



Automotive Safety: Driving or being driven? ESV conference

Stuttgart, June 15th 2009

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Automotive Technology

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Automotive Safety: Driving or being driven?

1

Safety as top priority – examples of driving factors

2

Active and passive safety systems – markets today

3

Technology driving improved safety

4

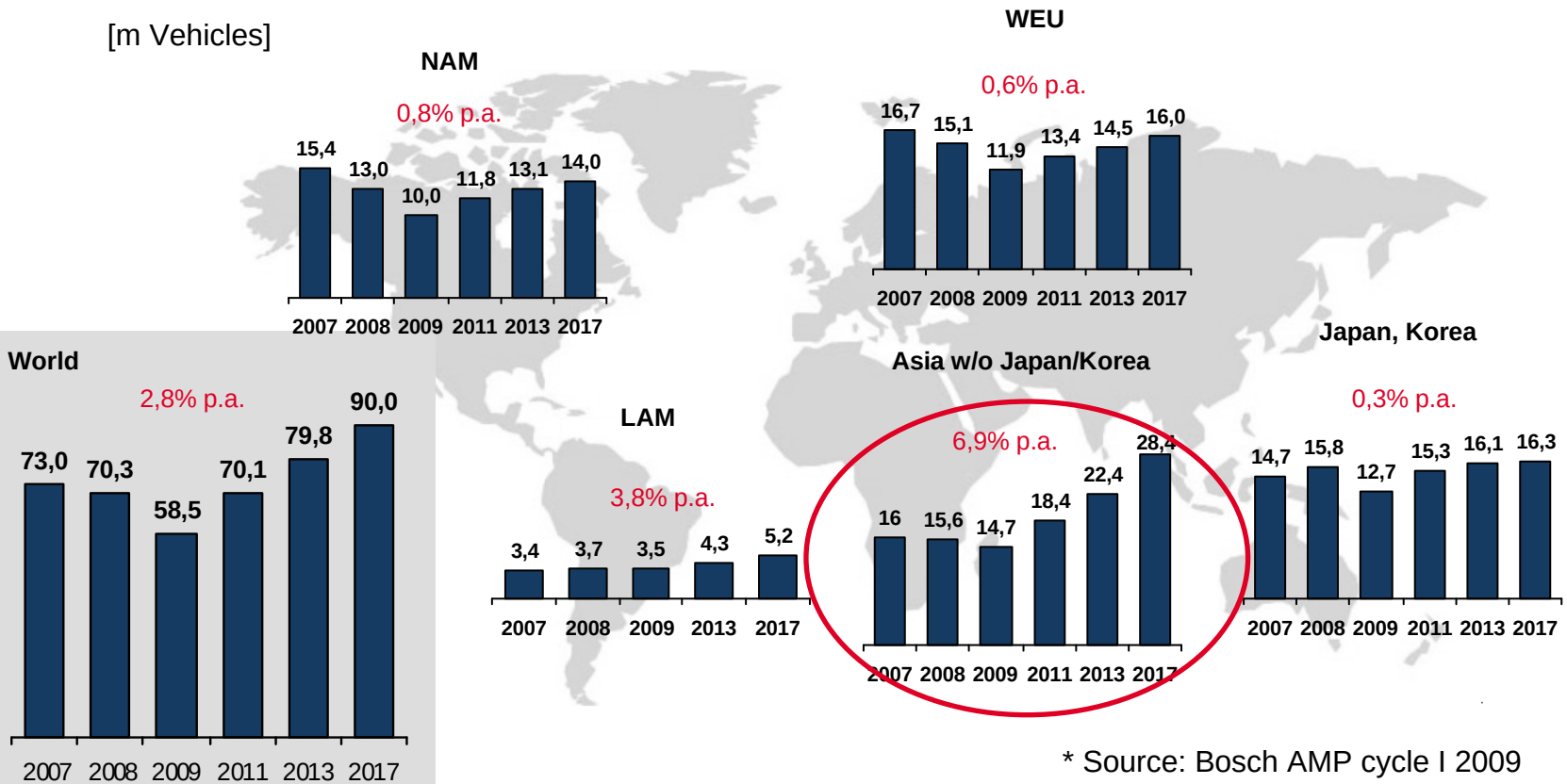
Conclusions



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Driver 1: Worldwide production forecast – growth in EM

