RoAD: Ethical, Legal, and Societal Challenges of Using Data from Autonomous Vehicles

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Rationale

Autonomous Vehicles (AVs) may offer significant societal benefits but will also create new types of incidents and accidents. The ability to access, explain and understand data related to failure or accidents will be a fundamental requirement for ensuring safety, liability and public trust.

However, datasets retrieved from data recorders – such as Event Data Recorders and Data Storage Systems for AVs currently developed by the UNECE - may not contain either enough data or the right data to facilitate practical and legal investigations, especially in collisions or near-miss events with vulnerable road users (VRU).

Moreover, drivers or AV operators and their legal representatives may face barriers in accessing datasets that are needed for an accident investigation, civil claim or criminal prosecution. Finally, there may be resistance within civil society towards data recording within AVs, with respect to the potential ethical risks and legal implications concerning their use.

Objectives

Drawing on Responsible Research and Innovation principles, the goal of the RoAD project was to investigate the ethical, legal, and societal challenges of using data from autonomous vehicles, with three main objectives:

- O.1 Investigate the ethical risks and legal implications related to the collection, access and use of data
- O.2 Test the legal usefulness of data sets
- O.3 Evaluate public acceptance of data recorders ('black boxes') for AVs

Methods and Tools

We evaluated AV data recording devices through desk research, dataset simulations, workshops with experts and stakeholders, and public surveys.

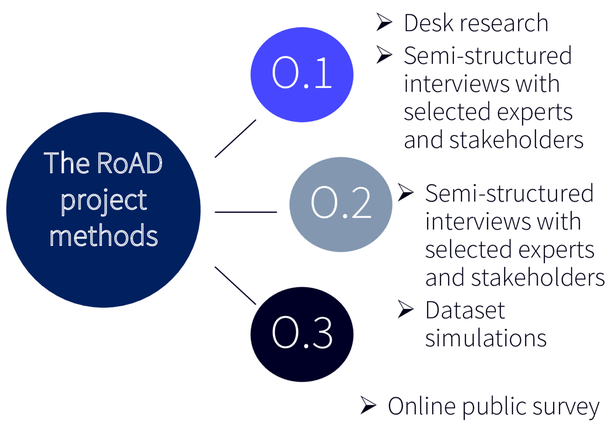

Table 1 provides an overview of the participants in the semi-structured interviews. Stakeholders are described by their type and focus. 20 experts were interviewed across academia, industry, the legal profession, interest groups, civil society and Government.

Table 1

No	Type of stakeholder	Focus of stakeholder
1	Civil Society	Equestrian road users
2	Civil Society	Pedestrians and other non-vehicular road users
3	Civil society	Police - Crime investigation
4	Civil society	Cycling
5	Academia	Cyberlaw specialist
6	Academia	Aggregated Homologation-proposal for Event Recorder Data for Automated Driving
7	Academia	Autonomous vehicles
8	Academia	Roboticist
9	Industry	Data security company
10	Industry	Autonomous vehicle software
11	Industry	Insurer
12	Industry	Insurer
13	Industry	AV manufacturer / design
14	Industry	Data management consultant
15	Professional	Aviation lawyer
16	Professional	Former air accident investigator
17	Professional	Smart Cities and data
18	Policymaking/ governmental	ITU focus group on AI for Autonomous and Assisted Driving
19	Policymaking/ governmental	Law Commission of England and Wales
20	Policymaking/ governmental	Federal Ministry of Transport and Digital Infrastructure (Germany)

Figure 1 illustrates the research path of the RoAD project: from the identification of safety-critical scenarios, the analysis of regulations and standards and the simulation and collection of data using the CARLA driving simulator.

