



↑ Caroline Coates



↑ Peter Baynham



↑ Sue Percy



↑ Bhavin Makwana



↑ Matthew Clarke

Intelligence needed in drive to fully embrace future mobility

Driverless vehicles promise many long term benefits including improved road safety and reduced congestion. But an agreed vision for intelligent mobility is urgently required and the period of transition towards a self driving future carries many uncertainties.

Government and the transportation sector have a poor grasp of the country's direction of travel regarding connected and autonomous vehicles (CAVs), according to a new survey of a select group of CIHT members.

Two thirds say Government has a 'limited' understanding of CAVs and 87% say the profession's understanding of CAVs is limited.

The need to overcome this uncertainty about the role driverless vehicles might play over the coming decades was among the main points raised by participants to a roundtable discussion on future mobility last month, hosted by *Transportation Professional* and consultant SNC-Lavalin's Atkins business.

"This apparent lack of understanding about connected and autonomous vehicles is a real issue that we cannot afford to ignore," said the event's chair and CIHT chief executive Sue Percy. "It's worrying that there is no agreed vision or framework and there appears to be a huge policy vacuum. The transition phase to autonomy looks to be very muddled, so it is important we focus on that as well as trying to reach an end goal."



↑ Autonomous cars are likely to depend on connected infrastructure
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Her concerns were echoed by Atkins strategic highways market director Peter Baynham. "The industry needs a vision with clear outcomes and we should be looking for ideas and opinions to stimulate debate around issues such as policy, legislation and collaboration," he said.

"The technology is emerging and improving but is our infrastructure ready to embrace it? The roads we are designing now will support a mixed fleet of vehicles with different technology and energy for some time to come."

Peter added that connected and autonomous vehicles promise to play an important role in making roads safer and improving accessibility, and building trust with the public is key to growing acceptance.

But will the prospect of improved safety be enough to convince people to buy a driverless car, asked Transport for the South East forum chair Geoff French FCIHT.

"Eighteen hundred people are killed on our roads every year and while it is right to try and reduce that number significantly, I'm not sure how big a



↑ Jon Hunt



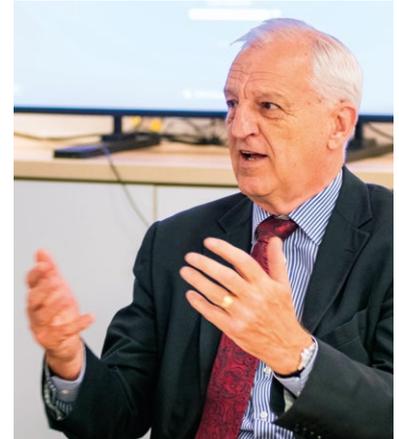
↑ Lucy Yu



↑ Ian Kemp



↑ Wayne George



↑ Geoff French

factor safety plays in people's decision making.

"People want something else and that is reliable transport. Promoting autonomous vehicles as being safer would be selling a solution to a problem that the public doesn't think exists."

Technology firm Five AI's director of public policy Lucy Yu suggested that the potential benefits of autonomous vehicles that people can most relate to are those that may overcome frustrations with their day to day travel. "From my conversations with members of the public, what matters to them are better access and improved journeys."

And there is no guarantee, she added, that people will accept driverless cars just because they may be statistically safer than humans behind the wheel. Care must also be taken, Lucy said, to ensure that autonomous vehicles are not only safer for a vehicle's occupants, but also other road users including cyclists and pedestrians.

Vehicle insurer Royal & Sun Alliance underwriting director Ian Kemp MCIHT said autonomous vehicles promise significant safety benefits, not least because "ninety three percent of accidents involve some form of human engagement".

He added that the World Health Organisation says there are 1.25 million road deaths around the globe each year and in the last three years there has been a 16% increase in the number of vehicles on the road.

"Even before we get to fully autonomous vehicles we are seeing technology leading to a reduction in the frequency of insurance claims, such as autonomous emergency

braking," he said. "Technology is already starting to make vehicles safer."

But the RAC Foundation's data analyst Bhavin Makwana warned that advanced driver assist functions which are currently available on some cars must not be confused with driverless systems of the future.

"There is a risk that some people could be lulled into a false sense of security by the technology available," he said.

"Understanding what technology is in your hands and how to use it appropriately are issues that will

probably continue for the foreseeable future. We have to ask whose responsibility it is to convey to motorists how to use the technologies properly."

In the longer term Bhavin added that driverless vehicles will need to demonstrate they can operate safely, even if external connectivity with the highway network fails.

Automotive and insurance lawyer Caroline Coates said there is a long way to go before people fully understand the huge safety benefits that autonomous vehicles can >

Cleaner propulsion championed at event

Alternative fuelled vehicles are another important strand of the future mobility landscape, the roundtable heard. Twenty years ago Toyota launched the Prius electric car and plug-in vehicles are steadily becoming more popular, with hydrogen power another technology which is slowly starting to gain acceptance.

Energy storage and clean fuel systems manufacturer ITM Power's business development manager Charles Purkess said the rapid adoption of cleaner emission vehicles will require the availability of vehicles with a similar range and performance of today's combustion engines.

Renewable energy for clean emission vehicles will need a managed and rapid transfer of stored energy



↑ Hydrogen is an emerging sustainable fuel ITM POWER

from the grid to vehicle, he said. "We have a growing network and more charging stations are urgently required. Roll-out of clean emission transport options for commercial fleets are a great way to encourage widespread public adoption."

Toyota's alternative fuels manager Jon Hunt said that batteries and fuel cells used in electric and hydrogen vehicles continue to get smaller and more powerful and could start to change the design of cleaner powered vehicles. He added that those looking at the future of mobility have to start thinking again about how roads are used.