[m Vehicles]



* Source: Bosch AMP cycle I 2009

Asia as main driver of worldwide PC fleet growth – share of small cars increases

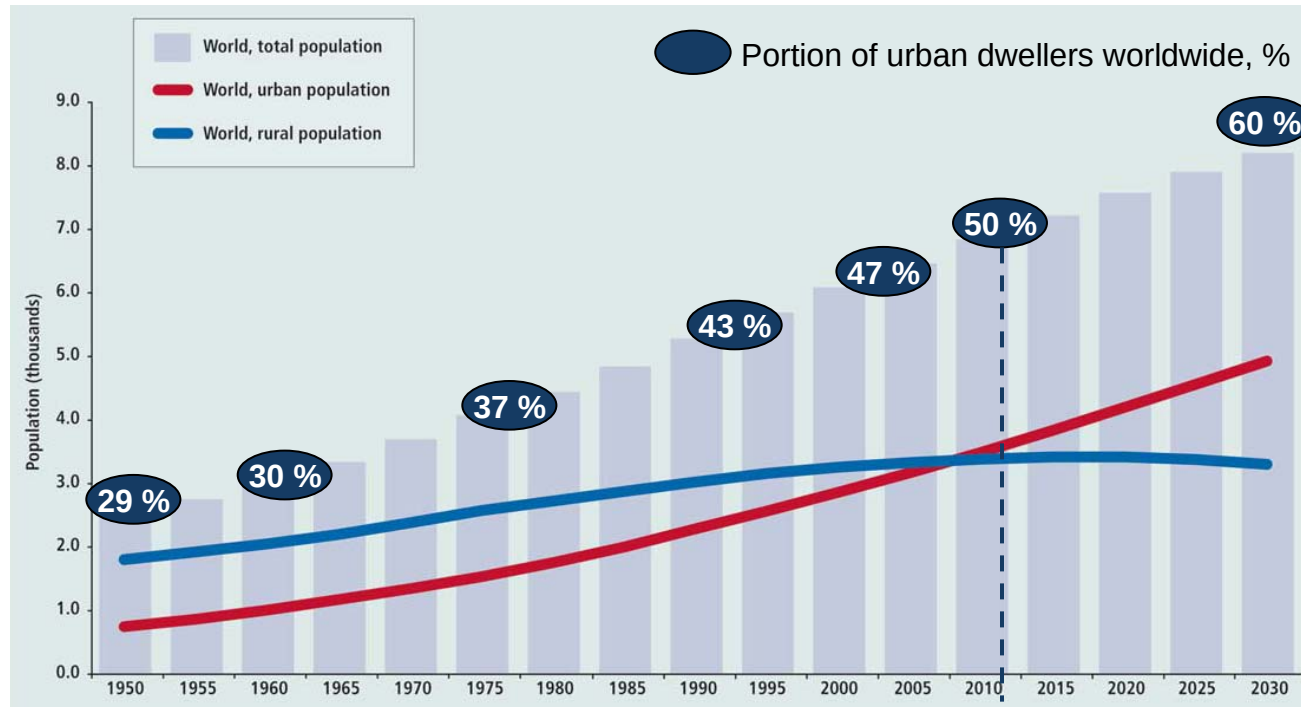




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Driver 2: Urbanization

Development of Urbanization worldwide, 1950 - 2030



Urbanization leads to traffic concentration – supporting segment shifts



Major drivers

- ➔ In developed countries extensive governmental programs to enhance traffic safety, reduce number of fatalities and decrease cost for society lead to focus on more efficient safety systems.
- ➔ Segment shift toward smaller and lighter cars – driven by growth in emerging markets and urbanization lead to growing importance of passive and active safety systems.



