Road Safety Improvements Through Itelligent Transport Systems (ITS)

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Definition of ITS

The deployment and roll-out of Intelligent Transport Systems (ITS) i.e. transport related systems employing information and communication technologies

ITS

ITS are being implemented and installed in both vehicles and as part of the road infrastructure.

Many systems use both in-car technology and technology at the roadside or on the road
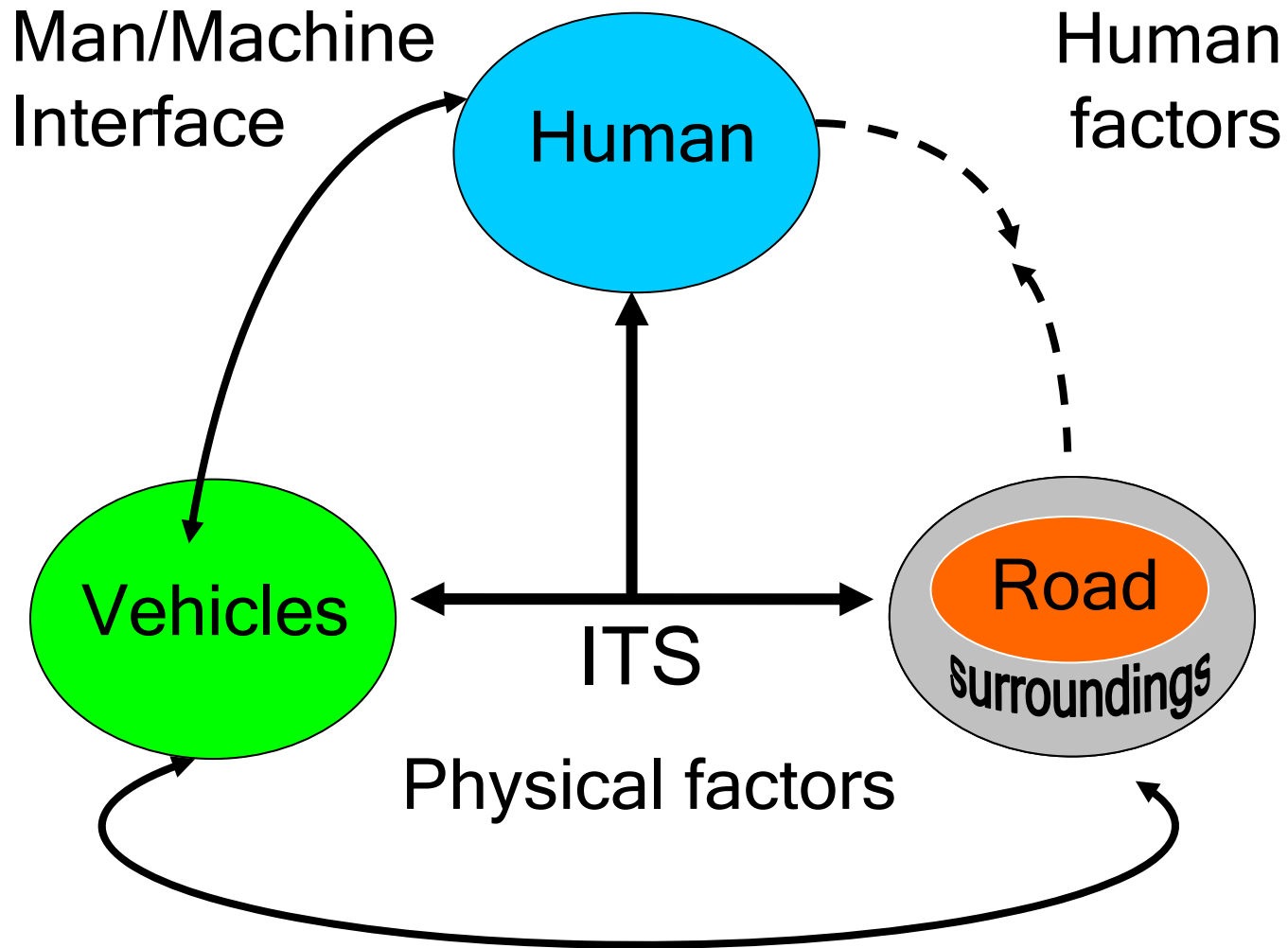
Objectives of ITS implementation

➔ Saving time, cost and energy

➔ Improving road safety

➔ Reducing the negative effects of the road transport on the environment


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Accident factors

Man/Machine Interface

Human factors

Human

Vehicles

Road surroundings

ITS

Physical factors

Is ITS God or Bad for Road Safety ?

