

HEAVY VEHICLE DIMENSIONS -
BACKGROUND TO PROPOSED LEGISLATION

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SYNOPSIS

This paper provides a descriptive background to some important effects of the recently proposed new size limits for heavy trucks. The paper does not provide full details of the proposed limits, nor differences from the existing limits. The existing limits are already well known, and the new proposals have been distributed and discussed widely within the roading and transport industries during the past two years.

The reasons that certain size limits changes are being made are discussed, including possible implications for roading and vehicle operations of the future.

These implications of the size limit changes need to be recognised and understood by roading and transport administrators, operators and engineers, and allowed for in future decision making.

1. THE INTRODUCTION OF THE NEW SIZE LIMITS

Proposals were circulated to interested parties for comment in December 1985 (1), modified in response to comments, circulated again in June 1986 (2), and finalised in early 1987 in the form shown in Appendix I. The Ministry of Transport is already allowing the use of vehicles built to the new dimensions, pending the drafting of the regulations amendments needed. "New Size Limit Permits" have been available for vehicles and combinations conforming to the proposed new regulations since the beginning of 1987. In the first four months about 200 "New Size Limit Permits" were issued, mostly for vehicles constructed to the maximum proposed limits.

The existing regulations remain in force and will continue in parallel with the new size limits until the latter take effect by regulation amendment. Provision will exist in the new regulations for all existing vehicles to continue to legally operate.

The review of size limits specifically excludes consideration of buses and coaches, which are to be treated separately from trucks at a later date.

2. NEW WEIGHT LIMITS

New weight limit proposals were considered in tandem with the size limits, enabling both sets limits to be mutually compatible. As a result some new vehicles could be at a disadvantage operating under the existing weight limits. Therefore, approval has been given by the National Roads Board for vehicles with "New Size Limit Permits" to be issued with overweight permits for divisible loads according to the proposed new

weight limits. This approval is limited to the existing maximum gross weight of 39 tonnes.

An increase in maximum gross weight to 44t has also been approved in principle, but implementation of limits above 39t is conditional upon a range of performance and design safety standards. Compliance with the new size limits is one of these conditions. Other proposed new safety design requirements are listed in the size limit package (1).

3. PREVIOUS SIZE LIMITS

Limits in effect before 1969 can be summarised as shown below.

Maximum Length - 30 ft (9.14m) for rigid vehicles
- 36 ft (10.97m) for articulated vehicles
- 60 ft (18.28m) for vehicles towing trailers

Maximum Height - 14 ft (4.26m)
Width - 8 ft (2.43m)

Maximum Overhang - 7.5 ft (2.23m) ahead of front axle
- 9.5 ft (2.90m) behind axis of rear wheels
- 4.5 ft (1.37m) radius ahead of king-pin on semi trailer

As the needs of the road transport industry developed to require the ability to carry bigger loads, a major revision of size limits occurred in 1969 with Amendment No. 17 to the Traffic Regulations 1956. This amendment increased the maximum width to 8' 2 1/2" (2.5m), and introduced a range of new length relationships between vehicles to allow longer combinations within acceptable limits of off-tracking. Off tracking is the amount of which the rear of a vehicle or combination cuts inside the path taken by the front of the vehicle when negotiating a curve. This determines the width of road occupied in negotiating a curve of given radius.

Control of off tracking was a paramount consideration in the 1969 amendment, and has continued to be the most important determinant of vehicle size limits up to the present revision. The definition of "Forward Length" (Appendix 2) enabled off-tracking of large combinations to be controlled by strictly limiting this dimension of each unit in a combination.

Amendment 19 in 1970 increased the allowable front overhang to 10 feet (3.05m), measured from the front of the driver's seat, and increased rear overhang to 12 feet (3.7m). Amendment 19 also introduced a maximum swept turning circle of 80 feet (24.38m) diameter.

Amendment No. 26 in 1973 metricated the 1970 limits without other major changes. The forward length limits, as in the current regulations can be summarised as:

Single Unit Vehicle: - 8.3
Combinations: - 4.7m with 7.4m
- 5.5m " 6.8m
- 6.2m " 6.2m

Provided the maximum length of 19m is not exceeded there is no limit on the number of units comprising a vehicle combination.

