WEARABLE TECHNOLOGY

Vision 2030: Smarter tech for a safer future

Infrastructure support specialist Amey is putting technology at the centre of ambitious plans to drive culture change in the highways sector. Under its Vision 2030 banner, the firm’s highways business is calling on the industry to embrace technology in a bid to improve health, safety and wellbeing, and engage and attract a more diverse workforce.

Safety is our primary goal and people are at the heart of this,” explains Joe Docherty, head of HSIO at Amey’s highways business. “Our bold statement within Vision 2030 is that we will remove all people from harm on the road network by 2030, and we’ll achieve this by changing how we do things.”

Docherty describes Amey’s role as an “agitator”, provoking discussions both within and outside the business about the safety and wellbeing of people who work on and use the road network. “If you look at highways as a sector, we’re largely doing the same things now we did 20 years ago and in a broadly similar way,” he explains.

“We have not really embraced the technological changes that have been happening around us, and that’s because the model has worked for a long time. But the challenge now coming – from the safety and wellbeing point of view – is for us to re-look at some of the risks to which we expose people and ask why we are still doing that. Why aren’t we doing some things in a different way?”

As well as an internal initiative, Vision 2030 is a broader “call to arms” to the sector, with collaboration seen as key to stimulating technological change. The idea is ultimately to break down silo thinking and encourage infrastructure and maintenance providers, asset owners and other stakeholder groups to pool knowledge and resources to develop solutions.

No longer tolerable

“The moment a worker is deployed on the live road network, it raises a risk of harm,” explains Docherty. But the potential for harm goes beyond that individual. “Someone else has got to create a safe enclosure for any work or inspection being carried out,” he adds. “And the creation of that enclosure may then create a hazard from the road user’s perspective.”

Allied to the moral imperative to protect people from harm is a strong business case for improved productivity and efficiency. “We’ll be doing things not only more safely, but also more quickly and leanly,” argues Docherty.

As an example, he highlights the hidden costs involved in setting up a road closure to protect workers undertaking what might be only a five minute inspection. “It could possibly take an hour of work to facilitate that, with all the associated disruption to road users,” he notes. “So we need to look at how else we can do things, such as using drones to examine the asset. Or even jumping further forward – how to improve the lifecycle of the asset so that something

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now checked three times a year might only need checking once every five years.”

“We also need to get across that there are risks out there that we shouldn’t be tolerating as a sector,” says Docherty. In the last 18 months, Amey has had five IPV (Impact Protection Vehicle) strikes that resulted in injuries to its workers, with a collective lost time of more than 200 days. More importantly, adds Docherty, is the non-physical effect this has on those involved, which can take much longer to recover from.

IPVs are works vehicles equipped with a lorry-mounted crash cushion at the rear, which is designed to absorb some impact energy during a collision. The sector uses these vehicles to protect workers installing and removing temporary traffic management on the live network. IPV strikes happen when errant road users, who might be speeding or simply confused, strike the IPV.

“IPV operators know what the job is: for the vehicle they are driving or sitting in on the live carriageway to take a strike in order to protect a colleague on the road in front,” says Docherty. “Yet, despite the known hazard to the driver this is still universally utilised in risk assessments as an industry-norm safe system of work.”

To eliminate the requirement for IPVs, Amey is currently collaborating with the Manufacturing Technology Centre in Coventry, Highways England and other industry bodies to develop a new type of remotely operated lane closure protection. The latest version of the innovative “crash control system” is an independent “crash skirt” cushion designed to be rapidly deployed and retrieved from a lorry using a hydraulic pivot lift without the workforce leaving the cab.

Do the automation

This type of automation is a key part of Vision 2030. In other developments, Amey has been pioneering the use of drones and lasers, overlaid on asset databases, to inspect the structure using virtual reality (VR), which removed the need for workers to go on to the carriageway or hang from the structures during recent work on the Forth crossings.

In a perhaps more mundane, but no less important area, a robotic mower is being used to automate grass cutting, not only removing workers from the risks of working near live carriageways, but also as a way of upskilling teams by introducing new digital capabilities.

Another recent innovation is the introduction of automated personal protective equipment (PPE) vending machines on one of Amey’s highways contracts. To avoid peak traffic on the road network, highways work is often done overnight when stock rooms and procurement departments may not be manned. Using automated vending means pre-approved PPE is available on demand 24/7 without the need for lengthy ordering processes and supervisor intervention.