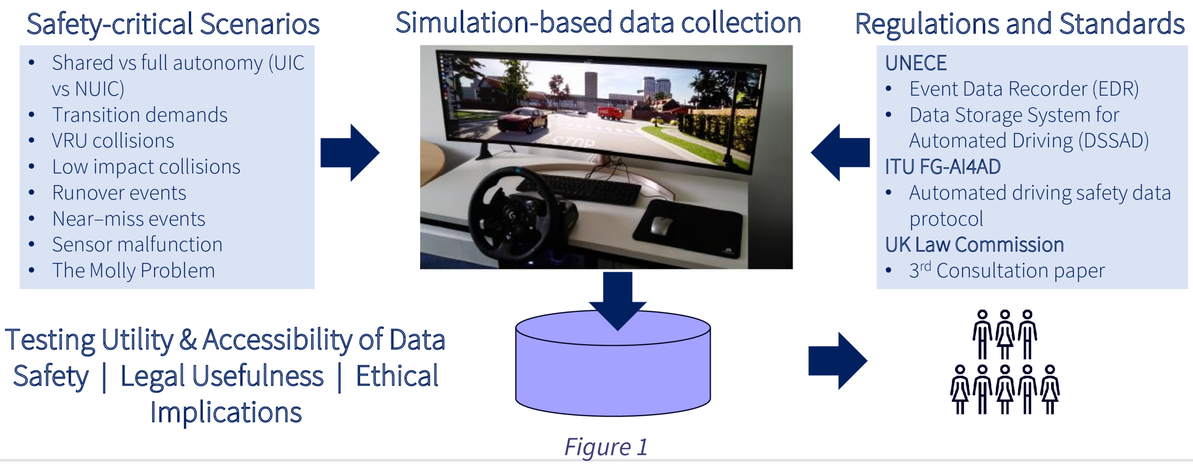

Figure 1

Results

O.1 INVESTIGATE THE ETHICAL RISKS AND LEGAL IMPLICATIONS RELATED TO THE COLLECTION, ACCESS AND USE OF DATA

- The current international guidelines for the recording of AVs data are likely to be insufficient for the purposes of verifying the safety of AVs (due to lack of: video, machine-learning snapshot, location data, near miss data, trigger events, driver information…).
- There are privacy issues associated with video and location data, as well as with the use of biometric data to identify particularly vulnerable road users.
- The public may be unaware or unsure of what data is being stored about them, and how data is used (more transparency is needed).
- The public may accept data being used for research or safety purposes, but would like choices about data being used for marketing purposes or commercial gain.
- Commercial sensitivity or the proprietary nature of data and the algorithms which produce the data can be a challenging barrier to properly investigating AV accidents and near-miss.

O.2 TEST THE LEGAL USEFULNESS OF AV DATA SETS

- Police sometimes have difficulty in accessing data from different types of vehicles. Expertise is required in how to extract data stored in vehicles. Where data is cloud-based, this is not easily accessed and requires Court applications.
- Courts and lawyers require experts to interpret AV data.
- Relying upon manufacturers to act as experts in legal proceedings is problematic.
- Contracts between manufacturers and third-party developers may inhibit disclosure of crucial information regarding algorithm operation.
- There are arguments for an independent authority to control AV data and to investigate AV crashes.
- Insurers will not be able to design accurate insurance products without access to data which verifies the safety of AVs driving on public roads.
- Vehicle data is being successfully used to investigate non-traffic related crime, however road users and drivers may be largely ignorant of the potential of recording devices in AVs to be used for this purpose.

O.3 EVALUATE PUBLIC ACCEPTANCE OF DATA RECORDERS

Awareness concerning data recorders in Avs (360 UK respondents)

No.	AVs record data as they operate. Please indicate yes or no to each of the following statements	Yes	No
1	I am aware that AVs may record internal system data - for example to do with braking and acceleration	78,1%	21,9%
2	I am aware that AVs may record location data	81%	19%
3	I am aware that AVs may record video and audio inside the vehicle	38,2%	61,8%
4	I am aware that AVs may record other data - for example doors opening and closing, which seats are being used	49,5%	50,5%
5	I am aware that AVs may record video outside the vehicle	68,9%	31,1%

Expectations concerning data recorders in AVs (360 UK respondents)

No.	Recording devices in autonomous vehicles will	Agree	Don't know	Disagree
1	Increase safety in self-driving cars	77.5%	7.03%	15.2%
2	Verify liability in case of accidents	91.1%	5.4%	3.05%
3	Increase trust in AVs	51.8%	34.3%	24%
4	Make autonomous driving more comfortable	41.4%	37.9%	20.7%
5	Decrease insurance costs	44.9%	33.2%	21.6%
6	Be a new business opportunity for big-data companies	68.6%	17.7%	13.6%
7	Be a way to make roads and cities safer	63.3%	27.2%	9.5%
8	Be an opportunity to enjoy a personalised experience in an AV	37%	34.1%	28.9%
9	Be an opportunity to enjoy benefits derived from sharing data to companies (such as insurance discounts)	35.2%	30.1%	34.8%
10	Be a threat to privacy	73.7%	19.9%	6.3%
11	Be a new target for cyber attacks	82.3%	11.7%	6%
12	Reduce our freedom	50%	29.7%	20.3%
13	An indirect way of surveilling (monitoring) citizens	73.1%	15.8%	11%

Attitudes towards access to data retrieved from AVs data recorders (360 UK respondents)

No.	Please indicate to what extent you agree with each of the following statements	Agree	Don't know	Disagree
1	Insurers of vehicle/s involved should have access to all data	73.7%	15.8%	10.5%
2	The police should have access to all data	88%	4.1%	7.9%
3	Legal professionals representing those involved in the incident should have access to all data	82%	11.1%	7%
4	Anyone involved in the AV incident (including the driver/operator, passengers, pedestrians, those in another vehicle) should have access to all data	62.1%	20.3%	17.4%
5	Non-governmental organisations related to vehicle safety should have access to all data	40.3%	30.5%	29.2%
6	Central Government Departments such as The Department for Transport should have access to all data	40.6%	27.6%	31.7%
7	The Local Government authority (eg the council in charge of roads) where the incident occurred should have access to all data	36.1%	29.4%	34.5%
8	An independent commission or body formed to investigate AV accidents and safety should have access to all data	71.5%	15.5%	13%
9	The manufacturer of the AV should have access to all data	57.3%	18%	24.7%

Level of comfort towards recording devices in AVs (360 UK respondents)

No.	Please indicate to what extent you agree with each of the following statements	Agree	Don't know	Disagree
1	I would be happy to travel in a car that could record what I am saying at any time	8.6%	9.5%	82%
2	I would be happy to travel in a car that could record me only at my request	68.7%	16.8%	14.5%
3	I would be happy to travel in a car that could record video of the inside of the vehicle	26.9%	21.2%	51.9%
4	I would be happy to travel in a car that could record video of the outside of the vehicle	80.3%	13%	6.6%
5	I would be happy to travel in a car where a third-party operator could monitor the vehicle and take control of it in an emergency	31.4%	32.6%	36.1%