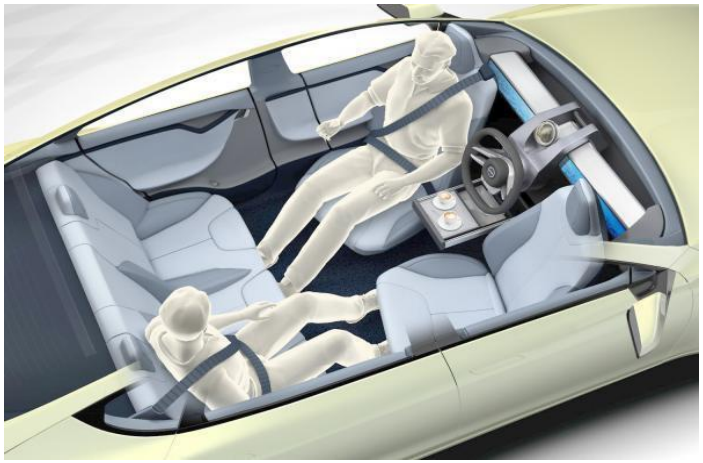
Autonomous Road Transport System Challenges



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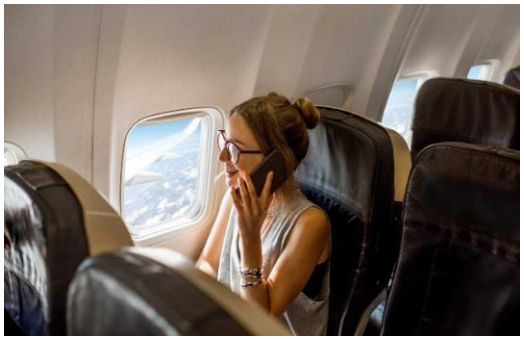
Driven by Artificial Intelligence?
The Human at the Heart of Mobility







Japan (Kobe) - 1981

London (DLR) - 1987

Western Australia
Rio Tinto Mining Corp

Artificial Intelligence Driving Autonomous Vehicle Development

- **Autonomous driving** is one of the key application areas of **artificial intelligence** (**AI**).
- **Autonomous vehicles** (AV) are equipped with multiple sensors, such as cameras, radars and lidar, which help them better understand the surroundings and in path planning.
- These sensors generate a massive amount of data.

But should we be concerned……?

- Playing catch-up to technologies that move faster than science can react (Hancock and Hoffman, 2015)
- Introducing technologies which create intended AND unintended consequences (Hollnagel et. al., 2006)
- Altering one of the foundational pillars of our society (Shladover, 2016)
- Automation doesn't replace human performance, it changes human performance (vehicle in control, driver remains responsible = recipe for stress?)

Hancock, P; 2018

Tesla Fatal Cash, May 2016

Trust

- 4000 drivers surveyed about self-driving car safety.
- 27% would feel unsafe;
- 24% would feel very unsafe.
- Less than a quarter would feel safe or very safe
- Less than 20% found prospect appealing or very appealing.
- Almost half (45%) find idea very unappealing; nearly one quarter (23%) found it unappealing.

Or be more positively embracing……?

- Automated vehicles may be very much like auto-piloted aircraft which exhibit an almost stellar safety record

Large commercial passenger planes:
One fatal accident per every 5.58 million flights

Average deaths per year worldwide from scheduled commercial flights:

292

Average deaths per year worldwide from road traffic accidents:

1.35 million

Personal Mobility

- A fully AV could provide new Mobility options for older people and for those with disabilities.
- Some older citizens and people with disabilities are able to drive today by adapting or modifying vehicles to meet specific needs.
- Fully AV could offer new Mobility options to many, helping them to live independently or to better connect them to jobs, education and training

Safety

Humans are very dangerous……

- Serious motor vehicle crashes; ~90 percent are due to human error or choices.
- Automated vehicles and driver assistance technologies have the potential to reduce crashes, prevent injuries, and save lives.
- Fully automated vehicles that see more and act faster than human drivers could greatly reduce errors, the resulting crashes, and their toll

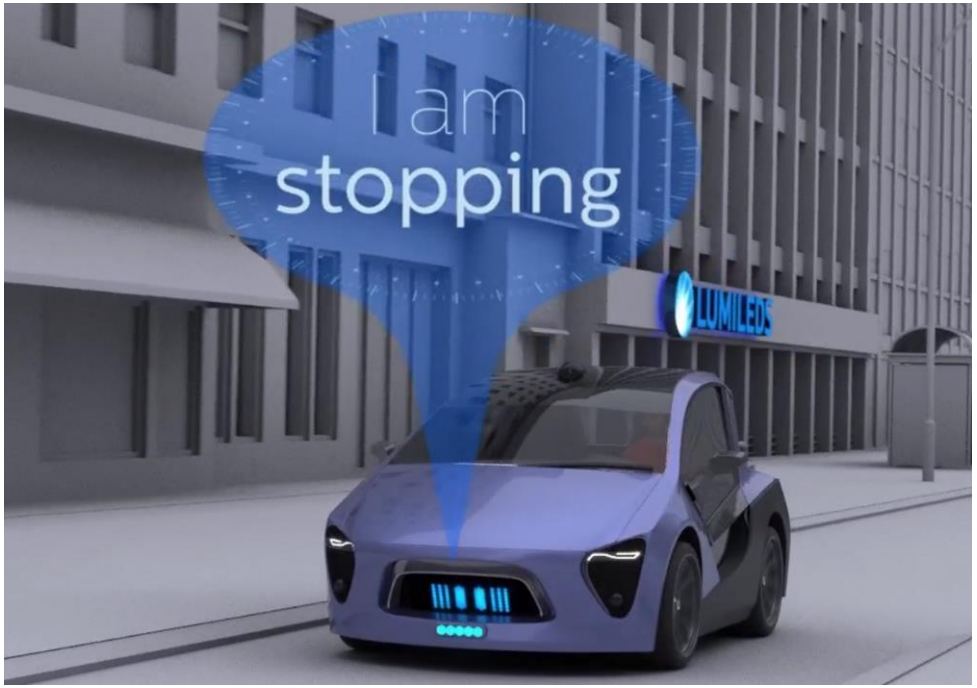
2018 – a bad year for the Airline Industry
Boeing 737-MAX

“*Under fire for Boeing 737 Max crashes, FAA chief vows to examine how humans interact with automated aircraft systems*”

Ethical Issues

- How should AV's respond in emergency situations?
- For example, child runs out to chase a ball in the middle of the road, does AV swerve into oncoming traffic threatening the life of vehicle's occupants - or would it know to immediately stop?
- Several fundamental ethical situations and it's difficult to understand how exactly AV's will be programmed to deal with these

How should Autonomous Vehicles communicate with other Road Users?



Appeal

- Will the technology be embraced by all?
- Could Autonomous Vehicle technology be too “creepy” for consumers?
- Would they actually buy them?
- Are they affordable?
- Is an AV vehicle a ‘trackable’ vehicle
  - Privacy issues