

SIZE matters

As technicians, engineers and engineering managers, we have a duty to improve transport efficiency – and longer semi-trailers must surely be part of that. Brian Tingham reports

“**W**hen you challenge the status quo, and try new designs, pioneering spirits will sometimes take the wrong path. But unless you start that journey, you stand still and risk others passing you by. I don’t intend to let that happen.” So said David Rowlands, Wincanton technical services director, opening the IRTE Conference session on LSTs (longer semi-trailers).

Wincanton first engaged with the DfT (Department for Transport) back in 2007, he revealed, believing that its then damning report into longer, heavier vehicles had left the door open for LSTs, given their potential to enable operational efficiencies for high-cube, low-gross operations. “Though few operators were interested, a small core saw the opportunity and worked to provide case studies, and examples of traffic flows and vehicles savings,” he said.

Hence, however, Rowlands’ reference to blind alleys. “Once we were confident that licences would be issued, but before DfT design criteria were confirmed, we built a 15.65m pilot trailer,” he told delegates. “This, I must admit, was to ride the wave of publicity surrounding the then transport minister Mike Penning’s announcement that we would be able to apply for licences from a pool of 1,800, split between 1m and 2m longer trailers.” But although that unit, built by Don Bur, enabled a 13% increase in platform length – meaning four extra UK pallets and a

15% productivity improvement – it missed out on the DfT’s late change, allowing a 27-tonne bogie by increasing the axle spread.

“Hence our pilot LST could never achieve a full 44 tonnes evenly distributed, coming in instead at around 42.5 tonnes. Also, the DfT’s decision to require physical proof that a trailer would meet the EC turning circles – of 12.5m outer and 5.3m inner radii – was a major issue. This change from a presumed compliance, based on a mathematical calculation, had us scrambling for steer axle drawings.”

Design decisions

But there was more: Rowlands explained that it also caused Wincanton to refocus on a key early design decision – to minimise complexity and cost while maximising payload by getting “a major trailer axle manufacturer” to build a self-steer axle with at least 22 degrees of steer. That avoided heavier and more expensive command-steer, but, when the DfT also moved to the wide spread axle, command-steer became much more attractive.

Nevertheless, with its build complete and VCA (Vehicle Certification Agency) tested, as well as DfT LST licences applied for, Wincanton went on the road, not only to showcase its achievement, but also to review site issues, such as entry and egress, and to consider driver training. “The truck simulator’s software was re-rendered to highlight the dynamics of



a longer trailer, emphasising the importance of tail-swing while slow-speed manoeuvring,” he told delegates. “We also reviewed impacts within our operations, and workshop provisions were confirmed, though this would be via Pullman Fleet Services.”

However, when – early in 2012 – the trailer was licensed and adopted into Wincanton’s fleet, hardly anything happened. “There was no major demand for our licences. The expected requests for trials were minimal. And, though some customers benefited hugely from the initiative, our general haulage market did not seize the opportunity.” Indeed, to date, Wincanton has only 16 LSTs (10 at 15.65m and six at 14.6m) of its 69 licences deployed.

Why? Rowlands explained that in low-weight, high cube functions and where trailers operate in a closed loop, the advantage of two additional metres is clear. “These operations have been exploited to good effect and utilise every percentage point of benefit,” he said.

But in general haulage – with its complex loading arrangements, backhaul, trailer sharing and dynamic scheduling – the situation is very different. “Network design is a problem: the ability to flex the fleet across a wide range of customers brings issues when trying to wedge in a few ‘hybrid’ trailers,” explained Rowlands. “Then there are load marshalling issues, where warehouse systems only plan to load 26 pallets, or equivalent, and either cannot cope with 30 or don’t want the risk of a 26-pallet trailer turning up.”

As for DC (distribution centre) design, Rowlands said challenges have been only minor. He cited: 15.65m trailers being sometimes difficult to manoeuvre and reverse, if DC space was tight; dock door wheel stops in the wrong position; and side-

load rain canopies not enclosing the trailer length.

More importantly, backhaul experience has been a downside, “with too many people finding reasons not to adopt LSTs and too few working to seek out the obvious productivity benefits” – although those do depend on traffic-load mix, he conceded. “Lower payload potential was also feared, due to the additional weight of moving to command-steer and the introduction of BS EN 12642 XL load containment on many of our new trailers,” he added.


What about engineering? Rowlands said this should have been easy, but aspects such as structural chassis design had to be revisited, because of the additional stresses that an LST goes through. “The longer chassis beams, with the additional load of steering remote from the tandem, have their own dynamic and showed some early, perhaps unexpected results,” he recalled. “Couple this with the additional suspension movement on the wide-spread axles, and you find some chassis engineers coming out of their comfort zones.”

Command steer

However, command-steer was arguably less about engineering and more about business issues, such as payload reduction, capital on-cost, and R&M impact – “though you can find plenty [of experience] on our construction, tanker and urban fleets”. As for reversing, he said: “This has been a problem, particularly for self-steer, where electrical suzie hook-up and reverse light switching to engage the reverse steering lock, as well as educating drivers and shunters, have been challenging.”

That said, for Rowlands there is no doubt that LSTs have proved themselves – although, because of the way licences were issued by DfT, the full 15% productivity gains remain largely latent. “Operationally, R&M is on a par with other similarly specified semi-trailers, while operating costs are around 25% more than a standard unit, with additional fuel use being almost unmeasurable. However, their productivity can far outweigh the on-cost. And, as for safety, we have had minimal accident damage.”

Talking of safety and manoeuvrability, Rowlands also told delegates that Wincanton is now working with professor David Cebon’s team at Cambridge University, with its advanced ‘path-following’ steered trailer design. A trial LST has already been built and is being tested, he said, and the results look promising.

But Wincanton is not stopping there. “We now need to reconsider the use of longer heavier vehicles,” insisted Rowlands. “With improved technologies and vehicle design, now is the time to look at another round of case studies. We need to lobby for support and progress legislation changes across the EU for designing and building pilots... Productivity improvements are likely to become essential, as the focus on CO₂ hardens and fuel prices increase.” 

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David Rowlands