air-operated brake systems in heavy trucks and trailer have accordingly been termed "dumb" braking systems, which is poor testament to the very satisfactory service achieved by a standard, well set-up air brake system. Smart systems are being used in all driving environments in Australia with the exception of trailers with more than four axles, which should remain exempt because the technology is not currently available to provide 'smart' brakes in these unusual applications.

2. Australian Trucking Association

The ATA is the peak body that represents the trucking industry. Its members include state and sector-based trucking associations, some of the nation's largest transport companies, and businesses with leading expertise in truck technology. The ITC advises the ATA General Council on technical policy matters such as the ADR. ITC is the only transport forum where operators and suppliers freely interact on technical matters both operational and policy.

3. Overview

While adopting these rules is not without its challenges for the industry, we believe the benefits are worth the effort involved. Few operators/members disagree with the desired result of trucks and combinations having smart braking systems on all axles of all vehicles.

The changes proposed are designed to prevent or minimise wheel lock in a lightly laden or unladen state. This effect then obviates the likelihood of truck jack-knife or trailer swing.

The challenge is to achieve this in a rational, affordable manner from an historical evidence base that has welcomed technology from many sources yet still achieved some significant safety gains, such as spring-applied parking brakes across all heavy trailers using air controlled brakes.

The road transport industry is a diverse industry in that it operates trucks and trailers in all road environments, from busy urban traffic to freeways and rural highways to unsealed tracks in the outback that are barely formed. We operate some of the heaviest and longest vehicle combinations in the world and even use powered trailers in long multi-combinations. We have also led innovation in long combinations that enhance roll stability and dynamic tracking.

Perhaps the most challenging aspect of this diverse mix of vehicles and applications is that in very many cases, the articulated vehicle fleet's trailers are interchanged with prime movers and other trailers as a matter of routine. Freedom to interchange trailers is an essential element of the industry's viability and productivity that leads the world in road transport efficiency.

So an apparently standard 13.7m long semi-trailer could reasonably appear:

- as a single trailer combination; or
- used in B-double (semi plus A-trailer); or
- B-triple (semi plus 2 * A-trailers); or
- Type 1 road train (two semi-trailers joined by converter dolly); or
- a Type 2 road train (3 semi-trailers joined by two converter dollies); or
- a AB-triple (semi-trailer towing a converter dolly with a B-double trailer set connected); or
- a BAB quad (B-double towing a converter dolly connected to a B-double trailer set); or
- a ABB quad (semi-trailer towing a convert dolly connected to a B-triple trailer set).

All these above are considered modular combinations since they are simply legal connections of legal vehicles. Such combinations are not 'tied combinations', which remain connected together, rather any of the component vehicles can be used in other modular combination provided they have adequate ratings. For easy reference, an *ATA Truck Impact Chart* is enclosed with this submission showing these and other common vehicle types and modular combinations.

The objective of the new ADRs is to reduce the likelihood of wheel lock in the unladen or lightly laden condition thereby, in turn, reducing the likelihood of truck jack-knife and/or trailer swing. This means that eventually, unladen/laden premature wheel lock should disappear on prime movers and trucks and be significantly reduced on trailers when the vehicle "fleet" is totally compliant with the new ADRs. These latest changes are simply an added dimension to that which already exists today, i.e., with disparity in tare masses between trailers within a combination and/or working with one trailer loaded and one empty - industry has been exposed to these issues since the introduction of B-Doubles, Road Trains and Rigid Truck/Dog combinations.

The situation is therefore complex yet brake deficiency-related crashes appear to be few in number in Australia.

However, the standards in the ADRs are not reflective of the technology available to us. Hence, the planned changes set out in these ADR amendments are acceptable since they will ensure the desired outcomes will be achieved in a timely manner. It should be noted the ADRs can only address *single* vehicles, the safe operation of combinations of ADR-compliant vehicles relies upon industry competence and attention to potential inter-operability issues. Industry also has a number of publications to assist stakeholders with this.

The changes to the ADRs improve the unladen and/or lightly laden braking performance of heavy vehicles – many trucks already are supplied with ABS/EBS systems as standard and the industry has been able to adapt trailers for use in combination with them.

