

CURRENT INNOVATIONS & FUTURE REQUIREMENTS IN ROAD TRANSPORT

Economic Gain In Changes In Weight & Length Regulations

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If you are aware that one third of the cost of any product is freight, then you will be well aware of the importance and need to look at any method of reducing freight cost, and particularly Road Transport cost.

The timber industry is one that has for many years been well aware of this fact, and has done all possible within the confines of the present regulations.

The capital cost is always the first consideration, and many hours are spent justifying rig A against rig B.

Most operators now realise that fuel is one of the main costs, and have experimented with all the devices that are meant to reduce that cost, i.e. fan clutches, radial tyres, wind deflectors, fuel additives, reduced tare weights, driver training, and many others.

Drivers wages are another factor, and some operators like that higher horse-powered rig giving faster turn around, that hopefully reduces that expensive overtime bill.

Axle configurations is another that is being carefully studied, and in particular its application to Road User charges.

In most areas, we have gone as far as we can go. When we look at what is happening overseas in Road Transport, we see some amazing changes taking place, all aimed at a more efficient and economical use of the road transport system. There is a trend to

- 1 Higher gross weights - 44 tonne in a lot of countries.
- 2 Longer train and semi trailer lengths
- 3 Increased overall widths-2.6 metre in U.S.A.

There are many reasons which have influenced these changes. The U.K. have had to increase their gross loading so they can interfreight to E.E.C. countries. With the introduction of a 23 tonne and heavier ISO container, these will have an influence on the need to increase gross weights in a great number of other countries. There is consideration being given to increasing the 40ft ISO container to 30 tonne and 14.630 metre (48ft) long.

It is evident then, that our next move must be to seriously studying the Socio-economic effects and gains that can be achieved for the Timber Industry and the Transport Industry, and the country as a whole, by

- 1 Increasing gross weights to 44 tonne
- 2 Alteration to present forward lengths which in turn will allow for longer semi trailers.
- 3 Increasing the overall width.

INCREASE GROSS WEIGHTS

This is the one area that can give immediate benefit if the gross weight were increased from the present 39 tonne to 44 tonne. Payload would be increased from 24 tonne to 29 tonne - a 20.8 percent increase - and in most cases without any increase in tare weight or alteration to a lot of the equipment at present being used. The ideal axle combination would be a seven axle rig - say front steerer, and three sets of tandems, i.e. truck with four axle trailer, 'B' train or similar.

Tandem axle loadings can still be kept to 13 tonne and five tonne on the front axle. This configuration is gaining popularity at present because of the reduced Road User charges, and eliminating the risk of overloading on any one group of Tandems. The latter is the argument that operators put forward, in particular when deciding a four axle full trailer instead of the three axle which normally has sufficient carrying capacity, in most uses within the present regulations.

FORWARD LENGTHS

This legislation was introduced some ten years ago, and certainly was an improvement and allowed for wider range of configurations than the previous method, but like a lot of other legislation; it has out-lived its usefulness and requires up-dating. The present forward length method was devised by "the sum of the squares" principle.

This regulates the amount of off tracking or swept area a unit will occupy when turning a corner. The maximum King pin to centre line of rear bogie being 7.4 metre.

(Australia 8.5 metre)
(Californian State 11.582 metres (38ft) King pin to rear most axle).
(Iowa, Minissota 12.192 metres (40ft) King pin to rear most axle).

Because of the vast range of trucks N.Z. imports, it is very rarely that the wheelbase and forward lengths are such that they will suit our regulations. Costly changes are usually necessary to wheelbase before they can conform. Three alternatives to the present dimension regulations could be considered:-

- (a) Use a "sum of the squares" basis to allow more forward length combinations. Turning envelope is not effected.
- (b) Adjust the table by introducing a new forward length for trailers and displacing the remaining limits by one space - turning envelope is effected somewhat.
- (c) Abandon the forward length relationship in favour of a system which has maximum vehicle lengths only with no restriction on axle location - turning envelope is greatly effected.

Policing the regulations would be made more difficult with the first option, no change is invovled with the second, and is greatly reduced with the third.

A move to longer forward lengths would allow more use of the semi trailer. At present to operate a 40ft semi, means either expensive and heavy self steering bogies or castoring axles to allow the bogie to be in position to obtain optimum weight distribution.

A longer forward length, i.e. King pin to centre of bogie, would mean a simple lighter tare weight tandem or tri-axle unit could be produced at a greatly reduced cost, and could possibly alleviate the need for full trailers, as it would be possible to carry an economic well balanced and distributed payload on the semi trailer.