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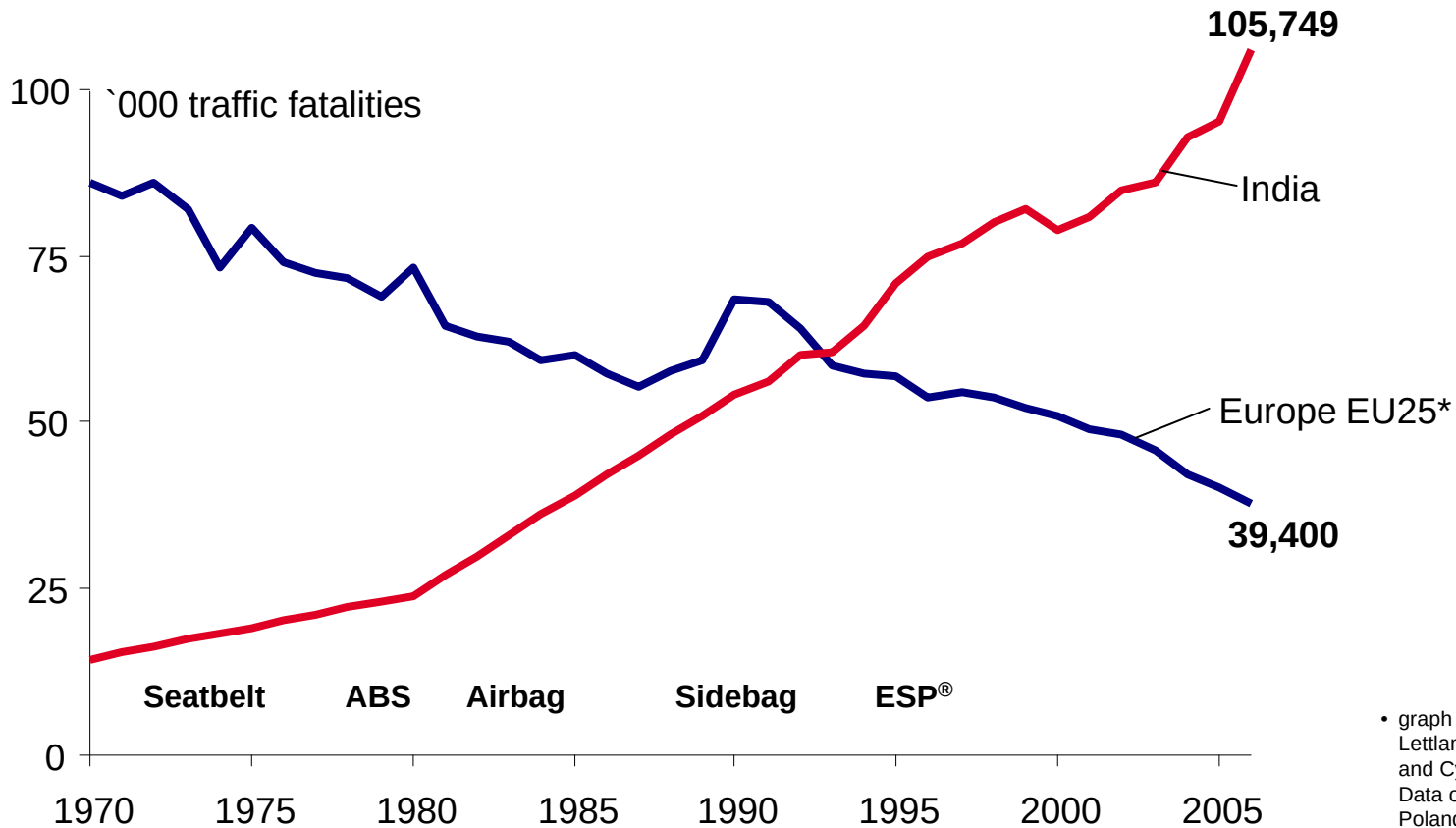
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Active and passive systems have strongly improved traffic safety



