# Towards Zero Fatalities: Realism on the Road from Driver Assistance to Autonomous Driving

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#### **Global Road Safety Challenge – The Urgency of Now**

Over 3000 people are killed in road crashes every day. Around 3% of global GDP is lost and road crashes are the leading cause of death of young people (15-29).

Low and middle income countries account for 90% of global road deaths and have fatality rates twice that of high income nations.

These countries now account for nearly half of new car production worldwide. Over the next fifteen years the global vehicle fleet is expected to double. This unprecedented increase in motorisation is a huge road safety challenge.









#### **Global Goals for Sustainable Development and Road Safety**

From January 1 2016 the United Nations (UN) is implementing a new framework of Sustainable Development Goals (SDGs) to be achieved by 2030. Road safety is included in Goals 3 and 11 for health and cities with a target to:

# Halve the number of global deaths and injuries from road crashes by 2020.

This is the UN's strongest ever commitment to road injury prevention, which gives new impetus to the UN Decade of Action for Road Safety (2011-2020), and has been endorsed by the 2<sup>nd</sup> High Level Global Conference on Road Safety held in Brasilia last November and by the UN General Assembly in April (A/Res/70/260).









#### Halving Road Deaths by 2020 – A Very Ambitious Target



DEATHS PER 100,000 POPULATION: 2010 BASELINE AND PROPOSED 2020 TARGETS BY COUNTRY INCOME BAND

LOW INCOME COUNTRIES	**************************************
MIDDLE INCOME COUNTRIES	**************************************
HIGH INCOME COUNTRIES	* * * * * * * * * * * * * * * * * * *



#### SDG target requires 4X rate of improvement of UN Decade Goal







#### Global NCAP's 2020 Vision...

In 2015 from a total of 68 million new cars as many as 25% fail to meet UN minimum safety standards, lacking air bags, anti-lock brakes, or electronic stability control.



This needs government action to apply UN vehicle safety standards more widely and greater effort to stimulate customer demand for safer motor vehicles.

ADAC







#### **UN Forum for Harmonization of Vehicle Regulations**



The Global Plan for the UN Decade supports application of the most important global standards available under the 1958 & 1998 agreements of the UN World Forum for Harmonisation of Vehicle Regulations (WP29).\*

#### These are:

- Reg. 14 Seat belt anchorages
- Reg. 16Safety belts & restraintsReg. 04Frantal collision
- Reg. 94 Frontal collision
- Reg. 95 Lateral collision
- Reg.13H (GTR 8) Electronic stability control
- Reg.127 (GTR 9) Pedestrian protection
- Reg. 44/129 Child restraints

\*or equivalent national standards (eg: FVMSSs)









#### WHO Global Road Safety Status Report 2015 - Vehicle Safety

The 2015 Status Report:

- Reveals "worrying data" showing that only 40 out of a total of 193 UN Member States fully apply the seven most important UN safety regulations and these are overwhelmingly highincome countries.
- Says "there is an urgent need for these minimum vehicle standards to be implemented by every country".
- Warns that "regulations helping to protect occupants withstand front and side impact crashes are poorly implemented globally" and also calls for mandatory fitment of electronic stability control.



Countries applying priority UN vehicle safety standards





#### Democratizing Car Safety: A Road Map for Safer Cars 2020

Global NCAP's Road Map for Safer Cars was launched in March 2015 and :

- Calls for the combination of stronger consumer information and universal application of minimum UN standards for crash protection and avoidance.
- Ten key recommendations including the application to all new cars of the UN's front, side and pedestrian impact crash tests and the anti-skid system, electronic stability control, by 2020 at the latest.
- Global NCAP updated the Road Map in November 2015 to include Automatic Emergency Braking and anti-lock brakes in motorcycles.







