

# MOBILITY OF THE FUTURE: SMART FLEETS AND THE FUTURE OF ROAD TRANSPORTATION





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# FOREWORD

I am delighted to introduce this report to you on behalf of Goodyear EMEA. *The Mobility of the Future: Smart Fleets and the Future of Road Transportation* explores the challenges that the road freight industry in Europe is facing in the coming decades. While the industry is meeting the ever growing demand from customers this is not a time for complacency. The continuing pressure for fleets to drive down costs, reduce fuel consumption and optimize operations is not likely to subside. Customers are eager for businesses to reduce their impact on the environment but continue to expect high standards and low prices. For fleets this means that every aspect of their operation must work at the most efficient level. And efficiencies improved in one aspect of a fleet, for example using the most fuel efficient tires, will only bring full benefits if drivers are well-trained and logistics reduce unnecessary journeys.

I welcome the fact that our research, which captures the views of nearly 600 fleet managers across eight European countries, shows fleet managers are embracing the need to reduce fuel consumption and are broadly supportive of the European Union's wider agenda to reduce carbon emissions. However, in return for this support it is clear that policymakers must work with the industry to ensure regulations to ensure regulations are also providing fleets with an operational environment (delete working for fleets too). Our research shows that fleets want to see clarity around the regulation of industry and to see a regulatory regime that is harmonized across the EU. And fleets want to see their efforts to meet the challenges of the environmental agenda rewarded.

Building on the work we did in 2012 to promote fuel efficiency, this White Paper explores in detail the emerging trends in technology that are addressing challenges and shaping the fleet of the future. Telematics are changing the way fleets are managed and offer huge potential to reduce empty journeys, enhance driver performance and increase road safety. But that potential has yet to be fulfilled.

If there is one clear message from this research it is that the automotive industry, regulators and fleets must continue to collaborate and innovate. No one factor is likely to have a transformational effect on how our trucks meet the daily needs of Europe's population. But taken as a whole advances in vehicle design, fleet management, telematics and driver behavior can ensure that the industry has a bright and green future ahead of it. I am proud that Goodyear has again shown its wider commitment to the future of the road freight industry and I hope that this report and our ongoing dialogue with fleets will prompt a lively and fruitful debate in the years to come.



**Michel Rzonzef**  
*Vice President, Commercial Tires,  
Goodyear Europe, Middle East and Africa*



# EXECUTIVE SUMMARY

## UNDERSTANDING THE ROAD FREIGHT ECOSYSTEM

A wide range of factors impact the efficiency and profitability of the road freight industry. In order for the industry to continue to contribute to Europe’s economy and meet the growing demand for transportation of goods, policymakers and the industry must work together to address them in turn.

### THE SURVEY RESULTS

The fleet survey shows that after fuel costs, the issues of most concern to fleet managers are hiring and retaining drivers and the impact of regulations.



There is broad support for efforts to improve fuel efficiency and for the European Union’s agenda on reducing carbon emissions. Fleets are overwhelmingly measuring their fuel consumption (92%) and imposing voluntary targets (72%) as well as indicating confidence that they can improve fuel efficiency further. 76% of fleets have invested in driver training to improve fuel efficiency. Fleet managers would welcome reductions in fuel taxes and investment in the road network, as well as more incentives for greener fleets. 68% of fleet managers want to see regulations harmonized across Europe.

### CHALLENGES AND OPPORTUNITIES

Reducing fuel consumption remains fleet managers’ most pressing priority. The need to reduce fuel consumption and improve efficiency means that fleet managers are aligned with policymakers who advocate reduced carbon emissions. However, given the improvement in trucks’ fuel efficiency in the last thirty years; further efficiencies will increasingly rely on a holistic approach that embraces technological advances, improved driving and more sophisticated logistics.

Fleets face a changing competitive landscape and most fleets are operating with very low profit margins. Rising salaries for drivers and the shortage of skilled drivers are likely to become increasingly important. The average age of drivers is rising and recruitment is challenging.

Urban congestion continues to impact on fleets’ efficiency. Policymakers should look at innovative solutions to enable trucks to operate outside busy times.

New technologies offer opportunities for the industry. Telematics are enabling some fleets to operate more efficiently. There is also potential for more interactivity between fleets and the road network, although this is at an early stage in Europe.

## THE FLEET OF THE FUTURE

The technology behind the road freight industry affects many different elements: tractors, trailers, tires, on board computers, logistics systems. Telematics are increasingly enabling fleet managers to monitor their fleets and drivers and the majority of fleets (73%) are using telematics in some form, most commonly to monitor their journeys. Many elements of telemetry available to fleets are not universally compatible and the full benefits could be realized if the industry worked more collaboratively. It is important that the benefits of telematics are fully understood by drivers as well as by fleet managers.

## THE TRUCK OF THE FUTURE

For the foreseeable future trucks will continue to operate diesel engines and the new Euro 6 standard engine is the cleanest in the world. Current restrictions on the length and weight of vehicles should be relaxed to allow larger and more efficient trucks.

## THE NETWORK OF THE FUTURE

The future road system could incorporate pricing schemes which are dynamic and incentivize or discourage drivers, although such schemes are controversial. Policymakers must work on solutions to address congestion given the growing demand for the transportation of goods. While all modes of transport have a role to play, they should work together to get the best of road, rail and maritime.

The European Union should look at some specific policy issues: the cross-border operation of larger trucks and incentives for fuel efficiency.

# RECOMMENDATIONS

## CLARITY ON REFORMS TO WEIGHTS AND DIMENSIONS

Our research and responses to our survey reflect the industry consensus that current restrictions on weights and dimensions of trucks are out of date and threatening the continued growth of the road freight industry in reconciliation with targets for sustainable transport. We call on the EU decision-makers, and in particular on the national governments, to adopt as soon as possible the proposals issued by the European Commission on the revision of Directive 96/53/EC on maximum weights and dimensions of vehicles.

According to the informal agreement reached earlier this year, the European Commission should be tasked to assess the safety and environmental impact of heavier and larger vehicles - up to 25 meters long and 70 tonnes heavy - by 2016. We welcome this decision and call on the EU policy-makers to fully consider the economic and environmental benefits such vehicles can bring to the European freight market.

## THE CROSS-BORDER OPERATION OF LARGER TRUCKS

Although EU Member States are free to authorize the circulation of trucks larger and heavier than the European limits set by Directive 96/53/EC, the revised Directive should explicitly recognize the Member States' freedom to allow cross-border operation of these trucks between countries where they are already on use. Given the current divergences of views between Member States and the European Parliamentarians, we understand this reference will not be inserted into EU law and regret this decision. Should the expected EU study confirm a positive impact of larger trucks on the environment, with no detriment to safety, and should the EU law be revised accordingly, we call on the policy-makers to review the possibility for cross-border operations of these vehicles.

## MANDATORY TPMS FOR COMMERCIAL VEHICLES

As Tire Pressure Monitoring Systems are already mandatory for new cars on the EU market and given the safety and environmental benefits of this technology, the EU legislators should extend the rule to include vans, trucks and buses. This rule should become mandatory on the occasion of the foreseen review of Regulation 661/2009 in 2015.

## INCENTIVIZING FUEL EFFICIENCY

The road freight industry is strongly incentivized to reduce fuel consumption in order to reduce the costs of running a fleet. Pressure from shippers and consumers is also effectively creating a market in which more fuel-efficient fleets have competitive advantage. We call on the European institutions to consider clearer incentives for green fleets, such as reduced tolls and taxes for fleets that offer eco-driving training.

## USE THE EU TIRE LABEL AS A DIFFERENTIATOR OF BEST FUEL-EFFICIENT TIRES

The tire label with grades CC and above for both rolling resistance (the fuel efficiency indicator) and wet grip (the safety indicator) should be used for enabling purchasing incentives of fuel efficient tires for all fleets. Likewise, the VECTO simulation tool the European Commission is developing for calculating CO2 emissions of trucks should consider the tires' contribution to energy efficiency on the basis of their label grade for rolling resistance.

## FLEET MANAGERS NEED SUPPORT TO MAKE THE MOST FROM NEW TELEMATIC TECHNOLOGY

Telematics offer significant benefits to fleets of all sizes. However, the current offer is disparate and confusing. We call on harmonized standards for telematics in order to optimize the benefits of telematics.

## PROVIDING SKILLED DRIVERS FOR THE FUTURE

Relevant policy-makers should plan to provide extra support to the road fleet sector to attract and retain skilled drivers. These could include incentives for fleets that provide driver training and eco-driving training as well as initiatives to promote the industry as a source of employment for young unemployed people.

# INTRODUCTION

There are times in human development when technology can enable people to radically change their lives—for good or ill. The development of the internal combustion engine has revolutionized our planet in the relatively short time since its universal adoption just over a century ago.

Today, the internal combustion engine remains the vital basis on which our societies move people and goods. Alongside other forms of transport, such as ships and trains, motor vehicles are central to our daily lives. But unlike the earliest adopters of cars and trucks, the motor industry today is not looking at a vast conquerable expanse. Instead it is a diverse and complex ecosystem which is struggling to achieve sustainability.

Each part of that ecosystem has a role in creating a sustainable mobility for the future—every driver, manufacturer, logistics provider and regulator. This report will consider the dynamic interaction between those parts, and in particular the influence of regulations. While regulations are often considered an obstacle to growth, it is worth remembering that it was the efforts on the part of the European Parliament to liberalize transport policy that was a key driver of growth in the 1980s and 1990s. As a report commissioned by the OECD put it:

***“This initiated a period of fast and occasionally hectic liberalization which focused on the road haulage market”<sup>1</sup>***

Between 1985 and 1990 road freight growth was at its highest rate of 4.5% every year<sup>2</sup>. It is in this context of continuous growth, predicted to continue that we set this report.

Demand for goods is growing, but roads are not expanding; demands for greener vehicles are increasing, but carbon-free fuel is many years from development; the power of computers to rationalize and optimize trucks and roads is gaining traction but it has yet to achieve its potential.

The technological advances that will achieve sustainability for road freight rest, therefore, not in one breakthrough idea. Instead, this report will look at multiple parts that make up our transport system and consider how each can make a contribution to the future of our mobility.

For that reason, Goodyear’s message for policymakers, manufacturers, fleet managers and regulators is clear—only by embracing incremental improvement at all levels can the road freight industry meet the demands of this century. To this end the industry will need to co-operate and share the fruits of our collective endeavor. And, just as there is no single solution to the challenges that the industry faces, there is no single party responsible for achieving sustainability. Instead, as a first step, we must work together to find the solutions that will meet our shared goals.

This challenge is why Goodyear is again convening the most influential players in the European road freight industry Future of Mobility Symposium, building on the success of the 2012 Fuel Efficiency Symposium. It is why Goodyear will continue to build relationships with fleets, with regulators at European and national level and with truck manufacturers.

And it is why this White Paper can only be the start of a process that will take us towards the mobility of the future. In the words of Henry Ford, that first great visionary of motorization:

***“Coming together is a beginning; keeping together is progress; working together is success.”***

## UNDERSTANDING THE ROAD FREIGHT ECO-SYSTEM

The European road freight industry drives Europe’s economic prosperity. The goods and services that we all take for granted in our daily lives are carried to us, for at least part of their journey, on Europe’s road network. Trucks and vans are responsible for carrying the overwhelming majority of the value of goods in Europe—some 90%<sup>3</sup>. Every single day trucks transport about 50 million<sup>4</sup> consumer and industrial goods, accounting for three-quarters of the freight carried by a combination of road, rail and maritime transportation. Even a high proportion of European air freight is carried from one airport to another by trucks.

The importance of road freight to our economy, to jobs and to our everyday needs is not a matter for debate. And this vital part of the economy must grow to start to meet increasing demand. The volume of goods carried by trucks is expected to grow by 60% between now and 2050<sup>5</sup>. This report will set out how the industry is rising to meet that challenge.