➔ **Positive effects:** reduce the time spent on the road, thereby reducing the number and seriousness of crashes, traffic congestion and pollution

➔ **Negative effects:** makes using a vehicles much more attractive = more traffic => the number of crashes increases
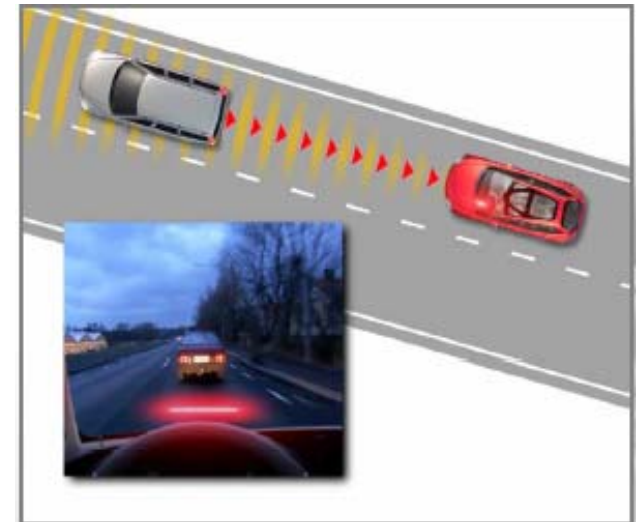
Automated Enforcement of Traffic Rules

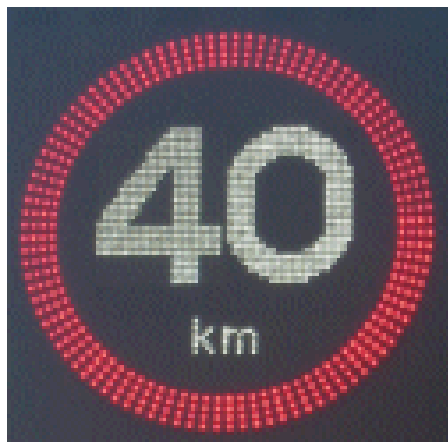| Type of ITS	Type of crash affected	Estimated reduction in fatalities in this specific type of crash
Automated Enforcement of Traffic Rules	Crashes involving violation of traffic rules like speeding, red light running	-15…-25 %

Intersection Signal Control

Type of ITS	Type of crash affected	Estimated reduction in fatalities in this specific type of crash
Intersection Signal Control	Crossing and turning crashes, pedestrian run-overs	-15…-25 %

Dynamic Traffic Management and Local Danger Warning

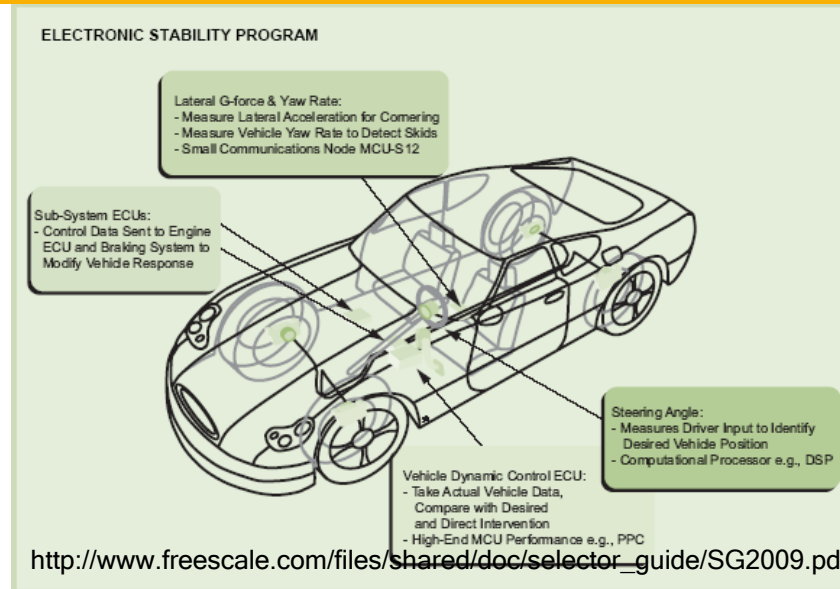| Type of ITS	Type of crash affected	Estimated reduction in fatalities in this specific type of crash
Dynamic Traffic Management and Local Danger Warning	Crashes in adverse conditions like pile-ups	-5…-25 %

Intelligent Speed Adaptation (ISA)