The existing vehicle size limits, as summarised above, have during the last 15 years determined the general dimensional characteristics of the existing heavy vehicle fleet. In the case of larger trucks and combinations the regulations have been reflected by a vehicle fleet with the following characteristics:

1. Short wheel base;
2. Long rear overhang;
3. Multiple articulation points.

These characteristics provide for:

1. Good manoeuvring at low speeds;
2. Poor stability at high speeds.

The changing nature of road transport in New Zealand, particularly with respect to long, distance transport affected by deregulation of the industry, means that the past size limits are not now well suited to transport and roading needs. Detrimental effects on both safety and efficiency are evident (3).

4. THE CASE FOR AN INCREASE IN VEHICLE WEIGHTS AND DIMENSIONS

The New Zealand Road Transport Association Inc made a comprehensive submission to Government entitled "The Case For An Increase In Gross Vehicle Weights and Dimensions" (4). In relation to vehicle size limits this submission addressed the following main issues:

- 40' (12.2m) containers;
- Self steering axle systems;
- Truck/trailer deck lengths;
- Short tractor units;
- Refrigerated vehicles;
- Petroleum Tankers;
- Side loader container trailers.

The submission canvassed three alternative dimension proposals in relation to forward length controls, and also proposed a new overall length of 21 metres.

The NZRTA submission was referred to the Axle Weights and Loading Committee of the National Roads Board. This resulted in a report to the Board (5) and subsequent recommendations for changes were referred to the Ministry of

Transport. The present proposed new limits have their basis in these recommendations.

5. VEHICLE RELATED EFFECTS OF THE PROPOSED NEW SIZE LIMITS

The new size limits allow the use of substantially more stable and potentially safer vehicles, as well as achieving cost and other operational advantages. Some of the more significant are discussed below:

5.1 Articulated Vehicle Tractor Units

For the longest semi-trailers (forward length 7.4m) maximum tractor unit forward length is 4.7m resulting in a tractor wheel base of about 3.0m under existing regulations. Various problems are associated with such short tractor units.

Original equipment manufacturers do not manufacture tractors short enough to meet this dimension. Post manufacture shortening of wheel base is required which often involves unapproved cutting and chassis welding. Braking, steering, ride, suspension, fatigue life can be badly affected and costs increase due to this modification.

Such short tractor units exhibit inferior braking performance in combinations, increased risk of jack-knife, have very bad ride leading to driver fatigue, poorer lateral, roll and directional stability, increased road damage.

The proposed size limits effectively remove restrictions on the forward length of semi trailer tractor units.

5.2 Steerable Axles

Existing limits necessitate the use of steerable axles on long semi-trailers, such as those needed for 40' (12.2m) long containers. This is a means to reduce the forward length, and increase rear overhang, while maintaining the axle spread required to meet weight limit regulations. Effects of steerable axles include increased capital costs, reduced lateral stability, reduced roll stability, increased maintenance, increased road damage, raised centre of gravity (3).

Steerable axles have the ability to be used in a locked position, in which case the forward length of the vehicle can be increased to substantially more than the legal limits. This is sometimes necessary to achieve semi-trailer stability a high speed, or on poor road surfaces.

The new size limits allow the construction of long semi-trailers with fixed axle suspension and provide disincentives for the use of steerable axles for normal applications.

5.7 Rear Overhang

Rear overhang of up to 4.6m is currently allowed (permits required if 4.0m is exceeded). This will be reduced to 3.2m for trailers and most rigid vehicles. In conjunction with the longer forward length a better load distribution and dynamic stability can be achieved (4).

5.4 Vehicle Unit Length

Some existing large vehicle combinations achieve

PROPOSED HEAVY VEHICLE DIMENSIONS

their overall length dimensions using several short units linked at multiple points of articulation, in order to minimise off-tracking. However, short wheel base, while reducing off-tracking, has a strong negative influence on vehicle stability. The vehicle characteristics which provide reduced off-tracking are also those which increase high speed out-tracking. When out tracking the rear of a vehicle tracks outside the path taken by the front. Lateral dynamic stability is also reduced so that the reduced off-tracking is exceeded in its effect by lateral oscillation and out-tracking, which may result in an increase in road space used. Such vehicles also has a high roll-over potential, poorer straight line tracking and reduced braking ability (3, 6, 7, 8, 9, 10, 11).

The new size limits provide for longer units within combination vehicles and encourage the use of fewer articulation points.

