FACTSHEET 18

ADVANCED DRIVER ASSISTANCE SYSTEMS

There is much potential for Advanced Driver Assistance Systems (ADAS) to produce significant road safety gains. However, some rely on appropriate infrastructure (quality, consistent signage) and road quality (bitumen, clear line markings).

Types of ADAS

There are various ADAS technologies.

- **Electronic Stability Control** recognises when a vehicle is losing stability and applies automatic braking to individual wheels of the vehicle to return the vehicle to the intended direction of travel.
- **Lane Keeping Assist** automatically takes corrective action to move the car back into the lane if the driver has not already done so.
- **Autonomous Emergency Braking** detects the potential of a crash occurring and applies the brakes to minimise the risk of the crash and/or potential resultant injury.
- **Intelligent Speed Adaptation** detects if a vehicle is exceeding the speed limit and provides an advisory warning/alert or autonomously adjust/limit vehicle's speed[1].

ADAS may be standard, optional as individual items, optional as multiple items in a single package, or not available on some vehicles.

Implementation considerations

General:

- Road infrastructure supportive of new vehicle technologies was found to be lacking[2]. This needs to be carefully considered during ADAS implementation.
- Facilities to maintain ADAS.

Electronic Stability Control (ESC):

- ADR requires all new passenger vehicles to be fitted with ESC from 2011. This has been applied to light commercial vehicles from 2017. The average vehicle age of motor vehicles is 10.6 years so it will be some time before ESC is widespread in Australia.
- Not all second-hand vehicles will have ESC. Organisations could stipulate that only vehicles with ESC can be purchased and used as part of their vehicle fleet policy.

Lane Keeping Assist (LKA):

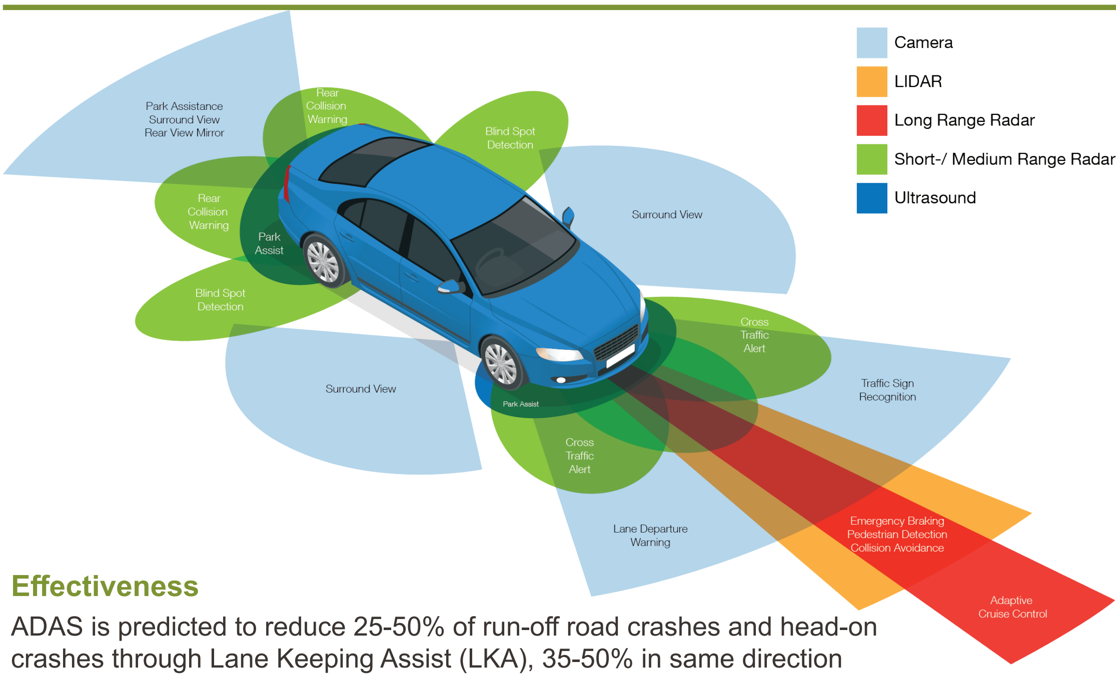
- Dependent on the presence, quality and accurate detection of road lane markings.
- Often packaged with Lane Departure Warning (LDW)

Intelligent Speed Adaptation (ISA):

- Relies on the availability of updated GPS maps.
- Relies on the quality of speed limit signage.
- Drivers need to respond to the warning in the advisory version and keep the system switched on in the autonomous speed limiting version.
- Vehicle travel speed may be more dependent on road and weather conditions rather than the posted speed limit[3].
- Road quality in regional and remote areas is generally not well mapped[2] thus this needs to be considered.