For some sectors, the prospect of rising demand, an economy that is moving into sustainable recovery and significant investment in technology would seem the perfect context for further commercial opportunity. However, the road freight industry faces significant challenges, as well as opportunities. For many operators the commercial aspects of a fleet operate in a fine balance. Many fringe players are operating on very low profit margins, struggling to gain access to capital and to grow in scale – for these operators, remaining competitive is a matter of survival. For larger fleets there is growing pressure from shippers, who are in turn under pressure from consumers, to meet ever more demanding environmental standards. Also, increasing consumer demand for speed of delivery and for the capability to track their goods has required fleets to invest in more flexible models and in technology to monitor vehicles

and cargo. Rising wages and training costs are making skilled drivers a rarer and more expensive commodity, at a time when skilled drivers are also vital to keeping costs down. As well as exerting pressure on the industry to transport their goods with reduced impact on the environment, politicians continue to be under pressure to limit the impact of road freight on congestion, on noise levels from trucks in urban centers and to curb their emissions. Public perceptions that trucks cause traffic accidents are also a consideration for politicians<sup>6</sup>. Finally, and most significantly for the fleet managers, the cost of fuel is determining the pace of change.

These challenges create the context in which the road freight industry must innovate in the coming decades. However, as this report will show, they are very closely interrelated. As Mike Sturgeon of the Association of Vehicle Logistics rightly says:

***“Everybody has a responsibility to improve the part of the supply chain that they contribute to, whether that’s truck manufacturers, those who regulate fuel, the tire manufacturers or the operators themselves.”***

Reductions in fuel consumption drive down costs and reduce a fleet’s carbon footprint. Development of technology by Original Equipment Manufacturer (OEMs) for “greener” trucks (e.g. with lower air pollutants and noise emissions) can reduce costs, but it in turn requires investment. Skilled drivers drive more economically and in a more environmentally sound way as well as being highly safe drivers—but they can demand higher wages. Advanced logistics can reduce inefficiency, but it comes at a price and requires additional training to produce real benefits. This is the ecosystem of the industry, in which changes to one aspect of transportation has a consequent impact on another. In some technologies, rapid change can occur in leaps of technological advance—consider the transformation in the development of smart phones. This will not be so for the road freight industry. Instead improvements across a whole range of moving (and non-moving) parts will offer modest improvements over time. Taken together these have the potential to see the industry meet the challenges of the first half of this century. But there is no silver bullet, no one all-encompassing solution.

3 Position Paper from Centre for European Paper Industries Road freight transport—Weight & dimensions’ limits: let’s make the best use of Europe’s roads!

November 2013 <http://www.cepi.org/topic/transport/positionpaper/roadfreighttransport>

4 IRU—Facts and figures on trucks in Europe <http://www.iru.org/cms-file-system-action?file=mix-publications/DYK-Truck.E.pdf>

5 European Union Road Transport Vademecum; Getting into the right lane for low carbon transportation in the EU, K Geurs, H Nijland, and B van Ruijen (March 2009)

6 “While trucks are commonly perceived as a road safety concern, this is not supported by the facts.” ACEA press release, 2013. <http://truckofthefuture.eu/truck-fatalities-dropped-25-in-last-20-years/>

This report will seek to describe the ecosystem of the road freight industry—which, like any ecosystem is in a permanent state of delicate balance. The report’s aim is to uncover the practical solutions that industry manufacturers, including tire manufacturers, rail and maritime freight, the European Union and national decision makers, shippers and fleets can implement to make our industry more efficient, greener and more commercially viable. And to reach those solutions, we must, in the first instance, establish the specific challenges that fleet managers are facing.

### THE SURVEY RESULTS

This data is based on a survey of 576 fleet managers in the following European markets: Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Poland, Turkey and the UK.

The purpose of the questionnaire to fleet managers was to gauge their views on the challenges and opportunities facing the road freight industry in Europe. The survey asked them to set out the external factors that have an impact on their business.

### PROMOTING FUEL EFFICIENCY

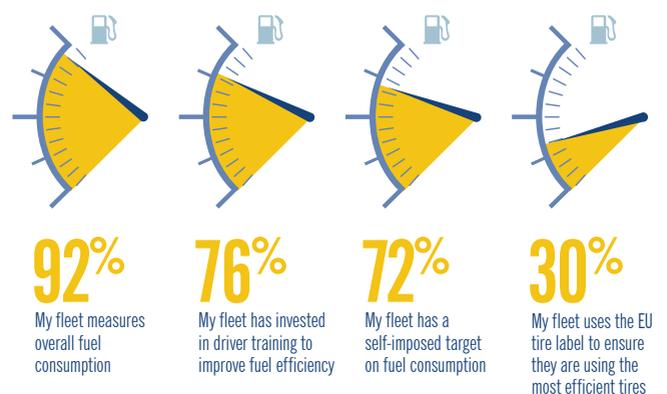
Unsurprisingly, the cost of fuel remains the single biggest factor: 53% of fleet managers consider cost of fuel has the biggest impact on their business. The second biggest factor (30%) is the challenge of hiring and retaining skilled drivers. This is consistent both with the 2012 Goodyear research into fuel efficiency and the views of the experts interviewed for the White Paper. Fuel costs and hiring and retaining drivers were also the highest scoring factors rated as the second most important with scores of 27% and 20% respectively.

As 83% of fleet managers consider these two factors the most important, other options scored relatively low. The remaining 7% of fleet managers ranked changes in demand from customers as the biggest impact on their business followed by increased legislation and regulation (3%), urban congestion (2%) and the poor state of the roads (2%). Only 1% cited competition from other forms of transport and road taxes relating to CO<sub>2</sub>.

These results confirm the fact that reducing fuel costs is the highest priority for fleets. However, given that fuel costs are inevitably the major factor, acting as the driving force behind innovation in vehicles and drivers, it is telling that the issue of hiring and retaining skilled drivers scores so highly. Changes in demand from customers is the third highest factor—a sign that fleet managers share the academic consensus that the industry is in a period of change.

There is some variation in these results related to fleet size. While fuel costs have the biggest impact for fleets of all sizes, the smallest fleets (under 19 vehicles) consider retaining and hiring drivers to be of the same importance, with 42% ranking either fuel or retaining drivers the number one issue. The largest fleets (500+) were more likely to rank changing customer demand as their top priority (15%) than other fleets. Larger fleets are also more concerned about the road network, with 12% citing the state of the roads as their major concern, compared to an average of only 2%.

Given the impact of fuel costs, nearly all fleets measure overall fuel consumption—92% in fact.

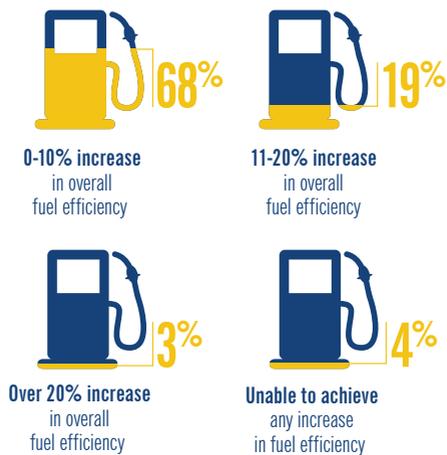


This figure is unchanged from 2011 research among fleet managers undertaken by Goodyear. Fleets of between 50-500 vehicles were most likely to measure overall consumption (95%). For the largest fleets this figure drops to 74% and for fleets of under 20 trucks to 87%. When we asked fleets if they have a self-imposed target for increased fuel efficiency 72% indicated that they do, with all fleets within 10% of the average.

Clearly measuring and managing fuel consumption matters to the overwhelming majority of fleets. That larger fleets are less likely to measure overall consumption may reflect reporting methods as much as their relative commitment to reducing consumption. This data shows that more fleets have targets than when Goodyear asked them the same question in 2012—those who have a voluntary target for fuel efficiency have risen from 69% in 2012 to 72% in 2014.



The vast majority of fleets believe that there are still significant fuel efficiencies to be made: only 4% of fleets think that they cannot improve their fuel efficiency. While a small minority of fleets (3%) think they will be able to reduce fuel consumption by over 20%, seven in ten (68%) believe they can make efficiency savings of up to 10%.



Again, when we asked fleet managers about the potential of technology to reduce emissions further, only a minority was pessimistic: 14% believe that the road transport industry has reached its limits regarding fuel emissions reductions. But 46% feel that Euro VI represents a strong position and believe that this is as far as diesel engine emission regulation should go until it is shown that further significant emission reductions can be reasonably achieved<sup>7</sup>.

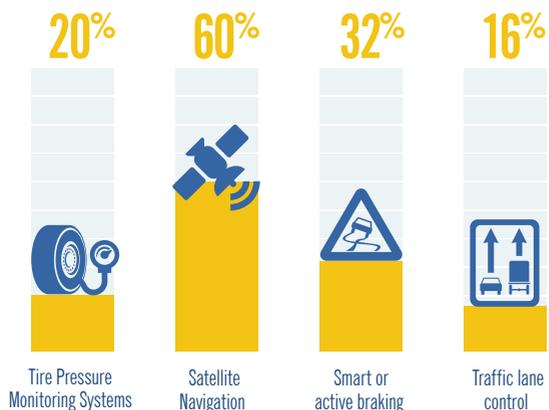
Over a quarter (27%) favor allowing OEMs to have more freedom to design trucks that have better aerodynamic form and to optimize loading—reflecting the expert consensus that current restrictions on size and weight should be relaxed.

Despite the efforts of the European Union to promote its broad ambitions on carbon emissions, as set out in the 2020 goals around emissions targets, only 35% of fleet managers are aware of them<sup>8</sup>. However, of those who are aware of the targets there is support from 35% of fleet managers, with a third (32%) neutral and only 18% very hostile. However, a significant minority of fleet managers (26%) believe the targets cannot be achieved without damaging the road freight industry. There are 36% who are neutral on the issue, while 37% disagree that the targets will necessarily be damaging.

### IMPROVING OVERALL EFFICIENCY

The survey explored the steps fleet managers are taking to improve their efficiency and profitability. Most fleets (76%) have invested in driver training to improve fuel efficiency, although this falls to 60% in the largest (500+) fleets. Half of fleets also take the time to ensure that their vehicles are the most fuel efficient (51%). Fewer fleets have invested in aerodynamic equipment (28%) and tire management (28%), although 30% do check the tire label<sup>9</sup> before purchasing a tire. The number of fleets benefiting from TPMS<sup>10</sup> remains low: only one in five (20%) have TPMS.

#### Do you use any of the following technologies in your fleet?



<sup>7</sup> Euro VI is the most recent standard for truck engine's. See glossary.

<sup>8</sup> The EU's 20-20-20 targets are part of the EU's 2020 strategy on carbon emissions reduction. See glossary.

<sup>9</sup> The EU Tire Label is a required label on tires which gives customers information. See glossary.

<sup>10</sup> TPMS—Tire Pressure Monitoring System. See glossary.

Given the emerging importance of telematics to the industry, the survey explored the extent to which Europe's fleets are exploiting telematics. About a quarter (27%) of fleets make no use of telematics at all and a further 16% make very limited use of telematics. This suggests that nearly half of Europe's fleets have yet to embrace the full potential of telematics. A quarter (25%) of managers are embracing the technology and consider telematics to be vital to the future of the industry and will continue to invest in them.

When it comes to the uses to which fleets are putting telematics, the most common are driver monitoring (62%) and satellite navigation (60%). Over half of those using telemetry use it to monitor fuel consumption (55%). Just under one third (32%) are using advanced telematics to monitor smart or active braking and 16% use it for traffic lane control. One in five fleets has systems to monitor tire pressure.

Those that deploy telematics are making use of its real time functions, with 68% of fleets receiving data in real time. Real time data is most likely to be used to track vehicles (94%) and to monitor driver behavior (85%). About half of fleets that collect real time data are using it to track fuel consumption (52%). Given that nearly all fleets are tracking their overall fuel consumption (92%) and a growing number have voluntary targets for consumption (72%) it seems likely that too few fleet managers are using the available technology to analyse consumption, depending instead on a simple record of fuel purchased.

