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Title:	A national framework for modular B-triple operations
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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 (ATA) on the NTC paper *"A national framework for modular B-triple operations"* released for public comment in August 2011.

Australia's freight task is forecast to increase significantly in coming decades, with some predictions indicating a doubling of the 2010 task by 2030. Accordingly, the ATA is committed to working with governments and the NTC to improve the transport industry's productivity, safety, and environmental performance. The ATA supports the NTC's objectives in this regard, which will result in fewer freight vehicles, reduced total kilometres travelled, reduced carbon emissions and freight being carried by modern, safer vehicles. The key outcome from these objectives is a positive impact on road safety, leading to reduced deaths and injuries.

The paper is positive and promising, with outcomes that align with the ATA's views. We welcome the chance to provide further access for modular B-triples, and to increase the use of these longer, safer, more productive combinations. The ATA endorses this paper, in particular the Executive Summary, which is a strong reflection of industry's desire for productive policies.

The ATC first signed off on B-triple routes in 2007, and directed the NTC to work with industry to identify the next routes for expansion. Now, four years later, the ATA encourages governments to support this paper and further embrace modular B-triples in Australia.

2. Australian Trucking Association

The ATA was originally established in 1989 as the Road Transport Forum and is the peak national body uniting and representing the interests of the Australian trucking industry.

The Australian Trucking Association is the peak body representing trucking operators. The ATA's direct members include state and sector trucking associations, some of Australia's major logistics companies and businesses with leading expertise in truck technology.

3. Recommendations

3.1. Recommendations

Recommendation 1

That governments endorse a nationally agreed modular B-triple network that can be extended beyond road train areas to include a strategic inter-capital network.

Recommendation 2

Further, that governments endorse modular B-triples as the national specification, whereby a reconfigured combination forms a complying B-double combination.

Recommendation 3

That modular B-triples be provided access to all Type 1 and Type 2 Road Train networks, and other roads that are physically and safely able to accommodate modular B-triples.

Recommendation 4

That governments cooperate with the NTC and each other to enable the two NTC objectives regarding modular B-triples to be achieved.

Recommendation 5

That governments acknowledge modular B-triples are not new to Australian roads and therefore do not require registration to the Performance Based Standards scheme.

Recommendation 6

That governments endorse the modular B-triple specification to allow a complying B-double to be created using either the first or second trailer in combination with the third trailer, without requiring the combination to be registered under the PBS scheme.

Recommendation 7

That a modular B-triple combination does not exceed 35 metres in total length, with the maximum king-pin to rear dimension being 29.6 metres.

Recommendation 8

That governments work cohesively to achieve the COAG objective of 2006 of a national network and operating conditions specific to modular B-triples.

Recommendation 9

That modular B-triples be treated as Class 2 vehicles and operate under notice. The ATA further recommends that drivers of modular B-triples not be required to carry the notice when driving a modular B-triple combination.

Recommendation 10

That ministers support the policy proposal that IAP participation is not made a requirement to operate modular B-triples.

Recommendation 11

That governments and road agencies undertake positive advertising campaigns to alert the public to the increased visibility of modular B-triples to counter any potentially negative media reporting.

Recommendation 12

That support be given to enhanced licensing trials to provide additional assurance to the community that drivers of modular B-triples, and in fact all large vehicles, are adequately trained.

Recommendation 13

That governments acknowledge the benefits provided by modular B-triples including the improved safety elements, increased productivity, and reduced carbon emissions..

Recommendation 14

That ministers support the cost-benefit analysis of the NTC's national framework for modular B-triple operations paper.

Recommendation 15

That governments work to implement the modular B-triple framework in a timely manner to ensure the benefits noted in the paper are achieved at the earliest opportunity.

4. Commentary

4.1. Introduction

B-doubles have carried the lion's share of freight in Australia since their inception in the early 1990s. A common sight on today's roads, on their introduction these innovative vehicles were touted as being the answer to the ever-increasing freight task. Despite initial negative media and public perception, B-doubles have proven themselves as the work horse of the industry, while improving safety outcomes through inherent better stability and reduced numbers of semi-trailers on the road. It takes a B-double just 26 trips to move 1,000 tonnes, compared to a staggering 42 semi-trailers for the same mass.