Source: IRTAD 2009, Government of India: Department of road transport and highways

• graph w/o Estland, Lettland, Litauen, Malta and Cyprus, Data of Slovakia and Poland partially

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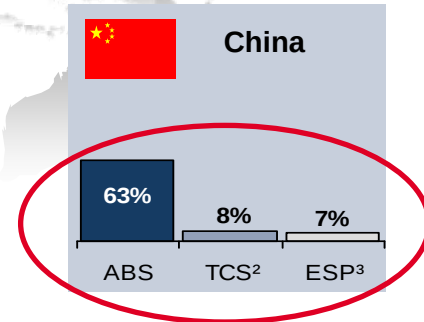
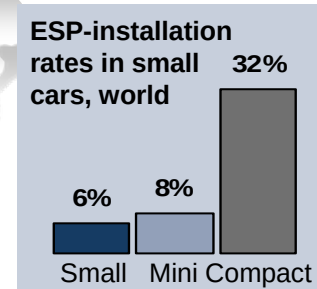
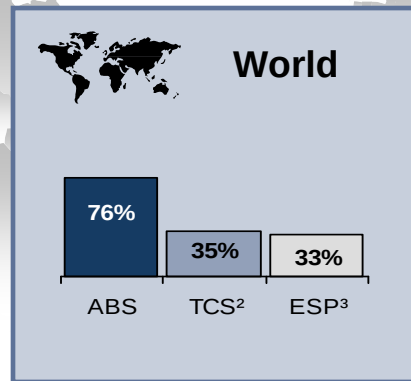
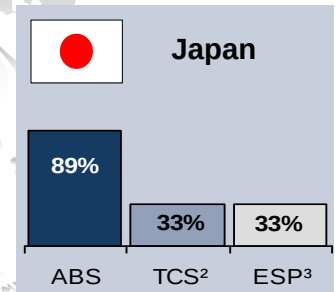
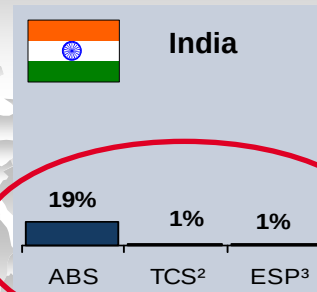
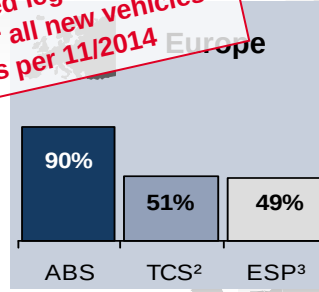
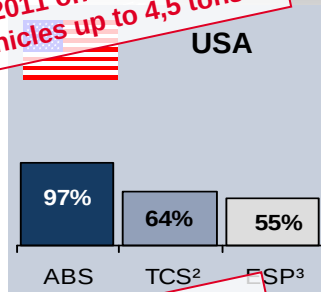
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Installation Rate by Production 2008¹

ESP mandatory from 09/2011 onwards for all vehicles up to 4,5 tons

European Parliament adopted legislation on ESP for all new vehicles* as per 11/2014

ABS and Front-Airbag mandatory from 2014 onwards for PC and LCV; ABS for all vehicles



¹ Passenger cars & LCV <6t

² TCS includes ABS

³ ESP includes ABS and TCS



Road safety – today's world

- Small car segments – which are growing – have much lower share of active safety systems.
- Emerging markets need to focus much more on safety. Continuation of the current trends will lead to a strong rise in fatalities, overcompensating the improvements in the US and EU.
- Legislation plays key role to improve situation.



