

# INFLATING PROFITS

## Low impact vehicles and tyre pressure control

The seminar, held on 23 June at Perth Racecourse, was organised jointly by Forestry Civil Engineering and Roadex, which is a trans-national collaboration to disseminate and implement roads management related information, practices and innovation gathered under previous stages of the project. The event represented part of ROADX IV which is the implementation stage of the project run by the partners from the northern periphery of Europe. FC Civil Engineering, Highland Regional Council and James Jones and Sons are the contributing organisations for the UK. The event was attended by some 160 delegates, mainly from forestry, transport and local authorities.

Highland Councillor Ian Ross opened the seminar and welcomed the first speaker, Allan Bradley of FPInnovations of Canada.

Allan had been involved in much of the early R&D involved in tyre pressure control systems (TPCS) carried out by FERIC, and opened his presentation by explaining the interaction between tyres and road surfaces, and how this interaction is influenced by tyre pressure.

After outlining the evolution of the technology from its use on US amphibious landing craft in 1942 until the present state of develop-

ment, he gave an overview of the current uptake of the technology in Canada amounting to some 1000 vehicles.

The presentation then explained the advantages TPCS offered in terms of both road and truck maintenance, operator comfort, and traction on both loose and tarmac surfaces.

Finally the presentation outlined some of the incentives that could be set by the regulatory bodies to encourage the wider application of this technology within the transport industry.

The next speaker was David Leslie of James Jones and Sons who are the recognised UK 'champions' of TPCS in that they are working through a programme which will see the adoption of TPCS on all timber vehicles in their fleet. Michelin Tyres were also contributing to the programme by advising on the use of the Michelin 'Maxi' tyres in conjunction with TPCS. David Leslie explained, "With a target of hauling 1,000,000 cubic metres of roundwood in the current year, we are already seeing clear advantages in a reduction in the running costs of our fleet, while at the same time making life more comfortable for our drivers." He also claimed that access to restricted roads had made



One of James Jones' Volvos fully equipped with TPCS.

it possible to take on harvesting operations previously out with their reach. David Leslie was also able to fully endorse the advantages listed by the previous speaker.

Pauli Kolisoja of Tampere University of Technology presented his report on the benefits obtained when vehicles are fitted with TPCS. His work, which had been carried out both in Sweden and in Scotland, confirmed and quantified the observations made by the previous speakers.

The report then moved to examine the reduction in road damage when roads are used by vehicles fitted with TPCS. Results were very positive showing a significant damage reduction for both the running surface and the substructure of the roads.

After explaining the need for road engineers to correctly identify the classification of rutting damage before effecting a repair, the road friendliness of single, twin single, super single and maxi tyres, when used on a range of common road construction forms, was then discussed and explained.

Pauli Kolisoja then summarised his work to date and indicated that plans were in place for further work to be done within the Roadex Project.

John Scott of JTS Services Ltd opened his presentation by tracing his work on developing low impact vehicles for use on forest roads over the past ten years. It had started with the use of tractors and trailers on the isle of Jorra, where the short haul distances made this approach very effective. Recognising that this approach was not particularly efficient on longer hauls, John Scott had then replaced the tractor with second-hand eight-wheeled Terborgs as the prime mover. Trailers of John Scott's own design incorporating wheel configurations to spread the load over the full width of the road

were used behind the Terborgs. Although this approach proved to be road friendly, the complex transmission system of the Terborgs was prone to overheating and they were eventually replaced with 6x6 Volvo units. These were run at 75 tonnes gross weight for a four-year period in the Aberfoyle area where the forest road network had been extended so that timber movements could be kept off public roads.

The next approach was to replace the Volvos with Terrogators ([see http://www.youtube.com/watch?v=ro1jymtTw\\_E&feature=fvw](http://www.youtube.com/watch?v=ro1jymtTw_E&feature=fvw)) and at the moment these are still in use.

John Scott then admitted that this system of work did involve double handling which required a significant transfer area, but listed the additional advantages of having dedicated 'in-forest' vehicles as:

- No 'convoy' effect on the roads
- Legal to use red diesel
- Tachographs were not required
- Dedicated forest road drivers in whose interest it was to keep the roads free from damage
- The required transfer area allows for a readily available buffer stockpile of timber to be stacked near to the public road.