With the increase in the freight task expected to double by 2030, Australia is ripe for another "B-double" type combination that can provide improved safety outcomes, better environmental outcomes, and of course, improved productivity. The modular B-triple has the potential to be that vehicle.

A modular B-triple is a prime mover towing two A-trailers and a semi-trailer. To ensure the combination is optimised when it is reconfigured, the length of the trailers should allow a complying B-double to be created in each case. See examples shown below where the A-trailers have been reconfigured with the semi-trailer, to form complying B-double combinations.

B-triple

B-double using first A-trailer and the semi-trailer from the B-triple combination

B-double using the second A-trailer and the semi-trailer from the B-triple combination

As identified in the NTC's paper, the main issue that currently prevents modular B-triples from operating at their optimum is the inconsistent regulations in each state and territory. This issue must be addressed to allow the use of modular B-triples to provide benefit to the Australian economy. Burdening operators with the requirement to fit costly government monitoring devices, or requiring the driver to unhook one of the trailers and complete, effectively, two trips that could easily have been completed in one trip is counter-productive.

Recommendation 1

That governments endorse a nationally agreed modular B-triple network that can be extended beyond road train areas to include a strategic inter-capital network.

Recommendation 2

Further, that governments endorse modular B-triples as the national specification, whereby a reconfigured combination forms a complying B-double combination.

Recommendation 3

That modular B-triples be provided access to all Type 1 and Type 2 Road Train networks, and other roads that are physically and safely able to accommodate modular B-triples.

4.2. Vehicle modularity and related technical terms

The modular B-triple offers benefits over the type 1 road train in a number of areas. Firstly, a modular B-triple can carry more at general mass limits than a type 1 road train. This means that there are fewer trips required to move the same amount of freight. The obvious benefit of this is there are fewer trucks on our roads.

Secondly, because a modular B-triple uses “B” type couplings rather than “A” type couplings, the combination is more stable and less likely to react during an emergency steering manoeuvre. This means improved safety outcomes, with heavy vehicle rollovers less likely to occur.

Modular B-triples are more versatile in the number of combinations able to be reconfigured. This has the potential to improve the productivity of the freight task, while providing additional stabilising benefits to the combination, thus providing the additional benefit of safety improvement.

Type 1 road trains serve the industry well and continue to provide a very important freight vehicle for certain freight tasks. Many of these tasks include travel on secondary, remote area roads, and in many cases, roads that are of basic forming (ie: a track made with a grader). It is a simplistic process to compare type 1 road trains with modular B-triples due to the similar mass limits. One uses “B” type couplings, the other uses “A” couplings. One can carry more freight, one can carry less freight. Most obviously, one has two trailers and one has three trailers. It is, however, more solid to apply an engineering process when comparing these vehicles. The NTC has completed a sound assessment of the two combinations using proven engineering modelling, backed up with demonstrated positive safety and productivity experience in state based operations over some 15 years.

4.3. The regulatory proposal and its alternatives

The NTC identified two objectives in the framework paper. The first objective is as follows:

> *To approve a 2011 national B-triple network that is the same as the Type 1 road train network, plus additional routes approved by a state, territory or local government authority, by considering B-triple productivity, safety and infrastructure impacts and comparing with A-double productivity, safety and infrastructure impacts as appropriate.*

The ATA supports this objective. It is important that governments work cohesively to deliver a national policy that encourages interstate operations. Modular B-triples have the ability to move large amounts of freight great distances, and the benefits of consistent jurisdictional policies and legislation relating to modular B-triples is essential for their success.

