The Operators' View Of Emerging Size And Weight Policy In Europe

Richard K. Turner
Director, Freight Transport Association, United Kingdom

ABSTRACT

New lorries coming onto the roads today are very different to the ones they replaced but throughout the UK and Europe the role of the lorry and its impact on roads and the environment continues to be questioned. Massive improvements in efficiency and quality have been achieved in recent years and there are more in the pipeline. The European attitude to weights and dimensions is dominated by the commitment to drive axle weights at 11½ tonnes and complicated by the recent addition of 2 member states that operate very heavy vehicles (up to 56 tonnes).

Till now, the policy on lorry weights and dimensions in Europe has been driven (subject to political acceptability) by economics and engineering (both vehicle and road) issues. It seems now to be dominated by environmental consideration covering emissions, intrusion, safety and sustainability. The search for efficiency is seen by some strong influencers as a false goal making transport too cheap and encouraging industrial activity out of keeping with the environmental needs of society.

THE SEARCH FOR EFFICIENCY

The modern commercial vehicle is a far cry from the days when it was just an engine, a chassis and a wheel on each corner. Today it is a sophisticated piece of high tech machinery. It costs a lot of money to buy and is equally expensive to operate and maintain, demanding a high level of management expertise to ensure its efficient operation, which inter alia calls for the ability to optimise its payload potential. In the own account industry, ie where a manufacturer runs vehicles to carry his own goods, there is often a requirement for specialised vehicles dedicated to a particular task. Long gone are the days when an operator just went along and bought a truck off the shelf. Today the proficient operator knows not only what he wants to carry, he also knows what vehicle specification will fulfil that requirement and also the legal framework within which he has to operate. The need to keep pace and be competitive in today's world of computerised information technology has resulted in the emergence in more recent years of new breeds of transport managers, maintenance staff and even drivers.

More and more people in the industry are becoming "qualified". As a result, in today's modern trucking industry those terms so often expressed in the past by its opponents like "irresponsible, amateur, inconsiderate" etc are now seldom justified.

In the UK our own Department of Transport officials have recognised the metamorphosis that has occurred over recent years and has conceded that, after over a quarter of a century of mandatory annual inspections on heavy goods vehicles, there are now many operators for whom a regular Government check on their vehicles is unnecessary, and we are currently in discussion with the Department on how a system of self-certification could be introduced for those operators.

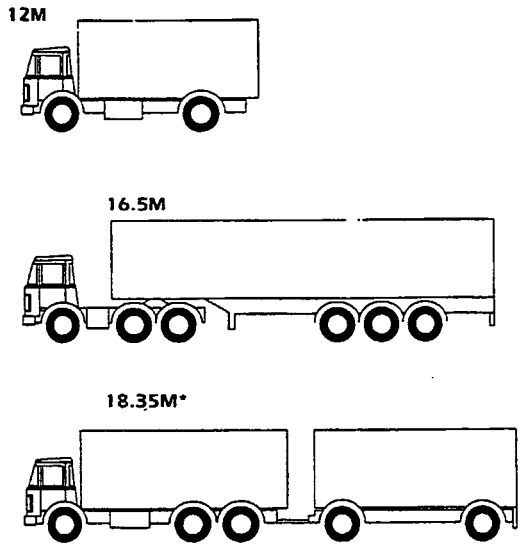
Much of the added knowledge and new found expertise would be wasted, however, if the operator was unable to utilise the full capability of his vehicle by maximising its dimensions and the weight it is permitted to carry. Statistics show us that over the last forty years, since 1955, the maximum permitted weights in the UK have increased from 24.4 tonnes (53760 lbs) to 38 tonnes (83775 lbs). That represents an increase of almost 56% (30,000 lbs). Over that period the total annual tonnes kilometre of road freight has more than trebled from 38 billion tonne kilometres to 127 billion tonne kilometres. On its own this figure is misleading as it indicates that three times the weight of goods are moved today as compared to

forty years ago. This however, is not the case. The tendency has been for longer trip lengths: moving more goods and moving them over longer distances. Other member states have under gone more dramatic independent changes over the years. Some have been more liberal in their domestic policies than others. However, it is likely that climate, topography, natural resources and infrastructure play an important part in influencing the decision makers.

Who are these decision makers? The current situation in Europe is similar to that of the USA in that there is one federal organisation governing a number of individual states, each of which has a certain amount of autonomy regarding its domestic rules. The Commission of the European Union provides general (international) rules (directives) and the countries that make up the individual states lay down their own domestic requirements within these limits. As a result the domestic maximum weights often vary, as to some extent they vary in the USA. It puts things into perspective somewhat when one considers that some USA states are larger than some European countries. Policing and enforcement is also similar, with national authority ending at state borders.

