Pulling off the human control from vehicles and converting it into a reliable automated driving task is the reason for numerous changes in the whole mobility system. How citizens will adhere to this technology and how automated vehicles (AVs) will penetrate into the vehicle fleet are just two of the various questions that have an immediate impact on transport systems performance throughout the process.

At a strategic level, governments need to look at this technology as an opportunity to improve the efficiency of mobility systems and consequently the social welfare. Technology development usually means more information and operational control. In this sense, it is expectable to assume that AVs in urban regions should be designed to grapple with urban problems, thus improving traffic congestion and road safety.

Road traffic safety has a key role in the social welfare as it is a basic claim to the mobility system performance because it directly affects all travellers, before, during and after their trips. Road safety itself varies on the environment (e.g. type of roads) and the variables involved (e.g. pedestrians, bikes, vehicles, etc). A hierarchy composed of three levels of action involves: the prevention of serious injuries and fatalities, the real time prevention for specific users, and the road design standards application. All combined impact the efficiency of the road safety, thus the mobility system. As AVs enter the picture, new strategies of control can be put in practice to improve road safety to levels of efficiency never thought before - but not without its challenges.

The future of urban road traffic requires a compromise between public authorities and citizens perspectives. On one hand traffic operators' will is to increase the social welfare through AVs traffic operation control, but on the other hand citizens want to keep their benefits, such as road safety, comfort and reduced travel times, while keeping the liberty of vehicle ownership.

In the light of the problem, transport planning in urban centres is therefore vital to leverage the AVs potential benefits. For this reason, traffic management for AVs operation is the main focus of this article, given an angle of the road safety risks and practical incompatibilities that might occur in reality.

Our study overviews several traffic strategies to be designed in metropolitan areas throughout the deployment of AVs. Each strategy is accompanied with pros and cons regarding road safety, human factors and technology. We sought to help public authorities with a general assessment of traffic solutions for this promising traffic. Thereupon, hypothetical scenarios are inevitably created based on the AVs deployment visions defined a priori.

In theory, there are two main visions to foresee the deployment of AVs. The geographical envisions an implementation of highly automated vehicles in one step that will gradually and geographically expand. The functional assumes incompatibilities during the process, so the deployment cannot be
performed suddenly and intermediate functional steps must be identified and optimized throughout the process. The level of automation can be considered a discernible functional increment from one level to the next as technology matures.

Hitherto investigation have looked to potential scenarios that involve the progress from mixed traffic through separate lanes which evolve from links to network to dedicated roadways for AVs only within the network. Also, the technology factor is present with regions that have V2I communication and others that don’t. The present research gap are the safety and human factors that still do not find enough support in literature.

At first glance, the main methodological issue of the following study is the fact that AVs are not deployed in reality yet. Nevertheless, we believe that this shall not be seen as limitation, but rather an opportunity to install the debate and discussion about AVs traffic operation in a safety new perspective.

The main conclusion of this essay is that traffic strategies will only have some credence if road safety is a considered topic at first. Furthermore, although some traffic strategies remind the current transportation panorama, they gain another perspective with AVs deployment. Traffic operation has indeed an infinite number of solutions to tackle AVs circulation. Moreover, it embraces pedestrians’ interaction and how this new technology shall be included in our city centres in the best possible way.