The NTC’s second objective is as follows:

> *To approve a single national B-triple vehicle specification and operating conditions based on the modular use of new or existing standard B-double trailer equipment.*

While the ATA supports this objective also, it is important to remember that some operators presently utilise non-modular B-triples. These vehicles provide their own benefits, however, it is not expected they would participate in this framework, as they are not-modular combinations and do not satisfy the same performance outcomes that modular B-triple combinations do. In particular they have a larger swept path and are not suitable for access on the some routes that modular B-triples would be. Having said that, they have operated safely in some states and should be allowed to continue to do so. This means it is important to communicate what is an acceptable modular B-triple, for use on the national B-triple framework under notices.

The Performance Based Standards (PBS) scheme has provided opportunities for new and innovative vehicles to be developed, however B-triples should not be considered ‘new and innovative’. Modular B-triple combinations utilise existing trailer stock and have been operating for many years, and therefore could hardly be called ‘new and innovative’. B-triples in Victoria have operated on a designated route between Geelong and Campbellfield for Ford Motor Company for around 14 years. B-triples have also operated for a number of years also in Queensland, WA, SA, NT and even New South Wales without being registered as PBS vehicles.

Recommendation 4

That governments cooperate with the NTC and each other to enable the two NTC objectives regarding modular B-triples to be achieved.

Recommendation 5

That governments acknowledge modular B-triples are not new to Australian roads and therefore do not require registration to the Performance Based Standards scheme.

4.4. Modular B-triple specification

The explanation provided in the B-triple framework paper is clear, and the ATA supports the direction taken by the NTC regarding the specification. The specification ensures maximum use can be made of existing trailer stock, while allowing compatible B-doubles to be created when reconfigured. By ensuring the prime mover complies with the requirements for a 26-metre B-double, the safety benefits are enhanced again, providing such improvements as front underrun protection and anti-lock braking systems (ABS).

The ATA agrees with the NTC's paper that a modular B-triple combination should have a maximum overall length of 35 metres, with the maximum king-pin to rear dimension being 29.6 metres.

Recommendation 6

That governments endorse the modular B-triple specification to allow a complying B-double to be created using either the first or second trailer in combination with the third trailer, without requiring the combination to be registered under the PBS scheme.

Recommendation 7

That a modular B-triple combination does not exceed 35 metres in total length, with the maximum king-pin to rear dimension being 29.6 metres.

4.5. Network access and implementation

The formally approved national B-triple network that was endorsed by ATC in 2007 did not include all Type 1 road train routes. Additional research has indicated there is no reason not to include the Type 1 road train routes, and in fact this would further assist in the update and utilisation of modular B-triples across the industry.

The regulatory proposal, to treat modular B-triples as Class 2 vehicles under notice, is consistent with the way B-doubles are treated. The driver of the modular B-triple should not be required to carry the notice, and this is the intent under the future National Heavy Vehicle Regulator and its legislation. This also means there is no additional regulatory burden than what B-doubles are subject to at present.

The Intelligent Access Program (IAP) was conceived as a tool to assist government in managing sensitive infrastructure. Unfortunately, some jurisdictions have become overly excited by the potential of IAP, and have made it an inconsistent operating condition for certain modular combinations (such as B-doubles and semi-trailers with road friendly suspension operating at higher mass limits) when there is no increased risk to infrastructure. It should be noted that type 1 road trains are not required to fit IAP anywhere in Australia, even though they may also be at risk of travelling on non-approved routes and may or may not be fitted with road friendly suspension.

The ATA has done a great deal of work to identify the lack of need for IAP on all modular combinations, not just B-triples. There is simply no evidence that drivers of B-triples, or B-doubles and semi-trailers at higher mass limits, are any more inclined to travel off-route than drivers of type 1 road trains. The ATA agrees with the policy proposal that IAP participation is not made a requirement under this proposed national policy.

Recommendation 8

That governments work cohesively to achieve the COAG objective of 2006 of a national network and operating conditions specific to modular B-triples.

Recommendation 9

That modular B-triples be treated as Class 2 vehicles and operate under notice. The ATA further recommends that drivers of modular B-triples not be required to carry the notice when driving a modular B-triple combination.

Recommendation 10

That ministers support the policy proposal that IAP participation is not made a requirement to operate modular B-triples.