Weights and dimensions of vehicles moving within the Community are governed by a Directive - 85/3/EEC. This Directive sets out the criteria that must be accepted by member states: vehicles complying with this Directive in so far as their weights and dimensions are concerned must be allowed to cross the state borders. In dealing with vehicle dimensions Directive 85/3 covers the length, width and height of vehicles of different categories and the vehicles when in combination.

Slide - "rigid, artic and drawbar"



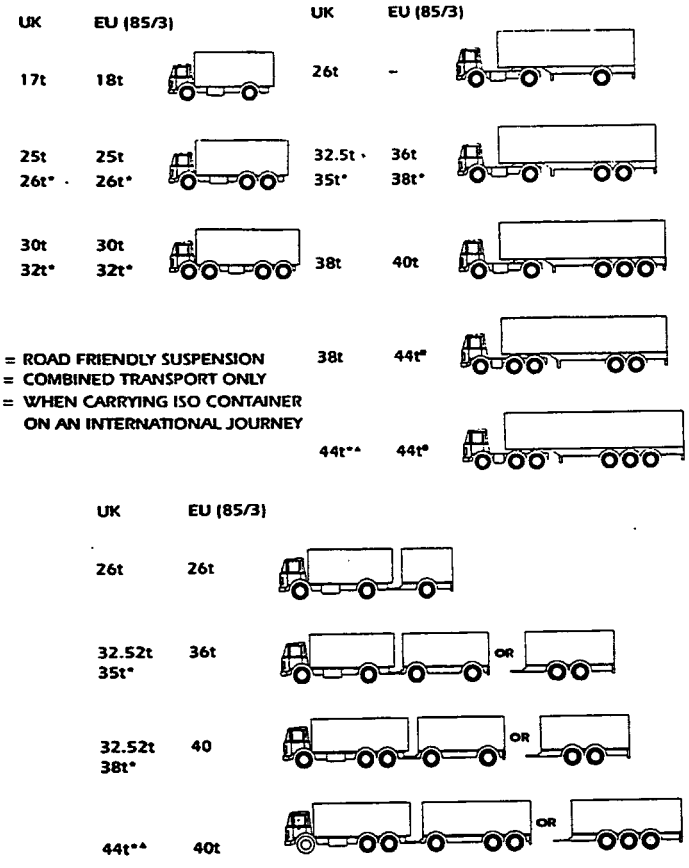
* = PROPOSALS TO INCREASE TO 18.75M

The Directive also stipulates the maximum permitted weight for each vehicle and each vehicle combination. It sets limits for individual axle weights and for axle bogies and it defines the tyre and suspension requirements for these. The Directive also determines the minimum number of axles and the axle spacing for those vehicles operated at a higher weight limit.

These are the requirements that need to be met to ensure vehicle entry into any member state. However, some member states have more generous limits for domestic operations and this can create confusion and barriers to free trade.

In contrast, some years ago the UK Government put up an argument against the adoption of the EU 40 tonnes gross vehicle and the 11.5 tonne drive axle. Derogation was granted to the UK on the grounds that its bridges could not support those weights. As a result the UK currently has a maximum permitted gross vehicle weight of 38 tonnes, with 10.5 tonne maximum permitted on a drive axle. The derogation ends on 31 December 1998. After that the UK will have to fall in line with the rest of Europe and permit the entry of 40 tonnes vehicles on five axles and, of course, the 11.5 tonne axle.

Slide - Maximum permitted weights (UK comparison)



AXLE WEIGHTS

Legislators in Europe, particularly the UK, seem to be pre-occupied with axle weights. The UK Government seems almost fearful of anything over 10.5 tonnes, and this has been evidenced in recent domestic legislation that introduced a higher gross vehicle weight limit of 44 tonnes (97,000 lbs) but only permitted it on vehicles engaged on combined transport operations. This change in legislation came about after a long and intensive campaign, headed by the FTA, for the introduction of 44 tonnes gross vehicle weights on combinations with six or more axles. The technical specifications for this vehicle did not call for an axle above 10.5 tonnes and because of its six axles the vehicle would be considerably more road-friendly than a 38 or 40 tonnes vehicle with five axles.