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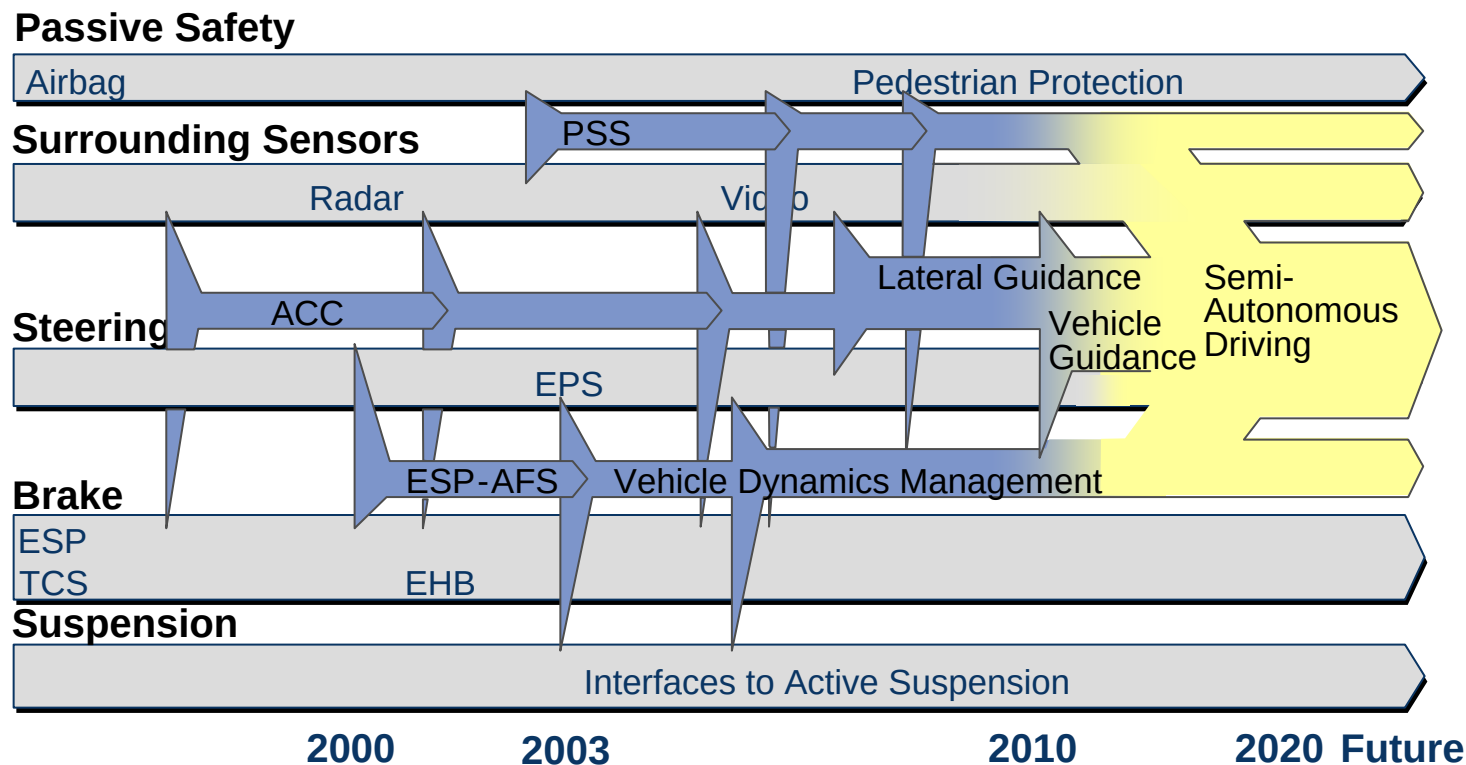