4.6. Productivity analysis

As noted in the NTC's paper, the productivity benefits of modular B-triples for all freight densities are compelling. When heavy vehicles carry mass-constrained freight, modular B-triples are able to carry more than a type 1 road train or a semi-trailer, meaning more efficient use of the fleet. For volume-constrained freight, modular B-triples offer a 5% payload volume increase over the type 1 road trains, and a 55% payload increase over semi-trailer combinations.

For operation on B-double routes, modular B-triples can be broken down into B-double combinations, meaning an improvement in productivity when compared to semi-trailers. Therefore, regardless of the freight density, modular B-triples are more productive than semi-trailers or type 1 road trains. In time, some B-double routes may be determined as suitable for B-triple travel, further increasing productivity gains.

4.7. Safety analysis

B-triples are inherently safer to operate than type 1 road trains or semi-trailers, especially when considering heavy vehicle rollover tendencies. The "B" coupling used in B-triples ensures the combination is more stable and less likely to rollover when involved in an emergency steering manoeuvre. The type 1 road train uses an "A" coupling between the trailers, hence the term "A-double". However, this type of coupling is less rigid and more vulnerable to rollover forces when involved in an emergency steering manoeuvre.

The other safety benefit arising from the increased use of modular B-triples is fewer heavy vehicles on our roads. Modular B-triples can carry more freight, therefore less vehicles would be needed to address the freight task. For example, if 20 modular B-triples can move the same amount of freight as 42 semi-trailers, this equates to 22 less vehicles on our roads.

The safety analysis conducted by ARRB Group Ltd found that modular B-triples significantly exceed the safety benchmarks set by the PBS levels and the conventional type 1 road train performance. Therefore, from a safety management perspective there is nothing to be gained from requiring modular B-triples to be registered with the PBS scheme, as they out-perform the type 1 road train.

4.8. Infrastructure impact analysis

While it is obvious that a modular B-triple can carry more mass than a type 1 road train or a B-double, what is notable is the amount of trips required and impact on infrastructure to complete the same freight task.

The Australian Trucking Association, in conjunction with Barkwood Consulting Pty Ltd, created a Truck Impact Chart which compares different combinations at different mass limits. This Chart is attached at Appendix A, and the tables following have used data taken from that Chart.

It must be remembered that damage to roads is caused by axle weights, not by a vehicle's gross mass. Axle weights and impact are measured by equivalent standard axles, or ESAs. These are a comparative measure of road impact and the passage of a standard axle across that road. It is a complex calculation, however, it is commonly used by road designers and bridge engineers to determine the damage certain types of vehicles can cause. The vehicles listed in the table following have had the ESAs calculated in the three columns on the right. The percentages in the headings of the columns refer to the amount of load a vehicle has.

			Load Status		
			0%	50%	100%
Vehicle Type	**GCM (tonnes)**	**Payload (tonnes)**	**Calculated ESA's 4th Power**		
Six Axle Artic GML	42.5	24.13	1.14	2.03	4.96
B-double GML	62.5	38.93	1.15	2.24	6.34
B-triple GML	82.5	52.44	1.16	2.51	7.72
Type 1 R/train GML	79.0	47.77	1.20	2.77	8.41

This table shows, quite rightly, that a six axle articulated truck (semi-trailer) has less impact than a modular B-triple, and the modular B-triple has less impact than a type 1 road train. However, this is only for one journey, or pass, across the infrastructure. When looking at ESAs for a particular freight task, the figures become quite different. For example, to move 1,000 tonnes of freight, it takes a modular B-triple only 20 trips, whereas it takes the semi-trailer 42 trips. This is more than double the number of trips across the infrastructure, which increases the exposure to the ESA impact. The outcome, shown in the table below, shows a very different story.

