

Selecting the right tipper for the job might need more consideration than you realise. Brian Tingham explores some of today's increasingly sophisticated options and establishes what works best where

Top tips for

So what do you look for when it comes to bulk transport vehicles? Do you believe your work requires eight- or six-wheel rigid tippers, because of their robustness, traction, stability, manoeuvrability and potential for additional onboard plant – such as cranes and hoists? Alternatively, do you favour tipper trailers for their greatly increased load and bulk carrying capacity, and hence also fuel efficiency? Or are you convinced by the even greater volumes, and better safety and flexibility arguments presented by the moving floor, horizontal discharge boys?

For that matter, do you just buy and run the vehicles you've always bought? Maybe you're familiar with them, the supplier and the dealer; the price is right; maintenance is no worse than it has always been; and the drivers don't complain. So why worry? After all, these workhorses of the industry are hardly renowned for novel technologies that might make a difference.

Or are they? The fact is that both the vehicles themselves, and their tipping and walking floor mechanisms have seen significant improvements over recent years. As a result, you might be surprised to learn that some of the old arguments for and against one or the other are just that – they're old and outdated. As always, the devil is in the detail, so it's worth reviewing what's changed and what other operators are using today that might just suit your business better than you think.

Andrew Smith, managing director of Newton Trailers, which deals in the whole range of bulk carrying tippers, is good value here. Although supplying whatever customers want, he challenges operators of rigid tippers to think carefully about that choice before their next purchase.

"Eight-wheelers barely exist in Europe, since everyone uses bulk trailer combinations," he asserts. "Yet operators in the UK stick to rigids, because they still believe they're best for traction, stability and

"Eight-wheelers barely exist in Europe, since everyone uses bulk trailer combinations. Yet operators in the UK stick to rigids, because they still believe they're best for traction, stability and manoeuvrability. How can all the rest of Europe be so wrong?"

Andrew Smith (pictured right), managing director, Newton Trailers

driveability. How can the rest of Europe be so wrong?" He has a point: clearly, there are just as many difficult sites in countries around continental Europe as there are in Britain, yet they manage perfectly well. "So the better traction argument for 8x4s just doesn't stack up," says Smith, "and the same goes for their stability."

Tilt test data

Certainly, tilt test data shows that eight-wheelers typically can't tolerate angles any greater than those for Category A tipping trailers, with 10 tonnes greater payload on board – both coming in at about 7.0°. And, in practice, 8x4s can come off worse. "Anecdotally, we all know that when artics fall over, they look like hell on earth, whereas downed eight-wheelers are not such a big deal," he states. "But the fact is, the narrower track on 8x4s [typically 800mm between chassis beams, compared to tipping trailers' 1,200 to 1,400mm] means they're much more prone to twist and topple."

Ralph Steiner, senior engineer at Don-Bur, which stopped making tipping trailers a few years ago, agrees. "There are certain anomalies around weight saving, profiles and stiffness on tipping chassis, though," he adds. "We used to specify the widest



tippers



PP O'Connor is first for new Boweld and Edbro tipper combo

Manchester-based demolition firm PP O'Connor has selected a Boweld Taperlite tipper body with Edbro CX14 lightweight tipping gear for its latest 8x4. Fitted to a Scania P400 chassis cab, it will enable the firm to operate with a payload of more than 20 tonnes.

Taperlite is Boweld's new steel, single skin tipper body, which tapers from front to rear by four inches and integrates an Edbro CX14 lifting cylinder. Boweld director George Boden says the technology provides weight and space saving. "The body and tipping gear weighs only 2,200kgs, driving down the overall chassis weight," he explains.

"With this design, we are also able to get the arms of the sheeting system within the body width," he adds. "This removes the blind spots created by the arms on traditional bodies. And the top rail is also unique: it allows the fully extended sheet to cradle against the tailgate, so covering the entire load."

"Our company has used Edbro gear for over 30 years and have never had a problem," comments Peter O'Connor. "We knew that the CX14 was lightweight and durable, and would improve the performance of our vehicles. We will almost certainly be ordering more CX14s in the future."

Edbro sales and marketing director Peter Smith says that the CX14 is designed for rigid vehicles up to 32-tonne gvw. He also explains that its new higher pressure pump and reduced hydraulic oil reservoir offers weight savings of 230kg against other products for similar applications, while tipping speeds are 30% faster.

