1. The Road Safety Markings Association’s submission to the Lords’ inquiry is brief and, in line with the Committee’s terms of reference, focuses on matters relating to the future uses of autonomous vehicles in the UK. This submission particularly relates to the 6th question around the changes to the physical infrastructure in the UK that will be required for the successful deployment of autonomous vehicles.

2. The Association’s main concern is that current standards of road safety markings in particular are not actually being maintained and, where assistive or autonomous technology relies in part on road markings and signs, any failure of maintenance presents a real safety hazard.

3. By 2025, at least half the travel on Europe’s roads will be in vehicles that to some extent can read the road ahead including markings and signs. A 2013 consultation paper by EuroRAP and EuroNCAP1 refers to lane markings as “the rails for self-steering cars”. Vehicles, like drivers, cannot function if basic road markings and signs are non-existent, non-compliant, worn out, obscured, inconsistent or confusing.

4. In the case of road safety markings, the Association’s most recently-published survey2 of lines on 7,000km of motorways, dual and single carriageways in England, Scotland and Wales shows that, despite a recognised Highways Agency (now Highways England) standard, and contractual obligations on behalf of main contractors, approximately half of road markings were inadequate.

5. LifeLines England, a report based on the survey carried out by the Road Safety Markings Association found that 52 per cent of markings on motorways, 42 per cent on dual carriageways, and 48 per cent on single carriageways all needed replacing immediately or needed to be scheduled for replacement. The survey also showed that just 16 per cent of markings on England’s motorways and 13 per cent on single carriageways made the “excellent” grade.

6. The survey of roads managed by the Welsh Assembly found 63 per cent of road markings on motorways needed replacing immediately or needed to be scheduled for replacement, while only one per cent of motorway markings made the “excellent” grade; nearly half (48 per cent) of markings on dual carriageways needed replacing immediately or needed to be scheduled for replacement.

7. There is a lack of research in relation to Local Roads whether, major roads, urban or rural roads. It is expected that with significant budgetary constraints over the last 10 years, standards of road markings will be lower than on the more strategic networks referred to above.

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2 The Road Safety Markings Association’s LifeLines 2014 Report [www.comparethemarkings.com](http://www.comparethemarkings.com)
8. In the US, Tesla and Volvo have taken the California Transportation Department and City of Los Angeles officials to task over the poor quality of markings. This is because their machine vision detection technologies are highlighting that the road markings have been poorly installed, monitored and maintained.

9. Numerous media articles have highlighted concerns that some vehicles with assistive, partially-autonomous or fully-autonomous technology depend on accurate reading of road markings. Vehicles with lane departure assistance systems use cameras on the car to track the positions of road markings and keep the vehicle in the centre of the lane, while sensors around the front, sides and rear of the car keep an eye on other vehicles. A recent report by Reuters claimed that the Tesla semi-autonomous vehicle refused to drive itself because of the poor quality road markings that were present (http://www.reuters.com/article/us-autos-autonomous-infrastructure-insig-idUSKCN0WX131).

10. Road markings can wear away, and they can also disappear under snow. Modern laser-surveying sensor systems (called LIDARS, after light detection and ranging) may not be accurate in those conditions. LIDARS calculate distances by illuminating a target with laser light and measuring the time it takes for the light to bounce back to the source. Radar does much the same thing with radio waves. In cars, LIDARS and radars have an effective range of around 50 metres, but that can shrink significantly in rain or when objects are obscured by vehicles ahead. Even the most advanced vehicles travelling at motorway speeds can "see" only around a second and a half ahead.

11. In the US The American Association of State Highway and Transportation Officials (ASSHTO) and the Society of Automotive Engineers have established a working group designed at developing guidance for agencies seeking to install and maintain road markings that meet the needs of machine vision systems. They are due to publish an initial report in May 2017.

12. It is recommended that such a working group is established in the UK in order to:
   a. work with industry in order understand the requirements of autonomous vehicle manufacturers, their trade bodies (e.g. SMMT), insurers, etc.;
   b. identify and plan for future changes to Sector Scheme 7 and legislative requirements;
   c. provide road marking industry input into road trials; and
   d. act as a focal point for knowledge transfer between different parts of industry, infrastructure designers, Central and Local Government and Government Agencies.

13. It is considered that with appropriate funding, the RSMA would be well placed to establish and lead such a working group for the UK, given its specialist knowledge of the road marking industry, current practices, knowledge of the current condition of road markings and its current role as custodian of Sector Scheme 7.

14. About the Road Safety Markings Association (RSMA)
a. RSMA is the largest specialist trade association in the highways sector, representing more than 90 per cent of the road-marking sector.

b. The RSMA’s activities emphasise quality, health & safety and training and it has invested substantially in these areas over the past decade, in order to help highways companies and organisations to drive up sector standards and deliver higher quality in a safer manner. It has a clear focus on setting standards for its members.

c. The association has developed a large NVQ Assessment Centre, qualifying in excess of 800 road marking operatives and has been the first organisation to introduce specialist apprenticeships in the highways sector. The centre delivers or facilitates delivery of a wide range of NVQ and training solutions for roadmarking companies. As a result, 90 per cent of the operative workforce is qualified, and there is a clear career structure now in place for the industry for both management and operatives.

d. RSMA is the only organisation which has carried out a condition survey of road markings on the Strategic Road Network in the UK and has been carrying it out every two years since 2001.

e. The RSMA has, as an industry body, imposed standards on its sector and pushed up quality, improved training and defined specific health and safety best practice for the sector moving the sector away from inadequate and often inaccurate blanket health and safety policies.

12 October 2016