Vulnerable Road User (VRU) Protection
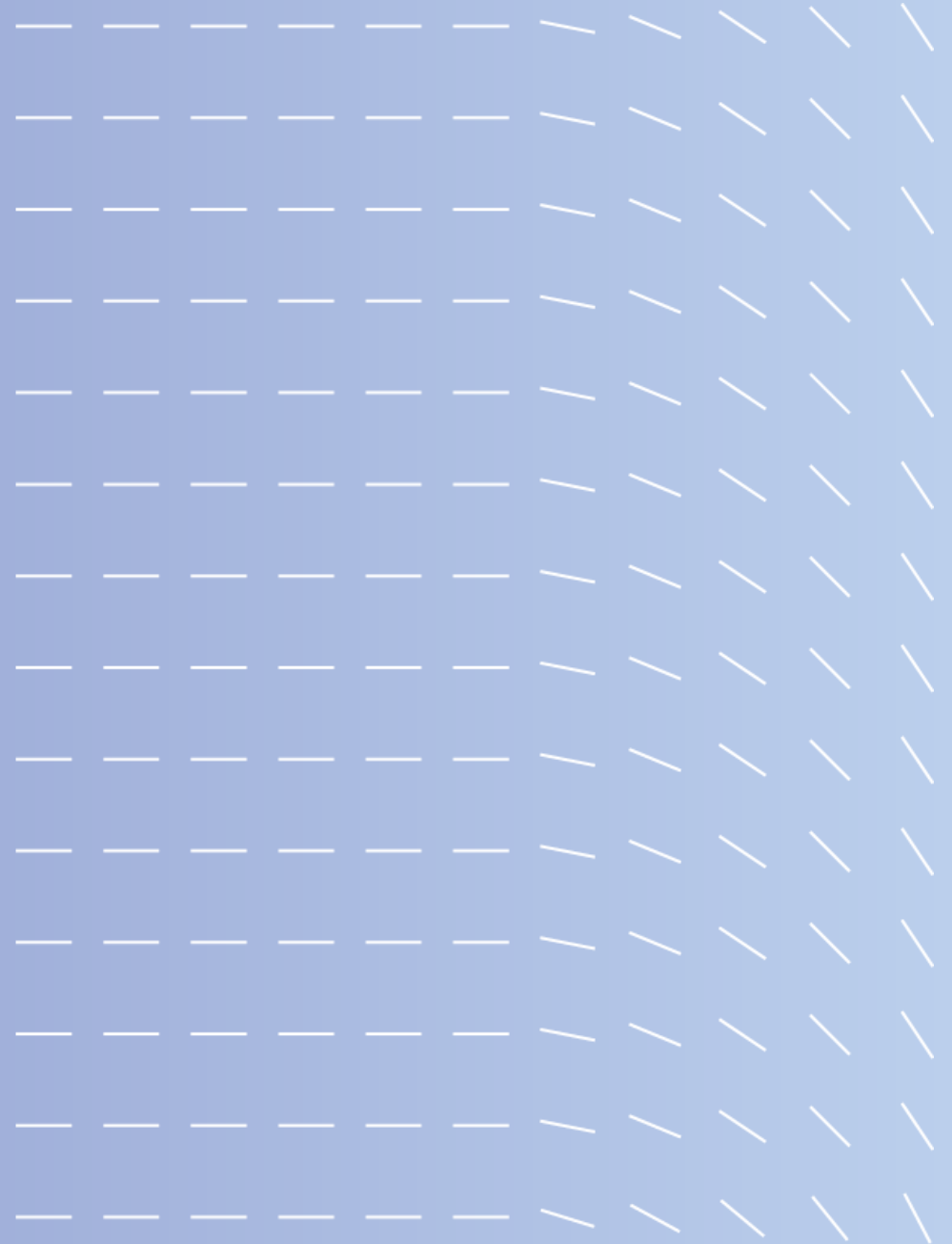
Cycling & Walking APPG

11.03.24

Yousif Al-Ani   yousif.al-ani@thatcham.org

Thatcham Research

Thatcham Research
Automotive Risk Intelligence

Established by the motor insurance industry in **1969**, with the aim of containing the rising **cost of motor insurance claims** while maintaining **safety standards.**

UK's only **non-profit insurer funded research centre,** engaging with vehicle manufacturers, regulators, law enforcement organisations, automotive bodies and insurers.