However, the new requirement for ABS/LSV on all new trailers means 'mixing' will become more common as operators create combinations by matching 'smart' trailers with older ("dumb") trucks and trailers. This will be true until a time in which vehicles with newer technology make up the majority of the fleet. A joint working group of industry suppliers, user representatives and departmental staff are developing additional guidance materials to support a smooth Phase 1 transition (draft at Attachment 1).

The proposed ADR changes make a sensible move towards the desired ultimate outcome and will ensure the productivity that flows directly from trailer interchange is not lost.

There are some specific comments in Recommendation 2 that address areas where further supportive comments is warranted and some suggested addition policies for consideration outlined in this report aimed at making transition to Phase 2 easier for transport operators.

3.1. Recommendations

Recommendation 1

The ATA recommends the proposed ADR amendments as a sound way to enhance baseline braking capabilities in the trucking industry of tomorrow.

Recommendation 2

The ATA recommends these additional considerations be addressed in the ADR amendments.

1. Auto-slack adjustment must be mandated where ABS or EBS is used, and Anti-lock sensors should be applied as appropriate to the axle group type.
2. Mandating 24 volt ABS/EBS power and "CanBus" signal on tow vehicles rated at more than 50 tonnes GCM.
3. All trailers able to tow another trailer being required to provide plugs and wiring that would support transmission of ABS/EBS power and "CanBus" signal at 24 volts, regardless if conventional SL foundation brakes are use or multi-volt ABS or EBS is fitted.
4. Changing the LS setting outlined in the ADR to that outlined in Attachment 3, and related amendments in attachment 4.
5. ADR amendments need to encompass the fact that powered trailers are in use, and can be expected to become more common over time. Similarly, smart dollies with computer-controlled steer axles are in use and need to be accommodated.
6. Special purpose trailers that are part of heavy load carrying combinations normally controlled by OSOM permits, should be excluded from the scope of ABS and LS provisions of the ADR.

4. Commentary

4.1. Institutional Realities

We are moving forward from a complex mix of vehicles and technologies to a very productive, efficient, industry in which trailer life is much longer than tow vehicle life (Articulated trucks achieve around 10 years, trailer commonly in excess of 15 years) and trailer population exceed tow vehicle population by some 60%.

There is also a cycle of diminishing utilisation with age, however, older trucks and trailers still provide valuable service to the industry and its clients by being available to complete freight tasks that do not support capital-intensive investments. Operators' waiting time in queues is usually unpaid and often lengthy, this means low utilisation which cannot support the high capital cost of equipment. However, due to demand such freight tasks must still be carried out. Hence, older equipment will commonly be used for short runs with long wait times or for low / seasonal use such as that typical of primary producers.

The opposite extreme is 'hire and reward' primary freight tasks in which equipment utilisation is high and trucks and trailers are typically purchased new, and resold before a significant overhaul is required. This means high visibility, high productivity and high demand tasks are undertaken by late model trucks and trailers. Therefore, these trucks and trailers also have relatively high exposure to other road users and due to frequent replacement they provide safety leadership with technology and design-related safety features. Hence, these ADR amendments provide a sensible way to enhance baseline braking capabilities in the trucking industry of tomorrow.

4.2. Heavy Trailers in Combinations

As noted above, the industry has many more trailers than it has tow vehicles. Trailers are often decoupled and coupled again to different tow vehicles, in different combinations, or in a different position inside a combination. This diversity is about flexibility and productivity. It allows trailers to be left with clients for loading and unloading. An operator can use a prime mover with their B-double tipper set one week, and be carting livestock in single semi combination for few days and so on. Some trailers may only be put to work seasonally, or be for special purposes with limited applications such as a low loader load sharing dolly. In

such case there is relatively long time period required for an operator or vehicle owner to achieve a return on their capital investment. Hence, stakeholders realise that in going forward with new technologies, the feature of backwards compatibility with existing fleet vehicles cannot be ignored. This is one reason why a load sensing braking systems alternative is provided for in the proposed ADR changes for trailers.

Load sensing has one key advantage over ABS - LSV needs no electrical signal to operate, it simply sets braking force proportional to vertical loading by mechanical means. This still achieves the aim of reducing the danger of wheel lock up. Hence, it can be readily used to some benefit in other vehicles with both traditional and smart braking systems.

It should be noted that EBS systems revert to traditional air signal controls to activate the foundation brakes when electrical power is absent. In the case of trailers, this will occur if the brake power/control electrical plug is disconnected or unable to be connected.

