The Driverless Future

Annual CEGSS Conference

Nicolas Saunier
nicolas.saunier@polymtl.ca

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Road Safety

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- Around 95 % of crashes are associated with some kind of human factor
- Therefore, the only way to realize Vision Zero is to remove the driver from the loop, to build driverless vehicles

Some Terms and Definitions

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Automation Levels (SAE)

SAE level	Name	Narrative Definition	Execution of Steering and Acceleration/ Deceleration	*Monitoring* of Driving Environment	Fallback Performance of *Dynamic Driving Task*	System Capability *(Driving Modes)*
***Human driver* monitors the driving environment**						
0	No Automation	the full-time performance by the *human driver* of all aspects of the *dynamic driving task*, even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a
1	Driver Assistance	the *driving mode*-specific execution by a driver assistance system of either steering or 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*	Human driver and system	Human driver	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 *driving mode*-specific performance by an *automated driving system* of all aspects of the dynamic driving task with the expectation that the *human driver* will respond appropriately to a *request to intervene*	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	**System**	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**

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Science-Fiction?

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Volvo develops the 'no death' car: Vehicles which drive themselves and are totally crashproof could be on British roads in eight years

- **Vehicle will be fitted with sensors that can detect potential collisions and take action**
- **Firm claims 'nobody will be killed or injured in a new Volvo by 2020'**

By RAY MASSEY, TRANSPORT EDITOR

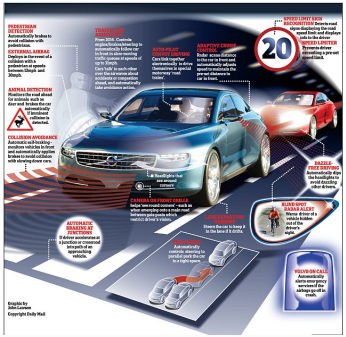
PUBLISHED: 17:59 GMT, 4 December 2012 | **UPDATED:** 07:45 GMT, 5 December 2012

Car giant Volvo is developing 'no death' cars that drive themselves and are impossible to crash – ready for launch in showrooms within eight years.

The computerised vehicles will be fitted with high-tech sensors and will 'refuse to be steered' into other objects.

Volvo says they will be on sale to customers by 2020, but that some of the life-saving technology will be incorporated into its vehicles even earlier – from 2014 – it says.

Scroll down for video



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- Announcements for 2020: GM, Volvo, Ford, Google Waymo, Tesla, Uber, etc.

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Why is it going to work this time?

“We were promised flying cars”

- No need for new dedicated infrastructure
- Progressive introduction of technologies: (advanced) driver assistance systems (ADAS)

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6. Jobs, jobs, jobs

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- Parking management becomes the management of curb space (pick-up and drop-in)

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  - the current alternative causes 1.2 million fatalities and more than 50 million injuries per year in the world
- There are risks to repeat history and make society even more car-dependent

Proactive Discussion

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- to take the opportunities to rethink the cities and our life styles
- to manage the complex and potentially chaotic transition

Eric Schmidt, Google CEO, said in 2010

> *“It’s amazing to me that we let humans drive cars. It’s a bug that cars were invented before computers.”*

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- Interactions with active modes of transportation
- Public transit and inter-city transportation