Opportunities and threats of autonomous vehicles to other modes in urban areas

Ceri Woolsgrove, ECF, Dublin, 2019
ECF - What we do

Advocating for cycling with institutions worldwide

Implementing change through projects and exchange platforms

Producing factual evidence on cycling
AVs - It's all good!

• “Driverless cars will reduce accidents by around 90 per cent and pollution”
• “Carbon emissions will drop, because urban driverless cars will be electric”
• “The old, the disabled and teenagers will suddenly gain mobility”
• “Driverless cars will hardly ever need to park, and certainly not in city centres”
• “Congestion will diminish, as driverless cars can drive in dense packs, won’t get lost and won’t have to circle around looking for parking”
• “Once driverless cars spread beyond urban centres, the tedium of commutes will go”
AV opportunities for active modes

- Safety programmed into vehicles
- Distraction/speeding/Drink driving a thing of the past?
- Traffic management (giving advantages to other modes) - Congestion busting possibilities
- Better public transport, less motorised transport more space for walking and cycling
Most here              Hands Off                    Eyes off                        Mind off

0  No Automation
Zero autonomy; the driver performs all driving tasks.

1  Driver Assistance
Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.

2  Partial Automation
Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times.

3  Conditional Automation
Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.

4  High Automation
The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.

5  Full Automation
The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.
Reframing Cycling/Walking as ‘a problem to be solved’

“One of the biggest problems is people with bicycles. The car is confused by [cyclists] because from time-to-time they behave like pedestrians and from time-to-time they behave like cars. They [cyclists] don't respect any rules usually.“ (Renault chief executive Carlos Ghosn)
Congestion solved?

• Currently 70% of cars with one driver. What happens with zero?!
• Parking solved? Possibly but increased empty running
• Parking charges ended – less money for PA’s
Congestion – induced demand

High traffic congestion costs → Road building → Reduced congestion costs

Increased road use

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Locking in sprawl and passive transport
AVs, MaaS, and the threat to public transport
Safety - is it solved?

• Over reliance of semi autonomous systems distraction etc. how does the driver come back to the driving task if there are any autonomous elements
• Good type approval is necessary. This will require regulation!
• “Behavioural regulation also necessary
• We need to be sure that the driver knows and understands the limitations of the vehicle
• Good communication between driver vehicle HMI
• Still huge unknowns!!!
Concentrate on the known knowns!

Intelligent Speed Assistance

**WHAT IS INTELLIGENT SPEED ASSISTANCE?**

1. Car receives position information via GPS and current speed limit from a digital map. Can also be combined with video camera sign recognition.

2. Speed limit is displayed on the dashboard.

3. Car helps driver not to speed when speed limit is reached.

Driver can override system by pushing harder on accelerator.

Source ETSC
Supports bus and truck drivers during turns – one of the most dangerous driving situations involving a commercial vehicle
- Monitors blind-spots on the nearside of the commercial vehicle
- Analyzes vehicle data to identify driver’s intention to turn
- Warns about unprotected road users potentially crossing the predicted driving path
- Automatically applies the brakes when driver does not take corrective measures

System uses a unique LiDAR sensor with active lighting to perform even in low visibility conditions
- A differentiating single sensor solution monitors the entire vehicle side with ranges of up to 180° field of view and 25m/80ft peak scanning distance.

Source WABCO
Other GSR technologies

- Event Data recorder
- Distraction/drowsiness detection
- Autonomous Emergency Braking to stop crashes with cyclists and pedestrians
- Tyre pressure monitors
- Standard alcolock fitment
AV/transport policy will have to take into account

• Increasing urban populations
• Increase in transport services
• Decrease in car ownership to cycling/walking/PT
• Cities want to tackle air pollution, increase active modes and PT, and decrease congestion; liveable cities. How do AVs help here?
• For future trends and AV research what we need to know
  • Effects on modal shift from active modes
  • How many less vehicles on the roads?
  • How many more vehicle miles?
  • How many zombies?
  • Effects on Public transport (and public ability to control transport in the city?)
  • Should/how public authorities intervene?
  • Impact of semi-autonomous stages
  • How to regulate for safety
Conclusion

Policies should prioritize human mobility and community liveability over vehicle mobility. Communities should be designed for people, not vehicles; AVs should serve the community, rather than the community serving AVs.