5.5 Spaced Axle Groups

Existing size limits do not control the maximum spacing of axles within linked groups. Some vehicles therefore have fixed axle spread as wide as 4.2m to help meet weight limit objectives. Unfortunately such wide spacing presents the following problems:

- Road surface scuffing;
- Excessive tyre wear;
- Excessive vehicle fatigue;
- Poor dynamic and static load sharing;
- Increased unsprung weight;
- Increased pavement damage;
- Encourages use of steerable axle systems.

The new size limit restricts the spacing of axles in linked groups to a maximum of 3.0m.

6. THE EFFECT OF THE NEW SIZE LIMITS

The proposed limits remove the existing complex constraints on forward length, and impose a single limit of 8.5m regardless of vehicle type. Rear overhang maximum is reduced significantly compared to the existing regulations. New overall length limits are established as follows:

Rigid vehicles and trailers	- 11m
Articulated vehicles	- 17m
Truck/Trailers	- 19m
B - trains (special conditions apply)	- 20m
A - trains (special conditions apply)	- 20m

Existing regulations do not specifically control overall lengths, other than the general 19m maximum. Off-tracking is controlled under the new proposals by the combined effect of the 8.5m forward length maximum and the new overall length limits. However, maximum off-tracking of new size limit vehicles may be up to 2m more than for most existing vehicles.

7. IMPLICATIONS OF THE NEW SIZE LIMITS

The increased swept path of new size limit combinations should not be expected to cause any problems on main highway routes. One category of combination, B - trains, built to the present size limits, generate about the same off-tracking as semi-trailers and other combinations under the new limits. B - trains have now been in use for about five years on line haul operations, on existing highway geometry without apparent problems.

For highway operations the effect of the increased off-tracking of new vehicle combinations should be negligible, and compensated for by more predictable behaviour, and increased driver control. The new vehicles are more likely to behave - in accordance with the assumptions made about them by roading authorities, as various undesirable modes of behaviour generally not taken into account by road design geometry, can be substantially reduced.

However, combinations built to the maximum allowed by the new limits will not be well suited to all types of goods vehicle operation. On local streets and in site and building access situations some problems can be expected with the reduced manoeuvrability of the largest new vehicles.

Fleet operators will need to adapt fleets to suit various types of operations, more so than in the past. The automatic selection of the largest possible vehicles without consideration of the environment constraints of the proposed operations will cause difficulties. In this respect it is of some concern that most vehicles constructed under new size limit permits have been based on maximum dimensions, and in some cases exceed the minimum size required for the intended purpose of the vehicles. In some cases limiting vehicles to the equivalent of the existing limits may be necessary to avoid operational difficulties in some areas. Limiting semi-trailer deck length to 12.5m sufficient for containers, rather than the maximum possible of about 13m is such an example.

Truck operators should not assume that maximum units will be able to negotiate all roads. This needs to be increasingly recognised by traffic planners by the designation and development of traffic routes designed to handle larger vehicles. Road controlling authorities will need to be alert to potential problems on existing heavy traffic routes. Some minor modifications to markings, kerbs, traffic islands may be justified in some areas. This is likely to be where low speed, small radius turns are frequently made by large combinations. Some traffic environments may need to be identified as not intended for use by the largest vehicles, and designated accordingly.

Transport operators are aware of specific problems of this nature, and some have occurred already e.g., where their vehicles have to mount curbs to negotiate some major intersections, should approach the road controlling authority concerned. It is expected that work needed to remedy this type of situation will cost about \$1 million for State Highways (5).

The more simple dimensional relationships of the new limit will help reduce vehicle construction mistakes which in the past have taken vehicles outside legal limits.

Enforcement and vehicle certification approvals will also be simplified to allow easier and more effective supervision of the size of vehicle and combinations actually in use.

8. CONCLUSION

New vehicle size limits will increase the swept path of the largest vehicles by about 2m on low speed small radius turns. This effect should be recognised by operators assessing their vehicle needs under the new limits. In the siting and design of transport facilities these effects of the new size limits should not be ignored. Maximum size new vehicles will not fit on some roads accessible by existing vehicles. The advantages of the increased size allowed must be weighed against the versatility needed of proposed fleet vehicle combinations.

The new limits provide the opportunity for many serious shortcomings of some existing rigs to be avoided, while allowing the same functions to be fulfilled. Safety and handling will be improved, particularly at highway speeds. Straight line tracking, and stability under cornering and braking will be greatly enhanced. Overall, these advances are considered to outweigh the loss of low speed manoeuvrability, which is achieved at the cost of less stability and control of tracking at higher speeds.