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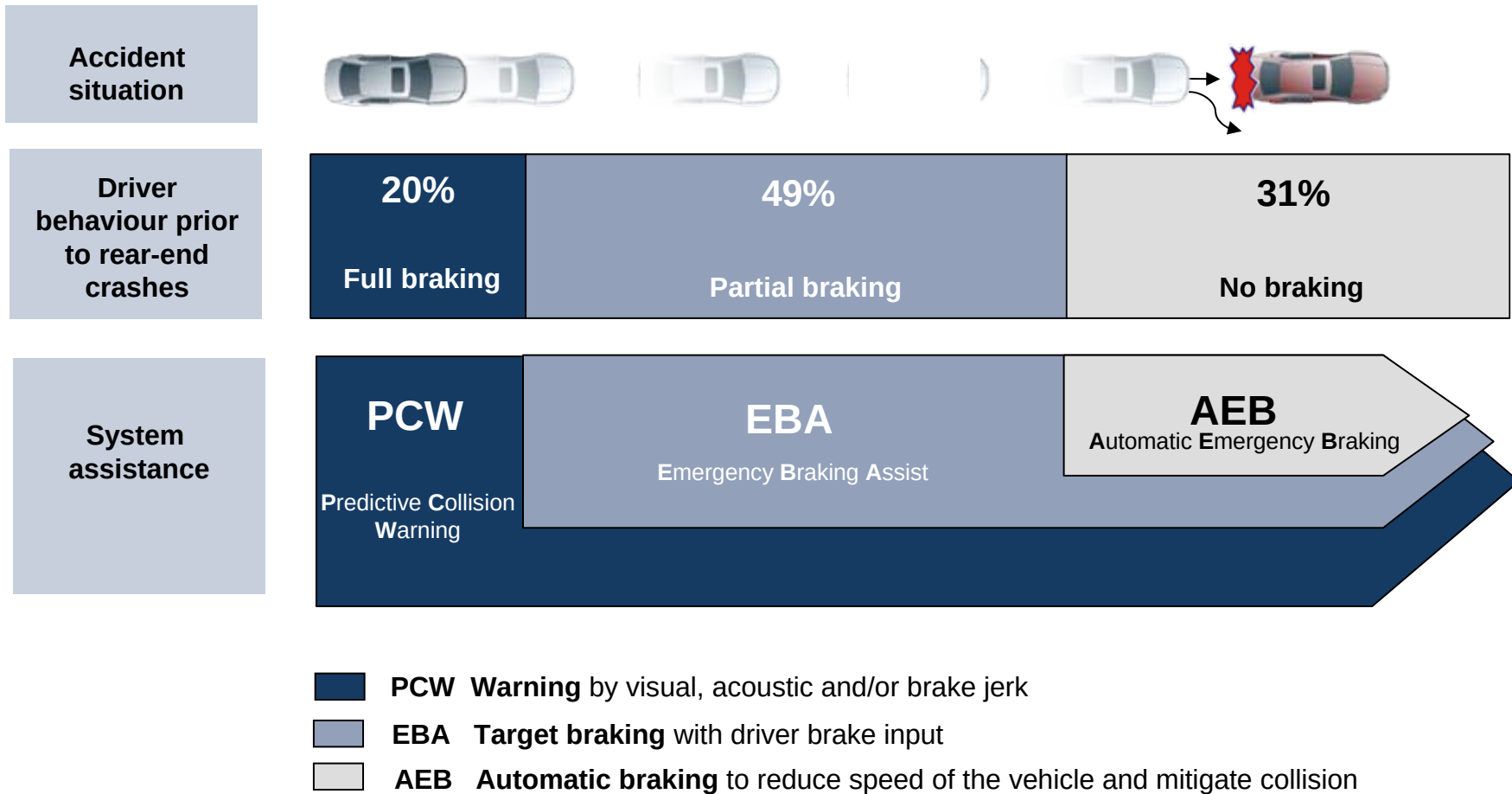