Recommendation 1

The ATA recommends the proposed ADR amendments as a sound way to enhance baseline braking capabilities in the trucking industry of tomorrow.

4.3. Additional considerations

We offer the following commentary that supports aspects of the ADR amendments should an argument be mounted against them, and also offer some additional concepts for consideration.

1. The ATA believes strongly that:
    a. ABS and EBS and other smart brake systems must use auto-slack adjusters to ensure that automatic cycling from '*On'* to '*Off'* during modulation by the control module does not draw a large amount of foundation brake system air due to poor foundation brake adjustment. Auto-slack adjusters must be mandated where ABS or EBS is used; (Note disc brake assemblies have automatic slack adjustment by design and do not use slack adjusters.) and
    b. Anti-lock sensors should be on both axles of tandems, and two or more axles for tri and quad axle groups. The sensors should be placed to deal safely with any steerable axles in the group.
2. The ATA knows that smart braking systems have been working successfully in long combinations in very harsh environments, but simple electrical physics shows that systems with higher initial voltages and sound wiring will be more likely to provide durable service as wiring length and each connection provide opportunity for degradation of performance over time. Hence, we believe consideration should be given to mandating 24 volt ABS/EBS power and "CanBus" signal on tow vehicles rated at more than 50 tonnes GCM.
3. Similarly, consideration should be given to all trailers capable of towing another trailer being required to provide plugs and wiring to support transmission of ABS/EBS power and "CanBus" signal at 24 volts, regardless if conventional SL foundation brakes are use or multi-volt ABS or EBS is fitted.
    a. This better prepares industry for Phase 2, facilitates a future with far more available trailers and enables smart braking to be achieved on the last trailer in multi-combination vehicles.
    b. One reason is that we expect Phase 2 EBS for trailers to require roll stability assist, and it is well known the rear trailer has potential to receive the most 'excitement' from driver steer input or from road surfaces, hence it benefits the most from having roll stability assist operational.
    c. As noted above, ABS and other smart braking (eg EBS) systems revert to dumb trailers when electrical power is absent. In the case of trailers, this will occur if the brake power/control electrical plug is disconnected or unable to be connected. Hence, there is strong merit in ensuring such connections are more widely available in future to support transition to Phase 2 smart brakes for all new vehicles.

4. The ATA seeks to change the LS setting outlined in the ADR, so that axles with tare weights of 2500 kg or more, are effectively within the bands without signal pressure modulation through LS. Supporting engineering material is provided in **Attachment 3**. A related suggested exemption clause is also attached at **Attachment 4**.
5. The ADR amendments need to acknowledge the fact that powered trailers are currently in use, and likely to become more common over time. Similarly, smart dollies with computer-controlled steer axles are in use, and the ADR should encompass these designs.
6. In the truck ADR amendments there is a limit on application that relates to the number of axles fitted. This is acceptable to industry. However, in practice a similar exclusion is required for special trailers that use axle groups with rows of eight tyres or are load-sharing dollies for OSOM low loader combinations, or are five axle platforms or more with detachable axles in platform trailers. These special purpose trailers that are part of heavy load carrying combinations normally controlled by OSOM permits should be excluded from the scope of ABS and LS provisions of the ADR.

Recommendation 2

The ATA recommends these additional considerations be addressed in the ADR amendments.

1. Auto-slack adjustment must be mandated where ABS or EBS is used, and Anti-lock sensors should be applied as appropriate to the axle group type.
2. Mandating 24 volt ABS/EBS power and “CanBus” signal on tow vehicles rated at more than 50 tonnes GCM.
3. All trailers able to tow another trailer being required to provide plugs and wiring that would support transmission of ABS/EBS power and “CanBus” signal at 24 volts, regardless if conventional SL foundation brakes are use or multi-volt ABS or EBS is fitted.
4. Changing the LS setting outlined in the ADR to that outlined in Attachment 3, and related amendments in attachment 4.
5. ADR amendments need to encompass the fact that powered trailers are in use, and can be expected to become more common over time. Similarly, smart dollies with computer-controlled steer axles are in use and need to be accommodated.
6. Special purpose trailers that are part of heavy load carrying combinations normally controlled by OSOM permits, should be excluded from the scope of ABS and LS provisions of the ADR.

5. Conclusion

After close examination of the proposals, the ATA concludes that the proposed ADR amendments should go ahead and seeks that policy consideration be given to the points raised in the recommendations.