Proposal to develop a framework document of key principles for automated vehicle safety and human centered needs

WP.1 March 2022

Considerations

- AV development risks being driven more by technology evolution than user needs.
- Vehicle automation must meet human needs, and foster safe use and interactions with vehicle occupants, and other road users.
- Failure to properly account for users in vehicle design and regulation, and the road safety rules that guide their use, will lead to hazardous situations.
- A more human-centered approach to the design of AVs is needed, particularly for:
    1. Driver interaction with automation;
    2. Interaction between the AV and other road users; and
    3. Description of the capabilities and limitations of AVs in branding or marketing.

Summary of proposal

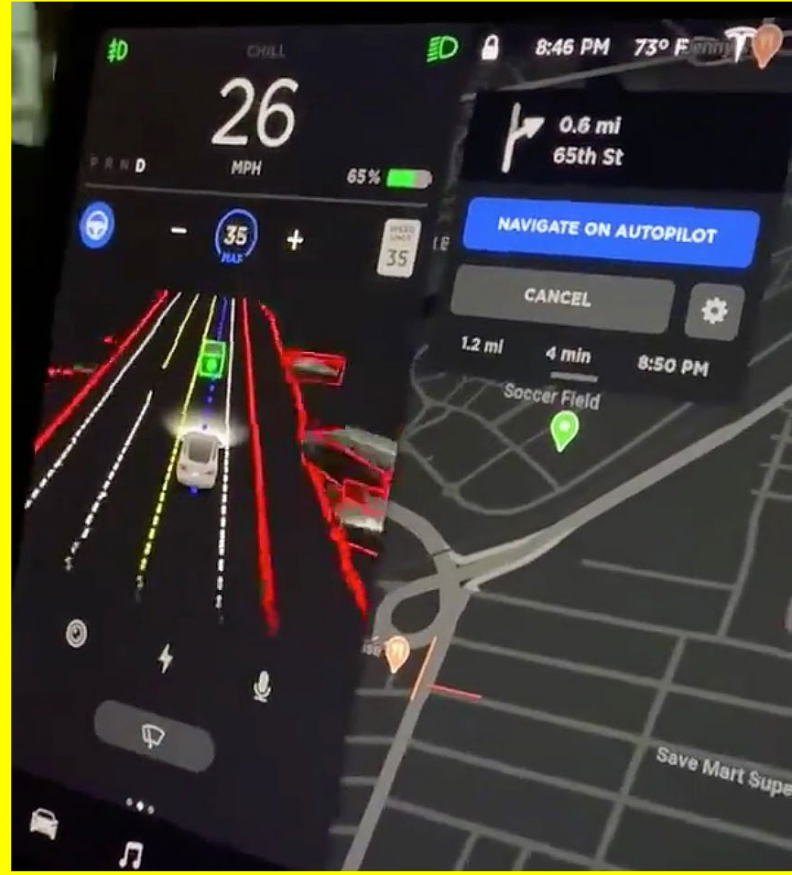
- Recommend the development of a framework of principles on AV safety and human-centered needs that addresses three core issues:
  - Consumer awareness
  - Human-centered vehicle design
  - Safe interactions with other road users
- Framework could help inform WP.1/WP.29 work to develop different AV policy instruments (e.g. guidance, resolutions, regulations, conventions, etc.)
- Focus on SAE Levels 1-5
- Aims to ensure that the development and deployment of AV technologies is conducted in a manner that prioritizes human-centered needs.

https://unece.org/sites/default/files/2021-09/ECE-TRANS-WP1-2021-Informal%20document-11e.pdf

Driver Interaction with Automation

Current situation - confusing, unpredictable and distracting

- Unknown functionality and vague operational domain
- Challenge to operate AV displays and controls
- Current system status, or changes in status, are never clear
- Who’s driving? Passive takeover requests.
- Complex displays



Interaction with Other Road Users

Current situation – more research is needed

- Predictable automated driving behaviour is important for other road users (uncertain whether human-like behaviour is needed)
- Vehicle dynamics may be sufficient to communicate vehicle intentions
- Need for external displays of automation status is uncertain – if yes, how should they be designed?
- Standardization is essential

System Descriptions

Current situation – inconsistent and misleading information may risk confusion, mistakes and inappropriate use of automation

- Lack of standard names
- Inaccurate/ misleading naming
- Misleading marketing

Comma Two	*Open Pilot*
Cadillac	*Super Cruise*
Tesla	*Autopilot, FSD*
Ford	*Co-Pilot 360*
Audi	*Driver Assistance Plus*
Mercedes-Benz	*Driver Assistance*
Subaru	*Eyesight*
Hyundai	*Smart Sense*
Kia	*Drive Wise*
BMW	*Active Driving Assistance Pl*
Porsche	*Active Safe*
Volvo	*Pilot Assist*
Toyota/Lexus	*Safety Sense 2.0*
Honda/Acura	*Sensing*
Nissan/Infiniti	*ProPILOT Assist*
Volkswagen	*Driver Assistance*
Land Rover	*Driver Assist*
Buick/Chevy	*Driver Confidence*
Mazda	*ACTIVSENSE*

Example of Highly Misleading Marketing

Questions for discussion

- Would a framework be a useful tool to inform WP.1/WP.29 work on human factors and vehicle automation?
- What are contracting parties currently doing to address human centered needs associated with AVs? (e.g. to promote consumer awareness, etc.) What best practices could help to inform a potential framework?
- Building on the three safety considerations discussed above [Consumer awareness; human centered design; safe interactions with other road users], are there additional safety issues associated with human use of vehicle automation that could be examined in a proposed framework?
- Training requirements are generally greater for more complicated technologies, particularly those that have not prioritized human factors in their design process. Should industry have some obligations for driver training on their new and complex technology? Is there a need for industry to educate and inform other road users about their products?
- How can human factors requirements be integrated in the AV development cycle to help vehicle manufacturers make better informed decisions about AV design and safety?