Vehicle Type	GCM (tonnes)	Payload (tonnes)	No Trips per 1,000 tonnes	ESA's per 1,000 tonnes
B-triple GML	82.5	52.44	20	178
B-double GML	62.5	38.93	26	195
Type 1 R/train GML	79.0	47.77	21	202
Six Axle Artic GML	42.5	24.13	42	257

This table shows that, because a modular B-triple can carry more freight and takes less trips to complete the task, it has less impact than a six axle articulated vehicle (semi-trailer). In fact, by using a modular B-triple to complete the freight task rather than the semi-trailer, the infrastructure is subject to around 30% less impact. When comparing the modular B-triple to the type 1 road train, the infrastructure is subject to around 11% less impact.

The benefit of using a modular B-triple compared to a semi-trailer in relation to infrastructure is quite obvious in that over time less maintenance and repair would be required, saving valuable tax dollars and enabling road expenditure to be directed where it is needed most.

Austroads uses a different approach, known as the “Green Line” which is a statistical model. While this approach has not been endorsed by the NTC, and is not supported by the ATA, two road authorities rely on this approach to assist them with PBS road access decisions. The “Green Line”, however, still clearly identifies that a modular B-triple satisfies the requirement of this approach, and therefore road agencies and road managers should have little reason to argue when considering increasing access to modular B-triples.

4.9. Community acceptance

The introduction of the B-double to Australia in the 1990s saw some wild and deliberately frightening media coverage, with stories such as “B-doubles cannot go backwards” being used to create fear in the community. When revisited some twenty years later, these media clippings today seem laughable. B-doubles are now widely accepted on our roads, with the understanding that they play a very significant part in our freight movements around Australia.

B-triples are already on some of our roads; the only difference with the implementation of further access will be that they will now be seen by more people. The media play a huge part in the perception of trucks. Negative reporting by media outlets generates fear in the community, who for the most part would not be able to identify a B-triple as being different to a B-double if they passed it on a freeway.

It should be noted that B-triples will not be seen on quiet suburban streets. The framework paper clearly identifies that there would be staging areas available on the outskirts of our major cities to enable the modular B-triples to be reconfigured to smaller combinations. The ATA recommends that governments and road agencies undertake positive advertising campaigns to alert the public to the increased visibility of these combinations to mitigate the potential media beat-up that may surround the introduction of modular B-triples into new areas. B-triples are about making the industry safer, and this must be the message from road agencies.

The NTC's survey in 2010 found that:

> *In most cases, trucks are not a 'top of mind' concern to everyday drivers and less so for weekend drivers.*

The findings from the survey are clear that the concern is more about how vehicles are driven; the community wants assurance that people who drive large vehicles are well trained, professional, and seen to be doing the right things when they are driving.

Modular B-triples will be driven by people who have a higher qualification than that required to drive semi-trailer combinations. The additional work being done to improve licensing and training of drivers, through an enhanced licensing trial about to be conducted by VicRoads, will also provide additional comfort that people who drive modular B-triples and other large vehicles are appropriately trained.

Recommendation 11

That governments and road agencies undertake positive advertising campaigns to alert the public to the increased visibility of modular B-triples to counter any potentially negative media reporting.

Recommendation 12

That support be given to enhanced licensing trials to provide additional assurance to the community that drivers of modular B-triples, and in fact all large vehicles, are adequately trained.

4.10. Cost-benefit analysis

The cost-benefit analysis completed by the NTC is encouraging. The summary, which shows the benefits based on a median take up of modular B-triples, shows total monetised savings to be in the vicinity of $1.1 billion Net Present Value (NPV). These savings are based on costing assumptions that access will be limited to road train routes, and that there is no additional cost to operators, such as IAP.

Considering that the network for modular B-triples could be further extended, as planned in the NTC's paper, there is a very real scenario that the benefits may significantly exceed this NPV. The additional uptake of modular B-triples as the network is widened will also provide additional benefits. The ATA's chief concerns are safety, productivity, and environmental. This is addressed by having at least 1,000 fewer heavy vehicles on the roads, 1 billion fewer vehicle kilometres, 25 fewer road fatalities, and over 1 million fewer tonnes of CO_2 emissions. Unquestionably, modular B-triples are an ideal solution.