	Road Map for Safer Vehicles 2020 UN Regulations* for:	All New Vehicles Produced or Imported	All Vehicles Produced or Imported
CRASH TESTS	Frontal Impact (No.94) Side Impact (No.95)	2016	2018
	Seat Belt & Anchorages (No.14 & 16)	2016	2018
ELECTRONIC STABILITY CONTROL	Electronic Stability Control (No. 13H / GTR. 8)	2018	2020
	Pedestrian Protection (No.127 / GTR. <b>9)</b>	2018	2020
ANTI-LOCK BRAKES	Motorcycle Anti-Lock Brakes (No. 78 / GTR. 3)	2016	2018
	Autonomous Emergency Braking Systems	Highly Recommended	Highly Recommended





#### **Driver Assistance Systems Are Already Making a Difference**

Three Advanced Driver Assistance Systems (ADAS) systems are today's priority crash avoidance technologies for passenger cars, commercial vehicles and motor cycles:

**Electronic Stability Control (ESC)** anti-skid system with capacity to reduce up to 40% of run-off road crashes. Now mandatory in most high income countries.

Autonomous Emergency Braking (AEB) automatically applies the brakes if the driver does not react and can cut collisions at low speed by 20%. Pedestrian systems are also now appearing.

Motorcycle Anti-lock Brakes (ABS) improves stability and braking performance. Motorcycles equipped with ABS have rate of fatal crashes 37 per cent lower than same models without.











### **ESC Global Installation Rates to 2016**



### IIHS Forecast AEB Installation Rate with Industry Voluntary Commitment (20 companies/99% share) by September 2022







### Self Driving Cars: SAE Levels of Driving Automation (J3016)

SAE level	Name	Narrative Definition	Execution of Steering and Acceleration/ Deceleration		Fallback Performance of Dynamic Driving Task	System Capability (Driving Modes)
Hema	n driver monito	ors the driving environment				
0	No Automation	the full-time performance by the <i>human driver</i> of all aspects of the <i>dynamic driving task</i> , even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a
1	Driver Assistance	te driving mode-specific execution by a driver assistance ystem of either steering or acceleration/deceleration using iformation about the driving environment and with the spectation that the human driver perform all remaining spects of the dynamic driving task		Human driver	Some driving modes	
2	Partial Automation	the driving mode-specific execution by one or more driver assistance systems of both steering and acceleration/ deceleration using information about the driving environment and with the expectation that the human driver perform all remaining aspects of the dynamic driving task	System	Human driver	Human driver	Some driving modes
Automated driving system ("system") monitors the driving environment						
3	Conditional Automation	the <i>driving mode</i> -specific performance by an <i>automated</i> <i>driving system</i> of all aspects of the dynamic driving task with the expectation that the <i>human driver</i> will respond appropriately to a <i>request to intervene</i>	System	System	Human driver	Some driving modes
4	High Automation	the driving mode-specific performance by an automated driving system of all aspects of the dynamic driving task, even if a human driver does not respond appropriately to a request to intervene	System	System	Syste m	Some driving modes
5	Full Automation	the full-time performance by an automated driving system of all aspects of the dynamic driving task under all roadway and environmental conditions that can be managed by a human driver	System	System	System	All driving modes





#### Autonomous Vehicles (AVs) : Global Market Share by 2035

Self-Driving Car Deployment Growth

In Millions	2020-2024	2025	2030	2035
Global Sales	0.15	0.25	3.79	11.8
Share of Sales (%)	0.03%	0.23%	3.19%	9.44%
Cumulative Sales	0.15	0.4	10.5	51.4
Share of light vehicles in operation (%)	0.001%	0.026%	0.60%	2.68%

Source: IHS Automotive sales forecast, December 2014; volumes represented in millions.





#### AVs: US Fleet Forecast – Full Conversion Unlikely Until 2060

Exhibit 13: The vehicle stock would take much longer to change over, with a full conversion of the US fleet to AV not likely until 2060 North America vehicles in operation forecast by vehicle autonomy level



Source: Goldman Sachs Global Investment Research





#### AVs Achieving Zero Fatalities?...Still Decades Away!

Autonomous Vehicles (AVs) will make no positive impact at all on road injury prevention by 2030.

There are still major issues with software, consumer acceptance, cyber security, regulatory approvals, transition periods, etc.

There is a real risk that 'hype' about the safety impact of self driving cars will divert attention from the L1 & 2 technologies that are already delivering road injury reduction and will continue to do so to 2030 and beyond. These are:

- Electronic Stability Control
- Autonomous Emergency Braking
- Intelligent Speed Assistance

The global policy priority now should be to mandate the ADAS systems already in use and which are building blocks towards more autonomous vehicles. Let's learn to walk before we run!











#### **Global NCAP is pleased to acknowledge support from:**





# **Thank You!**