Roading authorities should be aware that some traffic areas will need improvement to cater for larger trucks, and that appropriate routes may need to be developed or improved. However, it would also be reasonable to define areas not designed to provide for the largest line haul vehicles.

9. REFERENCES

- (1) Ministry of Transport (1985). Size Limit Package.
- (2) Ministry of Transport (1986). Size Limit Package (Second Draft).
- (3) Pettersson W.R. (1985). Proposed Heavy Vehicle Weight and Dimension Changes. Institute of Road Transport Engineers of New Zealand, Heavy Vehicle Design Seminar, Proceedings Vol.1.
- (4) The New Zealand Road Transport Association (1984). The Case for an Increase in Gross Vehicle Weights and Dimensions.
- (5) National Roads Board (1985). Report by the Axle Weights and Loading Sub-committee to Consider Increased Gross Vehicle Weights and Dimensions.
- (6) Jindra, F. 1963). Tractor and Semi-Trailer Handling. Directional Stability and Control of a Tractor and Semi-Trailer Combination in a Flat Turn. Automobile Engineer, October 1963.
- (7) Williams, D. (1951). The Mathematical Theory of the Snaking of Two Wheeled Trailers. Proc. Automobile Division. Inst. Mech. Engrs. (1951-2), 175-187.
- (8) Slibar, A. and Paslay, P.R. (1957). The Forced Oscillations of Trailers, ASME J. Appl. Mech. Vol.24, 515-519.
- (9) Schmid, I. (1967). Engineering Approach to Truck and Tractor Train Stability. Society of Automotive Engineers SAE 670006.
- (10) Sweatman, P. and Little, L. (1979). Articulated Vehicle Stability, ARR Internal Report AIR 323-1.
- (11) Ervin, R.D. (1985). The Rearward Amplification Response of Multiply - Articulated Truck Combinations. Institute of Road Transport Engineers of New Zealand, Heavy Vehicle Design Seminar, Proceedings, Vol. 1.

PROPOSED HEAVY VEHICLE DIMENSIONS

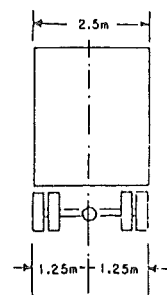
Appendix 1 - Proposed New Size Limits.

MAXIMUM PERMITTED VEHICLE DIMENSIONS

- Notes 1) Until the Traffic Regulations have been amended, these size limits can only be used if approval is obtained by application to Ministry of Transport, Traffic Engineering Section, Private Bag, Wellington.
- 2) Existing weight limits apply unless an overweight permit has been issued.
- 3) Buses and light vehicles are not included. Existing limits apply.

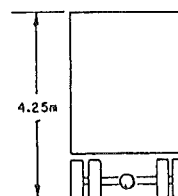
WIDTH

Maximum width = 2.5m
 Width on each side of vehicle centreline = 1.25m (except Agricultural vehicles up to 3.7m in width travelling no faster than 25 km/h in daylight)
 Ropes, lashings, straps, chains, and related connectors and tensioners may extend an additional 25mm on each side while in use to secure loads on vehicles which are loaded in accordance with "The Truck Loading Code". This 25mm does not include any devices fixed rigidly to a vehicle such as gates, bolsters, brackets, sockets, hooks, rails, etc.
 Side marker lights and direction indicators may exceed the width limit.
 Collapsible mirrors which do not extend more than 240mm on each side of the vehicle may exceed the maximum width of 2.5m.



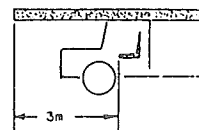
HEIGHT

Maximum height including all load restraints, loads and vehicle fittings and attachments = 4.25m



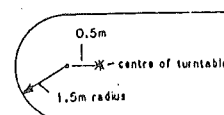
FRONT OVERHANG

Maximum overhang forward of the front edge of the drivers seat for vehicle and load (other than a trailer) = 3m.



DISTANCE AHEAD OF KINGPIN (Semi trailers and turntable type trailers)

Maximum distance from a point 0.5m ahead of kingpin or centre of turntable = 1.5m radius (does not include trailer drawbars)

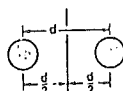


REAR AXIS - DEFINITION

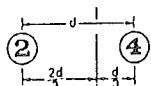
- (a) One non steering axle - that axle



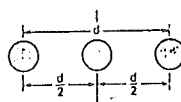
- (b) tandem axle group or single axle group of more than one axle. (i) both axles fitted with an equal number of tyres - midway between those axles.



