Institute for Transport Studies
FACULTY OF ENVIRONMENT

UNIVERSITY OF LEEDS

Regulation of Autonomous Vehicles

Dr Jo-Ann Pattinson, Research Fellow

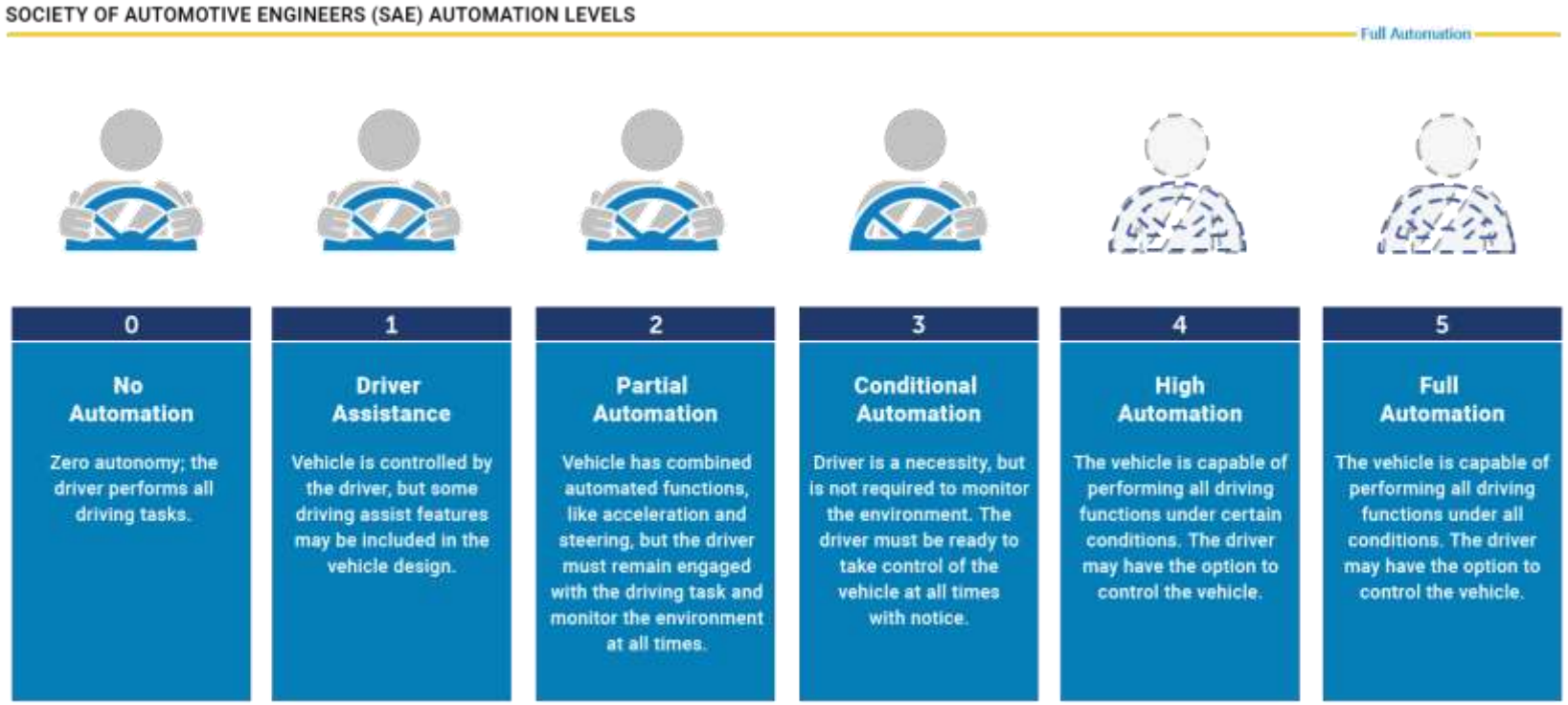
Email: J.M.Pattinson@leeds.ac.uk

This presentation was given by Dr. Jo-Ann Pattinson during the Public Webinar of 4 July 2019, on Legal perspectives of using IoT for AD, this in the context of AUTOPILOT H2020 project.
For any request please contact j.allard@mail.ertico.com or the speaker.