Recommendation 13

That governments acknowledge the benefits provided by modular B-triples including the improved safety elements, increased productivity, and reduced carbon emissions..

Recommendation 14

That ministers support the cost-benefit analysis of the NTC's national framework for modular B-triple operations paper.

Recommendation 15

That governments work to implement the modular B-triple framework in a timely manner to ensure the benefits noted in the paper are achieved at the earliest opportunity.

5. Conclusion

The ATA supports the NTC's objectives:

> *To approve a single national B-triple vehicle specification and operating conditions based on the modular use of new or existing standard B-double trailer equipment.*
>
> *To approve a 2011 national B-triple network that is the same as the Type 1 road train network, plus additional routes approved by a state, territory or local government authority, by considering B-triple productivity, safety and infrastructure impacts and comparing with A-double productivity, safety and infrastructure impacts as appropriate.*

While B-doubles have carried the lion's share of freight in Australia, the modular B-triple has the potential to approach the B-double's popularity. The ability to reconfigure a B-triple into many other modular combinations increases its appeal and usability.

With that increased usage, governments, road agencies and road managers will need to work together to extend the proposed B-triple network beyond road train areas and provide strategic inter-capital networks. This will in turn provide further benefits as modular B-triple use is increased, with less heavy vehicles on our roads. It is very important that local governments in particular are aware of this reality.

The specification of a modular B-triple is also important. It is vital that when reconfigured the new vehicle forms a legal combination. Drivers need to have confidence that the vehicle they have reconfigured is a legal combination, without the need to carry around a tape measure. The proposal that modular B-triples do not exceed 35 metres is in keeping with the intent that reconfigured modular B-triples may form compliant B-doubles.

This paper has been written about modular B-triples and compares these to type 1 road trains, as this is obviously the closest vehicle in capacity to a modular B-triple. However, it needs to be made very clear that this policy proposal is not about replacing type 1 road trains. Modular B-triples are able to provide an alternative to road trains, which have their own place in Australia's freight task.

The regulatory proposal put forward by the NTC through its two objectives is supported by the ATA, as is the finding that the alternative approaches, such as PBS and IAP, are just not appropriate or necessary in this instance. Modular B-triples use existing trailer stock and prime movers, which hardly makes them new or innovative. The impact on infrastructure is actually less than a type 1 road train, combinations that are not subject to costly IAP. Therefore, there would be no need to force operators of modular B-triples to become registered with IAP.

Network access to include all type 1 road train routes is sensible, and there are additional roads, such as the Hume Highway, that would provide an excellent platform for modular B-triple use. Modular B-triples should operate under notice as a Class 2 vehicle, just like B-doubles. The impact to infrastructure is well within acceptable limits to access the roads identified by the NTC's paper, and local and state governments can access the benefits identified in the paper by providing consideration to the most appropriate roads for these vehicles.

Again, it is important that governments, both local and state, work to inform their constituents in a positive way that modular B-triples may become more visible on their roads. Promoting the safety, productivity and environmental benefits of modular B-triples will assist in preventing some of the negative media that is often associated with longer, safer combinations.

The ATA supports the NTC's *A national framework for modular B-triple operations* and encourages ministers to adopt the policy proposals, providing a stronger framework for Australia's future freight transport task.

Appendix A - The ATA and Barkwood Consulting Pty Ltd Truck Impact Chart

The ATA and Barkwood Consulting Pty Ltd have developed a Truck Impact Chart that clearly demonstrates a number of different heavy vehicle combinations and covers GCM, payload, the equivalent standard axles (ESAs) for each vehicle combination, being the measure by which impact of a truck on the road is measured, the amount of trips required to move 1,000 tonnes of freight, the amount of fuel required to move 1,000 tonnes of freight, emissions and driver requirement. The information provided in the tables throughout this document is taken from the Truck Impact Chart.

The Truck Impact Chart has been reviewed RTA's Senior Pavement Engineer, Ravindra Prathapa. The Truck Impact Chart has also been separately peer reviewed by Bob Pearson, Pearson Transport Resources, and was referred to by TheCIE in the Benefit/Cost Analysis for the National Heavy Vehicle Regulator draft Regulatory Impact Statement, released in February 2011.

