



Risks Associated With Autonomous Vehicles

Abdallah Zabian
GM, Security and Analytics, Asia

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“new DXC”



Topics

❖ **4 Disruptive Trends Transform the Automotive Industry**

❖ **Connected Car**

❖ **Automotive Industry Threats and Risks**

4 Disruptive Trends Transform the Automotive Industry



C

Connected

Cloud-connected services enable new in-car functions and services such as vehicle management, assisted driving, and digital life interfaces (e.g., infotainment services, smart home connection) creating new monetization opportunities

28% combined US/EU/China CAGR growth potential for vehicle-centric connected services from 2017-2030¹



A

Autonomous

Autonomous driving has the potential to completely change the automotive industry as we know it. The debate is no longer whether autonomous driving is going to happen, but when.

\$173B amount the global autonomous driving market is expected to grow to by 2030²



S

Shared

Ridesharing and shared ownership are overtaking traditional models with an increase in on-demand transportation and other as-a-Service models.

5% of urban households worldwide will have reduced car ownership in 2022 in favor of mobility-as-a-service and public transportation options³



E

Electric

Electric car sales are increasing. This trend also includes all offers around electric mobility including intelligent services, energy storage for commercial and private use, as well as enhanced charging technologies.

55% or more of new car sales are expected to be fully electric by 2030⁴

Connected Car

A connected car communicates **bidirectionally** with other systems. The consumers have easy access to everything from streaming media, Wi-Fi access, entertainment systems, to remote control of vehicle using mobile applications (e.g. lock/unlock, ignition mechanisms, etc.)

Risk

Security breaches can lead to leaked personal information, service unavailability, accidents, etc. Failure to address these risks could have catastrophic effects on consumer, privacy and brand reputation.

Obligation

Security measures should be in place throughout the lifecycle of connected cars. Secure software development, preventive security solutions, **continuous monitoring**, upgrading and patching, compliant with regulations are essential.



Automotive Industry Threats and Risks

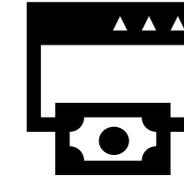
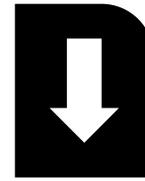


Data Breaches

A notable increase in personal user data collected and stored by the Auto Industry, with 5+ breaches in the past 2 years.

Intellectual Property Theft

Increasing connectedness and convergence of IT/OT expanding the exposure of IP and sensitive business information.



Business Disruption

Attacks targeting production and assembly lines that may yield losses from vehicle recall and production delays/disruption.

Connected Vehicle Theft

Attacks targeting keyless entry facilities in connected vehicles, increasing the attack surface for vehicle theft into the digital plane.



Remote Vehicle Takeover

As demonstrated by previous attacks, connected vehicles can be taken over remotely, by leveraging comms infrastructures.

Tracking and PII Theft

Constant connectivity and enmeshing with vehicle owner’s personal information introduces ability for attackers to track users and steal PII.



Questions and answers

“new DXC”



SAS Superweek 2020 ERM Session



Autonomous Vehicles and Cyber Panel Session with DXC Technology

Paul Wee, Bryan Shen

SAS Superweek

27th November 2020, ERM Session



Background

- Autonomous vehicles are part of Singapore’s “Smart Nation” vision, under the Singapore Autonomous Vehicle Initiative (SAVI) and Smart Mobility 2030 plan.
- Insurance development is still in the early stages and faces challenges.
- Questions on insurability, risk profiles, claims and liability regimes and impact of new technology, make this ripe for innovation and disruption.
- Autonomous vehicles remains an emerging risk for insurers and new horizon for actuaries.
- These are part of several broader common themes facing us in the new economy as we approach increased digitalisation.

Rank	Country	Total score	Policy and legislation		Innovation		Risk	Liability
			Rank	Score	Rank	Score		
1	The Netherlands	27.73	3	7.89	4	5.46	1	5.84
2	Singapore	26.08	1	8.49	8	4.26	2	6.72
3	United States	24.75	10	6.38	1	6.97	7	5.84
4	Sweden	24.73	8	6.83	2	6.44	6	6.04
5	United Kingdom	23.99	4	7.55	5	5.28	10	5.31
6	Germany	22.74	5	7.33	3	6.15	12	5.17
7	Canada	22.61	7	7.12	6	4.97	11	5.22
8	United Arab Emirates	20.89	6	7.26	14	2.71	5	6.12
9	New Zealand	20.75	2	7.92	12	3.26	16	4.14
10	South Korea	20.71	14	5.78	9	4.24	4	6.32
11	Japan	20.28	12	5.93	7	4.79	3	6.55
12	Austria	20.00	9	6.73	11	3.69	8	5.66
13	France	19.44	13	5.92	10	4.03	13	4.94
14	Australia	19.40	11	6.01	13	3.18	9	5.43
15	Spain	14.58	15	4.95	16	2.21	14	4.69
16	China	13.94	16	4.38	15	2.25	15	4.18
17	Brazil	7.17	20	0.93	18	0.86	19	1.89
18	Russia	7.09	17	2.58	20	0.52	20	1.64
19	Mexico	6.51	19	1.16	17	1.01	17	2.34