- (ii) where one axle fitted with twice number of tyres of the other - 1/3 of way from the axle fitted with greater number of tyres towards axle with lesser number of tyres.



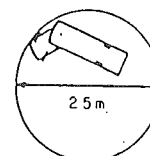
- (iii) triaxle group - midway between extreme axles of group



- (c) No non steering axles and all other vehicles - point determined by Secretary for transport

TURNING CIRCLE (all vehicles and combinations)

Maximum turning circle = 25.0m (wall to wall)



REAR OVERHANG

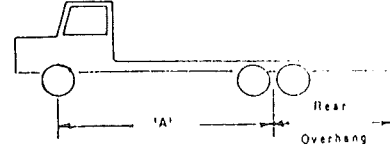
Rigid vehicles and trailers (except semi-trailers)

Rear Overhang must not exceed the lesser of

- (a) 3.2m (or 3.7m, if the rigid vehicle exceeds 9.5m in overall length or is a pole trailer (jinker) with one axle group)

OR

- (b) 60% of 'A' ('A' being the distance from front axis to rear axis or centre of tow coupling to rear axis).



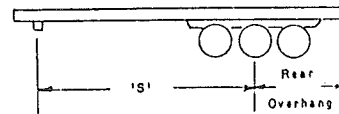
Semi-trailers

Rear Overhang must not exceed the lesser of

- (a) 3.2m

OR

- (b) 50% of 'S' ('S' being the distance from kingpin to rear axis).



Special Cases

- 1) Vehicles fitted with retractable axles:

The retractable axle shall be ignored for the purposes of determining rear overhang and regarded as a fixed axle for the purposes of determining forward distance.

- 2) Semi-trailers fitted with steerable axles:

Permits will be issued for steerable axles up to 37 tonnes and subject to conditions determined by the Secretary for Transport.

GROUND CLEARANCE

Within 1m of any axle minimum ground clearance shall be 100mm

At any point from the midpoint between adjacent axles and either adjacent axle, the ground clearance shall be at least 1/10 of the distance from the axle to the point where the ground clearance is measured.

At any point in front of the first axle and behind the last axle the ground clearance shall be at least 1/10 of the distance of that point from the axle.

AXLE GROUPS - DEFINITIONS

Single axle:- either one axle, or two axles with centres between transverse, parallel, vertical planes spaced less than 1.0m apart.

Tandem axle Group:- A combination of two axles which are not less than 1.0m and not more than 2.0m apart.

Triaxle Group:- A combination of three axles in which the front and rear axles are not less than 2.0m and not more than 3.0m apart.

PERMITTED AXLE GROUPS

Rigid vehicle or truck tractor shall be supported by two axles or axle groups disposed as follows:- (i) towards the front of the vehicle, with all wheels connected to the steering system for that part of the vehicle, either a single axle or a twin-steer group; (ii) towards the rear of the vehicle either a single axle or a tandem axle group or a triaxle group.

A semi-trailer shall be supported towards the rear by either a single axle or a tandem axle group or a triaxle group.

A trailer shall be supported by either (i) a single axle or a tandem axle group, or in the case of a pole trailer either a single axle or a tandem axle group or a triaxle group, or two axle groups disposed toward the front and rear of the trailer. Or (ii) a single axle or a tandem axle group or a triaxle group towards both the front and rear of the trailer provided that all wheels in the front axle or axle group are connected to the steering mechanism for that part of the vehicle.

LOAD SHARING

Note Future weight limits will require all axles in an axle group (except those in a twin steer group) to be load sharing.

PROPOSED HEAVY VEHICLE DIMENSIONS

OVERALL LENGTH

Single Vehicles
 Rigid Truck = 11.0m
 Full trailer (includes drawbar) = 11.0m

Vehicle Combinations
 Articulated vehicle = 17.0m
 Truck and trailer = 19.0m
 A - train = 20.0m
 B - train = 20.0m

FORWARD DISTANCE

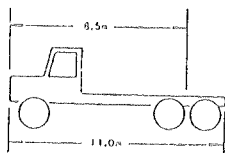
DEFINITION. - Forward distance is the distance from the rear axis to:
 (a) the front of the vehicle for a rigid vehicle
 (b) the front of the rigid part of the vehicle for a trailer with two axle groups
 (c) the front of the drawbar for a trailer with one axle group
 (d) the kingpin in the case of a semi-trailer.