It is important to note that in a number of countries a 12.2 metre (40ft) platform length is recognised as a common yardstick in transport.

To cover the three alternatives in more detail, we could look at the following:

(a) "Sum of the squares" proposal

This method is developed from the SAE J695B "Turning ability and off-tracking of Motor Vehicles".

The present regulations allow us certain combinations of forward length, which quantities when squared become (in metres)

$$\begin{array}{rcl} 4.7_2^2 & + & 7.4_2^2 = 76.85 \\ 5.5_2^2 & + & 6.8_2^2 = 76.49 \\ 6.2^2 & + & 6.2^2 = 76.88 \end{array}$$

A typical heavy duty tractor in regular use has a forward length of 5.2 metres. Under present limits it would be restricted to a trailer with a forward length of 6.8 metres. However, a trailer of 7.05 forward length would not track off more than any of the above.

$$5.2^2 + 7.05^2 = 76.74$$

Note: In the example given in the SAE standard the US regulations in most States, the equivalent total is 131.3 which means that in USA twice the off-tracking distance is permitted compared with N.Z.

For a revised regulation it is suggested that it read "The sum of the forward lengths when squared should not exceed 77 (metres)".

A difficulty arises with 'A' and 'B' Trains (tractors with 2 trailers). Present regulations would typically allow the squared lengths to aggregate 106. However, such a combination would exceed 19.0m OAL. It could be suggested that the sum be set at 100 for these cases.

(b) "Revised table" proposal

In Australia, a "forward length" concept is used, but in a less restrictive way. For a truck the maximum forward length is 8.3m (same as N.Z.) but for a trailer 8.5 is permitted.

In order to be able to use these trailers in New Zealand (CER) it is suggested that a new scale be introduced.

Truck	4.7m	Trailer	8.5m
	5.5		7.4
	6.2		6.8
	6.8		6.2
	7.4		5.5

The two columns have been displaced relative to each other by 1 space.

(c) "Vehicle length" proposal

A more radical approach is to abandon the forward length limitation entirely and substitute a range of lengths that have no relationship to axle position, which would then be determined by the "Bridge formula".

This approach is favoured in USA and UK for example.

Proposal dimensions:

- (a) Overall height as at present (alteration to width to be suggested later)
- (b) Maximum length of single vehicle 12.5 metres
 - 12.2 in Australia and U.K.
 - 13.7 in USA
- (c) Maximum tractor semi trailer 16.0 metres
 - 16.0 in Australia
 - 16.7 USA
- (d) The maximum for any other combination 19.0 metres
 - 16.8 Australia
 - 19.8 USA

The probable effect of this change would be to favour wider use of semi trailers. Other countries have found the 40ft semi an efficient transport tool.

INCREASE OF OVERALL WIDTH

U.S. Congress have recently passed a Bill, which comes into effect on October 1st 1983, increasing the overall width to 102" (2.6metre).

This 102" width has been extensively lobbied for many years by the Cube Limited Carriers and Shippers, especially the food industry, paper & building material suppliers, and airlines. It will mean a big productivity increase for grocers and those using standard 48" wide pallets, and others working with 48" modules such as building panel supplies.

It is obvious that this will have far reaching effect on N.Z. transport in the future. We can expect 2.6 metre wide ISO containers arriving causing havoc to the transport industry, and very soon truck cab and chassis arriving with front and tandem axles to the full 2.6 metre overall width.

This will obviously have an advantage to the timber industry if 2.6 metre was legislated in N.Z. The wider axles, wider spring centres giving better stability to truck and trailer coupled with the possibility of a lower centre of gravity payload, must all help for a more efficient operation, particularly in the sawn timber transport field which has been notorious for the number of roll-overs and lost loads it has had in recent years.

CONCLUSION

There is no doubt that the greatest gain to the transport industry is the increase of the gross weight from 39 to 44 tonne. This can virtually be done with a signature on the appropriate piece of paper, but I am certain that the

greatest need is an alteration to the present forward length legislation. Although the benefits may not be immediate, in the long term they will obviously be the right ones. It would allow for more sensible and economic units to be designed freely rather than as at present where design is based around Road User charges. It is true that Road User charges have created an atmosphere for high capacity vehicles, operators have re-equipped their fleets with units far bigger in capacity than they would have done normally, and there is obvious benefits to be gained if this capacity can be used.

It must also be acknowledged that there would be opposition to any change, whether it be increase of gross weight, alteration to lengths, or to overall widths, and whether it be local bodies, private motorists, or the man on the street. Nobody can stop progress, and particularly economic progress.