The UK Government's announcement to allow this vehicle, but only in a very restricted mode of operation (the transport of ISO type containers or swap bodies, directly to or from a railhead) was a severe disappointment to the vast majority of operators engaged in the general transportation of goods. The reason given was said to be in the interest of achieving parity between the payload carried by general goods hauliers and those moving containers. Container operators suffer a payload loss due to the weight of the container and in allowing a higher gross weight for vehicles engaged on this work it provided those operators with a potential of achieving a similar payload to that enjoyed by the general haulage operator. However, that explanation only masked the real reason which was to further promote the Government's interest in the privatisation of the railways network. Had the Government's interest really been centred on the need to provide parity for those hauling containers, then they would have extended the use of the heavier vehicle to the carriage of sea-born containers, which they did not.

In addition to restricted operation, UK 44 tonnes vehicles have to meet certain technical criteria aimed at reducing the increased road wear anticipated for these heavier vehicles. These technical requirements are:

Technical requirements for 44 tonnes vehicles	
1	The vehicle shall have at least six axles - with at least three on the drawing vehicle.
2	Any drive axle, unless it is a steering axle, shall be fitted with twin tyres.
3	Any drive axle shall be fitted with road friendly suspension or
4	No axle will have a weight exceeding 8.5 tonnes when it is actually operating on a road.

The requirement for road-friendly suspension on the drive axle came as no surprise as such a requirement is referred to in Directive 85/3 which also lays down details of its specification. In essence the term "road-friendly suspension" means that either the vehicle is fitted with air suspension or a suspension that is deemed to be equivalent to air as defined in the Directive. Basically this means that it must have a natural frequency no greater than 2 hertz and critical dampening factor of at least 20%.

The take-up of 44 tonnes operation, or more accurately operations involving vehicles higher than 38 tonnes, has been quite limited in the UK. It is estimated that currently less than 300 vehicles are engaged on this type of operation. There are a number of reasons for this. Firstly, the limited scope of the work means that operators have to look very closely at the capital expendutire required on what by and large will be a dedicated fleet. Secondly, vehicles engaged on this work need to be specified differently to those vehicles employed in general haulage. Thirdly, prior to the higher weight regulation being introduced the heaviest container suitable for road transportation within the UK's 38 tonne umbrella weighed approximately 25 tonnes (56,900 lbs). It has taken some time for the market to take advantage of the new weights threshold which can now accommodate containers and swap bodies grossing some 30 tonnes (68,280 lbs). This adjustment has been made more difficult by the fact that the UK 44 tonne regulations do not permit heavier loads to be picked up from locations other than a rail head.

TECHNICAL PROBLEMS OF WEIGHT DISTRIBUTION AT 44 TONNES

The tendency has been for an increased use of 13.6 metre (44.6 ft) containers/swap bodies. These can

be accommodated within the EU overall maximum vehicle length of 16.5 metres (55.13 ft). However, in order not to over-load the trailers 24 tonne tri-axle bogie the trailer will require a wheel base (king pin to centre of bogie) of approximately 8.4 metres (ft). Achieving this with conventional semi trailers is possible. However, vehicles operating in the EU at this length must be capable of being driven within a specified turning corridor, and this is not possible with trailer wheel bases exceeding 8 metres.

It is possible to overcome this problem by incorporating a rear self-tracking axle in the trailer bogie. As this axle is steered by the movement of the trailer and does not itself control the trailer's direction stability it effectively provides a load centre rearwards from the turn centre of the bogie. Even though when fitting a self-tracking axle there is a premium to be paid in original cost and because of its weight some subsequent payload loss, operators committed to 44 tonnes operation nevertheless include this equipment in their standard specification for semi trailers.

THE FUTURE

In 1994 the European Commission failed in its attempt to harmonise the domestic weights of vehicles operated by the member states of the Economic Union. In its proposals the Commission had advocated a maximum permitted gross weight of 44 tonnes on a vehicle fitted with at least six axles. In addition, the Commission had called for an increase in the standard width of vehicles from 2.5 metres to 2.55 metres. In their response to the Commission's proposals the member states made it clear that they resented the Commission trying to impose its authority on their domestic operations. The latest news is that while some work might yet be done on vehicle dimensions, and in this respect the first step would be to standardise the methods of measuring and agree common datum points on vehicles, little or no work is currently assigned to standardising weights.

Clearly, at some time, something will have to be done in order to create a level playing field across the whole of Europe. However, with no member state seemingly willing to give up what they already have, persuading them to change will be difficult if not impossible. The entry of three new states into the Union at the early part of this year has only tended to exacerbate the problem, as two of these countries currently enjoy maximum vehicle weights of 56 tonnes (about 127,500 lbs).

ENVIRONMENTAL PRESSURES

With the protection of the environment currently being top of the legislators hit list, there is no doubt that we will see more limiting legislation coming on to the statute books in the not too distant future.