Maximum forward distance for all vehicles and loads except pole (jinker) trailer = 8.5m
 Maximum forward distance for pole (jinker) trailers = 7.4m

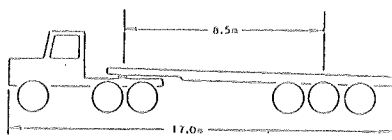
TRAILING LENGTH FOR A-TRAINS AND B-TRAINS

Maximum distance from centre of 5th wheel on the tractor unit to rear of combination = 14.5m

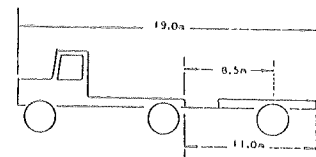
Rigid truck



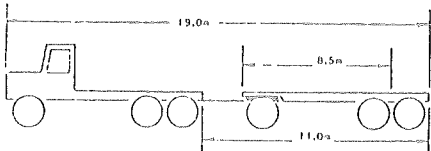
Articulated vehicle



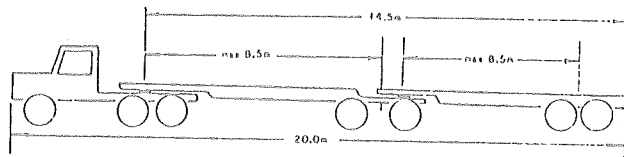
Truck and trailer (one axle group)



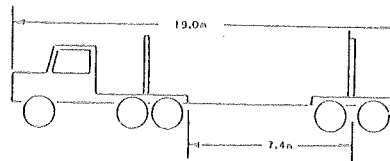
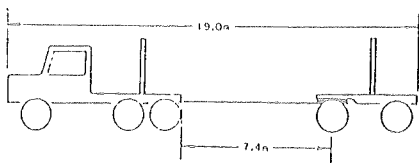
Truck and full trailer (two axle group)



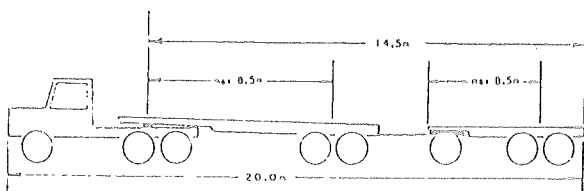
B-Train



Logging Jinkers



A-Train *



* Special Requirements for 20.0m Long A-Train

- (a) Three axle tandem drive axle tractor units (6x4) are to be used.
- (b) Semi-trailer:- The distance from the rear axis to tow coupling shall not exceed 30 percent of the distance from the point of articulation to the rear axis.
- (c) Will continue to be limited to 39 tonnes under the new weight limits.

DISTANCE BETWEEN VEHICLES

Maximum separation between vehicles in combination shall be 4.0 metres.

NOTES

- (1) Vehicles towing two trailers (with exception of B-trains) will be limited to 39 tonnes.
- (2) New Standards will be required for 5th wheel coupling for those vehicles above 39 tonnes.

Appendix 2 - Existing Size Limits.

MAXIMUM PERMITTED VEHICLE DIMENSIONS.

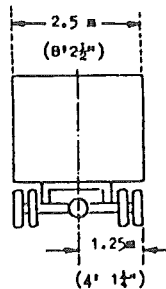
The following are the maximum dimensions of motor vehicles permitted by Regulation 48 Traffic Regulations 1976. Where two conflicting dimensions are shown the vehicle must not exceed the lesser of the two, i.e. the most restrictive of the two measurements.

WIDTH

48 (1) No person shall operate any vehicle, if the vehicle or its load or both exceed 2.5 metres in width or extend more than 1.25 metres from the longitudinal centre-line of the vehicle. The provisions of this subclause shall not apply to any agricultural trailer or agricultural machine, where -

- (a) The vehicle does not exceed 3.7 metres in width; and
- (b) The vehicle is not operated during the hours of darkness; and
- (c) The vehicle is not driven at a speed exceeding 25 kilometres an hour; and
- (d) The extreme right-hand front edge of the vehicle is indicated by a flag of the type specified by regulation 50 hereof to indicate excess dimensions.

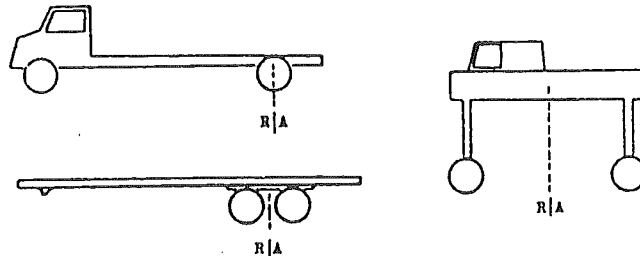
(2) For the purposes of subclause (1) of this regulation, any mirrors, side marker lights, or direction indicators shall be deemed not to be part of the vehicle or its load.