The largest fleets are more likely to use telematics for monitoring tires and the condition of vehicles in real time—24% of the largest fleets use real time data on tires compared to an average of 5%.

The survey asked those who do not collect real time data why this is the case. Two in five fleet managers cite the cost, while nearly a quarter (24%) simply do not see the benefits. A small number of fleets (8%) say that their drivers resent being monitored. While 23% of fleets say that they do not use telematics in real time to avoid data overload, not a single fleet manager raised the issue of concerns over data security.

Expert interviews to support this research cited the need for telematics manufacturers and regulators to work with OEMs and fleets to ensure telemetry is achieving more for fleets and helping reduce fuel consumption. One element of leverage could be lower insurance premiums. Given the huge range of inputs that shape the ecosystem of the road freight industry, more effectively targeted insurance premiums could have a role to play in promoting road safety and in reducing costs for the most efficient fleets. Given that only 16% of fleets have been offered lower insurance premiums based on their use of telematics there would certainly be a market for this type of innovation.

When it comes to sharing data, the majority of fleets pass information on to their drivers to improve their efficiency (66%). A significant minority of fleet managers (26%) actually financially incentivize efficient driving. Only 12% say that they prefer not to share data. These results show that despite concerns around data security and the challenges of managing so-called big data, the road freight industry is not as concerned as might be surmised about this issue.

## PRIORITIES FOR REGULATORS

The majority of fleet managers want to see investment by authorities to improve the road network, with nearly three quarters (72%) saying that they agree or strongly agree with this. Far fewer see the issue in terms of improving modal shift between road and rail (32%) or between road freight and maritime freight (27%). More advanced solutions, such as driverless trucks, do not capture the imagination of fleet managers – 48% are against public investment in such technology compared to 30% in favor. Reducing fuel bills by lowering fuel taxes is also popular amongst fleet managers. Nearly three quarters of fleet managers (74%) want to see taxes on fuel reduced. There is less of a consensus on allowing longer and heavier vehicles, with just over half (51%) in favor, 25% who are neutral on the issue and 24% who are opposed. Support for longer and heavier vehicles is highest amongst fleets of between 100-500 vehicles (60%), falling to just under half (48%) amongst the smaller fleets (1-50 trucks). It seems likely that mid-size fleets would benefit more from relaxing regulations as they can invest in new trucks to secure a return on investment. However, despite the potential impact on

smaller fleets of replacing their trucks, only a minority (28%) are actually against relaxing the rules. When it comes to allowing cross border operation of heavier and longer trucks, there is a similar consensus, with only 26% against changing the rules. Fears that such changes could benefit countries that already permit heavier or longer vehicles may have influenced the lack of support for increased weights and dimensions.

There was more disparity between fleets on the issue of incentives for environmentally friendly fleets, such as allowing low emission vehicles into towns and cities. Nearly four fifths (78%) of the largest (500+) fleets favor incentives for green fleets. This drops to just below half (49%) for the smaller fleets. However, despite the fact that big fleets might have the most to gain, only small numbers are hostile—on average only 21% of fleet managers oppose incentivizing greener vehicles. Fleet managers are similarly in favor of incentives for buying the most fuel efficient tires—60% are in favor compared to 16% who would oppose such a move.

When it comes to addressing different regulatory regimes in Europe, there is strong support for harmonization. As many as 68% of fleet managers would like to see fully harmonized rules for the road freight industry across the EU. Similarly 64% of fleet managers want to see the EU take steps to address congestion and develop smart transport systems (e.g. automatic tolls). The survey offered fleet managers a menu of options that the EU could implement which would have a positive impact on the road freight industry. Of these, by far the most popular was reducing fuel taxes (4.05/5)<sup>11</sup> followed by improving road maintenance (3.83/5). Tellingly, the least popular (3.03/5) was to relax carbon emissions targets, perhaps reflecting the commitment the industry has made to carbon reductions and the pressure from shippers and end-consumers for lower carbon emissions. On average, 34% of fleet managers would decrease regulation around CO<sub>2</sub>; this figure falls to 24% for larger fleets (100-500).

**Percentage of respondents who selected “agree” or “strongly agree”**



**TIRES AND EU TIRE LABELING**

In November 2012 the EU launched the EU Tire Label which provides important information about safety and environmental aspects of a tire. Similar to the energy label found on white goods, the EU tire label makes it easy to compare tires in terms of safety, fuel efficiency and noise. Goodyear’s research shows that the tire label is having an impact and nearly 40% of fleet managers say that the label influences their purchase. Fleet managers broadly favor the promotion of the EU tire label, with 43% in favor compared to 16% against. Research conducted by Goodyear in June 2013, eight months after the label’s introduction, supports this position: 54% of fleet operators said that the label influenced their purchase, with fuel efficiency as the key factor for 66% of respondents. Despite questioning the value of the EU tire label, most fleet managers say that it influences their purchase (61%). This suggests that while overall fleets are not convinced that the EU tire label is achieving all that it could, they themselves choose to take it into account. Fewer managers currently favor compulsory TPMS—37% would support this compared to 23% against. Support for compulsory TPMS is lowest amongst the smallest fleets, with 19% in opposed and only 25% in favor.

<sup>11</sup> Goodyear’s survey asked drivers to score their support for measures on a scale of 1-5 where 1 = I strongly disagree through to 5 = I strongly agree. A score of 4 or higher indicates strong support across the sample.

# CHALLENGES AND OPPORTUNITIES

## MEETING THE GREEN CHALLENGE

In 2012 Goodyear launched its White Paper, *Driving Fleet Fuel Efficiency*<sup>12</sup>. This report, together with the fuel efficiency calculator developed by Goodyear in partnership with Delft University, set out the challenges of reducing fuel consumption while remaining competitive. What was true in 2012 remains valid two years later:

***“The instability and uncertainty around the cost of fuelling their fleets have left Europe’s operators at a crossroads. A global recession and the rising cost of crude oil coincided with governments and consumers making a serious commitment to low-carbon living. This perfect storm has left the road transport sector facing a simultaneous increase in regulations, costs and customer expectations.”***<sup>13</sup>

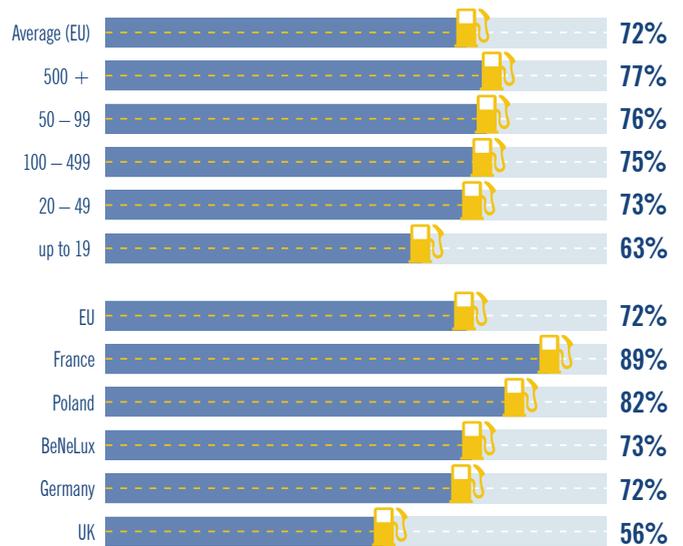
According to the Freight Transport Associations’ 2013 Logistics Report road transport operator profit margins fell to around 1% in 2014.

In 2012 Goodyear renewed its commitment to ensuring that it plays a role in increasing fuel efficiency, in partnership with vehicle manufacturers. As highlighted in the 2014 survey shows that the issues we raised in 2012 remain of paramount importance today

At our symposium on fuel efficiency in 2012, we also recommended that the European Commission consider an impact assessment on the benefits of Tire Pressure Monitoring Systems for commercial vehicles. We welcome the fact that the European Commission has consulted with manufactures on TPMS<sup>15</sup>. However, we still remain to see whether the EU legislator will extend the rules on TPMS from cars to commercial vehicles.

### Does your fleet have a self-imposed target for increased fuel efficiency?

Percentage of respondents who selected “yes”



We also recommended a review of the current restrictions on the permitted weight and dimensions for trucks. It is on that basis that we welcome the European Commission’s proposals to revise Directive 96/53/EC being currently discussed between national transport ministers and supported by the European Parliament and we look forward to their swift implementation.

<sup>12</sup> Goodyear, Driving Fleet Fuel Efficiency 2012 <http://fleet-fuel-efficiency.eu/en/home/>  
<sup>13</sup> Ibid

<sup>14</sup> Freight Transport Association, Logistics Report 2013, 2013 [http://www.pwc.be/en\\_BE/be/publications/2014/the-logistics-report-2013.pdf](http://www.pwc.be/en_BE/be/publications/2014/the-logistics-report-2013.pdf)  
<sup>15</sup> [http://ec.europa.eu/enterprise/sectors/automotive/files/pagesbackground/safety/consultation/consultation\\_document\\_en.pdf](http://ec.europa.eu/enterprise/sectors/automotive/files/pagesbackground/safety/consultation/consultation_document_en.pdf)

While there are moves which are undoubtedly supporting fleets to meet the challenge of reducing their carbon footprint, the pressure for lower carbon emissions shows no sign of abating. Trucks in Europe are amongst the cleanest in the world—nitrogen oxide has been reduced by 97% since 1990 and particulate emissions by more than 99%. However, while huge improvements have been achieved, some industry players have questioned whether that pace of change can be maintained. As Dr Wolfgang Bernhard, Head of Daimler Trucks and Buses Division, puts it:

***“Manufacturers have committed to a 20% fuel reduction in the period from 2005 to 2020. We’re making good progress toward that target. But we also know that due to diminishing returns, further progress will be even more difficult to achieve.”***

The industry is committed to meeting further carbon emissions reductions, in large part because of the direct relationship between fuel consumption and costs—as Martin Nielsen of the International Road Transport Union puts it:

***“There is goodwill from the industry to reduce fuel consumption because it amounts to 30% of their costs; it’s a no brainer for them”.***

However, further regulation must recognize the complexity of measuring fuel efficiency for trucks. It is easy for commentators, and even some regulators, to make assumptions about trucks that apply readily to cars. Car manufacturers understand that their customers want a car that is as fuel efficient as possible—given the cost of fuel even modest reductions of 1-2% can translate into real savings for a motorist. But trucks consist of far more variables—the tractor, the trailer, the tires, the load, and how the driver interacts with the road etc. Just as the industry as a whole is a series of interconnecting and interrelating components, so too is the vehicle. This is not to argue that manufacturers of tractors should not invest in further efficiencies, but it is the case that for a fleet manager the most efficient tractor loses its return on investment if it is carrying an inefficient trailer or is driven by a fuel inefficient driver. When you factor in logistics, the most fuel efficient vehicle quickly loses its ratio of fuel to payload if it makes journeys without a cargo. And it is the case that different

players in the industry have different approaches. In the words of David Ceborn at the Centre for Sustainable Road Freight:

***“I think there is a good chunk of the industry that is very committed. Our members are contributing funding and know-how into that same mission. But there are also small operators on tight margins who do not necessarily have the skills to implement large-scale change by themselves.”***

Goodyear recognizes the importance of reducing carbon emissions and we will continue to invest in tire and service innovations that will help fleets to increase fuel efficiency. However, the industry must address this challenge in a holistic way. Indeed, the fact that so many factors have an impact on fuel efficiency and carbon emissions can seem daunting. As Ray Engley of the Road Haulage Association says:

***“It’s confused—the big problem is that some companies use [fuel efficiency] as a green badge because they can afford to do so. There is uncertainty about what actually works.”***

This report will consider how together a greener road freight industry can be built in terms of the fleet, the vehicle and the network of the future.

