Four for the future

Predicting anything can be a challenge, but the automotive industry has given us some pretty strong clues when it comes to the clever stuff making its way into cars over the next 12 months. A Christmas edition of Good Motoring offers the perfect opportunity to look at the technological road ahead.

Our **Neil Barrett** takes a look at some recently-established vehicle tech that's going to become more commonplace, plus some concepts set to gain traction across the industry and in the media. Either way, you'll be hearing a lot more about these four innovations in 2019...

State-of-mind AI

2019 will see trials of autonomous vehicles ramped up like never seen before. The UK government is still keen to see self-driving cars on the roads in the early part of the next decade – with the said decade starting only a year from now – so there's a lot more to do in order to meet that ambition.

Some of the most sophisticated technology to get a vehicle from A to B is already nearly at B when it comes to research and development. One of the more tricky elements in the equation is the human one. How are self-driving cars going to know what that cyclist, pedestrian or other motorist ahead intends to do?

Well, Massachusetts-based Perceptive Automata believes it now has the software to answer that question. They've developed predictive

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technology which they say can make very quick decisions about both the intentions and level of awareness of people around the vehicle.

Working in a similar way to many Artificial Intelligence (AI) systems, this system takes sensor data from vehicles and reads the interactions with people on and near the road. From analysing this information it can build up a very advanced picture of human behaviour which helps to gauge future interactions.

There's big belief in what this tech could do for the autonomous vehicle industry when it really gets going. In fact, the belief in Perceptive Automata is so big that manufacturer Hyundai, through its open innovation arm, has invested significantly in it.

A practical example of the technology is that if a self-driving car using AI stops for someone >>

A glimpse into the future
(continued)

on foot and the pedestrian waves the car on, the technology will know it can accelerate and make progress. However, if state-of-mind AI lives up to expectations, it could be a crucial part of making a world with autonomous vehicles as safe as possible: nothing short of revolutionary.

V2X

Over the last few years, connected cars have become big business. Vehicles have in recent years been mainly hooked up to a network for remote control, mapping, traffic information, music, software updates and more. In the industry, it's called V2N (vehicle to network).

It's all about to get a lot more exciting - and potentially much safer - in 2019 as we see significant developments in V2V (vehicle to vehicle), V2P (vehicle to pedestrian), V2D (vehicle to device) and other connections. Let's wrap all of this up in the automotive umbrella term V2X: vehicle to everything.

One of the challenges hasn't been the technology – it's the race between manufacturers to have the edge over their competitors and push their brand of connected technology as a major selling point. However, the road safety and traffic efficiency benefits are only going to be seen when the big car makers get together. In 2018, that was certainly happening.

In July, BMW and Ford worked with the 5G Automotive Association to carry out an impressive live demonstration of C-V2X technology, which can most easily be described as vehicles communicating with everything through cellular networks, via connected infrastructure or directly with each other.

What does this all mean for driving? The main answer is that it could make the roads a much safer place to be. The demonstration showed off no fewer than six types of warning, all designed to help protect road users in different situations: potential intersection collisions, turning across traffic, slow and stationary vehicles, potential traffic signal violations, emergency braking and – perhaps most notable – vulnerable road users.

The technology being tested right now, which we'll see and hear much more about in 2019, could be potentially life-saving on a large scale.

Traffic Jam Assist

If you asked motorists for their top five driving dislikes – or perhaps even their very top one – it would be traffic jams. Of course, the preferred technology would be something to make them

> ## "You, the driver, have not been forgotten in the 2019 in-car tech revolution..."

completely disappear. But in the absence of a motoring magic wand, the next best thing could be Traffic Jam Assist.

To be found on some of the newer Volkswagen Touareg SUVs, this technology is a combination of their Lane Assist function and Adaptive Cruise Control. When these two innovations join forces, they're able to track and keep up with the traffic ahead, accelerating and slowing down as appropriate whilst staying in lane throughout. Other manufacturers have already launched similar functionality on advanced models, but expect to see this on an increased number of vehicle ranges as the technology advances and gets cheaper.

Driver Wellbeing

Don't worry: you, the driver, have not been forgotten in the 2019 in-car tech revolution. You will be taken care of too.

Already we have driver alertness monitoring, otherwise known as drowsiness detection. In the future, the industry wants to make things even safer by keeping an eye on you in new ways. One school of thought is that it'll be commonplace to find sensors placed in the steering wheel and the seat, monitoring your heart rate – and perhaps other vital signs – warning the driver or even taking appropriate action if a high level of stress is detected. Some car makers have experimented with this already.

It's not all about safety, though: some manufacturers see this as part of creating a 'smart cockpit' with a highly-adapted, highly-personalised environment, just for you. There's the paradox, right there: all this innovation, comfort, safety and enjoyment for the driver, only for the industry to remove the driver when fully autonomous vehicles come along.

Perhaps in the future that's further down the road than some would have us believe, and there could after all be space for human-driven and autonomous vehicles together on the roads. ∎

Below left: Progressive assist systems on the VW Touareg; Right: Intention and awareness are measured by Hyundai with Perceptiva Aurtomota. Bottom: testing for V2X - vehicles to everything.