Except:- Agricultural vehicles up to 3.7 metres (12' 1 1/2") in width traveling no faster than 25 km/h (15.5mph) in daylight.

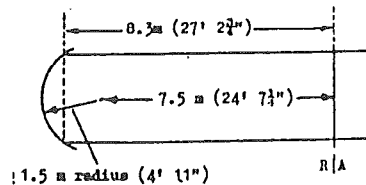
DEFINITION:- REAR AXIS

- (a) In relation to a vehicle with only one non-steering axle, means that axle;
- (b) In relation to a vehicle with 2 or more non-steering axles, means a horizontal line at right angles to the longitudinal centre-line of the vehicle and midway between the first and last non-steering axles;
- (c) In relation to a vehicle with no non-steering axle, means a horizontal line at right angles to the longitudinal centre-line of the vehicle at a point to be determined by the Secretary;



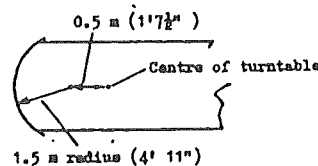
DISTANCE AHEAD OF REAR AXIS

- 48 (3) No person shall operate any vehicle if any part of the vehicle or its load extends more than 8.3 metres ahead of the rear axis of the vehicle. Provided that this subclause shall not apply -
- (a) In the case of any trailing unit, to its towbar or to any load the forward end of which is supported by the towing vehicle;
 - (b) In the case of a vehicle the load of which does not extend forward of the body, provided no part of the body of the vehicle extends forward beyond the arc of a circle of 1.5 metres radius with its centre on the vehicle centre line 7.5 metres ahead of the rear axis.



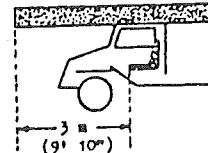
DISTANCE AHEAD OF KINGPIN OR TURNTABLE

- 48 (4) No person shall operate any articulated vehicle if any part of the trailing unit or its load extends forward beyond the arc of a circle of 1.5 metres radius with its centre on the vehicle centre line 0.5 metres ahead of the centre of the turntable or kingpin on which the trailing unit is hinged.



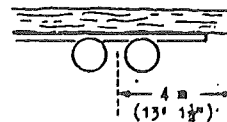
PROMT OVERHANG

- 48 (5) No person shall operate any vehicle other than a trailer if the vehicle or its load extends more than 3 metres forward from the front edge of the driver's seat.



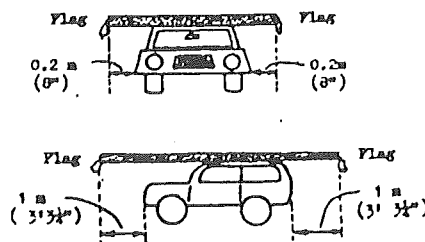
REAR OVERHANG

- 48 (6) No person shall operate any vehicle if the vehicle or its load extends backward more than 4 metres from the rear axis.



FLAGS TO INDICATE EXCESS DIMENSIONS

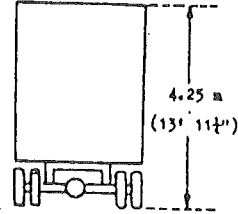
- 50 (1) No person shall operate a motor vehicle under a permission given under regulation 49 hereof, or any motor vehicle the load of which projects more than 1 metre backward from the body of the vehicle or more than 1 metre forward from the body of the vehicle or more than 200 millimetres out from the side of the body of the vehicle, unless the projecting load or the excess dimensions of the vehicle are suitably indicated by means of a clean white flag or a red or orange or yellow fluorescent flag. Such flags shall be at least 400 mm long and 300 mm wide.
- (2) For the purposes of this regulation any rear view mirror or direction indicator shall be deemed not to form part of the vehicle.



PROPOSED HEAVY VEHICLE DIMENSIONS

HEIGHT

48 (7) No person shall operate any vehicle, if the vehicle or its load or both rise to such a height as to be liable to damage any construction or wires lawfully over the roadway used by the vehicle, or in any case to a height exceeding 4.25 metres from the ground.