## A CHANGING COMPETITIVE LANDSCAPE

The road freight industry has historically operated on low profit margins. In some cases that can make fleets unsustainable. Marc Huybrechts, of Wijngaard Natie Logistics, says that for some fleets it is a matter of survival:

***“first of all survival in the face of cost pressures—there is high demand for freight but there are also many operators offering their services.”***

Operators looking to make profits in the longer-term are necessarily investing in order to do so. The evolution of the Euro VI engine is one example of this, and the life cycle for vehicles is shrinking. For fleets with less capacity to invest this presents a challenge. Market analysis suggests that while the industry will continue to grow in the medium term,

consolidation may be necessary if profitability is to improve. Consolidation could take a range of forms. In some cases operators may formally merge their functions. In others, greater co-operation between fleets will reduce unnecessary costs, in particular in relation to reducing journeys without a payload. Beyond Europe there is evidence that international players are entering markets that have traditionally been dominated by local operators. For example, Kuwaiti based Agility Logistics has an increasingly visible presence in the Australian market<sup>16</sup>.

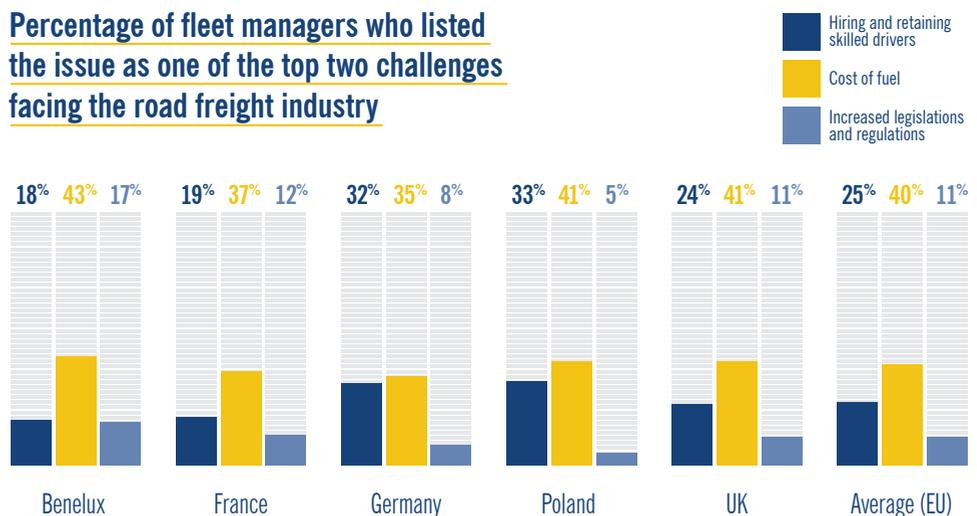
Fuel costs are consistently the principal concern of fleet managers. Fuel costs have been rising and are forecast to continue to do so at 2–3% per annum. Some large scale operators have the bargaining power to pass this growing cost onto their customers, but not all fleets can do this. As Goodyear asserted in its previous White Paper, Driving Fuel Fleet Efficiency, reducing fuel consumption is achievable through a wide range of initiatives. However, there are limits to meeting the fuel efficiency challenge. Historically the industry has maintained productivity in the face of growing fuel costs by delivering more for less. The improvements in fuel efficiency and the consequent reductions in carbon emissions are testament to the industry’s efforts in this direction: a modern long-haul truck today is 30% more fuel-efficient than 30 years ago<sup>17</sup>.

Increasing the size of the vehicle is one of the most efficient ways to reduce fuel consumption and improve the ratio between consumption and payload. For that reason the industry has been calling on governments on governments to allow larger trucks. But there remain significant barriers; an industry reliant on current vehicle sizes will struggle to increase productivity in the medium term.

Beyond fuel the most significant cost is salaries. The current workforce is aging and the average age of a truck driver is 50 years old<sup>18</sup>. The industry is now competing for skilled workers with other sectors. If the shortage of skilled drivers is not addressed, a dwindling supply of drivers will be well-positioned to demand ever higher wages. Average wage costs have increased annually since 2008-9 and this is forecast to grow by 3.5% per annum<sup>19</sup>. For operators of vehicle transporters recruitment is an especial problem as Mike Sturgeon, of the Association of European Vehicle Logistics, confirmed:

***“For the specialist transporters the major problem is driver recruitment. Driving a vehicle transporter is a tough job and it is made worse by the lack of facilities for drivers when they park up at night.”***

**Percentage of fleet managers who listed the issue as one of the top two challenges facing the road freight industry**



<sup>16</sup> EY, Transactions Advisory Service, 2013 [http://www.ey.com/Publication/vwLUAssets/EY\\_Road\\_Freight/\\$FILE/EY-Road-Freight.pdf](http://www.ey.com/Publication/vwLUAssets/EY_Road_Freight/$FILE/EY-Road-Freight.pdf)  
<sup>17</sup> <http://www.acea.be/news/article/acea-transport-policy-event-2013-wolfgang-bernhard-keynote-speech>  
<sup>18</sup> Business Week, 2013 <http://www.businessweek.com/articles/2013-11-14/2014-outlook-truck-driver-shortage>  
<sup>19</sup> EY, Transactions Advisory Service, 2013 [http://www.ey.com/Publication/vwLUAssets/EY\\_Road\\_Freight/\\$FILE/EY-Road-Freight.pdf](http://www.ey.com/Publication/vwLUAssets/EY_Road_Freight/$FILE/EY-Road-Freight.pdf)

## REDUCING URBAN CONGESTION

Congestion directly impacts on a truck's profitability. According to Professor David Cebon (University of Cambridge):

***“Operating in traffic uses up to twice as much fuel—for example when you are stuck in stop-start traffic.”***

Regulations which limit the length of time a drivers can remain on the road mean that drivers whose journey times are extended by traffic jams may not be able to reach their destination without stopping for a break—sometimes, to the frustration of other road users, by the side of the road. Traffic also hugely reduces the truck's fuel efficiency. For every one stop per kilometer of driving in stop-go traffic increases fuel consumption by 50%<sup>20</sup>. Even the cleanest trucks cannot reduce their carbon emission if they are stuck idling in heavy congestion.

Urban congestion also feeds negative perceptions of the truck industry. Drivers resent the space that trucks take up on the road and associate them with increased traffic. In city centers trucks are still perceived as dirty and polluting. And, of course, trucks are often noisy. Addressing congestion is not something that the industry can achieve alone. By working together with other modes of transport it should be possible to take some freight off the road—but with the predicted increase in demand this is not a solution in itself. Reducing unnecessary journeys through effective logistics, allowing trucks to operate outside the busiest times of day (e.g. night time driving) deliveries and more efficient hubs for the dispersal of goods from warehouses into the centre of cities all have a role to play. Marc Huybrechts favors relaxing restrictions on night-time driving:

***“Governments need to do something about congestion—there is awful congestion all over Europe. We need to find solutions, whether there's night-time driving or limiting trucks to driving at certain times of day.”***

Governments should recognize that taking cars off the road should also be part of the solution. The family car is the most inefficient way to transport goods between the warehouse or supermarket and its final destination, necessitating a journey without the payload and delivering the worst ratio

of goods to vehicle. Limiting citizens' right to use their car as they choose carries a heavy political penalty, but as the congestion charging zones in London, Stockholm and Milan have shown, they need not be political suicide. Reducing car usage in cities will require cultural shifts as well—and supermarkets are leading the way in finding mechanisms for getting goods to customers while reducing individual journeys. The growth in the delivery of goods to the workplace and the home, and the growth in online delivery for items that were traditionally shipped will also bring changing patterns of consumer behavior. The fastest growing providers of books and entertainment are no longer reaching new customers by undercutting music stores or bookshops and offering free next day delivery—they are marketing digital downloads and e-books that can be accessed instantly and require no packaging or delivery whatsoever. There is huge potential for consolidation and harmonization of those consumer goods that need to be collected or delivered (principally food). Some experts favor radical solutions, as David Ceborn says:

***“The family car is the least efficient freight vehicle known to man—if you could eliminate the family car from the delivery and collection of groceries you would get much more efficient urban delivery.”***

As in every element of the road freight industry, the eco-system is dynamic; regulation, investment, R&D and the political argument must be dynamic as well.

## ENHANCING ROAD SAFETY

The road freight industry faces a number of challenges relating to public perceptions of trucks and road safety. Anti-truck campaigns frequently cite the fact that trucks are disproportionately involved in road traffic accidents. In fact there is limited data on the incidence of accidents involving trucks, which prompted research by the International Road Transport Union (IRU) in conjunction with the European Commission<sup>21</sup>. Based on a survey of 624 accidents involving trucks, the data showed that human error is the cause of 85.2% of accidents, but that of those accidents only 25% were caused by the truck driver. Other factors, including weather conditions (4.4%), infrastructure conditions (5.1%) and technical failures of the vehicle (5.3%) played a less significant role. IRU's research shows that the three most common causes of truck accidents

20 <http://www.acea.be/news/article/acea-transport-policy-event-2013-wolfgang-bernhard-keynote-speech>

21 [http://ec.europa.eu/transport/roadsafety\\_library/publications/etac\\_exec\\_summary.pdf](http://ec.europa.eu/transport/roadsafety_library/publications/etac_exec_summary.pdf)

are non-adapted speed, failure to observe intersection rules and improper maneuver when changing lanes.

While the industry should not be complacent about the level of accidents involving trucks, nor about the impact that any accident has on the perception of trucks' safety, it should recognize the progress that has been made. While the volume of journeys has grown by 15% since 2000, the number of truck accidents involving fatalities fell by 60%<sup>22</sup>. A number of technological advances should support this ongoing trend: Electronic Stability Control; Lane Departure Warning Systems; Automated Braking Systems; and requirements for new cabin strengths. Whilst some of these technologies are already mandatory, there is a need for other telematics, such as TPMS, to join them, as part of the review of Regulation 661/2009. These technologies have the potential to address some of the most common causes of accidents.

## MEETING CONSUMER EXPECTATIONS

Consumers are at the top of the food chain for any industry providing goods and services, and the road freight industry is no exception. However, unlike the utilities, construction, property or government-procured services, the bulk of goods purchased by consumers and transported across Europe, exist in a competitive environment. Shippers, and the consumers to whom they ship goods, are increasingly demanding about the speed and traceability of their orders. To this extent the end consumer has an impact on every element of the road freight ecosystem. Consumers set the volume of supply and demand; consumers bring pressure to bear on retailers to reduce their impact on the environment; consumers are demanding and vocal about road safety. The road freight industry shares the roads with consumers; it is also consumers' taxes that contribute to national and European spending on infrastructure. It is consumers who vote for the politicians who set the regulatory regime under which the industry must operate.

The industry must continue to meet consumer demands on all these fronts, and to recognize their inter-related nature. However, it must also work to explain the industry to the public at large. If the industry is to continue to thrive in coming decades, it will do so only if the people of Europe continue to value the services that we provide and to operate under their license.

## EFFICIENT LOGISTICS

For an individual truck the most inefficient operations are those which include journeys without a payload. Regardless of how fuel efficient the vehicle or the driving, if a truck is empty its fuel is not being profitably consumed. Over the last decade significant progress has been made to increase the efficiency of fleets through better planning and the growing use of technology to enable transfer of data between trucks and fleet managers via telematics.

As the next chapter of this report will examine, telematics has the potential to revolutionize the road freight industry. However, just as a truck is made of many parts, telematics is not one all-encompassing solution, but rather the umbrella term for systems that communicate remotely. For some vehicles this simply means GPS technology. For other fleets it means advanced communications that decides routes, payloads and journey times.

The constant theme of this report is that the road freight industry is not monolithic but comprised of many inter-related parts: an eco-system operating in balance. Some of the ecosystems elements must function 100% at all times: if the truck cannot move then no amount of additional technology can help it. Others aspects of the ecosystem act as catalysts, speeding up processes. Others still can act as blockers, frustrating a fleet's primary goal of carrying its load on time and on budget. However, unlike an ecosystem, the many and various parts of the road freight industry can communicate with one another. Of course, this has always been the case. What telematics is changing is the speed of communication, the volume of data and the capacity of IT systems to analyze and act on that data.

