

Potential impacts of the increased deployment of advanced driver assistance systems on the numbers of killed or seriously injured (KSI) car occupants, pedestrians and cyclists in Norway

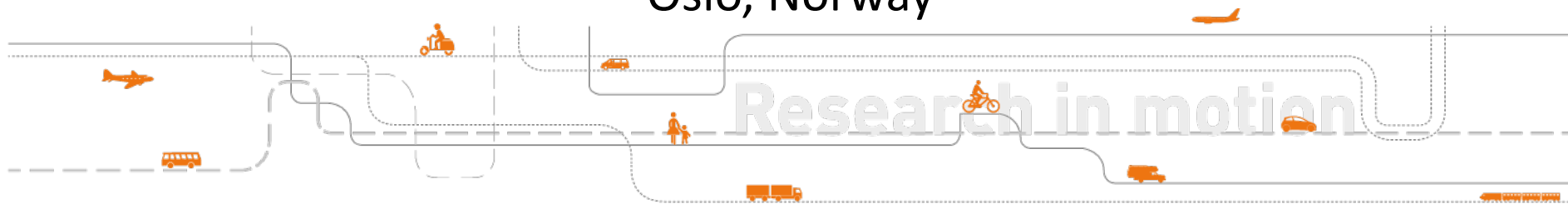
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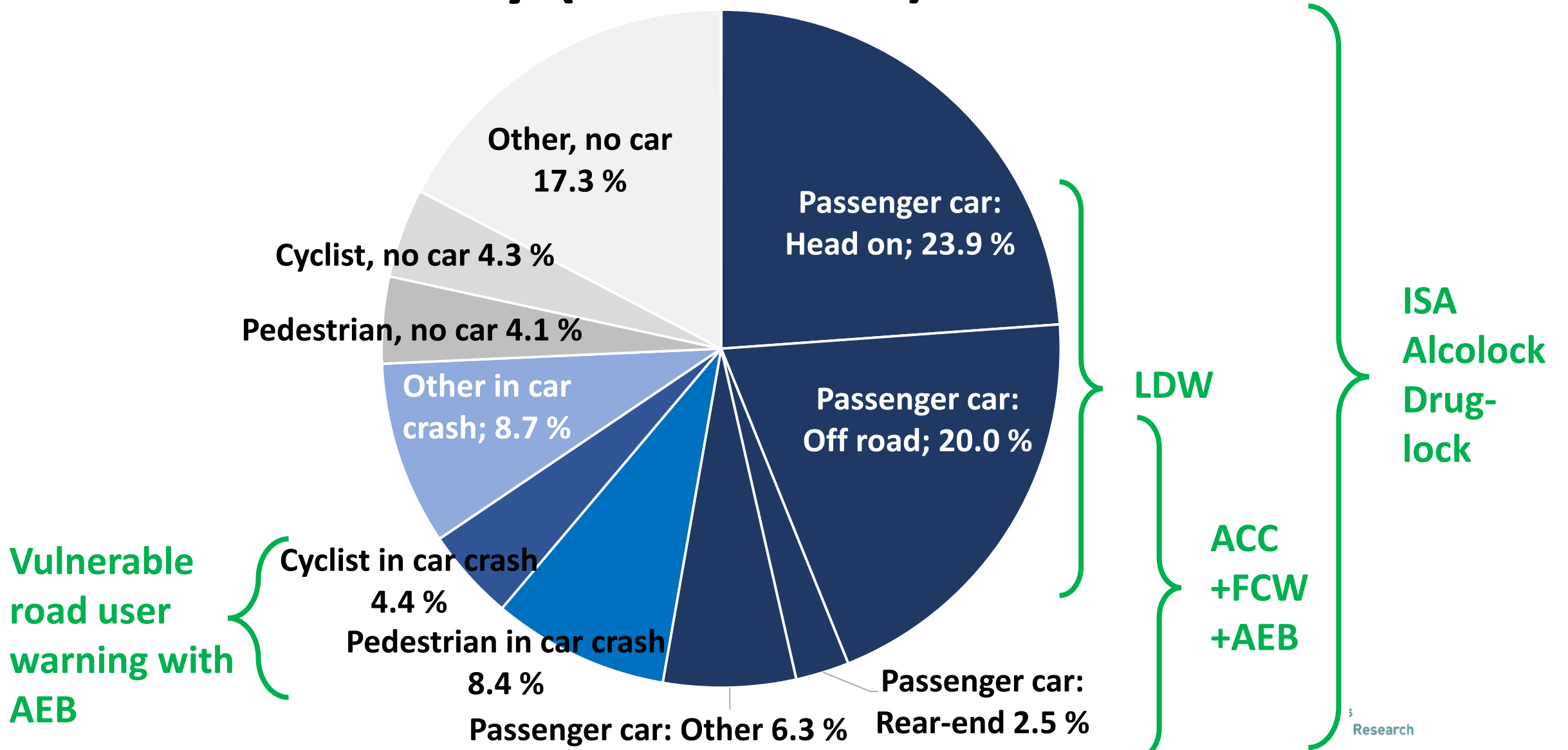
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KSI in Norway (2010-2014)