Changes to Risk Profiles and Insurability

- **Risk profile**

Depends on the level of automation and technology

Systemic exposures from evolving risk landscape

- **Claims profile**

Typically motor high frequency/low severity losses with occasional new high severity losses

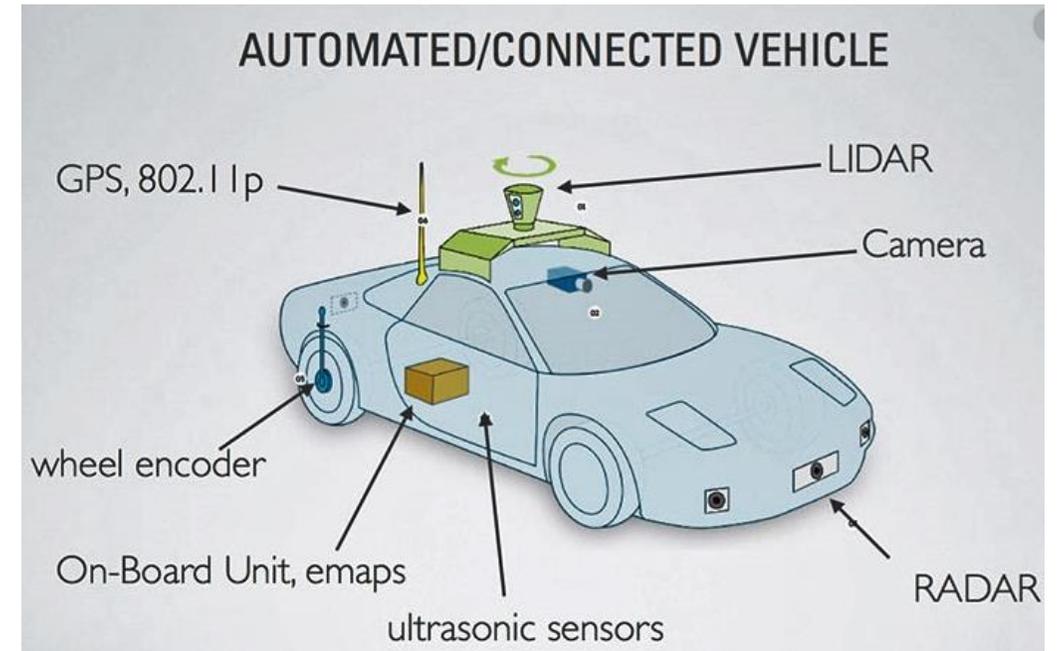
- **Price adequacy, model risk, exposures and data issues**

- Insurance regulations

- Pilot schemes and initiatives around the world

- Strategic partnerships with traditional car manufacturers (BMW, Toyota..)
- Europe C-ITS Corridor / USA I-70 Connected Roadway / Japan Park24 & Toyota

Refer to next slide for list of more than 100 initiatives



	L0	L1	L2	L3	L4	L5
	No Automation	Driver Assistance	Partial Automation	Conditional Automation	High Automation	Full Automation
DRIVER						
	In charge of all the driving	Must do all the driving, but with some basic help in some situations	Must stay fully alert even when vehicle assumes some basic driving tasks	Must be always ready to take over within a specified period of time when the self-driving systems are unable to continue	Can be a passenger who, with notice, can take over driving when the self-driving systems are unable to continue	No human driver required steering wheel optional – everyone can be a passenger in an L5 vehicle

Figure 1. Levels of driving automation

Smart Mobility Projects Globally

[Home](#)[About iMOVE Australia](#)[News and Articles](#)[iMOVE Projects](#)[Meet smart mobility experts](#)[ITS Monday](#)

How to use this table: By default the table is ordered by commencement date (YYYY/MM) but you can click the top of the table to re-order the list, or use the Search box to find a trial, concept, or location. For more details about items in the list, click the 'More info' links. For best viewing on a mobile phone screen, view in landscape mode.