Looking further ahead, Amey will be examining the feasibility of automating a wide range of traditional highways tasks, such as gritting (perhaps using automated or driverless vehicles) and barrier repairs, as well as using systems like the existing robot mower on a broader scale. “In the shorter term, it may not be that the technology we’re deploying is particularly new or ground-breaking,”

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Amey has had four Impact Protection Vehicle (IPV) strikes in the last 12 months

Joe Docherty, Head of HSEQ
(Highways)
Amey

suggests Docherty. “But that we look at different ways of using it, such as using VR for work zone safety training, or harnessing wearable tech to tackle driver fatigue.”

Last year, the highways business tested a range of wearable technologies during a nine-week trial on a maintenance contract for Highways England in the north east. The technologies included a collar drowsiness detector and ear clip, a “ruggedised” wrist-worn vital band to monitor vital signs and environmental factors; and a location badge that, when activated, sends an instant alert.

The trial generated a vast amount of insightful, and sometimes surprising, data. For example, the drowsy driver collar showed that, contrary to most people’s belief, night-time driving is not necessarily the biggest risk. Instead, this turned out to be to staff driving home in the late afternoon.

Innovate from within

To stimulate innovative thinking, Amey and its parent company, Spanish based Ferrovial, both run employee award schemes. Ferrovial’s Zukitankei (obtained from the Swedish expression “innovate”, which means big, and the Norwegian word “tanken”, which means idea) initiative aims to solve real operational challenges and celebrate innovative talent, by rewarding, recognising and most importantly implementing the best ideas. The programme involves a biennial competition, which invites employees across the businesses to come up with ideas and culminates in an awards ceremony.

Amey’s own “Springboard” competition is an annual process that originated in the Utilities part of the business but has now been adopted across the organisation.

Frontline operatives are invited to get together and identify an issue—which might be an operational or safety concern—and devise and start to develop a solution. “The concepts will be presented to a panel of judges drawn from the executive teams and key stakeholders such as clients, who award prizes for the best ideas, with the winning concepts considered for investment,” explains Docherty.

“It’s about trying to generate enthusiasm and encouraging people to generate their own ideas,” he stresses. “We need frontline input on the risks they face; stresses. “We need frontline input on the risks they face; they are out there every day and night keeping the network moving, so are best placed to say ’I think this or that can be done in a smarter way’.”

The focus on innovation is also part of trying to make the working environment attractive to a more diverse range of people, including younger, more tech-savvy generations. The traditional nature of the work, combined with the requirement for unsociable hours, means that most of the workforce is now male and over 50. “We are hoping that by stepping into new technologies and new ways of working, it will tempt other people to come into the industry who wouldn’t necessarily even look at it now,” says Docherty.

Remove the blocks

Docherty is confident that attitudes to technology within his own profession are moving on. “There’s a recognition that keeping on doing the same things all the time and expecting a different outcome is futile,” he suggests. “It’s becoming clear that—as safety and risk professionals—we need to do some things differently, and some of that is about technology, but some of it is about using technology and innovating.”

He believes one of the most important areas for practitioners to work on is “removing the block that ‘it will never work’ or that ‘it will never deliver what we need it to do’. Stage one might not deliver, and stage two might not be perfect, but it may be better than what we’ve got now. If we’ve got something that significantly reduces risk while we’re still working on something that will eliminate it, why not do it?

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His other piece of advice is not to be afraid to share. “People may not want to share an idea or concept if it’s not polished or finished, but sharing where you are now means someone else may look at it and make it better,” he argues.

Finally, he believes it is critical that the regulators keep up with the pace of technological change. “We may want to implement a different technology we believe significantly reduces harm, but we also need to know how the regulator will view that innovation and whether it will be compatible with existing guidance.”

More broadly, Docherty is aware that taking the workforce on the tech journey can be daunting. “When people hear automation, they fear their job will be replaced by a robot,” he acknowledges. “That is a real challenge but it’s all about education. Even the most intelligent machines at this stage still need some form of operator—but an operator working in a much safer place and with a different skill set.”

Above all, he believes it is crucial to “take people with us on the journey” and show them it’s about reducing harm, enhancing skills and improving the work environment. “In terms of Vision 2030, it’s not just about being smarter, it’s about ‘enthusing and engaging people’ and convincing them that its goals are credible, he says.

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