Left unopposed, the imposition of this legislation will continue to place restriction on vehicles and generally reduce their operational effectiveness and profitability. Legislation is already in hand for the introduction of tighter controls of vehicle noise and emissions and behind the scenes proposals have already been made and plans are going ahead for the introduction of the electronic recording of the driver's function: the tachograph will become to be known as the black box. Recent changes in the braking standards of ADR vehicles (dangerous goods) and proposals to adopt more stringent national standards for ATP operation (reduced temperature) will all in the end add some weight to the vehicle and, therefore, only tend to reduce its potential payload.

There has to come a time when reason must prevail, when politicians can be persuaded that the truck haulage industry is responsible and it needs to be able to operate at peak efficiency. It cannot do this as long as the legislators produce regulations that have no consistency throughout the Community and that are based on subjective political motivation rather than hard facts, engineering expertise and down right good common sense.

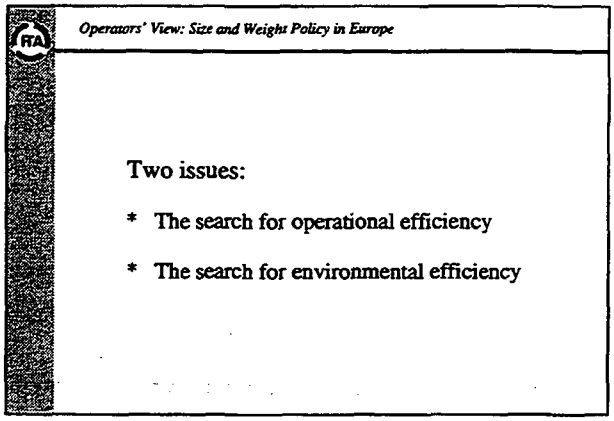
FTA believes that a maximum permitted weight of 44 tonnes on a vehicle fitted with six axles provides, not just the best compromise but also a very practical solution to maximising payloads and minimising road wear. It has been said that one 44 tonne vehicle produces the equivalent road damage of 150,000 cars. However, such examples are brought into perspective when you consider that it would take approximately 60 estate cars (station wagons) to carry the same load as one 44 tonne truck, apart from employing 60 drivers with 60 licences etc etc, that number of cars, if placed bumper to bumper, would accommodate over 400 metres of road space and if being driven at a reasonable speed and spaced from each other accordingly, the same number of vehicles would take up at least 1 kilometre of roadway. Comparing this to the 16.5 metres of a 44 tonne truck tends to put the whole question into better perspective and could be argued to justify the juggernaut.

THE TEXT OF MR. TURNER'S PRESENTATION

I address you as a representative of vehicle operators—a representative of the UK users association known as the Freight Transport Association.

The 12,000 members of the Freight Transport Association between them operate about half of the trucks in the UK, consign about 90% of the freight that is carried on the railways, and about 70% of the freight that is shipped to and from the UK by sea and air.

I will therefore concentrate on the users view, but I want to cover two aspects of it.



Firstly the search for operation efficiency and secondly the search for environmental efficiency.

First lets turn to the question of operation efficiency.

The modern commercial vehicle coming on the roads today is a far cry from the days when it was just an engine, a chassis and a wheel at each corner.

Today it is a sophisticated piece of high tech machinery. It costs a lot of money to buy, and is equally expensive to operate and maintain.

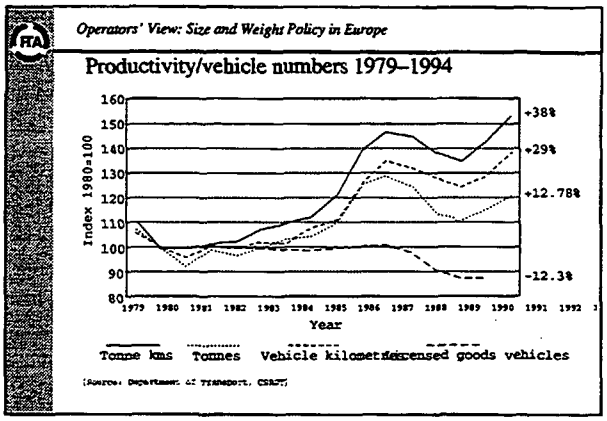
It demands a high level of management expertise to ensure its efficient operation which, amongst other things, calls for the ability to optimize its payload potential.

Long gone are the days when an operator just went along and bought a truck off the shelf. Today the proficient operator knows not only what he wants to carry, he also knows what vehicle specification will fulfill that requirement and also the legal framework within which he has to operate. To keep pace and to be competitive in today's world of computerized information technology needs a new breed of qualified transport managers, experienced maintenance staff and highly skilled drivers.