Type of ITS	Type of crash affected	Estimated reduction in fatalities in this specific type of crash
Intelligent Speed Adaptation (ISA)	Crashes involving speeding	-15...-25 %

eCall

http://www.esafetysupport.org/en/ecall_toolbox/

Type of ITS	Type of crash affected	Estimated reduction in fatalities in this specific type of crash
eCall	All serious crashes	-2…-15 %

Electronic Stability Program (ESP)

ELECTRONIC STABILITY PROGRAM

Lateral G-force & Yaw Rate:
- Measure Lateral Acceleration for Cornering
- Measure Vehicle Yaw Rate to Detect Skids
- Small Communications Node MCU-S 12

Sub-System ECUs:
- Control Data Sent to Engine ECU and Braking System to Modify Vehicle Response

Steering Angle:
- Measures Driver Input to Identify Desired Vehicle Position
- Computational Processor e.g., DSP

Vehicle Dynamic Control ECU:
- Take Actual Vehicle Data, Compare with Desired and Direct Intervention
- High-End MCU Performance e.g., PPC

http://www.freescale.com/files/shared/doc/selector_guide/SG2009.pdf

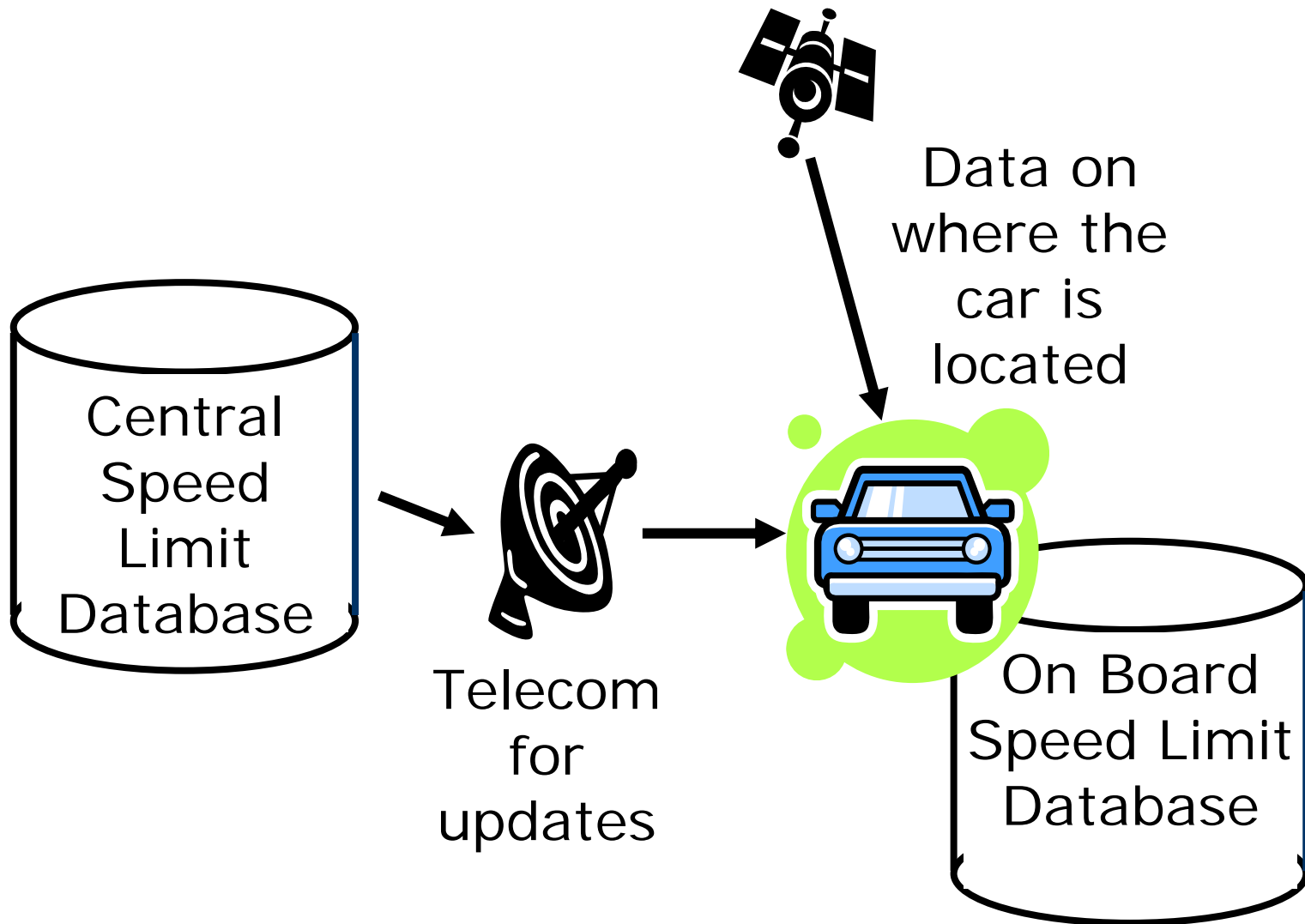| Type of ITS	Type of crash affected	Estimated reduction in fatalities in this specific type of crash
Electronic Stability Control or Program (ESC/ESP)	All but especially single crashes, loss of control, crashes on wet and slippery roads.	-15…-40%