The more widely telematics are adopted the more potential they have to enable fleets to operate as one and to reduce inefficiencies. As Marc Huybrechts puts it:

**“Compared to five years ago it is very different: today you can find a driver almost instantly to within a ten meter radius. This can have a positive impact on productivity. You can reach your driver, locate your cargo and update your customer all at once.”**

<sup>22</sup> <http://www.acea.be/news/article/acea-transport-policy-event-2013-wolfgang-bernhard-keynote-speech>

There remain significant challenges for fleets in terms of cost, inter-operability, the impact on drivers and the limits of technology. But there can be no question that telematics is having a broadly positive impact.

### CLEANER, SAFER, SMARTER TRUCKS

The European road freight fleets are among the cleanest in the world. In Europe, taking payload and average fuel consumption into account, we have the lowest CO<sub>2</sub> emissions of all major regions. While Japan has an average of 43 CO<sub>2</sub> grams per ton-kilometer, Europe has just 32. That is less than the US (41) and China (36). Newer, cleaner engines are eliminating particulate pollution and significantly reducing CO<sub>2</sub> emissions. Currently in development are trucks and buses which can operate on batteries for ever-longer journeys and smaller vehicles which are wholly electric.

As well as being cleaner, new technologies are making trucks safer. Truck designs can better protect the driver and lessen the impact of a collision. Smart technology can monitor driving behavior, or even intervene to overrule unsafe driving. And built-in telematics are making trucks more efficient, reducing idling time and lowering fuel consumption.

If the road freight industry is like an eco-system, then the truck is like a living organism operating within that system. Like a living thing it can be seen as a whole, but its functions depend on different organs serving different critical roles. Some of those organs must function 100% at all times. Others can be repaired, rested or even replaced. Between the organs is a constant flow of information back and forth and to a central command and control function.

The vehicle of the future will have to be greener, safer and smarter. Again, all these combine to produce an optimized outcome—but, as always with the road freight industry, the key does not lie in one element alone:

***“New technologies offer opportunities—electric engines, hybrids, liquid natural gas etc. In heavy vehicles it is hard to see that batteries will make a big difference. There is not one technology which is the solution; it will always be a combination.”***

*(M Salet).*

Eco-driving promotes safe driving, safe driving reduces fuel consumption and technology can monitor and promote both. Of course, all trucks have the capacity to act independently as long as they have drivers. By 2020, the driverless vehicle may be getting closer to reality. In the meantime the industry must continue to invest in driver recruitment, career progression and driver skills.

### AN INTERACTIVE ROAD NETWORK

The final piece of the jigsaw for the interconnected road freight industry is the network on which it operates. For the most part this comprises the motorways and road networks in Europe. But it also includes maritime and rail transportation. Given the predicted growth in demand, all modes of transport can expect to see increased volume. One desirable consequence should be greater co-operation between maritime, rail and road. It would be especially welcome if advocates of rail freight were to act in a way that delivers more collaboration and more modal-shift. For too long the rail lobby has acted as a direct competitor with road freight, a posture that bears no relation to the reality of the industry. The reality is that rail lacks the capacity to replace any volume of road freight. Instead of pressure to shift freight away from roads, national governments, the EU regulators, the automotive industry the environmental lobby and the rail freight industry should work together to optimize all modes.

Maritime freight offers an economical means of transporting goods, especially heavy goods that are not as time sensitive (e.g. aggregates for construction) but cannot offer the fast delivery time the road freight industry has become synonymous with. There are a limited number of ports and timetables can be inflexible. In any case, despite the clear advantages of shipping, it requires inland delivery to reach a final destination. Rail freight can offer speed, over distance it is environmentally friendly, and it does not impact on congestion. However, rail freight trains are necessarily confined to railways—as with maritime the goods delivered will invariably require further transportation by road. Road freight is flexible and convenient, but it does impact on congestion and for very long journeys it is not the most environmentally friendly option. To balance these various costs and benefits requires effective use of all modes.

# THE FLEET OF THE FUTURE

## THE FLEET OF THE FUTURE: MANY MOVING PARTS

When we talk of future technologies in hardware and software we usually think of the advances that will improve specific items: the mobile phone of the future; the microchip of the future; the oven of the future. But when looking to what the road freight fleet of the future will look like we are considering a wide range of factors that will shape how fleets will operate over the coming decades.

Technology will be the key driver of change, and in subsequent chapters this report will consider the technological advances that are shaping the truck of the future. In turn, the technology of the truck is itself made up of many elements: tractors, trailers, tires, on-board IT etc. There are also fast-moving technological advances in the systems that support fleets. Under the umbrella term of 'fleet telematics' these systems enable fleets to operate more efficiently and enable fleet managers to meet growing customer need both for delivery and for tracking. This first chapter will look in depth at the impact that fleet telematics are having on the industry and some of the challenges that telematics presents.

The technology of vehicles and telematics will continue to drive change in the industry, but it will not do so in isolation. At the heart of all fleets are the skilled drivers, engineers and logisticians that keep the fleet on the road. When we look to the fleet of the future we must look to the demand for increasingly skilled drivers and consider how European economies will ensure that recruitment and training of drivers does not fall behind. Our research shows that driver training is of huge importance to fleet managers—after the cost of fuel, this was the issue that fleet managers consider has the biggest impact on their business. Finally we must examine the context in which the fleet of the future will operate. Fleets are meeting

the demands of a dynamic social, technological economic and political environment. This will shape the network of the future, both in terms of the infrastructure on which road freight depends—most obviously the roads and interchanges between the road network and other transportation—and in terms of the interoperability of the network and fleets. The context is also dependent on the regulatory regime and the degree to which efforts to address emissions, to enforce taxation and to ensure safety can be flexible in the face of growing demand.

Mobility of goods across Europe in the coming decades is, therefore, dependent on a range of interrelated factors. This report groups them in terms of the fleet, the truck, the network and the regulatory context. However, in offering solutions we must consider the industry as a whole.

### HOW TELEMATICS IS CHANGING THE ROAD FREIGHT INDUSTRY

Telematics is not one, overarching system. Before we consider the impact, implications and challenges of telematics it is worth defining our terms.

Although the term 'telematics' covers many different systems, it is generally understood to refer to devices within vehicles which combine information technology (IT) with modern

telecommunications to control and monitor vehicles. Telematics enable fleet managers to monitor the trucks in their fleet in real time, to measure fuel efficiency, driver behavior and vehicle maintenance. By linking trucks in a fleet to one IT system, fleet managers can ensure efficiency across their fleet by reducing idling times, avoiding congestion and reducing times when trucks travel without a load.

Until the late 1980s, electronics did not feature on trucks in general. Electronic diesel control (EDC) to help reduce emissions and improve engine power and ABS to prevent brake lock-up were the first systems introduced, with traction control following soon after. Since then many other systems have been added. These include transmission control systems, which automate gear changing, as well as 'intelligent' systems such as active braking, which automatically applies the brakes when an obstacle in the path of the vehicle is sensed, and lane control, which prevents a vehicle from inadvertently crossing traffic lanes. The latest truck cruise controls, used on some vehicles, have reached a level of sophistication where they can now read the road ahead. By calculating the topography of the land, these systems will not only select the correct gear but also control the accelerator to ensure that the vehicle is driven in the most economical and efficient way. When going downhill, the system will automatically apply the appropriate braking system (wheel brakes, exhaust brake or retarder) when needed.

Since 2006, trucks have been equipped with electronic tachographs. These record the details of the driver (via his personal card) plus vehicle speeds against a time base. Hence all the time a vehicle is being used; its speed, distance travelled and stop times are recorded.

As well as these vehicle management systems, electronics have enabled further developments that can be incorporated on a truck for greater safety and to ensure conformity. Tire pressure monitoring systems (TPMS) can prevent accidents and breakdowns as well as help to optimize fuel consumption and therefore keep down emissions. By informing the driver and/or the vehicle operator that a tire is losing pressure, a tire problem can be resolved before a tire becomes damaged or fails. As pressure reduces, a tire loses performance and

this not only increases fuel consumption but also causes the tire to overheat, eventually resulting in a failure. Many modern trucks already have TPMS incorporated in their systems. However, these generally do not operate on trailers. The problem is that many tractor units do not have dedicated trailers and frequently couple to different trailers, often of differing makes and ages. Although TPMS systems are now available even as retrofit, the majority of trailers do not have them mainly because of their age. Goodyear believes it is important that mandatory fitting of TPMS on both trucks and trailers is universally adopted as soon as possible for safety, environmental and economic reasons.

Parallel to the development of this technology has been the development of mobile phone systems, satellite data transfer and GPS technology. Together these allow a vehicle to be tracked anywhere in the world in real time and the information made available to anyone with access to the relevant system. Thus not only does an operator know exactly where vehicles are but also information can be exchanged with the driver.

What makes telemetry possible is CAN bus (Controller Area Network). This is a message-based protocol used in modern trucks to link the many different Electronic Control Units (ECUs) that run the sub-systems on a vehicle. These include ABS, ASR (anti wheel spin), engine and transmission management as well as many other systems including cruise control, air bag control, tire pressure monitoring and even mirror adjustment. Since 2004 it has been mandatory for all diesel vehicles in the EU to use the on-board diagnostics OBD II standard and CAN bus is one of the five protocols in this standard. The telematics systems being fitted to the latest trucks link in via cable connections and therefore can access all on-board electronic information including satellite navigation systems which are also usually integrated in the systems. The recipients of the information from the telematics system, typically the vehicle manufacturer and/or vehicle operator, can then receive the information relevant to their requirements and in some cases information can be fed back to the vehicle by the system to give information to the driver or even to make adjustments to the vehicle systems.

# THE POSSIBILITIES OF TELEMATICS ARE ENDLESS BUT SOME OF THE BENEFITS INCLUDE:

## DRIVER ASSESSMENT

the data can show how efficiently the vehicle is being driven and help optimize fuel consumption, driving times and safety.

## LOGISTICS

information can be fed to the driver to optimize routing and reduce journey times—routing changes can be instantly invoked.

## VEHICLE MAINTENANCE

a truck’s electronic control units (ECUs) can signal faults or predict faults so that breakdowns or failures may be avoided. Service information can also be transmitted so that an operator can be informed when maintenance is due. This can be done via the vehicle manufacturer’s own systems or as part of a third party vehicle maintenance package.

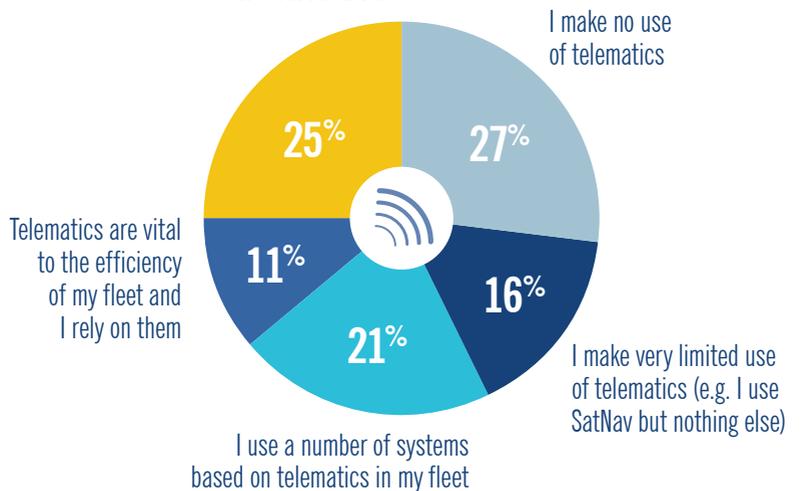
## SECURITY

the vehicle can be tracked and alarm systems integrated if necessary.