Research programmes include:

– Security

– Repair

– Passive Safety (collision protection)

– Active Safety (ADAS/AVs)

– Group Rating

Accredited **Crash test laboratory** (Thatcham)

Accredited **ADAS test laboratory** (Gamston)

Thatcham Research

Thatcham Research is a founding member of **Euro NCAP** (European New Car Assessment Protocol):

"Euro NCAP has created the five-star safety rating system to help consumers, their families and businesses compare vehicles more easily and to help them identify the safest choice for their needs."

Adult Occupant | Child Occupant | Vulnerable Road Users | Safety Assist

Experience gained by unique position:

– Ongoing consumer level **assessment of ADAS** products

– Development of **new assessment methods** for ADAS

– Deep-dive into **OEM implementation**

Current VRU Performance

Autonomous Emergency Braking is used to prevent collisions with VRUs. AEB has become more prevalent due to inclusion in Euro NCAP, with later adoption in R152 & GSR2 regulations.

NCAP VRU Scenarios:

2016 – **4**

2018 – **9**

2020 – **11**

2023 – **15**

New protocols add **more demanding** scenarios (obstruction, turning, night)

Existing scenarios are often **updated** (higher speed, more iterations)
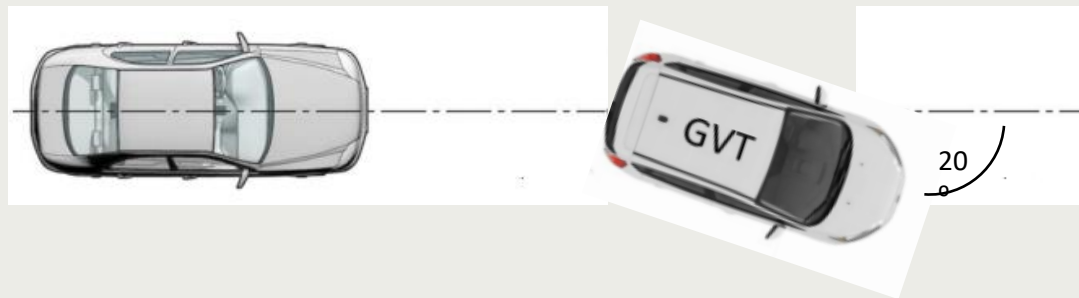
Current VRU Performance

Issues with current vehicles:

Premium vehicles tend to exhibit **higher performance**

Non regulatory requirement – OEM strategic choice

Rapid protocol development – vehicles **quickly obsolete**

Performance is no longer maintained when subject to **noise factors**

	40km/h CCRs Standard NCAP		40km/h CCRs & 20° Angle	
	Vehicle A	Vehicle B	Vehicle A	Vehicle B
Avoid %	80%	84%	28%	96%
Mitigate %	12%	8%	24%	4%
No Response %	8%	8%	48%	0%
Average FCW (s)	2.37	2.08	2.04	2.07

AV VRU Performance

Assessing Readiness of Self-Driving Vehicles

M.L. Cummings
College of Engineering and Computing
George Mason University, Fairfax, VA 22030
cummings@gmu.edu

<u>Goals:</u>

– Demonstrate that non-fatal crash reporting is insufficient in providing insight into whether AV test vehicles or AV full-deployments exhibit acceptable levels of risk.

– Compare the California Department of Motor Vehicles (CA DMV) datasets with NHTSA's Standing General Order (SGO) datasets on disengagements and reported collisions.

<u>Key Findings:</u>

– Cruise – 8 non-fatal crashes for every human non-fatal crash (x8 increase)

– Waymo – 4 non-fatal crashes per every human non-fatal crash (x4 increase)

– Whilst these non-fatal crashes are higher than average drivers, when **compared to transport network companies** such as Uber and Lyft, these **drivers are x4-x10 more likely** to have a collision.

– A combination of **human-initiated disengagements, autonomy-initiated disengagements** and crash reports should be used to ascertain the readiness of a self-driving system.

– **Transparency and data sharing is required** to foster a safety led culture in the self-driving vehicle industry, which is currently not exhibited by many technology developers, which is likely to lead to public distrust.