That leads to significant potential savings, with Edbro predicting up to £1,380 per annum additional income for general tipper operators, or savings of £8,280 during the lifetime of a typical chassis, over six years.

track axle we could find, with the widest frame centres and lowest ride height, to reduce tipping moments. We also built the body to straddle the chassis, not just sit on top, for better stiffness. Some bodybuilders still treat tippers as though they're pivoting box vans: they're not."

Steiner also points to the importance of the tipping gear itself – under floor or front mounted. "Harsh's under floor tipping gear, for example, is integral with the frame, so that helps with torsional rigidity and improves its resistance to rollover – but it's also heavier," he explains. "On the other hand, Edbro gear is front-mounted and floating, pivoting the tipper at the rear hinge, with everything at the front supported on the hydraulic ram cap. That makes it lighter, but stability is more of an issue."

So there's a lot to this. Indeed, IRTE's 'Guide to Tipper Stability' (transport engineers' best available reference, in the absence of British and European test standards) makes it clear that everything, from the suspension to tyre types and pressures, chassis stiffness and free play in both the suspension and hinge, has a bearing on stability – and that data when new can be very different to the vehicle, once in service for a few months and years.

Hence its emphasis on the importance of a low



centre of gravity, but also high suspension roll stiffness, good torsional chassis resistance between the hinge and rear suspension, and minimum free play in both suspension and hinge – and a good maintenance regime. It also makes the point that the hinge should be as close as possible to the rear suspension, and that sideways restraint frames between the body and chassis make a lot of sense.

But there's even more. Gerald Muldoon, chief design engineer and managing director of Muldoon Transport Systems, worries about the false sense of security that can come from tilt tests. "If they opened the rear door, the result could be very different, because material often comes down faster from the higher side and that can cause any tipper to go over.

Living on the edge

"Any 10.5m trailer tipping when it's at more than three degrees is living on the edge – and that's very easy to do, whatever the make. We're working on a solution at the moment that will involve self trimming on the suspension. Also, we're tapering our trailer bodies by about 150mm across the width, from front to back, so that you get the sand castle effect, with material leaving the tipper as a block."

Whatever the stability issues, Smith concedes that differences in custom and practice between the continent and this side of the Channel, particularly in the construction and landfill sectors, militate for robust eight-wheelers. For example, site traffic usually has to negotiate unmade tracks on building sites over here – making rigids more attractive – whereas, in Germany, the roadways go in first. However, he insists that, for the vast majority of on-road applications, tipping trailers are just as driveable

At full tilt: but which are the most sensible – tippers or tipping trailers?



as rigids. And, most important, they win the payload and fuel efficiency arguments every time.

“If fuel efficiency drives the transport industry, why are we running around with 20 tonnes per driver in an 8x4, when we could be shifting bulk in 30 tonne batches on tipping trailers? That’s getting on for a clear 50% fuel and time saving. And operators can get another 50% on top of that by moving to horizontal discharge trailers,” insists Smith.

For him, the real reasons for the UK’s failure to adopt more efficient tippers have to do with drivers and big business. “It’s all about politics, prejudice and power. Driving and tipping articulated vehicles off-road requires far greater skill than with eight-wheelers, so there’s one area of resistance. The other is that large companies won’t invest in

Horizontal discharge trailers

When it comes to moving floor trailers, you can get whatever you want. Legras, for example, offers standard build dimensions of 13.6m long by 4.2 metres high, giving 95m³ capacity, but, according to Iain Ogden, UK sales and service manager, almost any configuration can be met.

“We can fit cranes wherever you want and build compartments to separate, say, recycled glass types, with a bucket crane in the middle. Additionally, moving floor trailers can carry bulk, but they can also move pallets, so they’re immensely versatile,” he says.

Ogden concedes that walking floor trailers are heavier than tippers (Legras’ start at 8.2 tonnes, against 6 tonnes for tippers – although Newton’s Knapens come in at sub 7.5 tonnes and the firm can build down to 6.5), but points to their full height and extended length.

However, he also points to two other advantages – their safety, in the absence of tipping, and their potential for very accurate discharge rate control. “Drivers can go for unrestricted [full speed] discharge or they can control the rate to, say, one tonne per hour into a hopper.”

As for the moving floors themselves, all are based on Keith Walking Floor or Cargo Floor equipment, using under-trailer hydraulic drives, usually with three cylinders and cross drives to reciprocate the lengthwise moving floor planks.

