



Continental Commercial Vehicle Days

Evolution of Environmental Perception Based Functions

Dr. Georg Fässler | September 8, 2020

Future Transportation

Necessity: Addressing the transportation challenges



Future Transportation

Necessity: Addressing the transportation challenges



**Lack of
truck drivers**



**Very low
margins of fleets**



**High number of
fatal accidents**



**Sustainable
transportation**

→ Improve public perception of trucks!



Future Transportation

Perception will address specific pain points

Fleets | Total cost of Ownership (TCO)

- › Increase revenues
- › Reduce costs



Society | Legislation

- › Safer vehicles
- › Greener vehicles



**Search for uses case
which add value**



Future Transportation

The key role of environmental perception

Perception can:

- › Detect objects
- › Classify objects
- › Detect position
- › Detect motion
- › Detect intention
- › Much, much more!

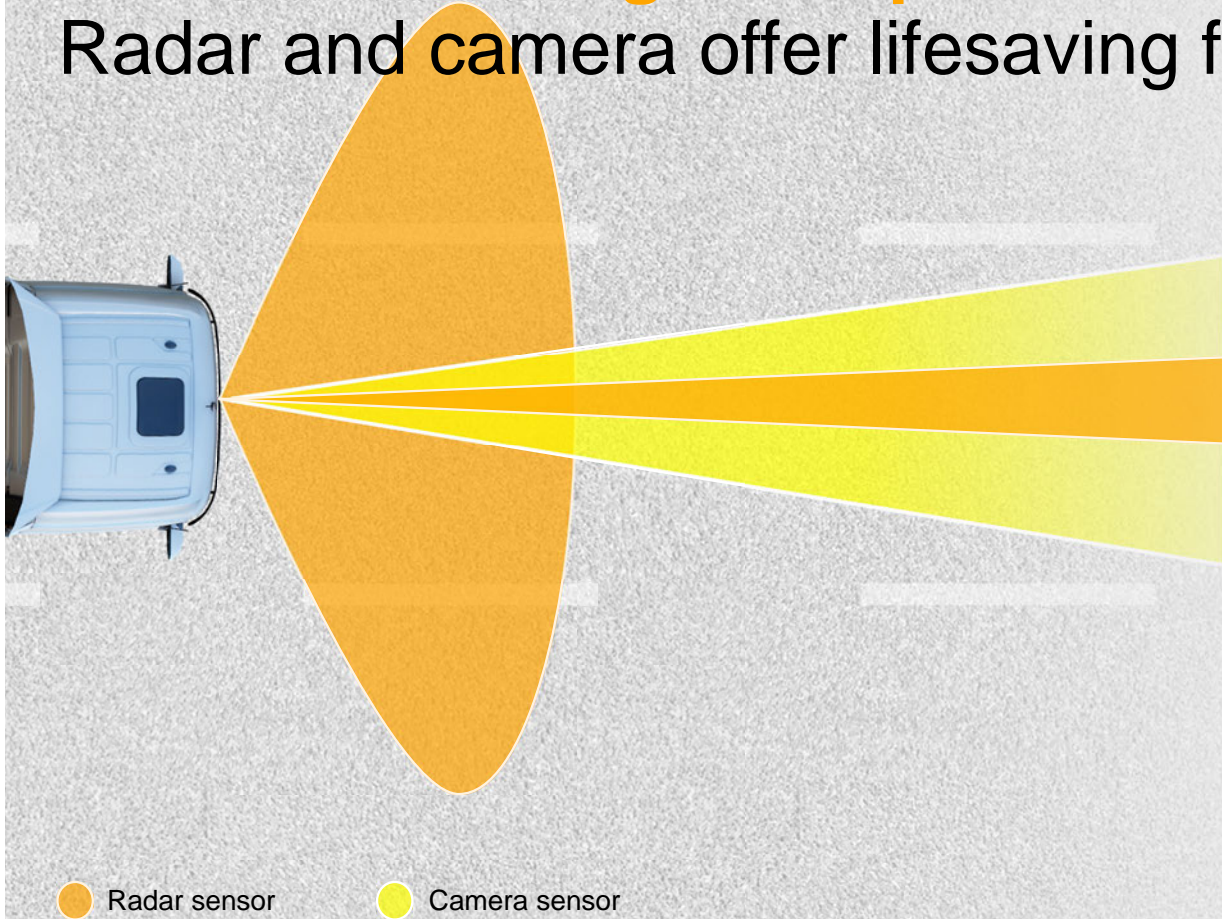
Perception should:

- › Look in all directions
- › Look inside and outside
- › Look beyond line of sight



Forward Looking Perception

Radar and camera offer lifesaving functions



Today

- › Automatic emergency brake assist*
- › Lane departure warning system*



-
- › Emergency lane-keeping system*
 - › Intelligent speed assist*
 - › Moving off information system**



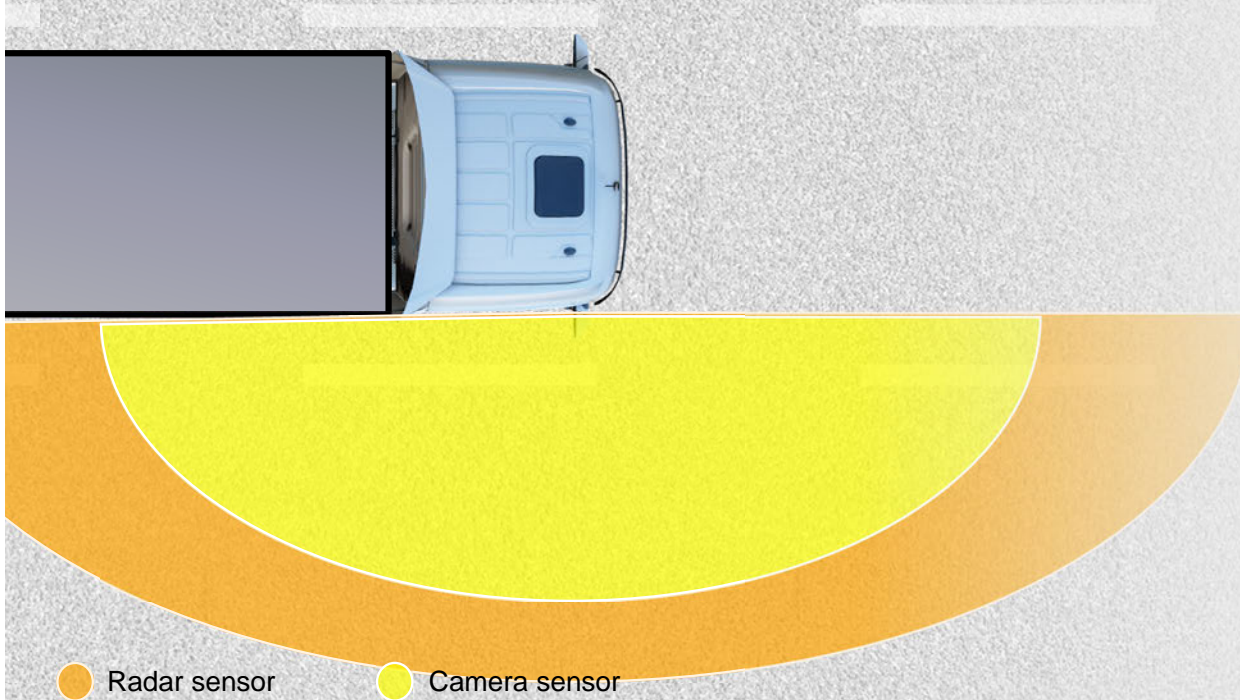
Tomorrow

* Part of EU General Safety Regulations

** UN ECE proposal

Side Looking Perception

Lifesaving functions for pedestrians and cyclists



Today

- › Surround view for rigid trucks



- › Blind spot information system*
- › Automatic maneuvers to protect vulnerable road users
- › Left turn at junctions assist