Telematics systems are increasingly being offered as a factory fitted feature on new trucks and as an example the following is what MAN boasts for the system it offers:

- TRACKING & TRACING
- VEHICLE DEPLOYMENT ANALYSIS AND REPORTING
- ASSESSMENT OF DEPLOYMENT ANALYSES AND ECONOMY
- MAINTENANCE MANAGEMENT
- DISPLAY OF REMAINING DRIVING TIMES
- REMOTE DOWNLOAD FUNCTION
- EXCHANGE OF TEXT MESSAGES
- ORDER MANAGEMENT
- OPEN INTERFACE FOR INTEGRATION INTO EXISTING SOFTWARE SYSTEMS
- ACCESS VIA ANY INTERNET-ENABLED PC
- CAN BE RETROFITTED FOR TRUCKS FROM OTHER MANUFACTURERS

Telematics are vital to the future of the industry and I will continue to invest in them



## WHAT CAN TELEMATICS DO FOR FLEETS?

Telematics allow operators to monitor the following:

### DRIVER BEHAVIOR AND MANAGEMENT

recording speeding, harsh braking, over-revving, gear changing patterns, green band driving and idling.

**DRIVER TIME** utilization, including delivery and travel time—can be linked to digital tachographs

**CUSTOMER SERVICE LEVEL** actual arrival time at customers’ premises which can be compared to expected arrival time

**VEHICLE PERFORMANCE** fuel efficiency through liters/ 100km and oil pressure recording

**ROUTE PLANNING** recording location where serious congestion takes place, which could influence future route planning

**TEMPERATURE CONTROL** providing temperature records for products transported in refrigerated units. Most systems provide an alert when the temperature goes outside a preset range, although the more sophisticated systems will also record actual temperature readings

**LOADS** monitoring environmental impacts, recording the whereabouts of a vehicle, as well as humidity and vibration, which could affect the condition of the product being transported

**VEHICLE ACCIDENTS** historical data can be used to help prove that a vehicle was not involved in an alleged incident. Some advanced systems can identify the difference between a vehicle crashing into something and being hit by another vehicle.

**LEGAL COMPLIANCE** monitoring the laden weight of the vehicle, driver’s hours and speed

**VEHICLE MAINTENANCE** odometer readings, components under warranty, ‘service due’ alerts and vehicle usage

**BENCHMARKING** monitoring key performance indicators (KPIs) for drivers and vehicles, to encourage good driving practices, timekeeping and safety

**LOAD SECURITY** recording the frequency and whereabouts of the opening trailer doors.

### How do you use data about your fleet from telematics or from other sources?



# THE FUTURE OF TELEMATICS

As has been stated, telematics is the umbrella term for a wide range of systems that allow operators to monitor different aspects of the vehicles in their fleet. Telematics will not evolve as one, but there are common factors that will improve their capabilities over coming years. Our research shows that telematics is important to fleet managers but has yet to reach its potential: 27% of fleets still make no use of telematics at all. This is particularly relevant given the move towards the adoption of global regulatory mandates in Europe from 2015 onwards, and the development of eCall\*.

Just as the advent of affordable GPS revolutionized telematics (and subsequent developments); the increase in mobile network bandwidth available (e.g 4G) will allow for ever growing volumes of data transfer. While the first generation of telematic systems allowed operators to build a comprehensive picture of how vehicles were performing, the transfer of this data will increasingly happen in real time. The potential of vehicle-to-vehicle telematics is also being looked at by experts and by the industry. As Nigel Base at the Society of Motor Manufacturers and Traders puts it: There is a lot of discussion about the potential of vehicle-to-vehicle communications, vehicle-to-infrastructure communications (e.g. vehicles in communication with traffic lights); platooning—when one vehicle follows another. Throw in automated braking, cruise control, lane assist etc. and you see that the technology is marching at a pace. The issue is that the legislation can lag behind.

As telematics become better at determining the causes of accidents, and indeed help to reduce them, fleets using such systems and with improving safety records may be able to negotiate reduced insurance premiums. Closer linkage

between the tracking of goods may allow the automatic tracking of goods on and off individual trucks, providing more information to shippers or to their customers. In time it could be possible to link telematics to road pricing, although this will depend on the appetite of regulators.

The impact of telematics has been incremental, and their usage, even at a basic level, is not yet universal. One can reasonably assume that ongoing advances will continue in this way—we do not predict a sea-change in the coming decades. However, as telematics reach saturation point and as the technology advances, telematics could reduce the impact of congestion, improve efficiency and reduce fuel consumption.

Telematics clearly bring significant advantages to fleet managers and to drivers, and in turn benefit end users—shippers and consumers. However, their growing usage is not without its challenges.

## TELEMATICS: RISKS AND CHALLENGES

Telematics have not evolved in one broad movement. The disparity between product development cycles of vehicles, apps and connected services has proved a challenge for OEMs, fleet managers and drivers. Many vehicle manufacturers have invested in onboard systems. However, there remain hurdles to overcome. For fleet managers these relate to the cost of integration and connectivity; the lack of standardization; varying regulatory regimes.

Investment by OEMs in onboard technology is vital to the industry, but the cost is usually passed on to fleets. In some cases costs are not simply a one-off purchase but require ongoing subscriptions. For larger fleets with greater purchasing power it can be possible to drive down initial costs and maintain affordable ongoing costs, but for the smaller fleets this is not always the case. There are also economies of scale, with larger fleets getting the greater benefit. While technological advances are enabling greater data transfer, this too is a cost as mobile telephone operators look to exploit access to greater bandwidth. The telematics industry, much like the road freight industry, is atomized and competitive—this means there is a great deal of choice but not a great deal of harmonization. The rate of development also carries an element of in-built obsolescence—that is to say that this year's new technology may be redundant in twelve months time. For fleets operating on very tight margins the return on investment must be both immediate and lasting. Finally, Europe's telecoms market is not harmonized—systems that operate in one region may be rendered useless in another.

Across all sectors there is uncertainty around the volume of data available—so called “big data”—and around data security. While there may be benefits to a manufacturer of knowing every detail of how their truck is performing, is a fleet manager going to be happy to subscribe to regular updates on further enhancements or maintenance? Drivers are divided on the extent to which they are happy to be monitored—for some the prospect of operating under the constant surveillance of their manager is not very appealing. However, evidence from beyond Europe suggests that once the benefits are clear to drivers they can embrace the potential of new

telematic systems. The Australians are successfully operating a program—the Intelligence Access Programme (IAP)—which offers specific advantages to drivers who sign up to it. In exchange for sharing information about their route and vehicle they gain better access to roads. As David Cebon explains:

**“If the driver goes off the designated route then he can be fined. There is a real big brother issue, but operators are signing up to it because it gives them significant fuel consumption reduction and in exchange the information is controlled securely by a central government agency. The operators get the benefit, CO<sub>2</sub> emissions are reduced, the government ensures that the higher capacity vehicles are operated safely—and the younger drivers are really engaged with it: they get the technology, they like the information they get back from IAP which helps them to avoid congestion and improve their driving skills.”**

Goodyear's research indicates that concerns about big data may be overplayed: when given the option of registering concern about data security not one fleet manager did so.

But it remains that fleet managers and telematics developers will have to work hard to explain the benefits to drivers in coming years. There are also concerns about the impact of big data on third parties. For example, will insurers begin to require information about individual driver performance and how will this impact on insurance bills? And what might be the consequences of government agencies, whether licensing authorities, the police or the tax collectors, requesting full disclosure of data collected on a vehicle or fleet?

Telematics offers great opportunities but it remains a young industry. As part of the ecosystem of road freight more integration and more collaboration will be required to deliver real results.

# THE TRUCK OF THE FUTURE

As has been emphasized in this report, the truck of the future will not be defined as one vehicle—rather, it will consist of advanced tractors, trailers, tires and onboard technology. And, just as the truck is made of many elements, its performance will depend on the driver, the fleet manager and the network on which it operates.

## INCENTIVIZING SAFE AND EFFICIENT DRIVING

OEMs have made great strides in recent years to improve the safety and fuel efficiency of their vehicles. Trucks are safer and cleaner than in previous years, and we should expect this trend to continue. However, that rate of change will slow. In part this is because there are fewer gains to make—once most vehicles use Euro VI engines it will require huge investment to reduce the emission of particulates beyond 99% (the current figure). The same is true for further reductions in carbon emissions based on the engine. That said, many manufacturers continue to strive for stretching targets—ACEA (European Automobile Manufacturers' Association) truck manufacturers are committed to a 20% reduction in fuel consumption between 2005 and 2020, and they are making good progress towards that.

However advanced a tractor, it will only be optimized for fuel efficient driving if the driver uses it correctly. Advances in automated transmission in modern trucks has improved the inefficiency of gear changes and reduced inefficiencies from driving in the wrong gear. But eco-driving can offer further reductions in consumption, estimated by some experts at around 10%. Critical to this is training for eco-driving. A combination of eco-driving training and onboard monitoring to record a driver's performance could enable fleet managers to actively incentivize fuel efficient driving.

## SPEDITION BARTKOWIAK CASE STUDY

In 2008 the established transportation provider Spedition Bartkowiak launched a program to implement significant savings in fuel consumption. As Andreas Manke, a vehicle manager at Spedition Bartkowiak explains:

*"In 2008 the reason for this was to save money—although we realise that we are also doing something for the next generation. We thought, if we save energy we will save money and we can reinvest the funding for new trucks and better wages."*

The first step was to set a speed limit on all the trucks at 80 kilometers per hour. The motive was to reduce the cost of penalties from breaking speed limits. SB found that the overall average speed of their trucks was not affected. The newly imposed speed limits meant drivers were more relaxed and more likely to arrive on time and there was a fuel saving of 1.5 liters per 100 kilometers traveled. Given that the average truck travels 500km per day this is a saving of 7.5 liters per truck each day. This was significant:

*"We have 40 trucks, so we were saving 300 liters a day. It was a win-win situation for everyone."*

Between 2011-13 SB invested the savings it was making in new vehicles. When SB started using the Mercedes Actros with Euro VI engines in 2012 they saw further savings:

*“The new trucks have so many new ideas: there are functions which put the vehicle into neutral on downhill slopes. In Germany where there many little hills you can be in neutral—or eco-rolling—for up to 10-15% of the journey. This brought further fuel efficiencies.”*

SB also invested in a tire management system and in new Goodyear tires, including the FuelMax tires.

The results were impressive:

*“In 2008 we were consuming 35.5 liters per 100 kilometers and we are now getting that down to around 29.5 liters for every 100 kilometers. By 2020 we aim for our trucks to travel 100 kilometers on just 20 liters of fuel. We think this is possible if we can drop a liter a year.”*

SB is currently looking at how it can optimize fuel usage by using newer trailers. Some eco-trailers with side wings under the trailer which manage the air flow are reducing consumption by 1-2 liters per 100 kilometers. SB has shown that by taking every element in turn—engine, cabin, trailer, tires, fuel—an operator can make incremental gains that add up to substantial savings. But they are also working closely with their drivers to incentivize the most efficient driving. There is a bonus system that rewards eco-driving. The first element rewards a fleet—if the fleet achieves an average fuel consumption rate of 33 liters per 100 kilometers over the course of one month all the drivers in the fleet receive a bonus of €100. There is also a personal bonus for drivers who achieve an average of 28 liters of fuel per 100 kilometers of €50. As Andreas explains:

*“This means that some of our drivers are making a bonus of more than €150 a month—that’s good money for a truck driver.”*

Andreas Manke and SB are evangelical about their work to reduce fuel consumption a liter at a time:

*“We are not worried about people copying us—it’s good for business, good for the environment and good for the industry.”*

## ALTERNATIVE FUELS AND ELECTRIC VEHICLES

The pressure for fuel efficiency is driving innovation in engine design, including radical moves towards electric vehicles or vehicles running on gas. The EU has a rule<sup>23</sup> which requires Member States to meet a minimum of 10% of transport energy needs from renewable sources. This is driving progress in work to use biodiesel in trucks. Research is also looking into Fischer-Tropsch fuel—a fuel synthesized from coal, natural gas and biomass. Such fuel does reduce emissions but remains too expensive to effectively replace diesel in a free market.