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This document has been prepared to assist operators and road asset managers in assessing the merits of utilising larger vehicle combinations in a transport task.

The assessment process assumes that the vehicle is dedicated to a specific task, operating travel being 50% unladen and 50% laden. The task relativities are 1000 tonnes with a lead of 1000 kilometres.

Equivalent Standard Axles:	ESA's are calculated by the average of the sum of ESA's for zero load (empty) plus ESA's for 100% load and multiplied by the number of trips as required for the transport task.
Vehicle tare weights:	Are predictions based on the averages for a range of equipment within each combination category. These estimates have been reviewed by a number of operators and confirmed as being representative of "real" vehicles of the category.
Fuel consumption estimates:	Are predictions based on accumulated averages where operation is nominally 50% unladen and 50% laden. Actual consumption will vary with operating conditions.
Emissions:	Reference is based on total fuel consumption only.
20 metre 7 axle Truck & Dog:	The maximum allowable mass limits for this combination at either CML or HML (for standard combination) is 55.5 tonnes.
19 metre 7 Axle B-double:	The maximum allowable mass limits for this combination at either CML or HML (for standard combination) is 55.5 tonnes.
B-triple:	Consists of a complying B-double with an additional complying leading trailer.
Converter Dolly:	All combinations utilizing a converter dolly are configured with a tandem axle. The configured vertical imposed loading of a 6x4 prime mover is similar to the allowable imposed vertical loading of a tandem axle converter dolly.
AB-triple:	Consists of a complying B-double with an additional complying road train leading trailer and a complying converter dolly.
BAB-Quad:	Consists of a complying B-double with an additional complying converter dolly and additional complying set of B-double trailers.