Typical of this development is the emergence of the specialist distribution companies in the UK that are applying an extremely high level of expertise to the distribution task.

In the European context these UK companies lead the field and are exploiting their expertise to the benefit of UK industry. Some of these names will also be well known over here in the States and Canada, particularly Excel Logistics and Tibbett and Britten.

As a measure of what these and other companies have achieved it is worth looking at the growth in work done in the UK by the lorry fleet.



This graph shows how the UK economy has demanded an increasing amount of tonne/kilometres of work — a 38% increase in the last 15 years — which has been achieved by a lorry fleet which is now more than 12% smaller than it was at the beginning of the period. The gap between these two lines represents the improvement in productivity and utilization that has been sought and found in the UK market.

Over a much longer period, 40 years (in fact going back to 1955), the maximum permitted weights in the UK have increased from just over 24 tonnes (53,760 lbs) to 38 tonnes (83,775 lbs). That alone represents an increase of 56% over 40 years but the work done has trebled from 38 billion to 127 billion tonne/kilometres.

Of course, much of this has been aided by an improvement in the road network, and higher speed limits.

This demonstrates how road freight transport, as the servant of society, has been called upon to do far more work and has achieved that in a very efficient and responsible way.

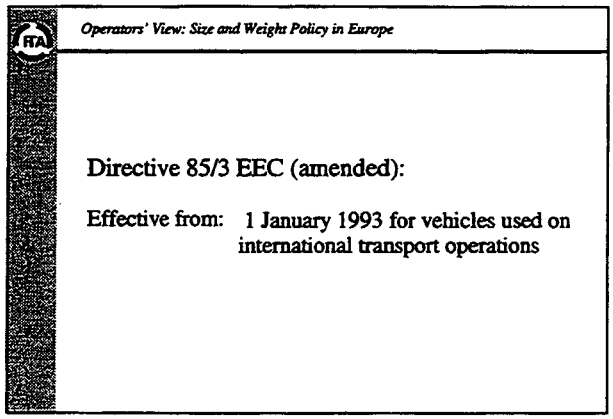
So what has all this got to do with weights and dimensions? Of course everything. The demands on our vehicles, your vehicles, everybody's vehicles require us to make the most of every bit of energy and fuel that we use and the space on the road that we use and the wear that we cause to the infrastructure.

The search, therefore, for the ideal vehicle in every circumstance remains the holy grail not only of users, but of designers, of infrastructure providers, in fact for all of us.

My brief is to set the scene on what is going on in Europe and perhaps I can first of all refer you to the overriding Community Directive 85/3 which was established in 1985 and sets out the criteria for vehicles that must be accepted by member states on international journeys.

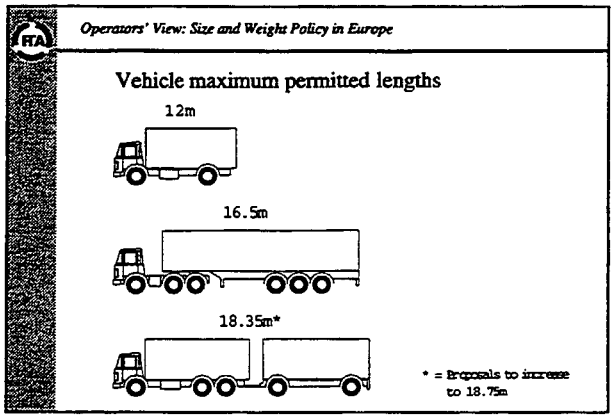
Let me paint the European picture for you.

The Commission of the European Union provides general international rules in the form of Directives, and individual countries within the Union (of which there are not 15 with the accession of Sweden, Finland and Austria at the beginning of the year) make up their own domestic rules within these limits.

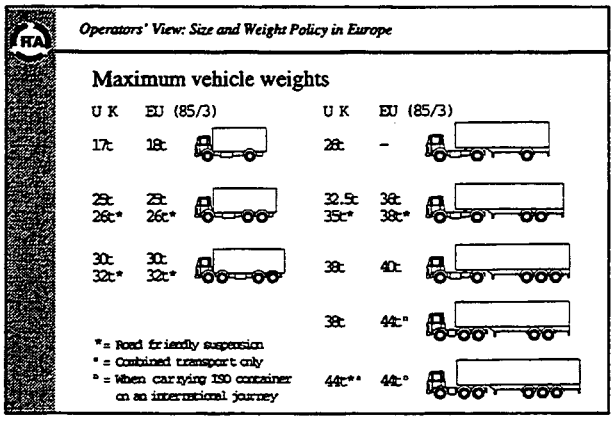


As a result, the domestic maximum weights often vary, as to some extent they vary in the USA. Policing and enforcement in the European Union is also similar to that in the States with national authority ending at individual state borders.