SAFE VEHICLES

FACTSHEET 18 CONTINUED ADVANCED DRIVER ASSISTANCE SYSTEMS



Effectiveness

ADAS is predicted to reduce 25-50% of run-off road crashes and head-on crashes through Lane Keeping Assist (LKA), 35-50% in same direction impacts due to Autonomous Emergency Braking (AEB) and 20-30% in run-off road and head-on crashes through speed warnings[4].

ESC in Australia contributed to a 28% reduction in single vehicle crashes of all injury severities and a 32% reduction in driver injury crashes of all severities[5]. ESC is very effective at reducing rollover crashes due to loss of control for vehicles with a high centre of gravity (e.g. light trucks, SUVs, and vans[6]). An analysis of Victorian fatal crashes in 2016 found that if ESC was fitted to the crashed vehicle, 41 lives from 140 lane departure crashes could have been saved[7].

ISA does not directly prevent crashes; however, estimated crash reductions resulting from the use of ISA are around 3 to 8% for serious injury crashes and up to 11% for fatal crashes[8,9].
It has the potential to influence a driver's compliance with the posted speed limit in these regions, particularly where road infrastructure treatments and police enforcement is not feasible to manage driver speeds[3].

Target road user groups

Passenger Vehicles, Motorcycles (ABS and ESC)

Target behaviour

Speeding, fatigue, lane drifting, loss of vehicle control

Inter-pillar link

Safe Roads - Wide Centrelines
Safe Speeds - Speed signs

[1]European Commission, 2019, Intelligent Speed Adaption (ISA). Retrieved from https://ec.europa.eu/transport/road_safety/specialist/knowledge/speed/new_technologies_new_opportunit ies/intelligent_speed_adaptation_isa_en

[2]Peiris, S., Berecki-Gisolf, J., Chen, B. and Fildes, B. 2020, Road trauma in regional and remote Australia and New Zealand in preparedness for ADAS technologies and autonomous vehicles. Sustainability (Basel, Switzerland), 12(11), 4347, https://doi.org/10.3390/su12114347.

[3]Austroads 2019a, National view on regional and remote road safety (AP-R603-19), Sydney NSW: Austroads.

[4]Austroads, 2017c, Safety benefits of cooperative ITS and automated driving in Australia and New Zealand (AP-R551-17), Sydney NSW: Austroads.

[5]Scully, J. and Newstead, S., 2010, Follow-up evaluation of electronic stability control effectiveness in Australasia. (Report No. 306). Melbourne, Victoria: Monash University Accident Research Centre.

[6]Riexinger, L., Sherony, R. and Gabler, H., 2019, Has electronic stability control reduced rollover crashes?, SAE Technical Paper 2019-01-1022, Society of Automotive Engineers https://doi.org/10.4271/2019-01-1022.

[7]Goldsmith, P., Nieuwesteeg, M., Logan, D., Strandroth, J. and Page-Smith, J., 2017, Estimated fatality reductions by the use of electronic stability control from 2016 fatal crashes. In Proceedings of the 2017 Australasian Road Safety Conference, 10-12 October, Perth, Australia.

[8]Doecke, S. and Woolley, J., 2011b, Cost benefit analysis of intelligent speed adaptation (CASR093). Adelaide, SA: Centre for Automotive Safety Research.

[9]Lai, F. and Carsten, O., 2012, What benefit does intelligent speed adaptation deliver: A close examination of its effect on vehicle speeds. Accident Analysis and Prevention, 48, pp.4-9.

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SPEED LIMIT 60

SAFE VEHICLES