"We have to remember that roads are about the safe movement of people, goods and services and that mobile telecommunications have already reduced the need for people to drive to the supermarket, for instance, when companies are delivering goods to their customers.

"Car sharing may become more popular or public transport networks optimised via real time data sharing, so that the size or number of buses dispatched changes dynamically based on how many people are waiting at a stop." But he added that the sector has to be careful that modern modes of transport do not detract from healthy lifestyles. "Sometimes it may be better to walk."

> provide. Another barrier to acceptance is fear around cyber security. "People are only just beginning to understand the challenges around cyber and data privacy, so to put those into the context of a vehicle only ramps up public concern."

Caroline added that 'the public' should not be viewed as a homogenous entity when discussing possible take up of both autonomous vehicles and those powered by alternative fuels. "Which form of transport people are interested in will vary enormously depending on age and their location."

"The generation coming through really wants ease of use and reliable, seamless journeys, whether that involves connected and autonomous vehicles or electric cars," she said. "Young people today are not so obsessed with owning a car, so we must not forget what they want and expect to use."

Discussion turned to the unintended consequences that may follow a large increase in connected and autonomous vehicles on our roads. Road congestion might rise in the early years of automation until over half of all vehicles are driverless, it was claimed.

An increase in the number of trips taken by car, reduced demand for conventional public transport and a fear that rates of walking and cycling may fall were also cited as possible outcomes.

Atkins' technical director of intelligent mobility Matthew Clarke warned: "While vulnerable road users will certainly benefit from improved safety associated with autonomous vehicles, we have to be mindful of the concerns of some cycling groups."

"It is claimed that bicycles may be banned from certain highways if their presence is deemed to be too disruptive for the new vehicles so we have to ask if autonomy will hinder certain modes of transport."

But he added: "There is unlikely to be a huge uptake in connected and autonomous vehicles before the end of the next decade, so we have time to think and work this all out."

Highways England's senior network strategy manager Wayne George said that the phrase 'connected and autonomous vehicles' is too broad when discussing this agenda.

"Connected and autonomous are two very different things; autonomy is the aim and connectivity is the enabler." He added that data received from vehicles that communicate with highway infrastructure will prove helpful in improving safety, customer service and capability of the network.

But he added: "We have to ask where the starting point is for all this. Is it motorways or A roads where a lot of technology already exists on some sections, or could it be urban areas for first and last mile travel?"

It is still not clear where this journey will begin and develop." He suggested that a 'CAVs ready' network map would be useful, showing which parts of the country's roads are fit for vehicles with different levels of autonomy.

Lucy Yu welcomed the idea of a network ready CAVs map showing where traffic signals, for instance, can communicate with vehicles. But she said self driving cars should still be able to navigate streets on their own accord.

She added that autonomous vehicles could change how people value their time, allowing them to make journeys more productive and even persuade them to travel further for work.

According to Geoff French autonomous vehicles are almost certain to become popular in urban areas, but he expressed doubt that they will be as popular in rural areas. "However, I can see the Oxford to Cambridge corridor as being an ideal place to start introducing new vehicle technology," he said.

Geoff also called for future mobility solutions to have "accurate, reliable information from one source that people can trust."

Roundtable participants:

- Peter Baynham, Atkins
- Matthew Clarke, Atkins
- Caroline Coates, lawyer
- Geoff French, Transport for the South East
- Wayne George, Highways England
- Jon Hunt, Toyota
- Ian Kemp, Royal & Sun Alliance
- Bhavin Makwana, RAC Foundation
- Sue Percy, CIHT
- Charles Purkess, ITM Power
- Mike Walter, Transportation Professional
- Lucy Yu, FiveAI

Setting the scene for changing times



Unprecedented change is forecast for the transport sector as growing interest in connected, autonomous and low emission vehicles place greater demands on road infrastructure.

Strategic highways market director Peter Baynham from SNC-Lavalin's Atkins business says the sector should be excited by future prospects. But he adds that the period of transition must be managed carefully. "We can all imagine how the end state might look, but the question is how do we get there," he says. "We need to agree standards, otherwise it is inevitable we will stumble into a position that is far from optimal."

"It's clear that the Government has already invested in key areas such as connected and autonomous vehicles, so we need to build on this by clearly articulating what we are aiming for from 'future mobility' as a nation."



↑ Peter Baynham

Peter adds that transportation is a fascinating sector to be part of at the present time, with a growing "appetite for innovation and a desire to improve productivity". But those championing developments in mobility can never overlook the importance of safety.

There is also a large piece of work around public perception and acceptance of future mobility, he says. "We need to articulate the benefits in simple terms: such as improved transport and savings of fuel, or improved accessibility."

Atkins is involved in several projects which focus on the future implementation and integration of CAVs on UK roads, including 'FLOURISH' and 'Human Drive'. It also led the recently completed 'VENTURER' research and development project (pictured) which explored barriers to the adoption of CAVs in the UK and how best they could be overcome.

Peter adds: "A key focus area for FLOURISH is secure and reliable vehicle-to-infrastructure communications and how this connectivity can be harnessed to deliver added benefits, including layers of extra functionality."

He also says that the drive to connected and autonomous vehicles and low emission fuels must not come at the expense of those who keep older cars. "I'm a technologist but also a petrol head and appreciate classic cars."

"I want to be able to drive my car at weekends, but during the week there is no enjoyment in sitting in a traffic jam. By making mobility more efficient we can help to improve productivity."

This article has been produced in association with SNC-Lavalin's Atkins business.