AUSTRALIAN TRUCKING ASSOCIATION Truck Impact Chart June 2010

	GCM	Payload	Load Status 0%	Load Status 50%	Load Status 100%	No Trips per 1000 tonnes	ESA's per 1000 tonnes	Nom Fuel / 100k	Fuel Required per 1000k	Driver Requirement	Overall Length (metres)	Low Speed Swept Path (metres)	Referenced Static Roll Stability	High Speed Dynamic Tracking	Emissions / 1000 tonnes
			Calculated ESA's 4th Power												
Two Axle Rigid GML	15.0	7.00	0.42	1.18	3.00	143	490	23	65780	186%	<12.5 metres	General Access Vehicles			153%
Two Axle Rigid Euro4	15.5	7.63	0.43	1.34	3.57	132	529	23	60720	171%	<12.5 metres				141%
Three Axle Rigid GML	**22.5**	**13.12**	**0.51**	**1.27**	**3.58**	**77**	**316**	**28**	43120	**100%**	**<12.5**				**100%**
Three Axle Rigid Euro4	23.0	13.69	0.53	1.46	4.16	74	347	28	41440	96%	<12.5 metres				96%
Six Axle Artic GML	42.5	24.13	1.14	2.03	4.96	42	257	47	39480	55%	19.0				92%
Six Axle Artic HML (RFS)	45.5	27.13	1.14	2.03	4.96	37	226	50	37000	48%					86%
Six Axle Artic CML (Non-RFS)	43.5	25.13	1.14	2.07	5.29	40	258	48	38400	52%					89%
Six Axle Artic HML (Non- RFS)	45.5	27.13	1.14	2.18	6.05	37	267	50	37000	48%					86%
Truck & Dog (6 Axle - 45T)	45.0	30.09	1.10	1.93	5.74	34	233	49	33320	44%	19.0				77%
Truck & Dog (6 Axle - NSW)	48.0	33.09	1.10	2.08	7.13	31	256	49	30380	40%	19.0				70%
Truck & Dog (7 Axle)	50.0	34.19	1.10	1.89	5.57	30	201	51	30600	39%	19.0				71%
Truck & Dog (20M - PBS)	55.5	38.69	1.10	2.18	7.71	26	230	53	27560	34%	20.0				64%
Truck & Dog (20M PBS CML)	57.0	40.19	1.10	2.27	8.50	25	241	55	27500	32%					64%
19M B.double GML	55.5	35.66	1.10	2.12	7.71	29	256	53	30740	38%	19.0				71%
19M B.double CML & HML	57.0	36.20	1.10	2.20	8.50	28	269	55	30800	36%					71%
B.double GML	62.5	38.93	1.15	2.24	6.34	26	195	62	32240	34%	26.0	8.9			75%
B.double HML (RFS)	68.0	44.43	1.15	2.24	6.34	23	173	65	29900	30%					69%
B.double CML (Non-RFS)	64.5	40.93	1.15	2.34	7.00	25	204	63	31500	32%					73%
B.double HML (Non - RFS)	68.0	44.43	1.15	2.50	8.26	23	217	65	29900	30%					69%
B-triple GML	82.5	52.44	1.16	2.51	7.72	20	178	68	27200	26%	35.0	10.6	Approximately same as equivalent B-double	Better than Type 1 R/train	63%
B-triple HML (RFS)	90.5	60.44	1.16	2.51	7.72	17	152	72	24480	22%					57%
B-triple CML (Non-RFS)	84.5	54.44	1.16	2.60	8.34	19	181	69	26220	25%					61%
B-triple HML (Non-RFS)	90.5	60.44	1.16	2.88	10.47	17	198	72	24480	22%					57%
AB-triple GML	99.0	64.20	1.18	2.90	9.78	16	176	75	24000	21%	42.5	11.2	Better than Type 1 R/train	Better than Type 1 R/train	56%
AB-triple HML (RFS)	107.5	72.70	1.18	2.90	9.78	14	154	79	22120	18%					51%
AB-triple CML (Non-RFS)	101.0	66.20	1.18	3.00	10.47	16	187	76	24320	21%					56%
AB-triple HML (Non-RFS)	107.5	72.70	1.18	3.30	12.80	14	196	79	22120	18%					51%
Type 1 R/train - GML	79.0	47.77	1.20	2.77	8.41	21	202	68	28560	27%	36.5	10.3			66%
Type 1 R/train - HML (RFS)	85.0	53.77	1.20	2.77	8.41	19	183	72	27360	25%					63%
Type 1 R/train - CML (Non-RFS)	81.0	49.77	1.20	2.88	9.12	21	217	69	28980	27%					67%
Type 1 R/train - HML (Non-RFS)	85.0	53.77	1.20	3.08	10.59	19	225	72	27360	25%					63%
Type 2 R/train - GML	115.5	71.41	1.26	3.51	11.85	15	197	80	24000	19%	53.5	13.7			56%
Type 2 R/train - HML (RFS)	124.5	80.41	1.26	3.51	11.85	13	171	83	21580	17%					50%
Type 2 R/train - CML (Non-RFS)	117.5	73.39	1.26	3.61	12.55	14	194	81	22680	18%					53%
Type 2 R/train - HML (Non-RFS)	124.5	80.41	1.26	3.98	15.12	13	214	83	21580	17%					50%
BAB Quad - GML	119.0	77.37	1.21	3.20	11.16	13	161	81	21060	17%	51.5	12.4	Better than Type 2 R/train	Better than Type 2 R/train	49%
BAB Quad - HML (RFS)	130.0	88.37	1.21	3.20	11.16	12	149	85	20400	16%					47%
BAB Quad - CML (Non-RFS)	121.0	79.37	1.21	3.30	11.82	13	170	82	21320	17%					49%
BAB Quad - HML (Non-RFS)	130.0	88.37	1.21	3.72	15.01	12	195	85	20400	16%					47%

For further information contact ATA on 02 6253 6900

The B-triple; AB-triple; & the BAB-Quad are based on modular vehicle units as agreed by ATA General Council.

* The data in this table is provided for general information and does not take into account your specific circumstances. You should obtain professional engineering advice before taking action.