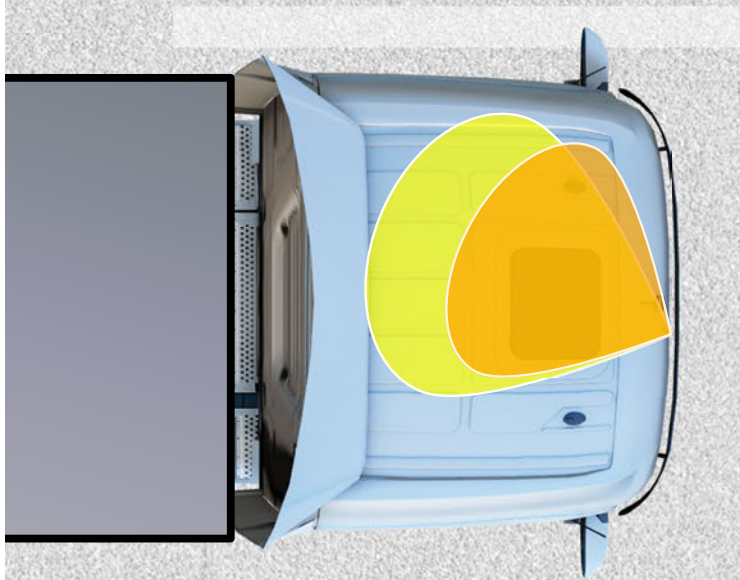


Tomorrow

* Part of EU General Safety Regulations

Driver Looking Perception

Knowing the driver is fit to drive



● Radar sensor ● Camera sensor

Today

- › Steering based drowsiness detection



- › Driver drowsiness and attention warning*



- › Advanced driver distraction warning*



- › Detection of driver health & wellbeing




Tomorrow

* Part of EU General Safety Regulations

Rear Looking Perception

Eliminating a significant blind spot