AV VRU Performance

Assessing Readiness of Self-Driving Vehicles

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AV Bill safety ambition – **"As safe as a careful and competent driver"**

Additional context:

– A disengagement occurs when a human safety driver takes control due to an unplanned event or action, or the onboard autonomy stops working. These can be human-initiated or autonomy-initiated.

– Apple's crash rate is comparable to that with human drivers (**2:1 crash ratio**), however their human-initiated disengagement was **0.001 per mile** driven under self-driving mode, vs **<0.00001 per mile** for Waymo.

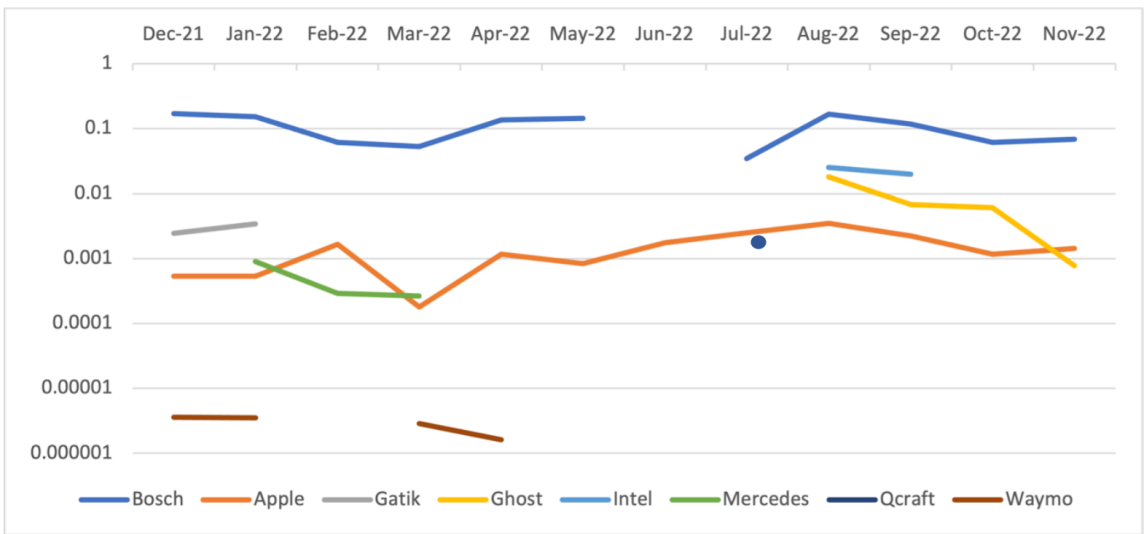| Company	Dec21- Nov22 SGO Crashes	VMT	Crash Odds Ratio
Commercial Permits (All operational miles combined)			
Cruise	27	1478159	8:1
Waymo	53	5549530	4:1
Safety-Driver Testing Permits Only			
Apple	1	250191	2:1
Mercedes Benz	2	52975	16:1
NVIDIA	1	7169	59:1
Pony.ai	3	280412	5:1
Zoox	20	552133	15:1

Figure 4 AIDs comparisons for CA DMV 2022 data

AV Insurer Requirements

AV Bill provisions for:

– Prompt **data access** in the event of an incident,

– **Investigation** by inspector(s) in the event of an incident,

– Suspension of operating license(s) if **safety principles are violated.**

Thatcham/ABI Insurer Requirements for Automated Vehicles outlines key requirements for safe deployment of AVs.

Data access key enabler in:

1) Measuring **safety principles** are continually met

2) Enable **effective insurance** of new technology

3) Building **public trust** in AVs

4 KEY ASKS FROM THE UK MOTOR INSURANCE INDUSTRY:

Safety First Principle
Automated vehicles should follow a safety first principle. Clearly defined capability and operational constraints of the systems to ensure users understand their roles and responsibilities when using and/or owning such a vehicle.

Visibility
Transparency of the authorisation process. Visibility of authorised automated vehicles, authorisation requirements per feature, the level of functionality, and software versions authorised for road use.

Data Access
Access to relevant vehicle data in order to ensure that consumers are protected and that insurers are able to fulfil their obligations to their customers as set out by AEVA 2018. Timely and unhindered access to data is required.

Cybersecurity
Cybersecurity threat is addressed. Vehicle systems and connectivity, either by the vehicle manufacturer or other source, must be robust to detect and mitigate the risk of a cyber induced incident over the life time of the vehicle.

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Thank you