John Scott concluded his presentation by claiming that there was clear evidence that this type of operation could, in a number of circumstances, actually improve the condition of the road, but warned that regardless of which low impact vehicle system was used, an overloaded tipper or a forest machine with bandtracks could seriously undo all the benefits.

Neil Wylie of Innovative Transport Equipment Ltd, who are the distributors of the Bigfoot CTI (central tyre inflation) system, gave an interesting insight into their experiences in New Zealand.

When first introduced there was a strong suspicion amongst potential users as to the claims being



Michelin's tyre regrooving process being demonstrated in the car park during the lunch break.



made for the system, but the sceptics quickly became advocates once they had seen the benefits that could be obtained.

The New Zealand Log Transport Safety Council realised the potential of the system and encouraged forestry companies to make use of CTI as part of their timber haulage contract conditions, greatly increasing the adoption of the system. However, NZ hauliers are very much aware of ROI (return on investment) which, in most cases, results in their fitting of TPCS to drive axles only.

Neil Wylie showed slides that illustrated the steep gradient work in hauling New Zealand timber and the steepness of forest terrain. Since the preferred extraction method is by yarder, the result is that the timber is stacked at the top of hills, and although soft conditions are not uncommon, the steep gradients coupled with long hauls are the biggest transport problem. To further complicate the issue, transport regulations in New Zealand allow for gross loads of 140 tonnes, thus creating serious demands on road surfaces and tyres.

Neil Wylie closed his presentation by making the claim that the worse the conditions, the greater were

the potential benefits of fitting their Bigfoot CTI System.

Dan Lamb of Michelin UK next gave an informative talk on tyre management with and without TPCS.

He advised on how to select the best tyre for any particular application and advocated that when in doubt, choosing a size up rather than down would allow for lower pressure to be used which would give a bigger road-contact patch.

He then reviewed the characteristics of the range of available tyres from his own company.

Next he looked at figures from a particular case study on an actual operation on one of James Jones and Sons' fleet, and showed a diagram that demonstrated that without TPCS almost half of the mileage on a work cycle would have to be covered with the tyres at the wrong pressure. He emphasised that to obtain the best performance all tyres must be used at the correct pressure for the weight being carried and the speed at which it is being used.

Dan Lamb then explained his company's approach to the matter of retreading tyres. He stated that Michelin build in an additional

thickness of rubber into the tyre's architecture to accommodate their 'hot cure retread' process which, he claimed, offered the same tread pattern, the same mileage and the same rolling resistance at 55% to 60% of the new cost. He also explained the regrooving process and claimed that it gave an additional 30% of mileage, improved traction and reduced rolling resistance. The regrooving process was subsequently demonstrated in the venue car park.

The final presentation was by Brian Spreen, President of TPC International, who underlined the advantages already covered by the previous presentations, before giving an overview of the features incorporated into his own company's product to ensure its reliability, durability and simplicity of use.

To bring matters to a close, Councillor Ian Ross gave the speakers and Les Bryson, Head of Operations for FCS, and Frank MacCulloch, Head of Forestry Civil Engineering, an opportunity to pass comment on the day's proceedings.

Of particular interest were the comments from Les Bryson, who recognised the cost benefits of using low impact vehicles, but pointed

out that TPCS was, "Only one of the tools in the box," and that it was always necessary to select the right one for each particular situation. Currently there were only 30 TPCS units in the country and the FC has no intentions to put pressure on any individuals to adopt the system, nor has it ever been a condition in any contract. "However," continued Les Bryson, "the FC would be failing in its duty if it did not continually seek to cut road maintenance cost which is a major component in the price of timber at the gate." He also explained that there were some roads currently classified for use by LGP vehicles only, and that this had been the case for some considerable time.

"In our efforts to cut road costs it is essential that the FC evaluate all available technology," said Les Bryson, "but the adoption of any new working systems will always be discussed with the industry before being implemented."

Note: Johan Granlund of Vectura Consulting AB was unable to present his topic entitled *Vehicle and Driver Vibration*. His presentation will be posted along with the others on the Roadex website, <http://www.roadex.org>.  
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