 Camera sensor

Today

› Rear view cameras in rigid trucks



› Reversing detection for rigid trucks*

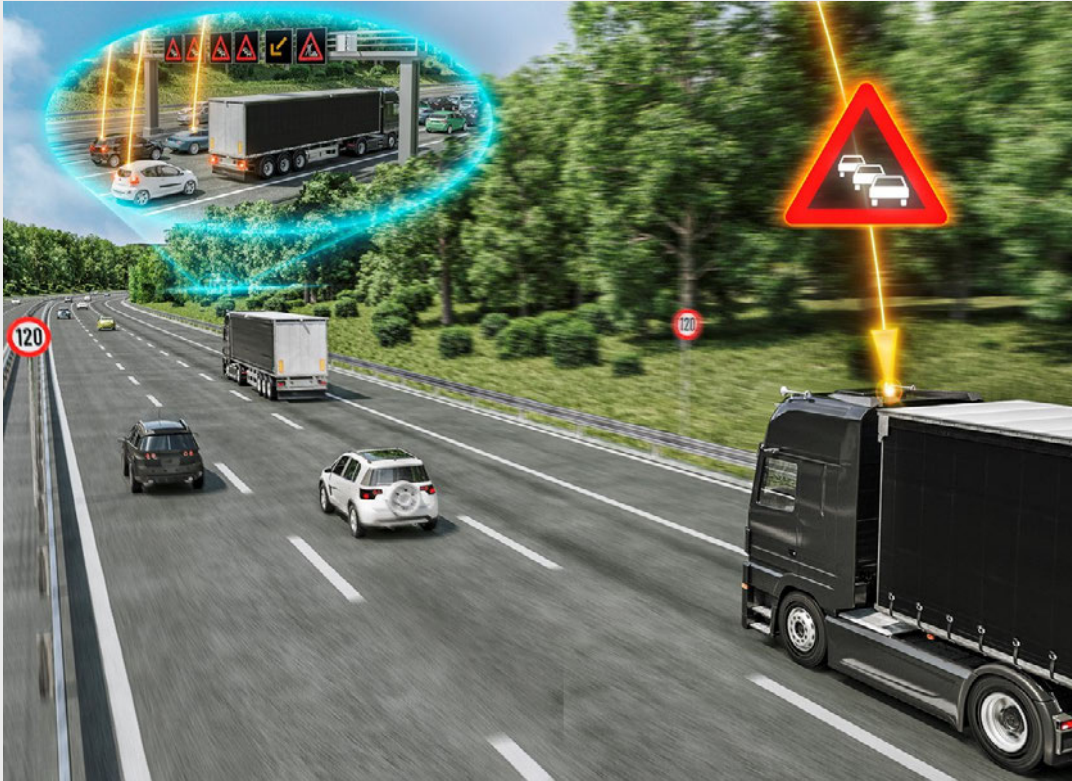


Tomorrow

* Part of EU General Safety Regulations

Perception Beyond the Line of Sight

eHorizon



Today

- › Static road data for most probable path e.g. road topology



- › Traffic flow data for most probable path



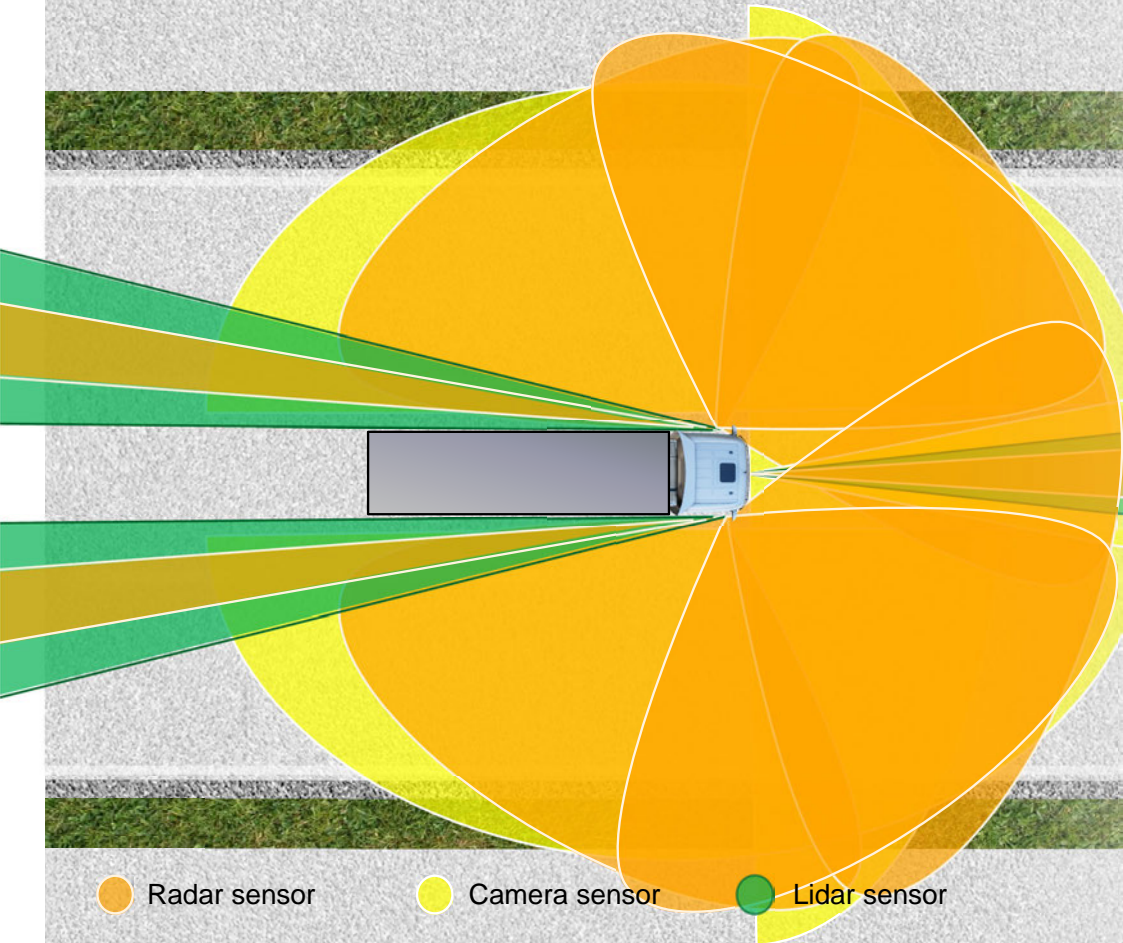
- › Road friction data for most probable path