Further improvements through sensor fusion



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Optimal deceleration with Predictive Emergency Braking



Support in critical situations - Evasive Steering Support

Situation

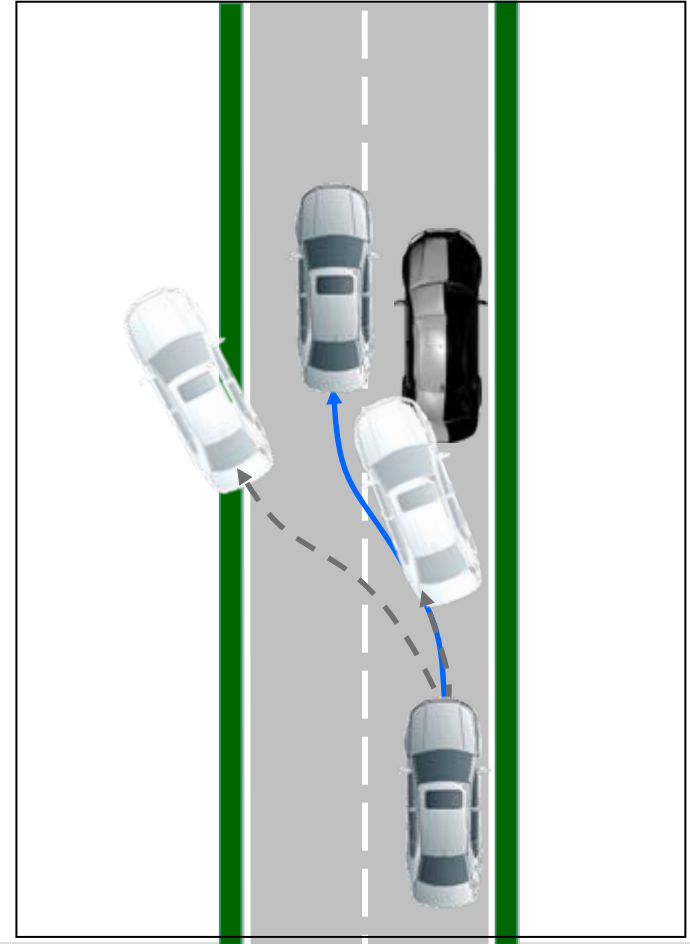
- Potential rear-end collision
- Emergency braking is insufficient to avoid accident
 - Evasive maneuver must be undertaken
 - Driver inexperienced and stressed
- **Driver likely over-reacts or under-reacts**

Hazards

- Getting off road
- Incomplete maneuver (rear-end collision)
- **High risk of even more severe crashes**