## OPTIMIZING TRUCK CAPACITY AND INCREASING PAYLOAD

The most effective way of increasing the fuel efficiency of an individual journey is to maximize the payload to fuel ratio—put simply, using the least amount of fuel to carry the most goods. Over the last few decades ever larger and more capacious vehicles have achieved significant efficiencies. Special high volume vehicles with a capacity of up to 125m<sup>3</sup> are available in Europe without exceeding current limits on weights and dimensions. Truck trailer combinations, which reduce the gap between the cabin and the trailer can also improve capacity. Replacing rigid semi-trailer axles with independent suspension at each wheel of the semi-trailer can deliver further space for cargo. Finally there is ongoing research into improving command steer systems which can steer the trailer in proportion with the articulation angle between tractor and semi-trailer.

All of these potential improvements to the vehicle bring advantages and trade-offs. However, one factor remains consistent—research and development can bring some improvements within the current weights and dimensions regulations, but reforming the regulations would bring far, far more.

Any measure to improve the aerodynamics of a vehicle, to improve the safety of the tractor or to make a vehicle more fuel efficient which takes up space reduces the size of payload and affects the ratio of payload to fuel. Many industry players have long campaigned for reforms to the current regulations and have welcomed the recent vote in the European Parliament which supports the European Commission’s proposals to

revise Directive 96/53/EC, which sets limits for the dimension and weight of vehicles. The experts interviewed for this report were unanimous in their support for longer and heavier vehicles. Martin Salet, from the Ministry of Transportation in the Netherlands, has direct experience of this:

**“In the Netherlands we have experience of putting longer and heavier vehicles onto the road—even in our small country this has proved very effective. Some truck companies have managed to reduce the emissions by 35% on the basis of the longer trucks.”**

One challenge for the European Commission will be reconciling reforms to the regulations on dimensions with the anti-mega-truck lobby, most vocally led by pro-rail campaigners. Martin Salet has experience of this as well:

**“There is a very effective lobby. The European rail lobby has been very effective in bringing doubt into the minds of those who are not experts in this policy area. Where larger vehicles have been used the results have been positive and they have not had an impact on modal shift. There are fears about larger trucks but they have turned out to be unfounded.”**

Nigel Base is more emphatic still:

**“We really do need to create a level playingfield for longer vehicles. The technology exists to do this. For example, if you go to Scandinavia, vehicles can operate up to 70 tonnes with a 25 meter long vehicle—this is a super-efficient way of reducing your carbon footprint.”**

### BETONS FEIDT CASE STUDY

Betons Feidt is a specialist construction company which supplies pre-fabricated concrete and other materials to the construction industry. The nature of their business necessitates the transportation of goods in vehicles which carry a very heavy load. Changes in the nature of construction have required

Betons Feidt to evolve how they operate. As the managing director, Ferd Feidt, puts it:

**“We had to develop our trucks to follow this trend to be able to deliver concrete the way it should be.”**

By increasing the volume of concrete that the trucks could carry up to 12 cubic meters Betons Feidt was able to reduce the number of required journeys to meet customer demand. This reduced fuel consumption, the number of accidents and helped to reduce congestion on the roads and at construction sites. The key to this program of change was to make incremental savings in the weight of the vehicle to optimize the ratio of payload to the size of the truck—in other words, to ensure the greatest weight of concrete requires the lowest weight possible for the vehicle which carries it.

Working closely with the OEM Liebherr, a company which specializes in mining trucks, Betons Feidt were able to get the load from 32 tonnes per vehicle to 38 tonnes per vehicle. But it was also important to ensure that at that weight they were optimizing the payload to 10 cubic meters. As Ferd Feidt explains, every element of the truck counts:

**“What we had to do was to find another 250 kilograms and in this case we found it in the tire. It was like a puzzle—we had to develop a new concept to lose that 250 kilograms.”**

Another strategy adopted by Betons Feidt was to argue that a truck with four axles could comply with weight restrictions that limit the tonnage a vehicle can carry linked the number of axles. Consequently if Betons Feidt invested in vehicles with four axles in the truck they could raise the allowed tonnage up to 38 tonnes.

Luxembourg allows up to 44 tonnes on vehicles with four axles. This compares to a limit set at 36 tonnes in Germany, 38 tonnes in France and 39 tonnes in Belgium—the three countries with which Luxembourg shares a border. For Ferd Feidt this does not make sense:

**“We are probably the only country in the world that has to cross three borders every day so we are most exposed to regulations in each country. The issue is not about relaxing all rules but about harmonization.”**

For Betons Feidt, clearer rules and a level playing field across the EU would be good for Europe’s economy:

*“This is limiting economic growth. There is too much paperwork—we need harmonization”.*

With Goodyear’s support Betons Feidt was able to improve efficiency by increasing payload. Ferd Feidt believes that there are benefits for Europe if the EU can work with national governments to agree new rules, although he recognizes that this could be a challenge:

*“The issue is bureaucracy—every country has its own minister. Every country has its own regulations. If you consider the gigaliner, they are testing them in some parts of Germany but not in others. There are too many jurisdictions and we need clear, European-wide standards.”*

### TIRES AND FUEL EFFICIENCY

Low rolling resistance tires remain the most popular option for fleet operators looking to achieve greater fuel efficiency. Investing in energy efficient tires can deliver fuel savings of up to 10%<sup>24</sup>. Low rolling resistance tires reduce the amount of energy spent by rolling tires and reduce the amount of power (KW) required, and so reduce fuel consumption. Second only to aerodynamic drag, rolling resistance has the most dramatic effect on the fuel efficiency of journeys operating long-haul journeys.

When considering how to reduce fuel consumption in a vehicle which is consistently travelling over 90km/h on a 300km or longer journey, tire selection is responsible for approximately 30% of variation in the amount of fuel consumed<sup>25</sup>. Quality fuel efficient tires also ensure high levels of wet grip and offer other performance benefits. These include high mileage, good grip and handling, low noise, enhanced comfort for the driver and less damage to goods. EU Tire labeling, introduced in November 2012, has empowered fleet managers to purchase the most efficient tires for their trucks. Some experts see that the EU tire labeling is helping. But labeling is not yet having the impact it might. As Ray Engley (Road Haulage Association) says:

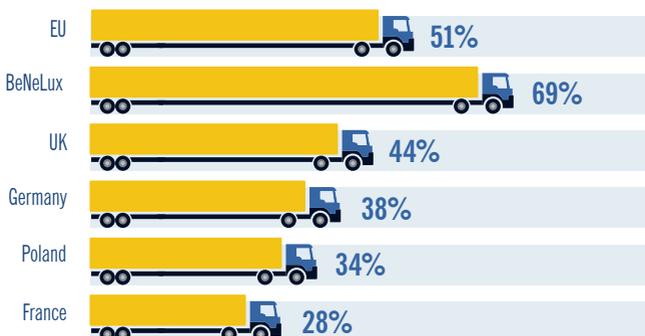
*“There needs to be more education for fleet operators on tires, particularly focusing on what different tires can do for their needs. The EU tire label is making a difference.”*

However, data from our 2014 survey shows that more could be done: fleets are divided on whether the label is currently adding value, although 43% of fleet managers would favor more promotion of the label. Ray Engley also raised concerns that understanding about the impact of low rolling resistance tires was not as widespread as it could be:

*“Fleets need to understand more about what they can practically do with the vehicle to reduce running costs. For example, there could be more understanding about rolling resistance on tires. This is not something that is universally understood.”*

As well as using the best-designed tires, fuel efficiency can be best achieved with tires at the correct pressure and tires which are effectively monitored, one reason why some fleets are opting for a tire management service—indeed, over half of the largest fleets surveyed have invested in this. Goodyear will continue to innovate to develop tires and tire management services which promote fuel efficiency and encourages its fleets to capitalize on the fuel efficiency calculator it developed in 2012.

**Please indicate the extent to which you believe the EU should allow longer and heavier trucks - percentage who agree**



24 [http://www.transportenvironment.org/sites/te/files/media/2009\\_02\\_briefing\\_tyre\\_label.pdf](http://www.transportenvironment.org/sites/te/files/media/2009_02_briefing_tyre_label.pdf)  
 25 [http://www.goodyear.eu/uk\\_en/tire-advice/eu-tire-label/truck/fuel-efficiency/index.jsp](http://www.goodyear.eu/uk_en/tire-advice/eu-tire-label/truck/fuel-efficiency/index.jsp)

# THE NETWORK OF THE FUTURE

## SMART PRICING

Smart pricing is the use of variable pricing to incentivize and deter drivers from using roads at certain times of day and in different parts of the road network. For example, by charging motorists more for driving at rush hour one might reduce peak congestion by spreading the volume of cars through the day. Congestion charging is a crude version of smart pricing, charging all vehicles between certain times of day and on particular days with a fixed price. A more advanced form of smart pricing can vary the price depending on the traffic, raising the price at peak times.

Unrolling such programs on a large scale would certainly be controversial. While many road users accept fixed-rate forms of congestion charge, the prospect of setting out on a journey which could vary in price would concern motorists operating on limited budgets. For key workers who rely on a car to travel to and from work this would be an especial concern. Another barrier would be the requirement for all vehicles to be fitted with a tracking device, raising concerns about civil liberties.

At a European level, in addition to the well known Eurovignette Directive, the latest proposals of the European Commission (EC) make clear reference to road charging, which is often termed 'smart pricing', with emphasis on the need for prices to reflect real costs.

The EC proposals are complemented by various existing and proposed schemes at national level. For example, Germany has been operating such a scheme for trucks above 12tonnes since 2005 and, in 2010, Slovakia introduced a GNSS charging scheme for Heavy Goods Vehicles over 3.5tonnes in selected corridors. By far the most ambitious scheme to date, however, has been recently unveiled by the Dutch authorities, whose objective is to charge all vehicles per kilometer throughout the entire national network.

While the technology to implement such pricing schemes exists, doubts about the technical and economic feasibility of large-scale application have persisted; especially with respect to the accuracy, integrity, availability and continuity requirements that are critical to avoiding driver overcharging

on the one hand, or loss of revenue for the road operator on the other. Moreover, the lack of tangible evidence about the impact of GNSS Road User Charging (RUC) schemes on congestion and pollution has acted as a further impediment, reinforcing a notion among the general public that pay-per-kilometer will simply end up tantamount to an added tax.

## ADDRESSING CONGESTION

Smart pricing is one means of addressing congestion. Another is to expand the network—but the appetite for large scale investment in new roads is limited at a time of fiscal austerity, and would in any case be strongly opposed by the environmental lobby.

Among other options is achieving modal shift between road vehicles by locating distribution points on the outskirts of urban centers and transferring goods from trucks to smaller electric vehicles. Relaxing restrictions on trucks driving at night would also improve congestion, although it will have to be accompanied by efforts to reduce noise from trucks. Current telematics also offer a solution by communicating routes with lower congestion direct to the vehicle.

In addressing congestion there are fundamental challenges. However goods are transported over long distances, the last few miles in a city requires vehicles to travel in smaller streets and amongst the population. Any major solutions require significant investment and disruption. And there is no one-size-fits-all approach: every city much find a solution that works for their needs.

## MODAL SHIFT

In 2013 the European Commission announced a new fund of €66.7million to tackle road congestion and make road freight transport greener as part of the Marco Polo program. The program is broadly aimed at achieving modal shift away from road freight and on to short sea or inland waterways. Marco Polo aims to free Europe's roads of an annual volume of 20 billion kilometres of freight, the equivalent of more than 700 000 trucks a year travelling between Paris and Berlin<sup>26</sup>. This will not be easy. Alternative forms of transport may well be greener, cleaner and even cheaper over time, but producers,

manufacturers and hauliers can be reluctant to invest in change in what is a very competitive sector of the economy.

The road freight industry should welcome such initiatives. Unlike the rail freight industry, the road freight industry broadly recognizes the need for effective modal shift. Some experts are exasperated by this approach:

**“We are concerned that the approach taken by other modes is to argue for them and against the other. All modes will be needed if the transportation industry is to meet current and growing demand. Such pressure from other modes is holding back reforms that would make road transport more efficient and safe—at IRU we want to see less narrow vertical mode-specific thinking and instead strive towards more co-operation between modes.”**

As demand is on track to continue growing, there is no danger that rail freight will replace road freight. However the debate must move to one in which all transportation industries are committed to cooperating to tackle road congestion and to address environmental concerns. Substituting road with rail is not an option—every year Europe’s rail would have to increase its transport capacity by 20% only to cover the additional volume of transport in Europe. Even with massive investment in Europe’s railways, it would remain inefficient in terms of speed: the average international rail freight train in Europe runs at 18km/h compared to 75km/h for the average truck. On shorter distances trucks even beat trains on CO<sub>2</sub> emissions.

