Department for Transport

AI in self-driving vehicles
## A regulator's perspective

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What is a self-driving vehicle?

A vehicle is self-driving if:
1. It is being controlled by the equipment of the vehicle and not by an individual
2. Neither the vehicle nor the surroundings need to be monitored by an individual with a view to immediate intervention
3. It is capable of doing so safely and legally
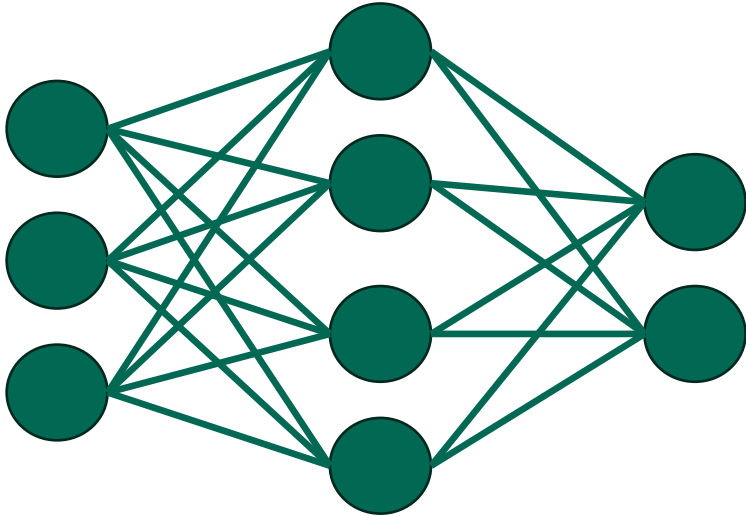
Artificial Intelligence (AI) will play a safety-critical role in self-driving vehicles:

o Used to perform the dynamic driving task

o There will be no human driver to intervene and correct for deficiencies in the performance of the self-driving vehicle

Self-driving vehicles can contribute to the Department for Transport's strategic aims of improving transport for the user, reducing environmental impact, and growing and levelling up the economy

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What are the challenges with AI in self-driving vehicles?

Performing the dynamic driving task in an uncontrolled changing environment is challenging....

Diversity of road users

Diversity of infrastructure

Diversity of weather and lighting conditions

Self-driving vehicles need to demonstrate robust performance when encountering events that may not have been considered during system development.

How do we gain confidence in the capabilities of the AI?

Five AI principles…

In 2023, the UK Government published a whitepaper on a pro-innovation approach to regulating AI outlining five principles…

Safety, security and robustness

Appropriate transparency and explainability

Fairness

**Accountability and governance**

Contestability and redress

Challenges for vehicle type approval…

- **Safety, security and robustness**, **transparency & explainability**, and **fairness** are influenced by the design and development of the AI – How to assess AI against such principles?

- Risk assessment-based approach to engineering - no single absolute safety metric which, if met, guarantees safe performance

- Safety needs to be managed on an ongoing basis across the AI lifecycle

- New ways of assessing vehicle performance – lots of scenarios and extensive use of virtual testing (which requires validation)

- Explainability – how do we have confidence that the outcome of a test was for the right reason?

How collaboration and standards can help…
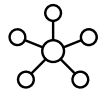
Sharing of knowledge amongst experts
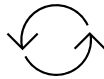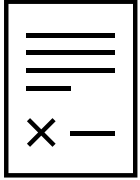
Feedback on lessons learned

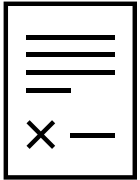Establish common best-practice across the industry and globally

Address the questions posed by AI

Thank you!

AI whitepaper:

https://www.gov.uk/government/publications/ai-regulation-a-pro-innovation-approach/white-paper

Automated Vehicles Bill:

https://bills.parliament.uk/bills/3506

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