DEFINITION OF FORWARD LENGTH

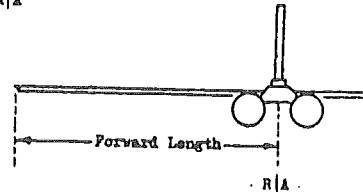
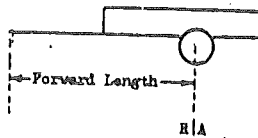
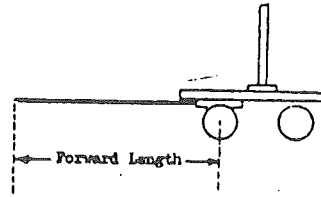
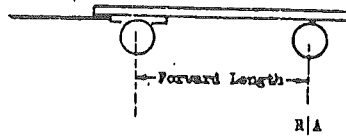
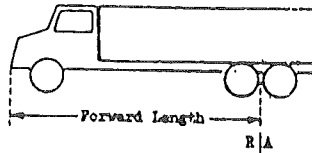
(a) In relation to a motor vehicle other than a trailing unit, means the distance from the rear axis to the foremost part of the vehicle or its load, whichever is the greater;

(b) In relation to a trailing unit the front axle of which is steered by the towbar, means the greater of the following distances:

(i) From the front axle of the trailing unit to the point of attachment of the tow-bar to the towing vehicle;

(ii) From the rear axis of the trailing unit to the front axle;

(c) In relation to any other trailing unit, the distance from the rear axis of the trailing unit to the point of attachment to the towing vehicle;



FORWARD LENGTH (VEHICLE COMBINATIONS)

48 (10) No person shall operate any combination of vehicles if the forward length of that vehicle in the combination with the greatest forward length -

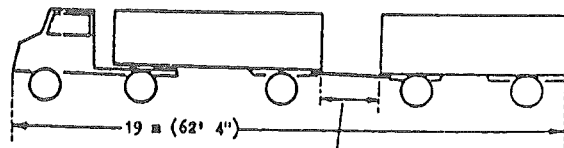
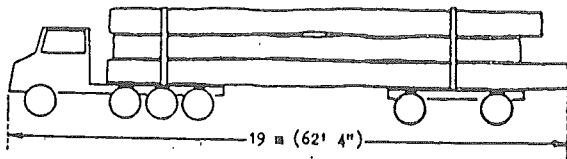
- (a) Exceeds 7.4 metres; or
- (b) Exceeds 6.8 metres if the combination includes another vehicle with a forward length exceeding 4.7 metres; or
- (c) Exceeds 6.2 metres if the combination includes another vehicle with a forward length exceeding 5.5 metres.

Acceptable Combinations of Forward Length

7.4 metres	with	4.7 metres	(24' 3 1/2" with 15' 4")
6.8 "	"	5.5 "	(22' 3 1/2" " 18' 0 1/2")
6.2 "	"	6.2 "	(20' 4" " 20' 4")

OVERALL LENGTH

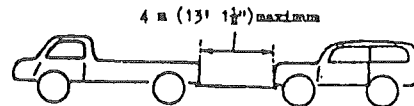
48(11) No person shall operate any combination of vehicles if the total length of the combination together with its load exceeds 19 metres.



LENGTH BETWEEN VEHICLES BEING TOWED

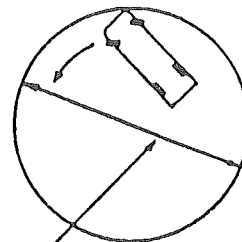
48(12) No person shall operate any combination of vehicles if the space between any 2 vehicles in the combination exceeds 4 metres. For the purposes of this subclause, any towbar, rope, wire, or chain used to connect 2 vehicles together shall be deemed not to be part of either vehicle.

Provided that this subclause shall not apply to 2 vehicles which are designed or being used to support a common load.



TURNING CIRCLE

48(13) Except in the case of a vehicle first registered before the 1st day of January 1971, no person shall operate any motor vehicle or combination of motor vehicles if the vehicle or combination is not capable of completing a 360° turn without projecting outside the circumference of a circle of 25 metre diameter.



OVERDIMENSION VEHICLES AND LOADS

Vehicles or loads which exceed these dimensions may not travel on New Zealand roads unless they have a permit from the Secretary for Transport, Chief Traffic Officer or other authorized person and unless they abide strictly by all the conditions on the permit.

25 m (82' 0 1/2") diameter maximum