ITS

SAE Automation Levels

UNIVERSITY OF LEEDS



⇧

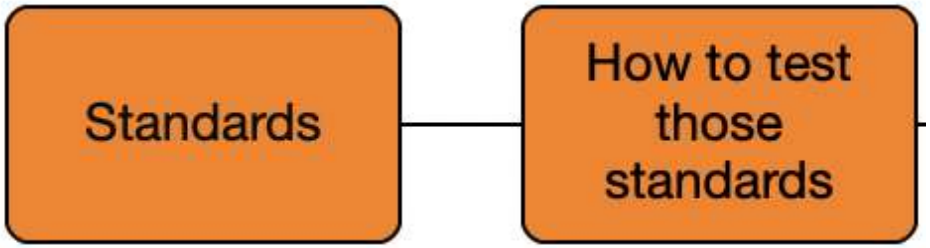
AUTOPILOT Testing

ITS

Regulation and Certification

UNIVERSITY OF LEEDS

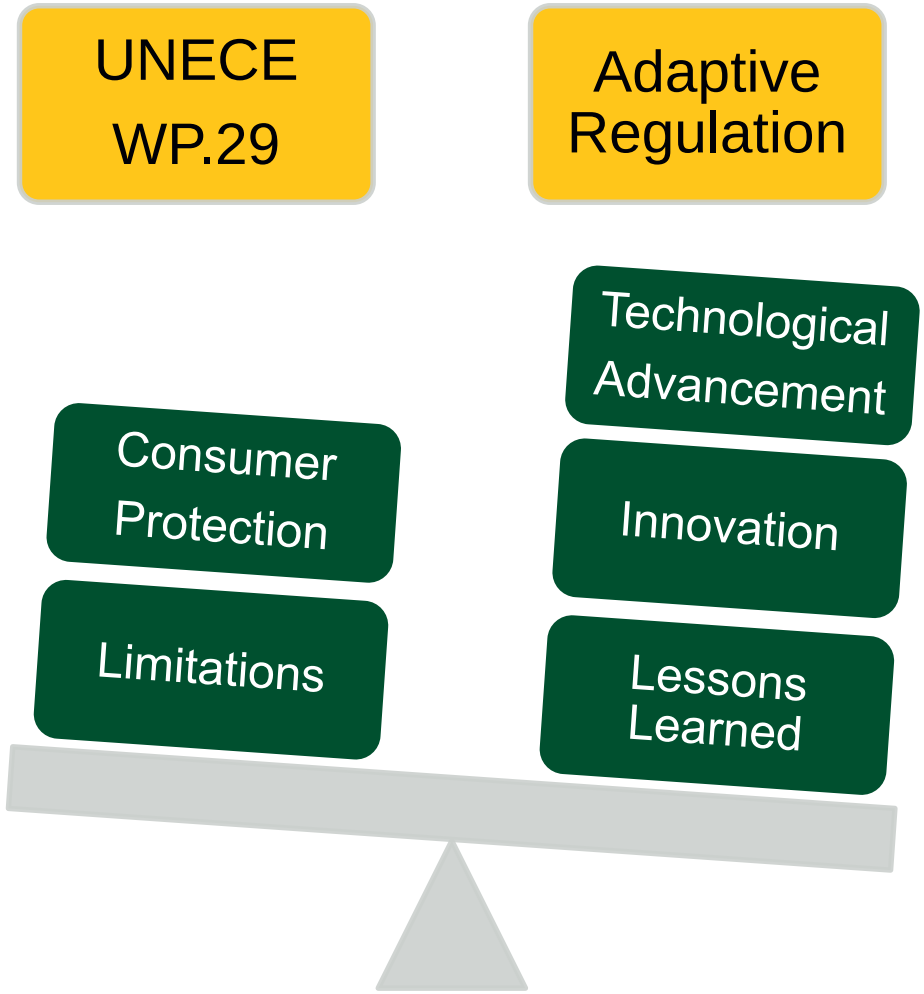
HAV are proposed as a solution for reducing collisions and reducing the number of causalities on the roads, however before this occurs not only must the technology be state-of-the art, we need to address:



ITS

Regulation facilitating innovation

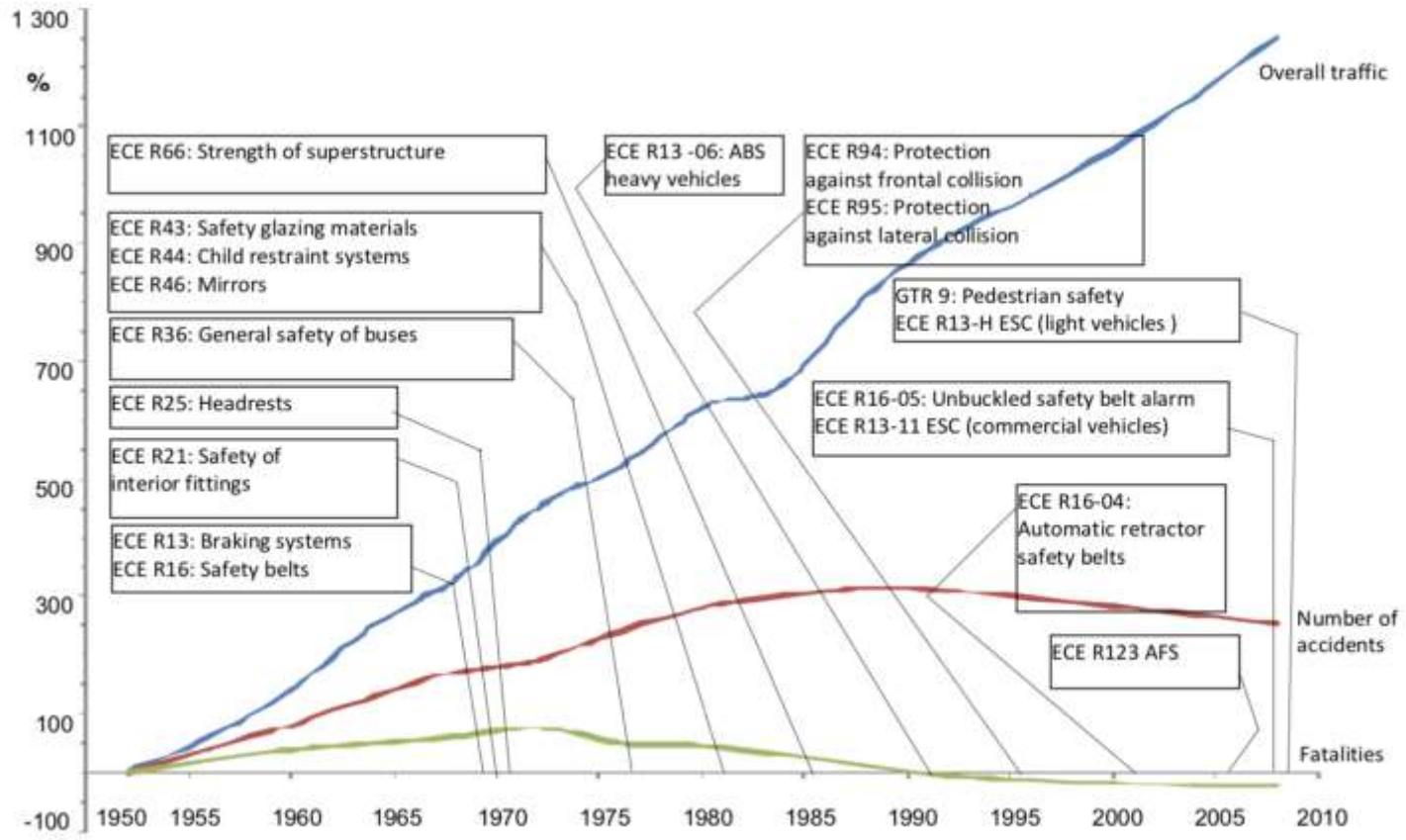
UNIVERSITY OF LEEDS



ITS

UNECE REGULATION impact upon safety

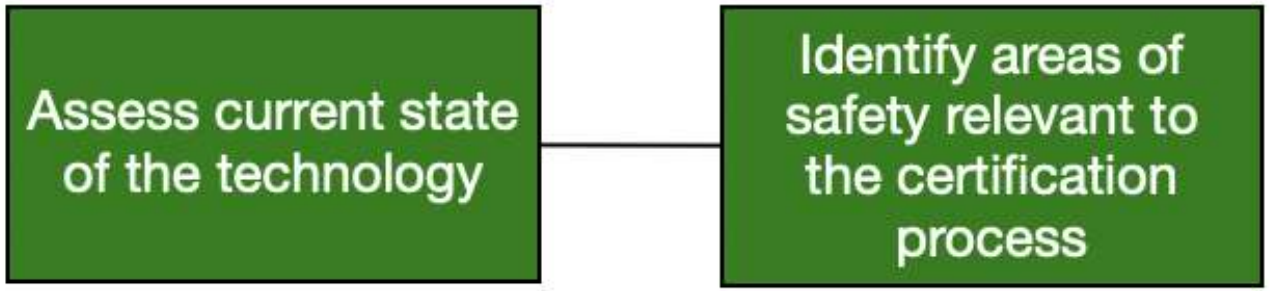
UNIVERSITY OF LEEDS



Source: Australian Government Department of Infrastructure and Transport, Regulation Impact Statement for the Harmonisation of the Australian Design Rules

ITS

AUTOPILOT can help inform the formulation of policy by:



Classical Vehicle Standards

UNIVERSITY OF LEEDS

Rollover tests

Seatbelts

Light signaling

Adhesion on wet surfaces

Emergency Stop

Parking laden vehicle 20% gradient

ITS

Three Pillar Approach

UNIVERSITY OF LEEDS

This approach incorporates anticipating and responding to the behaviour of other road users

ITS

AUTOPILOT SITE testing

UNIVERSITY OF LEEDS

- Testing at pilot sites relevant to matters of the future certification of HAV
- In particular testing involved accumulating data regarding the detection of vulnerable road users (VRU)



- Tests were conducted to ascertain if HAV adapted driving behaviour to avoid VRU by way of in-vehicle sensors and via smart phone detection

ITS

VRU DETECTION

UNIVERSITY OF LEEDS

At Brainport (NL) The vehicle detected VRU using ITS G-5 and 4-G on VRU smartphones, and adapted driving by braking earlier

The vehicle detected and avoided a crowd on the planned route by use of wireless sniffer receiving wifi probes

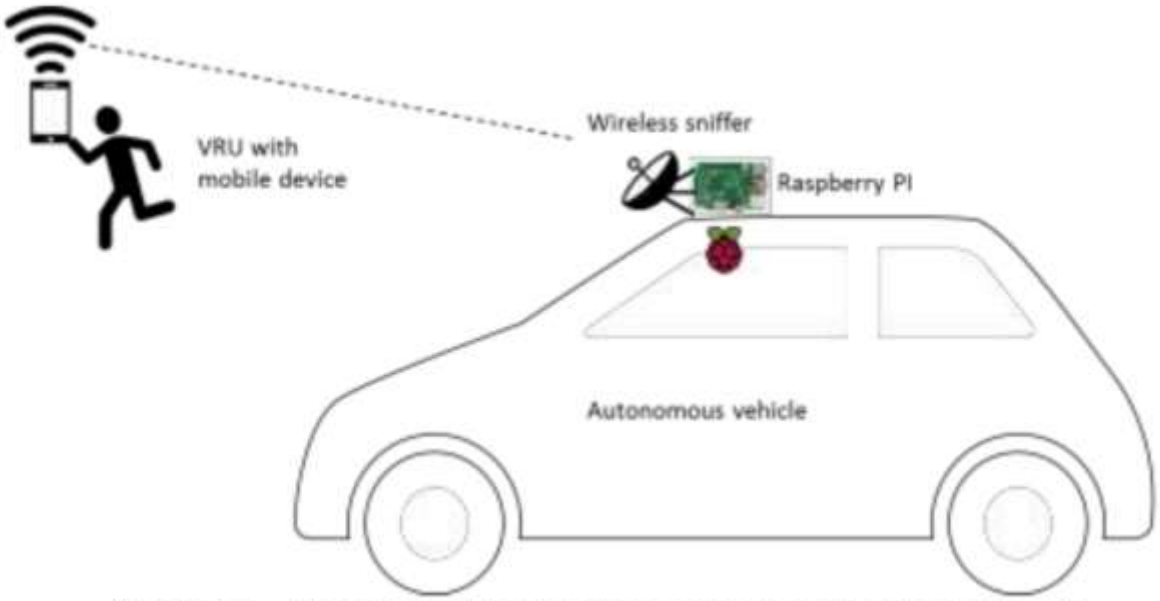


Figure 22 – Wireless sniffer receiving wireless signals from VRU.

ITS

Versailles Urban Driving

UNIVERSITY OF LEEDS

Likewise, in the Urban Driving Test Case, a pedestrian and cyclist crossed in front of vehicle

Tests involved comparing the responses between:

1. With VRU connected via IoT and 2. Tests relying upon in-vehicle sensors only

ITS

VERSAILLES RESULTS

UNIVERSITY OF LEEDS

- When relying only upon the in-vehicle sensors only, the vehicle braked abruptly, particularly when the cyclist crossed
- When the cyclist was connected via IoT, the vehicle adapted speed well in advance - braking was very smooth
- Confirms the requirement for critical and edge case scenarios (obstructed VRU) within the certification process and that HAV will require access to multiple data sets to properly anticipate VRU
- Highlights the additional safety which would be afforded to VRU carrying IoT (Smartphone or Bluetooth Low Energy Beacons)

ITS

Conclusion

UNIVERSITY OF LEEDS

The certification of HAV by reference to rigorous safety standards and testing is an essential component to its successful deployment

Work carried out within AUTOPILOT compliments the adaptive model of regulation favoured by the UNECE

Provides data useful in the improvement of policy in response to state of the art developments in technology

ITS

Thank you