1. We suggest that the developed world in general, and the UK in particular, are at the peak of the hype cycle (van Lente et al. 2013) with respect to automated vehicles.\(^1\) This is partly thanks to the media and the prominent work of organisations such as Google and Tesla. But, in the UK, it can also be attributed to the government’s explicit ambitions in terms of commercial opportunity and a more general “being at the forefront”. Whilst we do not take issue with the government’s desire to capitalise upon this opportunity, we believe it quite possible that this has prompted an optimistic way of thinking about the likely consequences of increasing automation in vehicles. That same optimism can be seen in this inquiry’s terms of reference which appear not to question the government’s objectives but to take them as read. This seems a missed opportunity since, if we are going to ask whether the scale of facilities is “sufficiently broad and ambitious”, we might equally ask what that scale should actually be.

2. This question of scale is legitimate because our current position in the hype cycle is associated with a tendency to assume positive outcomes of this technology and at best play down the more negative possible implications. Allied with this is a strong vein of “technological determinism”, a belief that automation will come and that we (society, government) will need to adapt accordingly. Both traits are very prominent in the academic and grey literature on the subject. The bulk of writing reflects an enthusiasm for the technology and a general lack of circumspection on the authors’ part. To give a specific example, there is practically nothing in the literature to date about the possible public-health impacts of automated vehicles; yet it seems obvious that an increasingly “door-to-door” transport system is very likely to lead to an increase in obesity, all other things being equal.

3. A supine approach to the governance of this new technology, as shown by most of the research done to date and the pronouncements of government (which appear to reflect a belief that regulation is the natural enemy of innovation), is far from desirable. Automated vehicles may bring huge benefits but considerable costs too and government at all levels is uniquely equipped to determine the balance. Therefore, we argue that, in addition to asking questions about breadth and ambition, the committee should also be asking questions about whether the government has given sufficient attention to the possible wider impacts of automation and to its own role in managing these positively.

4. There are good examples in the UK of well governed technological advance, of “responsible innovation”. One such is the work of the HFEA, whose concerted efforts to capture and act

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\(^1\) We argue that “automated” is a more appropriate term than “autonomous” given this inquiry’s terms of reference. What is at issue is whether a vehicle requires a human driver, and some vehicles will successfully conduct the driving task largely on the basis of instructions received from outside (e.g. a central control system). Such vehicles would not be autonomous, strictly speaking.
on public opinion and to address the potential ethical consequences of the advance of embryology are argued not only to have resulted in positive outcomes for the users of IVF etc but to have secured a good economic position for UK organisations working in the sector (Wilsdon & Willis 2004).

5. To illustrate our points further, it is worth exploring briefly three aspects of the current debate concerning automation:
   - Safety
   - Congestion
   - Ethics

6. With respect to safety, there is broad consensus in the literature that automated vehicles will bring safety benefits. Conclusions are overwhelmingly based on the observation that 90 per cent or so of current collisions arise from human error, the assertion being that self-driving technology will eliminate at least a substantial proportion of these. Less fully explored so far is the relationship of levels of automation, traffic mix and highway regime with the volume of collisions: the greatest gains can be expected once the entire fleet is fully automated, for example, but the pattern could be very complex during the lengthy period of transition. Also very significant from the technological point of view is that attention is focused in the literature on the human error that leads to a large proportion of the crashes that do occur today. There is less acknowledgement of the fact that human drivers make good decisions a great deal of the time, many of them based on interpretation, generally acknowledged to be the weak suit of artificial intelligence. The presumption that self-driving technology will definitely be able to match humans in making such decisions may in time be proved right but the transition could again be a lengthy one.

7. As with safety, there are numerous assertions that automation will increase the practical capacity of the highway system, with decreasing headways and vehicles negotiating (or being assigned) optimal paths through the network. If levels of travel do not significantly increase, congestion might therefore be expected to fall. Whilst this is a plausible scenario, it is only one. We must acknowledge that current loads on our networks reflect extensive use of mass transit, walking and cycling, together with the fact that many potential journeys do not take place because they are not currently feasible. So another plausible scenario involves a significant increase in vehicle-kilometres as automation enables trips not currently made and, possibly, encourages travellers to change to a mode that is less space-efficient. And there is so far only scant acknowledgment that some users (of manually driven vehicles, say) might exploit the necessary timidity of AVs, causing numerous emergency stops. This combination of developments seems likely to be associated with an increase in congestion.

8. Finally, much attention has been devoted to hypothetical situations in which an automated vehicle may be confronted with moral dilemmas – so-called “trolley problems”. Here, the

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2 It must be said that there is less of a consensus on this front than with respect to safety.
lack of circumspection takes a different form: instead of choosing to disregard the possibly less positive alternative scenarios (as with safety and congestion), researchers are ignoring the significant social and political questions that precede a situation in which cars might choose between Person A and Person B. Would society countenance assigning that power to a computer? Who would develop the algorithm(s) and on what basis? Who would be ultimately responsible for the consequences of the algorithms’ operation?

9. In summary, this is a much more complex and more nuanced topic than most discussion and writing to date reflects. And, more specifically, government needs to acknowledge that the scope of its potential influence extends far beyond merely providing a fertile testing ground.

References


26 October 2016

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3 MIT has in fact established a website devoted to such problems - [http://moralmachine.mit.edu/](http://moralmachine.mit.edu/)