Directive 85/3 sets out the criteria that must be accepted by member states. Vehicles complying with this Directive must be allowed to cross the state borders.



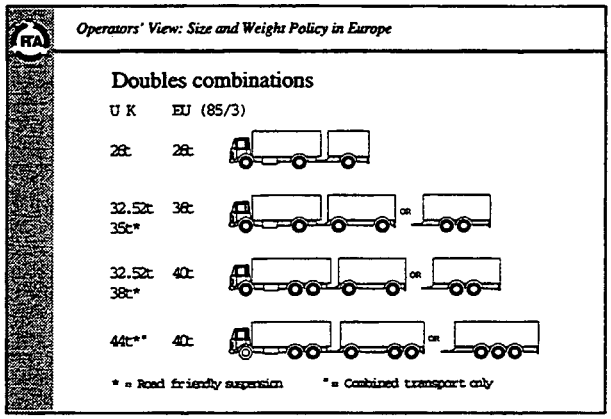
The simplest dimension to look at is the vehicle lengths and this slide summaries the principal constraints on vehicle length through the European Union.



This slide is more complicated and shows the maximum permitted weights through the Union by virtue of Regulation 85/3 and compared on this slide with the maximum permitted weights domestically in the UK.

You will immediately notice that the UK does not quite match up to the EU standard. The derogation, as it is known, was allowed by the European states when the Directive was made in 1985 because the UK Government claimed that our infrastructure was to weak to cope with these higher weights and we were allowed until 1 January 1999 to bring our infrastructure up to date: then we have to match up to the EU standard, and there will be common rules throughout the Union for international transport.

This next slide shows similar information for the drawbar combinations.



Legislators in Europe are preoccupied with axle weights. The rest of the world are trying to keep them small but in Europe we are making them larger.

Axle weights in Europe are generally much larger than those accepted elsewhere in the world. The current maximum axle weight on a drive axle in the UK is 10.5 tonnes but throughout the rest of Europe it is 11.5 tonnes.

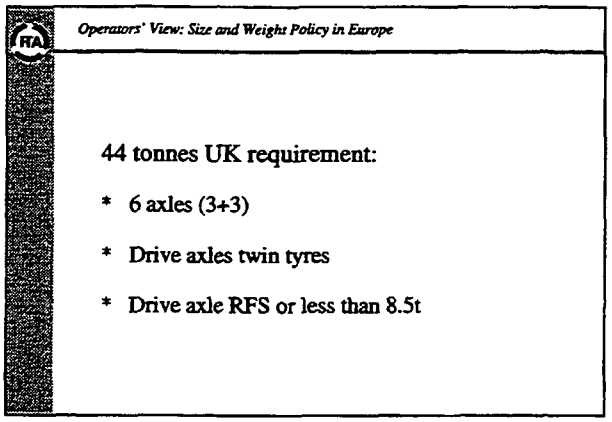
This high axle weight which is generally adopted now through most of Europe is starting to cause quite severe maintenance problems. Germany in particular which, since Unification has attracted a lot of transient traffic from Eastern Europe into the Union, is finding that its infrastructure is suffering badly with this heavy drive axle. There are also worries in Sweden where their maximum weights go up to 60 tonnes but not on 11 tonne axles. My personal view is that European Union highway engineers are beginning to regret this move, but the prospect of a reversal in the legislation is just inconceivable at the present time.

Those of you that are familiar with the European scene will know that there is much talk about weights heavier than those I have shown you. In particular some member states operate up to 50 or even 60 tonnes and there is currently a draft proposal to allow 44 tonnes permitted for all traffic, not just multi-modal.

In the UK the FTA has been campaigning for 44 tonne operation on 6 axles. We saw the opportunity of encouraging operators to adapt to a heavier vehicle with more but lighter axle weights. The maximum axle weight on a 6 axle 44 tonne vehicle would be 8 tonnes. This would give a better payload without any increase in size but reduce road wear: you will understand this well. As a result

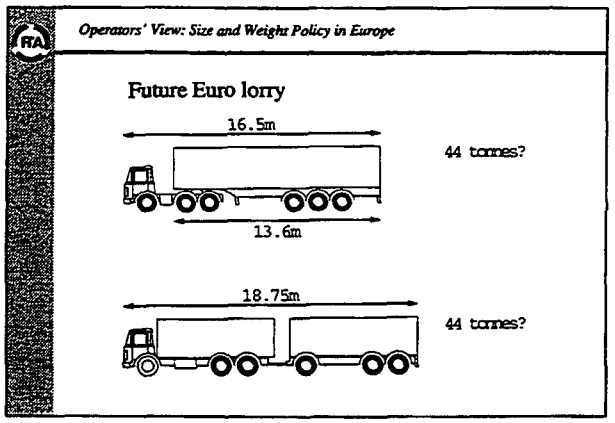
we calculated that the UK lorry fleet would decline by a further 9,000 vehicles with a massive saving in fuel, environmental intrusion, and road wear.

