Emerging Findings from Survey of Willingness to Share and Pay for Autonomous Vehicles

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In the last months, the VENTURER social research team has been undertaking and analysing a survey of South Gloucestershire and Bristol residents. Our respondents were currently using the different urban transport modes available in roughly the same proportions to the whole Bristol-South Gloucestershire population. The survey presented respondents with four possible types of autonomous vehicle, all of them operating completely without a driver:

- a privately-owned and used car,
- an exclusively used taxi on demand,
- a shared taxi which would be lower cost to use than an exclusive taxi, and
- an autonomous bus which would be smaller and more frequent than typical buses today.

Each option was presented with some basic information about how it would work. Around half of the respondents said they were willing to use the autonomous modes. We found no major difference in preferences for using the four different kinds of autonomous vehicle (AV), although the shared taxi option lagged the other three options, including the bus. That might be because there are very few shared taxi services around at the moment for people to compare with. Alternatively, it might be that sharing a driverless vehicle with a very small number of fellow travellers is less acceptable than sharing with a larger number, which makes the vehicle more 'public'. Unsurprisingly, we also found that people who currently mainly travel by car showed greater willingness to use a private autonomous car than people who mainly currently travel by other modes.

Most of those who reported mainly getting around by car agreed that they enjoyed driving. Those that 'strongly agreed' with that statement were more likely not to be willing to use a private AV car.

Similarly, the more car-oriented respondents were less likely to use an autonomous bus or autonomous shared taxi than those who mainly travel by modes other than car. There was though little difference between these groups for the exclusive taxi option.

Notably, when we asked people if they would prefer the human-driven version or the autonomous version of each private car, exclusive-use taxi and bus, in each case half or more preferred the human-driven version. When we compared the responses by current car use, we found that two thirds of those who mainly travel by car preferred a human-driven car to an autonomous car, whilst for those who mainly travel by other modes this preference was reversed: an autonomous car would be preferred to a human-driven one. Similar but smaller differences were seen for taxi, but interestingly not for bus.

These findings regarding willingness to share are critical, because it is only with more efficient use of vehicles and road space that the wider societal benefits of moving to autonomous vehicles will be unlocked. When we asked this question explicitly about willingness to share a vehicle with strangers, then one-in-ten "agreed strongly" they would share, whilst just over a third "agreed" they would be willing. However, nearly another third were unsure. People who also agreed with the statement that they "didn't mind interacting with people they didn't know" were a little more likely to be willing to share.

Ultimately, another major benefit of shared autonomous vehicles could be fewer vehicles being parked on streets, if people use a shared fleet rather than owning their own cars. Notably, over half of those who currently mainly travel by car agreed that they "would be willing to give up personal car ownership if they had access to a shared Driverless Vehicle system which was able to provide me with the same level of service as the car, for approximately the same price". For those who mainly travel by other means than the car, this figure rose to approximately 70%.

Autonomous technologies will, however, like all transport systems, need to be paid for by someone. It seems likely that autonomous cars will be more expensive than human-driver cars, at least in the early stages of their roll-out. We found that, on average, respondents would be willing to pay up to a third more per mile for the benefits of having a self-driving vehicle. They would also be willing to pay a similar amount per mile for a shared autonomous taxi. Interestingly, the average that people would pay for an autonomous taxi would be around half per mile of the cost of a current, human-driven taxi. This reflects the fact that taxis are generally only used where essential: to make trips when no alternatives are available, such as late at night, or when a

group is travelling together. Driverless taxis might be much cheaper to operate though if there is no driver to pay, so they could become much more popular. The findings were similar for the bus: people would remain willing to pay levels of bus fare nearly as high as current fares, but autonomous buses should be cheaper to operate per mile, so it would be possible to radically improve the services for the same total expenditure. This could make buses more popular.

One limitation of our survey work to date that we should acknowledge, though, is that our sample mainly included long-term residents of the area, so was older than the actual population with most respondents aged between 30 and 70 years: the kind of people who are most likely to be buying new cars now. It will probably be at least another 20 years before completely autonomous cars are available, and there is a debate as to whether the views of current middle-aged adults are the best guide to the likely attitudes towards autonomous technology of those who will be middle aged in twenty years' time, or whether studying the views of younger people, who will become the middle aged of 2030 and over, offer better insights. If the social and economic conditions of being middle aged are the dominant factor on attitudes, then probably those won't change very much from one generation to the next. If acceptance of technological change is more important, then maybe the views of current young adults are more relevant, although the current middle aged have also grown up with the emergence of computing and many of them have readily adopted the smartphone and tablet. Our next step will be to undertake similar research with younger adults in order to test out some of the questions arising.