The rise of connected and autonomous vehicles (CAVs) is expected to be one of the most significant and potentially disruptive changes in future personal mobility. Connected vehicles promise integrated, reliable, and safer travel, whilst autonomy could increase mobility, reduce incidents, and increase national productivity.

AVs use information from on-board sensors and systems to understand their global position and local environment, enabling them to operate with little or no human input. Connected vehicles have a driver but communicate with their surrounding environment (including infrastructure and other vehicles) to provide him or her with information that informs decisions about aspects of the journey such as route, travel conditions, destination details and so on.

One problem for AVs is that the world was built to cater for human drivers, with whom they must share the roads. Humans communicate by flashing their lights and using other non-verbal cues, which (like other driving customs) can vary from place to place. AVs will probably end up being tuned to fit in with their surroundings. "You have to make the vehicle so it can operate in the world as it is today," says Chris Urmson of Aurora, an autonomous-driving startup.

There may soon be road lanes or entire districts dedicated to AVs, and special equipment to support them. Already, in some areas where AVs operate, traffic lights have been modified to tell approaching vehicles when they will change. In future, vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) technology should allow AVs to co-ordinate their actions better.

Implications for Gwent

One issue that may slow adoption in the UK and Gwent is the weather. AVs are on the cusp of working on public roads, but – as The Economist notes - in orderly environments with good weather. "Once you can crack that nut, it's incremental," says Chris Urmson, a man who is used to trialling vehicles in California and Boston.

Another issue may be how quickly the UK can develop and put in place the technological infrastructure required for level 5 autonomy – particularly (and perhaps critically) outside the cities. Signficant questions about the network need answers too. Where will regional government get the money to make roads more CAV-friendly? Who will be responsible for the vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) low-latency wireless networks required to manage the traffic?

Will AVs change the nature of cities and threaten Britain's natural environment? And what kind of autonomous infrastructure will create competitiveness in the future?

These are challenging questions – but the answer may be simple and, as Chris Urmson suggests, incremental. Gwent will want to keep an eye on developments and plan its response (perhaps with other parts of Wales and the sider UK) in order to make sure it stays ahead of the competition.

How might the issue impact on Gwent in the future			
Very uncertain	Rather uncertain	Reasonably clear	Very clear

How might Gwent public services respond?			
Watch and wait	Consider response	Plan and prepare	Act