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PERSPECTIVE

Advanced driving assistance systems: Three issues impacting litigation and safe adoption

Background

Automotive safety technology is designed to reduce the incidence and severity of motor vehicle accidents. In particular, advanced driver assistance systems (ADAS) are intended to reduce accidents by delegating discrete portions of driving to the vehicle. ADAS, in combination with a sophisticated onboard computer, is what makes a vehicle autonomous.

ADAS includes both passive and active technologies. Passive ADAS delegates perceptual functions to the vehicle, alerting the driver to hazards. Examples include blind spot monitoring and backup cameras and sensors. Active ADAS automates a difficult driving task when a driver may not have the time or skill to do so. Anti-lock braking systems (ABS) is an example of older active ADAS technology, automatically pulsing a vehicle's brakes when the driver hits the brake pedal too aggressively. Newer examples include parking assist and emergency braking systems.

As various ADAS technologies are developed, adopted and become more prevalent, we anticipate three issues that will affect the defence of claims involving ADAS and considerations around the safe adoption of these technologies in the short term:

- piecemeal adoption of ADAS;
- lack of updated driver norms; and
- inadequate driving skills.

As the technology advances, driving norms will change and best practices will evolve. However, in the interim, stakeholders have to consider how to eliminate, or at least mitigate, the risk arising from these three issues.

Piecemeal adoption of ADAS

The popular perception of a connected and autonomous vehicle (CAV) is an engineered suite of passive and active ADAS technologies, governed by a sophisticated onboard computer, and seamlessly integrated into the body of a vehicle. A layperson would have some familiarity with a few of the technologies typically integrated into a CAV: sensors, navigation, etc. However, the specific types and models of technologies used are generally at a manufacturer's discretion. As a result, for the foreseeable future, the driving public may be exposed to vehicles with markedly different equipment and capabilities, even within the same SAE level of automation.

At one level, this is to be expected. Some ADAS technologies can be expensive and may be restricted to luxury models or lines. In other cases, the manufacturer may have a choice in the type of ADAS technology to equip to address a specific issue, such as the use of radar, light detection and ranging (lidar), or both for vehicle sensors. One manufacturer's technology, capabilities, and business strategy will differ from another. As such, competing models from different manufacturers may have different capabilities, even within the same price point and automation level.

The potential for variance in vehicle capability and equipment raises important questions for manufacturers, insurers, regulators, road authorities and consumers. Can vehicle manufacturers be held liable for failing to equip a particular model of vehicle with a specific class or type of ADAS technology? Should regulators require certain ADAS technologies?

One example of the first issue has already been litigated. In an interesting case from Arizona in the United States, a plaintiff injured in a collision sued an auto manufacturer for failing to equip her vehicle with forward collision warning and crash-imminent braking systems, which existed at the time her vehicle was manufactured. The plaintiff was unsuccessful in that case.

The second issue is something that regulators already address. Transport Canada mandated including ABS and electronic stability controls on all vehicles from 2012 on. More recently, in March 2019, the EU announced that it would make ten ADAS technologies mandatory on all vehicles by 2022, including driver attention monitors, emergency stop detectors and lane departure warnings.

Lacking driver norms

Vehicle technology is just one component of driving safety. The way drivers use and interact with ADAS features will also have a significant impact on their efficacy. As active ADAS features become more sophisticated, drivers have been in a number of accidents, as they appear to have entirely abandoned the task of driving.

In March 2019, a driver operating a CAV with the ADAS engaged was killed when a tractor-trailer crossed its path. Neither the driver nor the ADAS took any evasive maneuvers. Data from the CAV indicated that the ADAS engaged about ten seconds before collision, and that the driver had – contrary to warnings – apparently removed his hands from the steering wheel approximately two seconds after engaging the ADAS.

This case suggests that the driving public has not sufficiently developed or established norms about the proper use of active ADAS. In particular, some of these accidents seem to occur because the notion of a driver keeping their attention on the road and the vehicle runs counter to the popular conception of CAVs making drivers redundant. In a November 2019 news story, a driver admitted to sleeping behind the wheel of a CAV for 14 miles. The story also explains how CAV drivers attempt to trick or otherwise circumvent the driver oversight software.

Examining driver error may complicate analyzing accidents involving CAVs. It may be that a norm of continued human oversight will have to be developed, just as the norm of wearing seatbelts was developed. Legislation mandating continued human oversight is a necessary step, but it is by no means the only one. Legislators and regulators will have to consider whether driver attention technologies will be mandatory on CAVs of a certain level, and will have to devise mechanisms for enforcing compliance with those technologies.

Legislation alone is not enough to develop good driver norms. A robust public safety awareness campaign and safety reminders, like those used to encourage seatbelt use, will likely be needed. Developing such norms will take time and may never be fully adopted. Even today, with seatbelt laws in place for a generation, vehicle occupants still occasionally fail or refuse to use them.

Inadequate driver skills

Finally, we anticipate a similar but a slightly different issue in relation to driver skills, which is exemplified best by drivers failing to fully understand the limitations of CAV sensors. This is because of the different limitations of different types of passive ADAS sensors (radar, lidar and cameras). Lidar may fail to recognize obstacles in poor lighting conditions. Cameras must first be “trained” to recognize hazards and may fail to register a novel hazard. Radar may have difficulty distinguishing between objects near the road and hazards on the road.

Sensor technologies are so new that there is not yet widespread familiarity with their limitations. This lack of knowledge and familiarity can lead drivers to assume that a passive ADAS will detect any hazard or obstacle and that an active ADAS will respond appropriately at all times. Education in these limitations will be necessary for drivers to understand how to use them safely and how to take control of the vehicle safely when necessary.

Driver skills in a world of CAVs will be less about driving a vehicle and more about overseeing a vehicle as it drives itself. Returning to the example of CAV sensors, this will mean knowing the types of items and obstacles that may be immediately apparent to the human eye, but may fool the different sensor technologies used by a CAV. This is just one of many new skills drivers will have to develop.

Equally important are considerations around appropriate marketing of ADAS technologies in a way that is not only accurate, but avoids any misapprehension about the capabilities of the technology by operators of CAVs. Manufacturers may be able to mitigate against defective marketing claims against ADAS technologies on the front-end by carefully considering marketing materials to ensure safe adoption and deployment of ADAS technologies.

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