## THE ROLE OF REGULATION IN IMPROVING FLEET EFFICIENCY

Transport in the European Union is highly regulated at both a European and a national level. Regulations dictate the size and shape of the vehicles permitted on the roads, and this varies from country to country. There are also restrictions on which vehicles can cross borders. While these regulations were implemented in good faith, they are now out of date. Transport ministers should embrace the opportunity to reform Directive 96/53/EC as proposed by the European Parliament and the European Commission.

Larger and heavier vehicles—up to 70 tonnes and 25 meters long—have demonstrated in some countries like Sweden and Finland significant efficiency benefits, and should be allowed for use across the whole European Union. The International Road Transport Union sees this issue as a priority:

**“We are pushing hard on weight and dimension proposals so that trucks can transport more with less and so that we can encourage innovation in the way that cabins and trailers are to obtain for efficiency and safety gains”**

Euro VI sets the standards for engines in new vehicles— from January 1st 2014 all new trucks and buses must be fitted with Euro VI certified engines. As this report has shown, Euro VI represents a significant achievement in reducing particulates and carbon emissions. OEMs remain committed to further improving engines, although the return on investment in terms of emissions may be shrinking.

Regulations also limit the number of journeys that a driver may make beyond their state of origin if operating in more than one member state. Road hauliers are notably restrained by EU law only to perform a maximum of three cabotage operations in different Member States from the primary destination within a period of seven days starting from the day the international shipment is unloaded<sup>28</sup>. Again, there are sound reasons for these limits—cabotage rules. If cabotage were not in place then countries where wages are higher could be undercut by fleets from countries with lower wages. It would not be wise to move towards a road freight industry that originates from the country with the lowest wages and Member States are right to protect their own industries and the skills which their own fleets retain.

Regulations also limit the journey times for drivers. Again, this is a sensible approach. Driving when tired is a prime cause of accidents in all vehicles and road users should have the confidence that the drivers responsible for the largest vehicles on the road are well-rested and fit to drive. However, there can be unintended consequences. Heavy congestion can bring that time limit to bear just as a driver is due to reach a destination and force trucks to stop in cities to rest—causing further congestion and aggravating other road users. A combination of monitoring through telematics and flexibility around time limits should have the potential to resolve these issues.

Beyond the laws which restrict the industry, there are government interventions that shape its operation in terms of taxation, licensing and training requirements. The Eurovignette has shown some of the benefits of universal tolling. Some commentators favor an all-encompassing tolling system for vehicles and the requirement to pay Eurovignette for vehicles outside those countries which have adopted it (Belgium, Netherlands, Luxembourg, Denmark and Sweden) has forced other states to look to balance its effects. For example, the UK is considering applying a tax on vehicles that enter the UK. Universal tolling would create simplicity and allow for a level playing field; however, given the power of some road freight unions within member states, it may not be on the agenda in the near future.

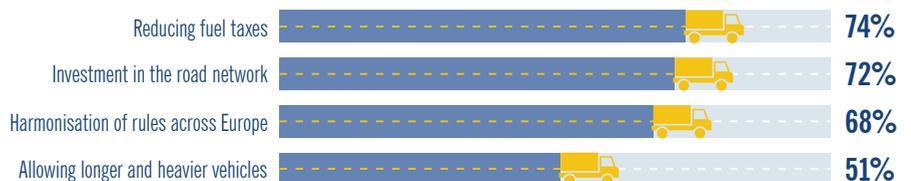
Harmonization across Europe is also a concern for the industry. As Mike Sturgeon says:

***“For our sector the biggest issue is that we are governed by EU legislation across Europe but almost every country in the EU also has its own individual regulations for vehicle transporters—we want harmonization. This has created a crazy patchwork that is a long way from the single market in which we are supposed to be operating.”***

This attitude is echoed in our research—68% of fleet managers want to see harmonization of the regulatory regime across the EU.

**Do you think that the following measures by governments would have a positive impact on the road freight industry?**

**Percentage of respondents who selected “agree” or “strongly agree”**



## BENEFITS OF THE EU TIRE LABEL AT A GLANCE



The calculation is based on the following assumption: Average fuel consumption of vehicle 32.3l/100km → 323l/1000km → 14.7% potential savings = 47.5l less fuel consumption per 1000 km → fuel price 1.50 EUR/litre = 71.25 EUR/1000km → 100,000 km mileage/year = 7,125 EUR savings/year.

# CONCLUSIONS AND RECOMMENDATIONS

As this report has shown, the road freight industry is made up of many interrelated parts and its efficiency and profitability do not depend on one or two major issues. Rather, every measure taken by the industry and government to improve performance has a knock-on effect that may alter the impact of another measure. The context in which the industry operates is one of fiscal austerity from governments, growing demands for speed from consumers, pressure to reduce carbon emissions from shippers and a shortage of skilled drivers.

Given the complexity of the industry, this report does not offer one killer solution that will address all the challenges and realize all the opportunities in one measure. However, we do offer a number of practical solutions and call on the European institutions to look again at some critical issues.

## CLARITY ON REFORMS TO WEIGHTS AND DIMENSIONS

Our research and responses to our survey reflect the industry consensus that current restrictions on weights and dimensions of trucks are out of date and threatening the continued growth of the road freight industry in reconciliation with targets for sustainable transport. We call on the EU decision-makers, and in particular on the national governments, to adopt as soon as possible the proposals issued by the European Commission on the revision of Directive 96/53/EC on maximum weights and dimensions of vehicles.

According to the informal agreement reached earlier this year, the European Commission should be tasked to assess the safety and environmental impact of heavier and larger vehicles - up to 25 meters long and 70 tonnes heavy - by 2016. We welcome this decision and call on the EU policy-makers to fully consider the economic and environmental benefits such vehicles can bring to the European freight market.

## THE CROSS-BORDER OPERATION OF LARGER TRUCKS

Although EU Member States are free to authorize the circulation of trucks larger and heavier than the European limits set by Directive 96/53/EC, the revised Directive should explicitly recognize the Member States' freedom to allow cross-border operation of these trucks between countries where they are already on use. Given the current divergences of views between Member States and the European Parliamentarians, we understand this reference will not be inserted into EU law and regret this decision.

Should the expected EU study confirm a positive impact of larger trucks on the environment, with no detriment to safety, and should the EU law be revised accordingly, we call on the policy-makers to review the possibility for cross-border operations of these vehicles.

## MANDATORY TPMS FOR COMMERCIAL VEHICLES

As Tire Pressure Monitoring Systems are already mandatory for new cars on the EU market and given the safety and environmental benefits of this technology, the EU legislators should extend the rule to include vans, trucks and buses. This rule should become mandatory on the occasion of the foreseen review of Regulation 661/2009 in 2015.

## INCENTIVIZING FUEL EFFICIENCY

The road freight industry is strongly incentivized to reduce fuel consumption in order to reduce the costs of running a fleet. Pressure from shippers and consumers is also effectively creating a market in which more fuel-efficient fleets have competitive advantage. We call on the European institutions to consider clearer incentives for green fleets, such as reduced tolls and taxes for fleets that offer eco-driving training.

### **USE THE EU TIRE LABEL AS A DIFFERENTIATOR OF BEST FUEL-EFFICIENT TIRES**

The tire label with grades CC and above for both rolling resistance (the fuel efficiency indicator) and wet grip (the safety indicator) should be used for enabling purchasing incentives of fuel efficient tires for all fleets.

Likewise, the VECTO simulation tool the European Commission is developing for calculating CO<sub>2</sub> emissions of trucks should consider the tires' contribution to energy efficiency on the basis of their label grade for rolling resistance.

### **FLEET MANAGERS NEED SUPPORT TO MAKE THE MOST FROM NEW TELEMATIC TECHNOLOGY**

Telematics offer significant benefits to fleets of all sizes. However, the current offer is disparate and confusing. We call on harmonized standards for telematics in order to optimize the benefits of telematics.

### **PROVIDING SKILLED DRIVERS FOR THE FUTURE**

Relevant policy-makers should plan to provide extra support to the road fleet sector to attract and retain skilled drivers. These could include incentives for fleets that provide driver training and eco-driving training as well as initiatives to promote the industry as a source of employment for young unemployed people.

# METHODOLOGY

The study was carried out by ReputationInc on behalf of Goodyear EMEA to better understand the issues of concern to fleet managers in Europe.

The survey encompassed 24 questions, which was disseminated to fleet managers in nine different countries. The countries who took part were: Belgium, France, Germany, Italy, Luxembourg, Netherlands, Poland, Turkey, and UK. A total of 576 fleet managers completed the online survey.

Fieldwork was carried out from April to June 2014.

# GLOSSARY OF TERMS

**20-20-20 climate change targets** The European Union's targets to reduce greenhouse gases to 20% below 1990 levels, energy consumption by 20%, and increase the share of renewables to 20% by 2020.

**Cleaner trucks** Trucks which produce less pollution (particulates, CO<sub>2</sub> emissions, etc).

**Eco-driving** Using fuel-efficient driving techniques to reduce fuel consumption and CO<sub>2</sub> emissions.

**Empty journeys** Journeys taken by trucks without a load.

**End-customer** The final business customer in the logistics supply chain, such as a supermarket.

**Euro VI** is the latest diesel engine emission legislations being driven by the European Commission. Since 1993, when the very first 'Euro 1' legislation was introduced for trucks and buses, the European Commission has regulated the amount of pollutants coming out of the tail-pipe of a diesel engine. In particular, the Commission identified two key constituents within the exhaust stream Oxides of Nitrogen or 'NOx', and 'Particulate Matter (PM—basically soot particle)—as being harmful, and which needed to be controlled and reduced.

**Eurovignette** The Eurovignette is a road user charge that must be paid for trucks to travel through five European countries (Belgium, Denmark, Luxemburg, the Netherlands and Sweden).

**Fuel-efficient tires** Tires with low rolling resistance, which require less power to drive them, resulting in the use of less fuel.

**Fuel-monitoring technology** A telematics system that allows fleet managers to monitor the fuel usage of their vehicles.

**Longer, heavier vehicles (LHVs)** Trucks that are longer and heavier than the EU's current regulations allow (40 tonnes, 18.75 meters).

**Low rolling resistance tires** Tires designed to minimize rolling resistance by decreasing friction with the road's surface.

**Marco Polo** Marco Polo co-funds direct modal-shift or traffic avoidance projects and projects providing supporting services which enable freight to switch from road to other modes efficiently and profitably.

**Modal shift** The transferring of freight delivery from one type of transport (such as road) to another (such as rail).

**OEM** Original equipment manufacturer, including vehicle, tire, aerodynamics manufacturers.

**Rolling resistance** The rolling resistance of a tire is the resistance to vehicle motion that a rolling tire generates, primarily due to energy dissipation occurring during its cyclic deformations. Its effect is equivalent to a braking force opposing the vehicle motion. It is commonly expressed as a coefficient of that force over the load applied to the tire.

**Self-imposed fuel efficiency schemes** A commitment from an individual fleet or group of fleets to reach a target of increasing its fuel efficiency, which they decide upon and enforce themselves.

**Telematics** Any system that combines telecommunications with information technology, transmitting information, which includes vehicle tracking, fuel tracking, satellite navigation, and cold storage management systems. A fleet telematics system may transmit information from the fleet's trucks to the fleet hub and manager.

**Tire labeling** A regulation from the European Commission commencing November 2012 that requires tire manufacturers to provide customers with a standardized set of information describing how their products perform in the categories of rolling resistance, wet grip and noise.

**Tire pressure monitoring systems (TPMS)** Systems of electronic sensors which measure tire pressure and can alert drivers and fleet managers when a tire has fallen below optimal pressure.

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