Show entriesSearch:

COMMENCED	COUNTRY	NAME	DESCRIPTION	LINK
2023	Germany, Netherlands, Austria	C-ITS Corridor	This multi-project R&D environment on a Rotterdam – Frankfurt – Vienna motorway corridor will result in the 'gradual deployment of Cooperative Systems, allowing the exchange of traffic-related information among vehicles and between vehicles and the roadside infrastructure.'	More info
2021	USA	I-70 Connected Roadway	Project partners the Colorado Department of Transportation and Panasonic have installed roadside units along the I-70 Mountain Corridor to provide real-time information to drivers and traffic managers about V2X-equipped vehicles.	More info
2020/09	USA	Smart Columbus Connected Vehicle Environment research study	A 7-month study, concluding in March 2021. Aims to improve driver safety and mobility in central Ohio, by equipping 500 residents' vehicles with study equipment designed to provide in-car safety alerts which may help participants make more informed driving decisions.	More info
2020/07	USA	Smart Columbus: Connected Vehicle Environment pilot	Deployment of a Connected Vehicle Environment along seven major corridors, including 16 of the top 100 high-crash intersections in Columbus. Due to go live in July 2020.	More info
2020/07	Australia	Driverless Shuttle Trial: Newcastle NSW	A 3-month trial of a driverless shuttle, running in the NSW Mid-North coast city of Newcastle, daily between 10am and 2pm.	More info
2020/06	Scotland	Project CAVForth	Commencing in mid-2020, this pilot project of an autonomous bus will take passengers on a 14-mile journey on the Forth Road Bridge Corridor in Edinburgh.	More info
2019/09	Canada	Colibri	A 1-year pilot project in Quebec of electric cargo bikes and other zero-emission vehicles,	More info

<https://imoveaustralia.com/smart-mobility-projects-trials-list/>

Liability Regimes – Who is at fault?

Connected stakeholders:

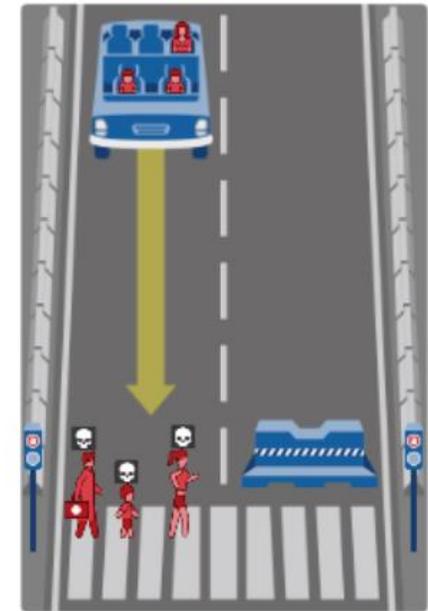
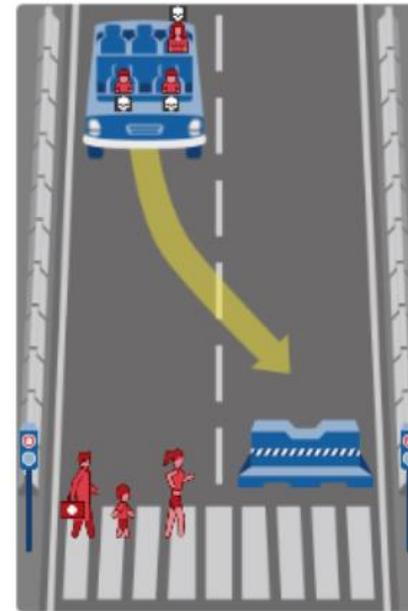
- Driver
- Car manufacturer
- Software provider and AI programmer
- Repair workshop
- Digital map provider
- Telco Firm
- Government authority
- Hacker

Shifting Liabilities:

From: Motor Third Party Liabilities

To: Product Liability / General Liability / Cyber Liability / Tech E&O

What should the self-driving car do?



Connected Themes Linked to and Extending Beyond Autonomous Vehicles

Technology

- 5G connectivity
- Telematics
- V2I Vehicle-to-Infrastructure
- V2V Vehicle-to-vehicle
- V2P Vehicle-to-passenger
- V2X Vehicle to any other (e.g. Alibaba City Brain)
- **Big data**
- **Artificial Intelligence**

Macroeconomic

- Usage Based Insurance
- Monetization of passenger miles
- Demographic changes
- Sharing economy
- Urbanisation

Regulatory

- General Data Protection Act GDPR
- **Cybersecurity**
- eCall assistance
- Ogden rate for compensation (in the UK)

Conclusion

- Autonomous vehicles is a new emerging area and opportunity for insurance development.
- One challenge is in the liability framework to reflect the key stakeholders, and also any ethical dilemmas.
- Another is to understand the changing risk profiles of autonomous vehicles due to new technologies and regulations which affect the work done by actuaries in pricing and reserving.
- Understand the connected themes facing autonomous vehicles in the risk landscape.

Any Questions

