

Will we all be passengers or are we putting the cart before the horse?

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Iggy Pop's song, "The Passenger" has already been used for car adverts and yet seems out of tune when cars are sold as enablers of freedom, won through agency and control. But with the coming era of autonomous vehicles, it aptly represents a new kind of freedom on the roads.

In the future, our commutes could entail first hailing an autonomous [vehicle](#) (AV) through our smartphones. While being transported noiselessly through streets free of pollution and congestion, we could start our working day from the car seat's comfort; alongside our fellow ride-sharing commuters of course.

With numerous high-tech and engineering companies including Ford, Google, Tesla, and Apple embroiled in a race to bring AVs to our roads, the above scenario might be fast approaching. Yet the introduction of AVs is likely to happen incrementally, in tandem with enabling technologies such as electric vehicles (EVs).

Navigating the road ahead

The last few weeks have seen momentum building for EVs. For example, fuelling the demand side, last month, the UK government announced that after 2040, no new petrol or diesel cars would be allowed on the market. On the supply side, also in July, Tesla announced that its all-electric Model 3 had passed regulatory requirements and cars have already started rolling off the production line.

While autonomous and electric vehicles are not synonymous, their fate is inextricably linked, as most AVs are likely to be electric. It's easier for computers to control EVs and to connect them to wider infrastructure data and analytic systems. Establishing the EV infrastructure, such as charging points, will obviously also greatly enhance later public acceptance of AVs. Crucially EVs are also less polluting than current fossil fuel alternatives and so offer an attractive contribution to environmental targets.

The rough with the smooth

The Society of Automotive Engineers has actually developed a series of autonomy levels (SAE standard J3016). Starting at Level 1 which requires driver assistance, the standard climbs through partial autonomy, up to level 5 of full autonomy. Indeed, a number of the lower level features already exist such as Autonomous Emergency Braking (AEB) systems and lane departure technology. The autonomous cars that Ford has committed to put on the [road](#) by 2021 are considered to be level 4 high autonomy vehicles, described as 'ride-sharing platforms'.

As well as helping authorities to meet environmental commitments to CO₂ and NO_x reductions, AVs are also explicitly designed to address current safety concerns. Currently, over 90 percent of vehicle accidents are caused by human error, resulting in well over one million deaths globally per year. AVs employ a range of road positioning satellites, cameras and radars, alongside massive computing power, to build a picture of the road environment and react safely. If this wasn't enough to tip the balance, advocates also point to the opportunity that less vehicles on roads, either parked or driving, will open up our public spaces.

And yet significant hurdles remain, with the most cited being the legal framework. Alongside the need to rework some road rules and licensing arrangements, come issues around liability. In the case of an AV-caused

accident who would be responsible; the passenger, the software designer, the manufacturer? Indeed, there have already been AV accidents in test environments, resulting in a fatality for Tesla last year.

Shaken but not stirred?

Yet it is perhaps within the argument that a mix of AVs and 'normal' vehicles, with differing priorities will cause problems, that we identify what is often missing in the debate—actual human agency. For many people driving is in itself a pleasurable activity, reflecting personality and status. So how readily will drivers relinquish this aspect?

The answer seems to be mixed. One recent survey by a UK insurer Direct Line, finds that 39 percent look forward to AVs, with 35 percent 'skeptical' and 26 percent unsure. The same survey showed that 53 percent said they enjoyed driving, viewing AV as a 'dull' replacement. On the other hand, another survey conducted internationally by KPMG found that half of today's car owners will not want to own a vehicle and demand for self-driving and electric cars will continue to grow.

Perhaps we will know the balance has finally been tipped towards AV acceptance when James Bond is seen sipping a Martini as a passenger, during his first autonomous car chase.

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