



Driverless Cars: Why it's Time to Consider Their Disruptive Power

It is inevitable that there will be driverless or “full autonomy” cars on the roads in the foreseeable future. The relentless force of competition and the accelerating deployment of new technology will transform the car industry, just as the internal combustion engine disrupted horse powered mobility over a hundred years ago.

Google has so far led the disruptive influence with its “moon-shot” driverless car program, which is now building driverless automobiles from scratch. Tesla has recently launched its “Autopilot” features and Apple is believed to have launched a skunkworks automotive program. Car OEMs (Original Equipment Manufacturers) are responding, furiously working to catch up by introducing autonomous features into their existing range of cars. “Park Assist” and “Traffic Jam Pilots” are increasingly available and Mercedes-Benz is further advanced in the pursuit of full autonomy for cars and trucks.

But if these developments make driverless cars an inevitability, a number of big questions remain unanswered. For instance: What ownership models will emerge? What will be the impact on other industries? Who will be the first adopters? What will be the wider impact on society? What role should governments play?

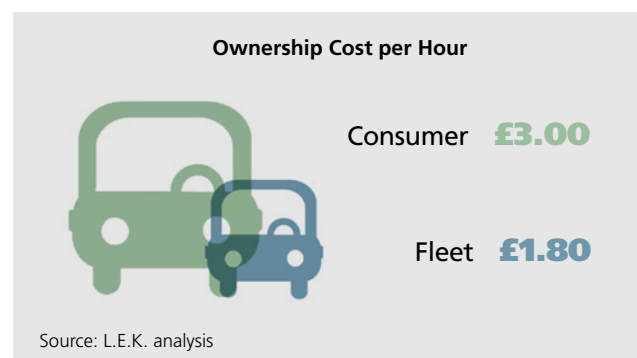
Right now, you would need a crystal ball to answer these questions with any certainty. This *Executive Insights* begins to outline the likely shape of the emerging driverless car market and the wider disruptive impact not just on business but also on society at large.

Let's look first at the economics.

The Economics of Driverless Cars: The Case for Fleet Ownership

In simple terms, a £15,000 car, amortized over a 10 year life, costs a consumer £1,500 per year in capital expenditure. In addition, there is another £500 per year in insurance and tax. If this car runs for two hours a day — or approximately 700 hours a year — then the ownership costs of running the car (excluding fuel and maintenance) amounts to approximately £3 per operating hour.

If we assume that driverless cars would cost twice as much to manufacture as normal cars while they are produced in small volumes — around £30,000 according to our illustration — then this makes them an expensive novelty for consumers. It is fair to assume that they will not be competitive for consumer purchase until they are manufactured in large numbers. This makes the business case for large scale consumer ownership of driverless cars look dubious — at least at the outset.



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Top image: Courtesy of Daimler Mercedes-Benz



Google's Self-driving Vehicle Prototype

Photo Courtesy of Google

As part of a fleet, however, cars could be better utilized, running for 8 -10 hours a day if not longer: let's say, conservatively, 2,800 hours per year. At those sorts of utilization levels, a driverless car would cost £1.80 per hour in ownership costs, significantly lower than those of today's consumer-owned cars. They would also require lower insurance coverage — Google's driverless cars today already have less than half the accident / claim rate than the U.K. average, and this is almost certainly an over-statement as in all cases cause was attributed to the driver of the manned car that collided with Google's car. In combination, the resulting economics of driverless cars look compelling under a shared model.

How many cars do we ultimately need? Certainly fewer than we have today if we look at the current usage patterns. An unscientific spot check on cars parked between 8 a.m. and 9 a.m. in urban residential areas suggests that 30-40% lie unused at peak times. At a minimum, the quantum of demand fulfilled by these vehicles could be serviced with a driverless fleet that also serves peak demand, suggesting a significant reduction in car requirements.

The remaining 60-70% of car "peak demand" would need to be serviced, but it is not unreasonable to suggest that, with clever network design and traffic decongestion, this could be achieved with half the number of the active cars on the roads today.

However, if the cost of using a driverless car was substantially lower, then additional demand, such as people switching from

public transport systems, could also become addressable. Uber and BlaBlaCar have already demonstrated this with manned cars.

The Disrupted Businesses

OEMs are set to face sweeping change. Their businesses are focused on individual consumer ownership. If, however, there were fewer cars and if many of these were part of a fleet, then OEMs may have to vertically integrate downwards and enter the fleet operation business. If they didn't do this, they would run the risk of the customer value being ceded to a few large fleet operators.