Floor choice then depends on the product. In the paper industry, for example, the preference is smooth 7–10mm aluminium that won’t damage paper reels. Ogden explains that his company designs its own planks – up to 17mm thick, high-impact ribbed aluminium, for loading waste from transfer stations, and 4mm steel floors for abrasive materials.

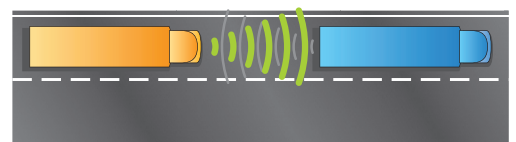
Incidentally, Legras (and others) also offers Keith’s V9 and V18 vee-profile slat systems, claimed to offer greater wear and impact resistance than flat floors, but principally known for their improved sealing and leak resistance for more difficult bulk materials.



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improvements to their intake yards. Their docking bays for goods-out will be pristine and efficient, but they're happy to sit on typically small tipper operators and let them worry about difficult access problems. Mostly, they don't seem too concerned that they could be cutting fuel costs and emissions."

Interestingly, however, Smith suggests that change is coming and from one of the least likely bulk haulage industries – waste. "Whereas bulk is generally the poor relation, when it comes to waste big business has woken up to the fact that they're carrying a precious energy resource. So, although waste trailers used to be the cheapest and most knocked about [and some still are] newcomers, such as Viridor, are buying top quality moving floor trailers and investing in new, efficient yards, because what matters to them is efficiency and image."

Horizontal discharge

For Smith, this industry and others like it will eventually see off some of the market not just for 8x4s, but also tipping trailers and bulk blower/ejector trailers, because horizontal discharge trailers will take over. "They're much safer. Their carrying capacity is half as much again as tipping trailers, because there isn't the shorter wheelbase restriction. The floors these days will outlast the trailers. And companies don't need to build vast halls to accommodate raised bodies. Also, discharge rates are getting much faster – a modern 90m³ moving floor trailer will complete a discharge in just over seven minutes. That's two minutes more to discharge 50% more."

And although prices for horizontal discharge trailers are typically around the £42,000 mark, compared with £32,000 for a high spec tipping trailer, the additional carrying capacity means that an operator with 16 trailers can expect to save around £300,000 per year in reduced journeys and fuel.

That only leaves residual values, maintenance and versatility to worry about. And as Muldoon puts it:

Tipper construction

Tipper trailers come in a range of shapes, sizes and constructions, designed for the spread of industries they serve, but clear patterns are emerging. Gerald Muldoon, of Muldoon Transport Systems, makes the point that hollow plank section is now generally preferred over traditional monocoques, where structural integrity relies on the body itself.

"There's no difference in structural integrity, but you do get additional capacity, because of the extra 150ml width on the inside of a planksider," explains Muldoon. "Also, the sides are smooth, so there's the ease of cleandown, and potential for improved aerodynamics and fuel saving."

That said, there is still some weight-saving (200–300kg) to be had from ribsiders, because the stiffening effect enables some reduction in material thickness, but don't expect much price difference. "Although there's less material, fabrication is more labour intensive," he says.

Beyond that, most of the talk is about modular build systems and the choice of floor material. That is increasingly aluminium, for its weight-saving and durability – as long as the bodybuilder uses hard aluminium and doesn't just trade on material thickness. For operators concerned about abrasive media, reputable manufacturers also use higher brinell alloys or beef up the trailer rear. "Most wear on a tipper is in the back 25%, because that's where all the velocity of material is picked up. So we add wear plates on the sides over that part of the trailer length, but then lighter sheet towards the front," advises Muldoon.

Moving on to the running gear, it's the same as for any trailer, except that tipping trailer manufacturers tend to specify heavier wall thicknesses in the axles, as well as heavier duty suspensions. "Normally, on BPW axles, we use 12mm box section, whereas for tippers the spec is 15mm, so the vehicle can handle the off-road duty."

"Residual values of tipping trailers are nowhere near as much as those of eight-wheelers, but neither is the purchase price. There's also nowhere near the maintenance on trailers, and operators will find them far more versatile. Incidentally, if UK operators followed the Dutch example and added rear steers to their tipping trailers, they would vastly outmanoeuvre any eight-wheeler." **TE**

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