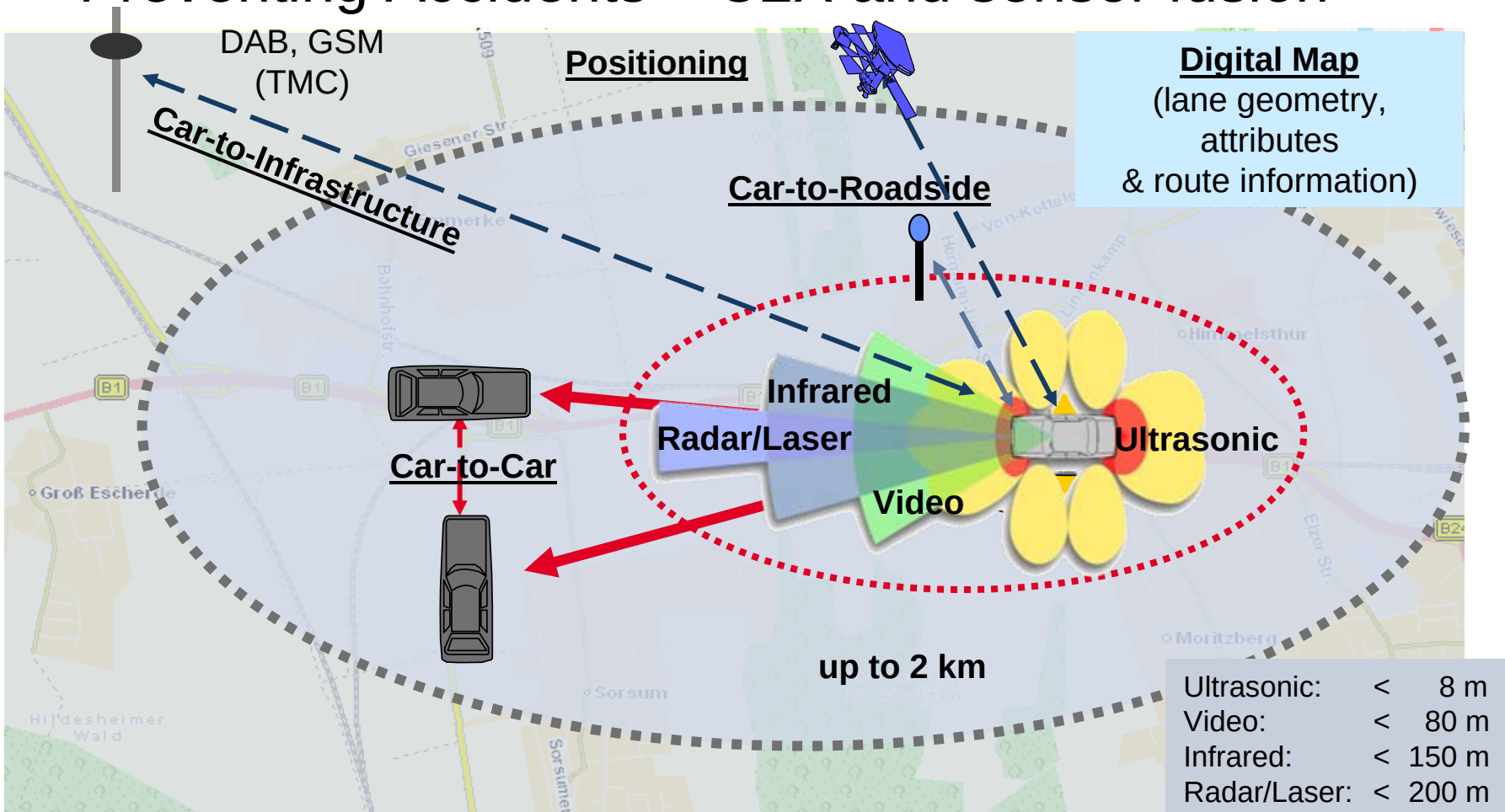
ESS-T*

- Optimal steering support to avoid front crashes
- Reduced risk of crashes and injuries



* Evasive Steering Support by Torque

Preventing Accidents – C2X and sensor fusion



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Bosch invests in affordable technologies

- e.g. Airbag Basic Line

Approach

- development at low cost location with support from RB Germany
- manufactured in the customer region

Customer benefits

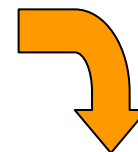
- reduced size and weight by use of innovative packaging concept
- concept based on standard Bosch components
- Simplified mounting concept



Investing in road safety in emerging markets

Supporting Motorization

- RB-Investment in systems for low price vehicles – to support the change from 2-wheelers to affordable cars



Investing in the regions

- Since 2007 ABS production in Brazil
- In October 2009 ABS production in India



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- Urbanization and growth of motorization in emerging markets drive growth of the smaller car segments.
- High market penetration of passive and active safety systems – esp. belt, ESP, airbag – is crucial for achieving low injury and fatality rates.
- Providing systems for LPV to support the change from 2-wheelers to affordable cars is important to improve road safety in emerging markets.
- Future reduction of injuries and fatalities through advanced system with a network of sensors and intelligent actuators including C2X
- Legislation plays an important role.





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