Tomorrow

Redundant 360° View

Enabling autonomous driving



● Radar sensor ● Camera sensor ● Lidar sensor

Today

- › Continental prototype testing on public road

- › Driverless maneuvering in confined areas

- › Driverless level 4 hub-to-hub travel



Tomorrow

Redundant 360° View

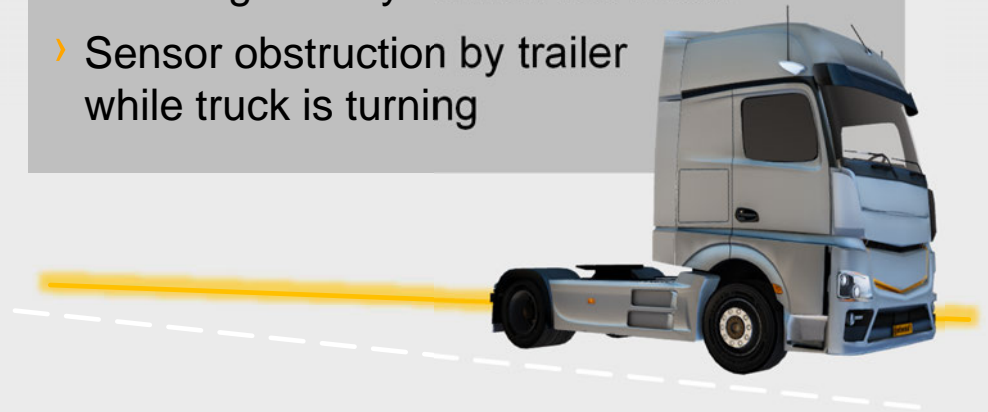
More than placing a few sensors on a truck

General challenges

- › Perception range
- › Safe and robust localization
- › Free space / small obstacle detection
- › Detection performance

Truck specific challenges

- › Compensation of nick and roll of cabin
- › Accommodation of varying trailer configuration
- › Sensing directly behind the trailer
- › Sensor obstruction by trailer while truck is turning



Summary: What Environmental Perception Can Achieve

Support for fleets and society

Trucks can deliver!

- › New perception functions can reduce road fatalities and thereby fleet costs
- › Legislation will drive truck ADAS penetration in EU and will add an important facet to vehicle safety
- › Level 4 hub2hub automation is one way to address driver shortage & TCO reduction



Continental can deliver!

- › Leading edge radar, camera and lidar sensors
- › Functions, algorithms and solution elements
- › Solutions which fulfill forthcoming GSR* requirements
- › Highly sophisticated connectivity solutions to support safety & TCO reduction



* General Safety Requirements

Georg Fässler, © Continental AG



He will...
...see you on
the road!

A large, dense pile of 3D white question marks is scattered across the right side of a light gray background. The question marks are of various sizes and orientations, creating a sense of depth and volume. Some are standing upright, while others are lying flat or partially buried in the pile. The lighting is soft, casting gentle shadows that emphasize the three-dimensional nature of the objects.

Questions and Answers

Continental

