



Autonomous vehicles: what they are, how they work and why we need them


Adoption of AV technologies would bring about numerous benefits

Business

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Increasing road safety is one of the key drivers for the widespread use of AVs. Photo: Shutterstock.com

Autonomous vehicle (AV) technology is a fast-growing phenomenon which has, in recent years, been the subject of research projects in multiple countries seeking to introduce alternative means of shared transportation. But the mass roll-out of self-driving cars and introduction of a digital infrastructure which, in its most extensive form, eliminates the role of the driver, entails a host of points of contention.

An autonomous – or driverless – vehicle operates and performs driving functions with little to no human involvement, through its ability to sense its surroundings and take ‘educated’ decisions on the basis of data collected through a sequence of sensors.

The extent of human intervention required for operation of any vehicle varies depending on the level of driving automation, ranging from 0 (no automation) to 5 (full automation).

Malta has so far seen the introduction of up to level 2 (partially automated) vehicles, a relatively low level of automation which does not displace the role of the driver save for very limited instances such as assisted parking. Level 3 (conditional automation) will follow relatively shortly.

Level 4 (high automation) and level 5 (full automation), however, represent a different category altogether, which at its highest level dispenses with any and all intervention by the human driver.

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Road traffic accidents claim millions of lives each year and cause tens of millions of non-fatal injuries. The majority of such accidents are the result of human error, with overspeeding, driving under the influence of alcohol or other substances, and distracted driving being major contributing factors.

Using artificial intelligence (AI) technologies, however, would decrease or even totally remove the human element from the equation and would thus offset such error, reducing traffic incidents and road fatalities.

Increasing road safety is indeed one of the key drivers for the widespread use of AVs. But that's not all. Aside from increasing mobility options and facilitating commutes for persons unable to drive or keen not to remain so dependent on private cars, through an increase in shared mobility, the use of such vehicles would contribute to a greener, more sustainable way of life.

In summary, the adoption of AVs brings about numerous benefits, such as improved road safety, reduced traffic costs, reduced environmental impact, and more sustainable and inclusive modes of transport. However, the benefits of AVs cannot possibly reach their full potential without: (1) the introduction and continuous maintenance of appropriate technical infrastructure; and (2) a suitable regulatory framework.

Both these key deliverables will be the subject of forthcoming articles in this series authored by Project MISAM (Malta's Introduction of Shared Autonomous Mobility), an initiative led by the Department of Spatial Planning and Infrastructure within the Faculty for the Built Environment at the University of Malta, with the support of Debono Group and Infrastructure Malta.

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