The Government have responded to our campaign by allowing 44 tonne vehicles only for multi-modal journeys for accessing railheads and they have added further technical requirements.



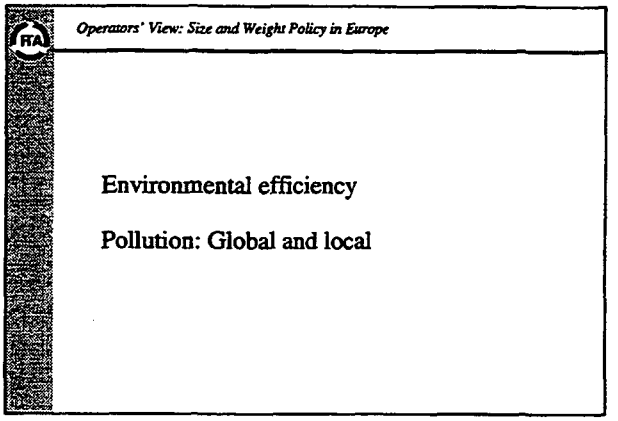
Not surprisingly few operators have taken up this opportunity with little over 200 vehicles currently in use. The paper that I have prepared, and which will be circulated, gives some of the more technical details associated with this vehicle and in particular some of the weight and distribution problems associated with the tri-axle boogie and trailer wheel base.

I would like to summarize the first part of this paper by referring to this next slide called the future Euro lorry.



This shows the dimensional increases for the artic remaining very similar to what they are at the moment but with a modest increase in the drawbar trailer unit up to the 18.75 metre limit. On the weight side I believe there will be another lurch forward in the community, most likely to 44 tonnes, but there is a lot of pressure from some of the northern states to go even higher, possibly 46 or 48 tonnes.

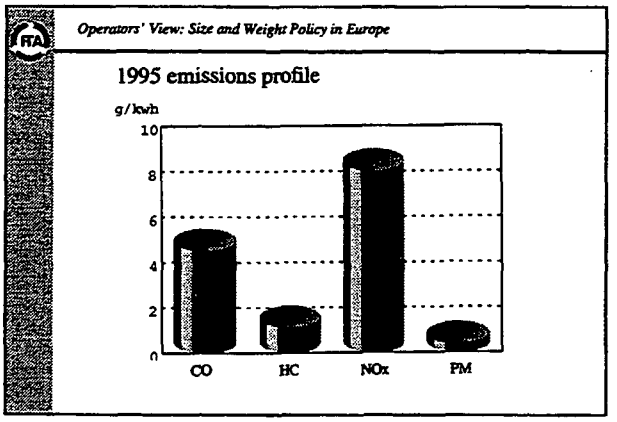
I do think, however, that the experiences of the past with heavy axles will condition the type of vehicle that we adopt in respect of its road wearing characteristics.



Industry must also take care to consider the environmental efficiency of our operation.

I know this might appear to be outside the agenda for this symposium, but I believe very strongly that getting what we want in terms of weights and dimensions will inevitably be conditioned by what the public find acceptable and the way in which we as operators, designers and users of vehicles behave towards our environment.

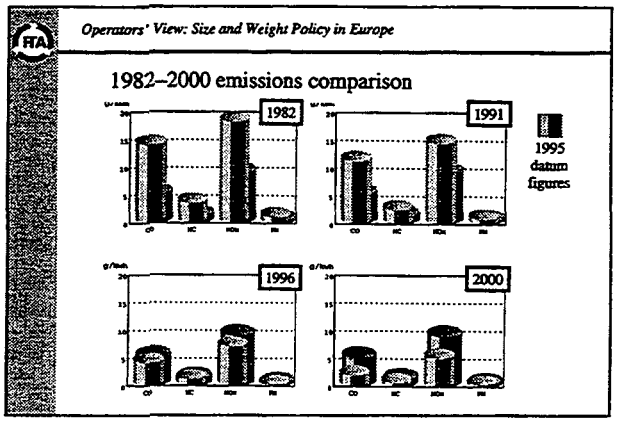
As an example, I briefly want to concentrate on one aspect of environmental efficiency: pollution from the vehicle itself. You can think of pollution in two ways, first there is carbon dioxide which is in fact a global pollutant and has well documented global warming properties, and the others are the local pollutants and dirt which give rise to smog and localized health risks.



