

## DRIVING LESSONS IN MUNICH



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Garry Laurence, portfolio manager of Perpetual's global equity strategies, recently returned from Europe. Among the many companies he visited, he scheduled time with BMW to learn, first hand, how the auto manufacturer is meeting the technical revolution head on.

Self-driving cars might sound like science fiction, and yes, they are futuristic – the relatively near future! Each week it seems another company announces its commitment to the development of autonomous vehicles, and this is not limited to traditional car manufacturers.

To learn as much as I could about this emerging sector, I spent half a day at BMW's autonomous driving headquarters, an hour out of Munich. While Perpetual is not an investor in BMW, it does invest in Aptiv, one of BMW's main parts and service providers. Aptiv is helping BMW build out its portfolio of electric vehicles and move through the stages of autonomous driving cars. Interestingly, Aptiv has recently launched a fleet of 30 autonomous vehicles in Las Vegas on the Lyft network, a competitor to Uber.

There are numerous levels of autonomy that will emerge over the next decade before 'every day' cars become completely driverless. Change is structured around a five-stage framework, advancing from Level 0 (manual driving) to Level 5 (full automation).

At Level 0, the driver performs all operating tasks; at level 1, the vehicle can assist with some functions, but the driver remains in control of accelerating, braking and monitoring the surrounding environment.

Presently, the most advanced cars available to the driving public are at level 2 autonomy, where a car provides partial driving assistance; for example, it might automatically brake if it senses a collision. The driver remains in charge of most safety-critical functions and is responsible for monitoring the surrounding environment. At this level, the BMW 5 series has 23 sensors in the car with cameras, lidars and radars.

The next stage of autonomy will be level 3, where the car becomes responsible for monitoring its external environment. As such, the driver will be able to take a break from driving; after sufficient warning, the car will signal to the driver when manual driving is required. High definition mapping will be added to vehicles on top of cameras and sensors.

Level 4 is the stage of robo taxis; you will still need the driver in the car, but the car will be in effective control when conditions are safe. BMW expects to get to this level by 2025.

Level 5 is completely autonomous driving; this however, is dependent on governments having the confidence to regulate in favour of it.

Manufacturers of cars, components and related technology will benefit from this shift. According to David Wilson, a planning professional part-way through a PhD doctoral thesis on the topic <sup>[1]</sup>, automation will shake up the car industry.

In his view, the car industry will go from a pyramid structure, with global carmakers on the top supported by suppliers, to a hub and spoke integrated network. While global carmakers may be at the centre, they will be surrounded by equally powerful suppliers, including tech giants, and industrial companies such as Siemens and component suppliers such as Aptiv. This opens up investment opportunities around the globe.

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[1] <https://www.thefifthstate.com.au/urbanism/infrastructure/driverless-cars-benefit-humanity-road-to-an-orwellian-dystopia>

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