Alcohol (Ignition) Interlock

http://www.rta.nsw.gov.au/roadsafety/drinkdriving/alcoholinterlock.html

Type of ITS	Type of crash affected	Estimated reduction in fatalities in this specific type of crash
Alcohol (Ignition) Interlock	Crashes involving intoxicated drivers.	-20...-25 %

Human Factors

Central Speed Limit Database

Telecom for updates

Data on where the car is located

On Board Speed Limit Database

Recommended actions for Road Authorities (1)

➜ Exchange information

➜ Take care that sufficient research is carried out with regard to the road safety aspects of ITS

➜ ITS to improve the safety of vulnerable road users

Recommended actions for Road Authorities (2)

➔ Monitor the quality of the systems and services

➔ Monitor the issue of standardisation

➔ Develop a vision and strategy for the deployment and operation of services and systems
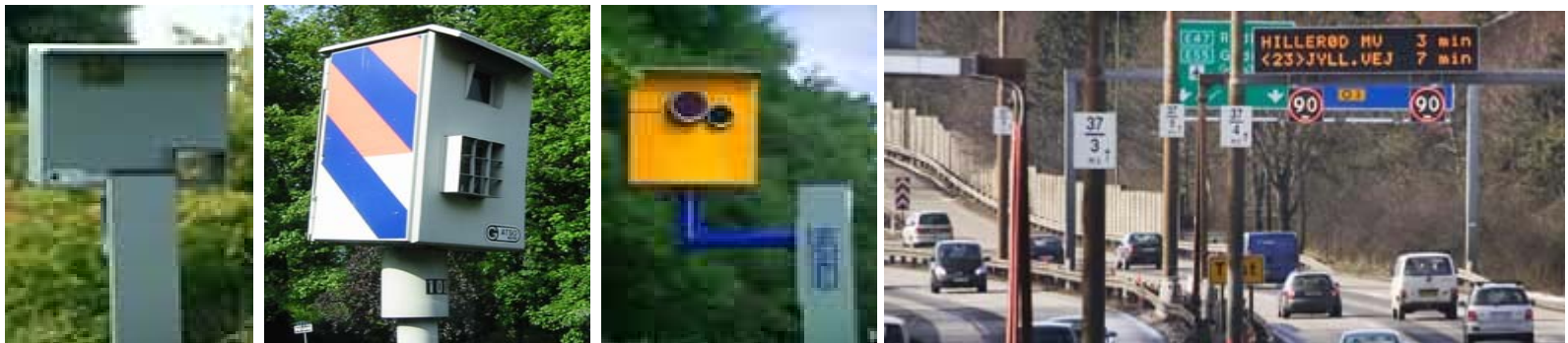
Conclusions

For the road based systems Road Authorities should:

➔ implement those systems at locations where they are expected to have measurable influence on the number of crashes.

➔ the same is the case with systems incorporating both road and vehicle technology

Conclusions

For the vehicle based systems Road Authorities should:

➔ put pressure on vehicle manufactures to include the systems as a standard features and they should influence governments to lower taxes on those systems that save lives
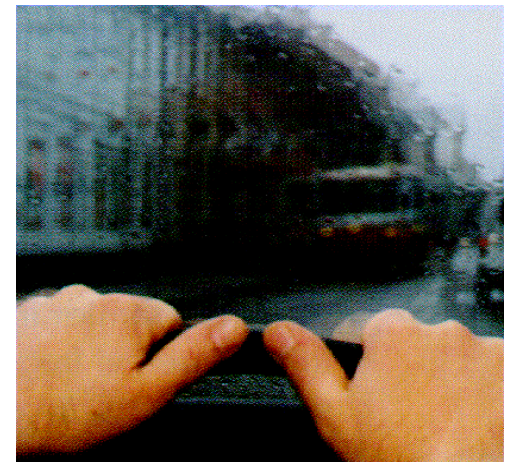
The full report will be avialable at the PIARC website later this year

Thank you very much