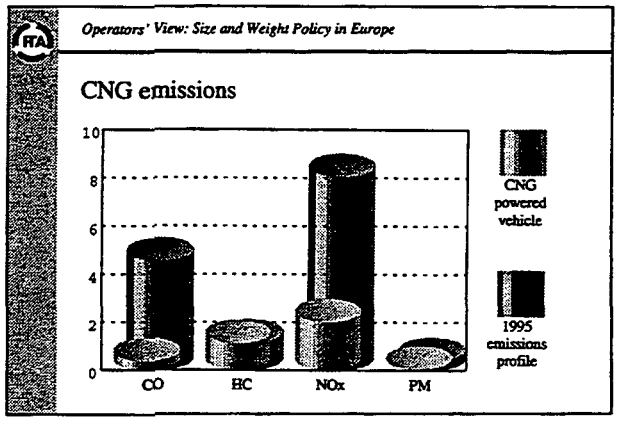
This slide shows the emissions profile of a typical modern truck in the UK coming onto the road in 1995.

This next slide [following page] shows how the vehicle today and the profile of the vehicle today compares with vehicles that were produced back in 1982 and those that we hope to produce at the end of the millennium.

They refer to heavy duty diesel engines and you can see that the progress we have made so far is tremendous and there are equally big steps yet to be made. Most of these are being achieved by engine design, combined with higher quality, particularly lower sulphur, fuels.



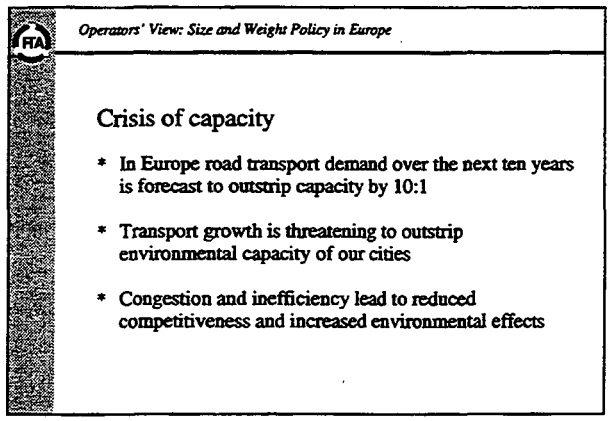
And if we want to go even further by using compressed natural gas this slide shows the dramatic improvement that can be made on local emissions.

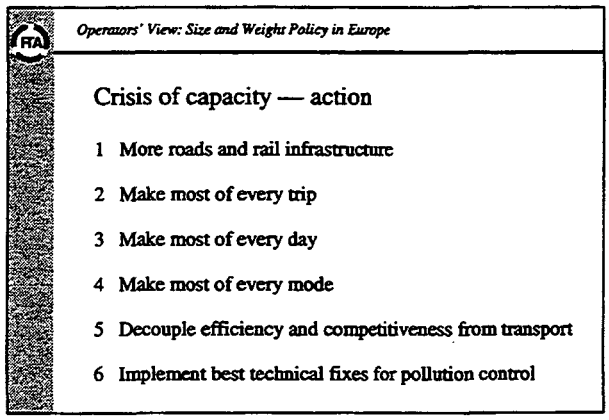


We can therefore conclude that we have within our grasp technical fixes for the environmental issues related to local pollution. Fixes that will cost a lot of money (up to 10% on trucks), but fixes that are important to put in place if we are to be allowed to continue to serve society with increasing efficiency and competitiveness.

I said a few moments ago that there were many issues surrounding the environment. I want to show you two slides which I believe summarize important issues for all of us to bear in mind over the next few days. These are problems that face not just us in the industry, but society as a whole throughout Europe and I suspect in many parts of the States and the rest of the world.

It is important for us not just to optimize the vehicle design but how we use it or more importantly how society will allow us to use it.





This first slide summarizes what I see as the crisis facing us all — its in a European context but that is what I am an expert in — no doubt you can translate it into your own local context. We should not be depressed by this analysis, but challenged. We need to be realistic because there are things that we can, should and must do and these I have summarized on my last slide.

I was asked to provide an operator's view of vehicle weights and dimensions in Europe, this I have done. But I have also taken the liberty of setting those issues in the wider context of political and social reality. Many of us are engineers, some are planners, some are researchers, and all of us have a contribution to make. I hope the wider overview as seen by European operators will be a helpful focus on these important issues.