ZipCar, the U.S.-based car-rental service, has already shown the success of the car-sharing phenomenon. In the wake of this, some OEMs, including BMW and Ford, have made an initial foray into car-sharing clubs in London. OEMs need to navigate the difficult transition in their business model in a driverless era and also position themselves for the opportunities as fleet operators. And they may face new competition from organizations that really understand the customer — including trusted service providers such as the Automobile Association and the RAC, who could position themselves as trusted mobility providers.

Other businesses dependent on current models of car ownership — car dealers, finance companies and service centers — are also likely to face disruption and need to consider some long-term strategic bets.

Another business facing seismic change is the taxi industry. If we add a driver's minimum wage — a minimum of £8 per hour — to the cost of car ownership — about £3 per hour — then the comparison is compelling. A driverless taxi fleet operating at capital costs of £1.80 per hour could trigger the demise of the taxi industry operating at a minimum of £11 per hour. No amount of margin squeezing will help.

As it is, Uber, the online taxi hailing service, is already upending the traditional taxi business. Its lofty valuation — around \$62 billion — is built on the 20-25% commission it gets on every taxi ride. If the value of the fare itself drops by a factor of six then Uber's current valuation trajectory doesn't stack up. Anyone projecting Uber's cash flows into perpetuity should probably step back and consider how Uber itself may be disrupted in a driverless

car era. This is certainly something figuring in Uber's thinking as they drive their own research into driverless cars.

Traditional public transportation systems will also have to adapt, given that the cost of travelling by the Underground and bus (say £1.50 - £2.00 per ride) is comparable to the hourly cost of a driverless car. This has considerable implications for governments and urban planners, particularly if there is an inter-modal transfer of passenger demand.

Last but certainly not least, the insurance industry will have to face some testing questions. In the U.K., motor insurance is a £15 billion business. Clearly, if drivers no longer need to pay insurance premiums — because they no longer have responsibility as drivers and the number of accidents falls dramatically — then the claims pool and thus the motor insurance business will necessarily shrink.

The New Consumers: The First Adopters of Driverless Cars

The pioneer of driverless cars is Google, but who are the pioneer users? Who will be the first to benefit from driverless technology?

We think there are four key groups:

- **The over-65s:** In a world with an ageing population, there will be a growing need to provide mobility that is safe and convenient and which reduces the physical demands of operation. See this [video](#).
- **Urban dwellers:** I lived in Silicon Valley ten years ago and owned two cars. I now live in London and I don't own any. I use Uber for most excursions and I have a time-share in Zipcar when I need it. It's not quite hassle-free, but it certainly beats dealing with traffic, and parking, and maintenance, and refuelling, and oil changes, and washing, and road tax, and... you get the picture. According to the U.K. Office for National Statistics, household car ownership has already fallen in London over the past ten years. Mine is one of the nearly half of all London households that don't own a car.
- **The under-25s:** Getting a driver's license used to be a rite of passage, but the cost of the car and associated insurance premiums has become an expensive business for young

people. Driverless cars present them with many of the benefits of car ownership on a purely pay-per-use basis, enabled by technology with which they're so comfortable. So they are likely to be early adopters — particularly after late night soirées.

- **Logistics and delivery businesses:** Companies such as Ocado and Peapod are likely to be early adopters as technology transforms the operating cost requirements of their industry.



Volvo Self-Steering Technology

Image Courtesy of Volvo Car Group

The Disrupted Society and the Role of Governments

The more one stops and thinks about it, the more one realizes just how revolutionary the impact of the driverless car could be. I started thinking about motor insurance, but after considering the economics questions, quickly discovered the wider ramifications on all kinds of sectors of the economy.

The disruptive power of the technology is enormous. For this reason, governments have an essential role to play.

They must encourage research and development with supportive policies. They can be effective: just look at the way Kansas City facilitated Google's roll-out of high speed broadband. Already,

some progressive governments are viewing driverless cars as engines of innovation and skilled job creation.

They must also consider the negative impact on society. Like so much else, these haven't yet been completely thought through. It is possible that vast swathes of jobs — across a range of sectors — will be at risk. Politicians and businesses will be advised

to consider the likely adverse impact and develop mitigating strategies.

This will be critical if the era of the driverless car is to begin without years of industrial strife. The protests against Uber give an indication of the kind of reaction that can be triggered when people's jobs and livelihoods are put in jeopardy.

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