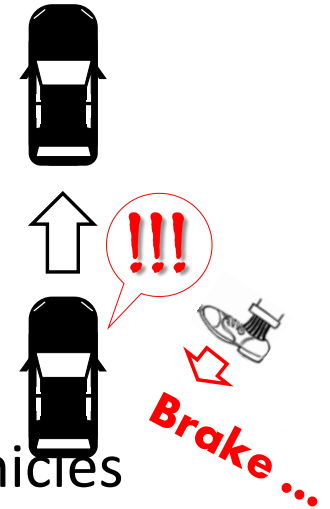
ACC with forward collision warning (FCW) and automatic emergency brake (AEB)

▪ Definition

- ACC regulates speed and headway (can be turned off)
- FCW warns, AEB brakes – Wide range of different systems
- “High speed”

▪ Effect on KSI

- Affects rear-end collisions and most other collisions with motor vehicles
- Spare part calls, insurance claims, field/simulator studies, crash statistics
- Highly inconsistent findings
- Assumed -5.3 % KSI in passenger cars



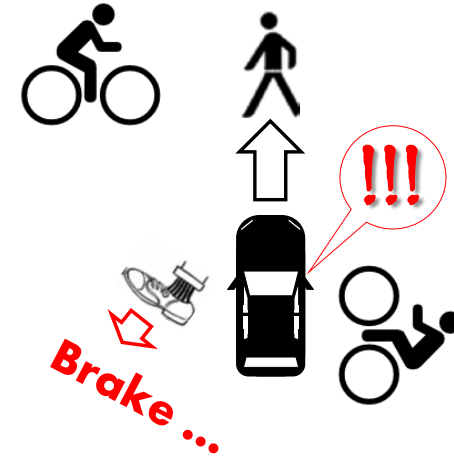
Vulnerable road user warning with AEB

▪ Definition

- Basic: Detects pedestrians in front of the car, AEB brakes
- Medium: ... + cyclists
- Advanced: ... + blind spot warning

▪ Effect on KSI

- Field/simulator studies, crash statistics: Pedestrian/cyclist – car collisions
- Basic: -7 % KSI pedestrians in pedestrian-car crashes
- Medium: -7 % KSI pedestrians, -7 % KSI cyclists....
- Advanced: -7 % KSI pedestrians, -8 % KSI cyclists....



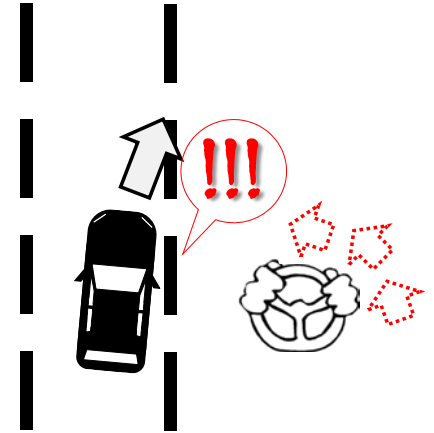
Lane departure warning (LDW) / Autonomous lane keeping

▪ Definition

- LDW: Warns the driver
- Autonomous lane keeping: Keeps the lane (in specific situations)

▪ Effect on KSI

- Crash studies, field/simulator studies, crash statistics
- LDW: -6.4 % KSI in passenger cars
- Autonomous lane keeping: -15.8 % KSI in passenger cars



Intelligent speed adaptation (ISA)

▪ Definition

- Informative: Warns the driver
- Overridable: Counterforce on the accelerator pedal
- Mandatory: Non-overridable

▪ Effect on KSI

- ISA affects speed – Speed affects KSI
- Informative: **-7.5 %**; Overridable: **-9.3 %**; Mandatory: **-16.2 %** KSI in crashes with passenger car
- Involuntary drivers speed more + are less inclined to comply



Alcohol ignition interlock / drug ignition interlock

▪ Definition

- Alcolock: Prevents drunk driver from starting the engine
- Drug ignition interlock: ... driver under the influence of drugs



▪ Effect on KSI

- Alcohol/drugs – crash risk
- Alcolock: **-11.1 %** KSI in crashes with passenger car
- Drug ign. interlock: **-14.6 %** KSI in crashes with passenger car
- Max effect for most involuntary drivers
- More drunk/drug driving in older cars

Uptake of driver assistance systems: Delphi survey

▪ First round

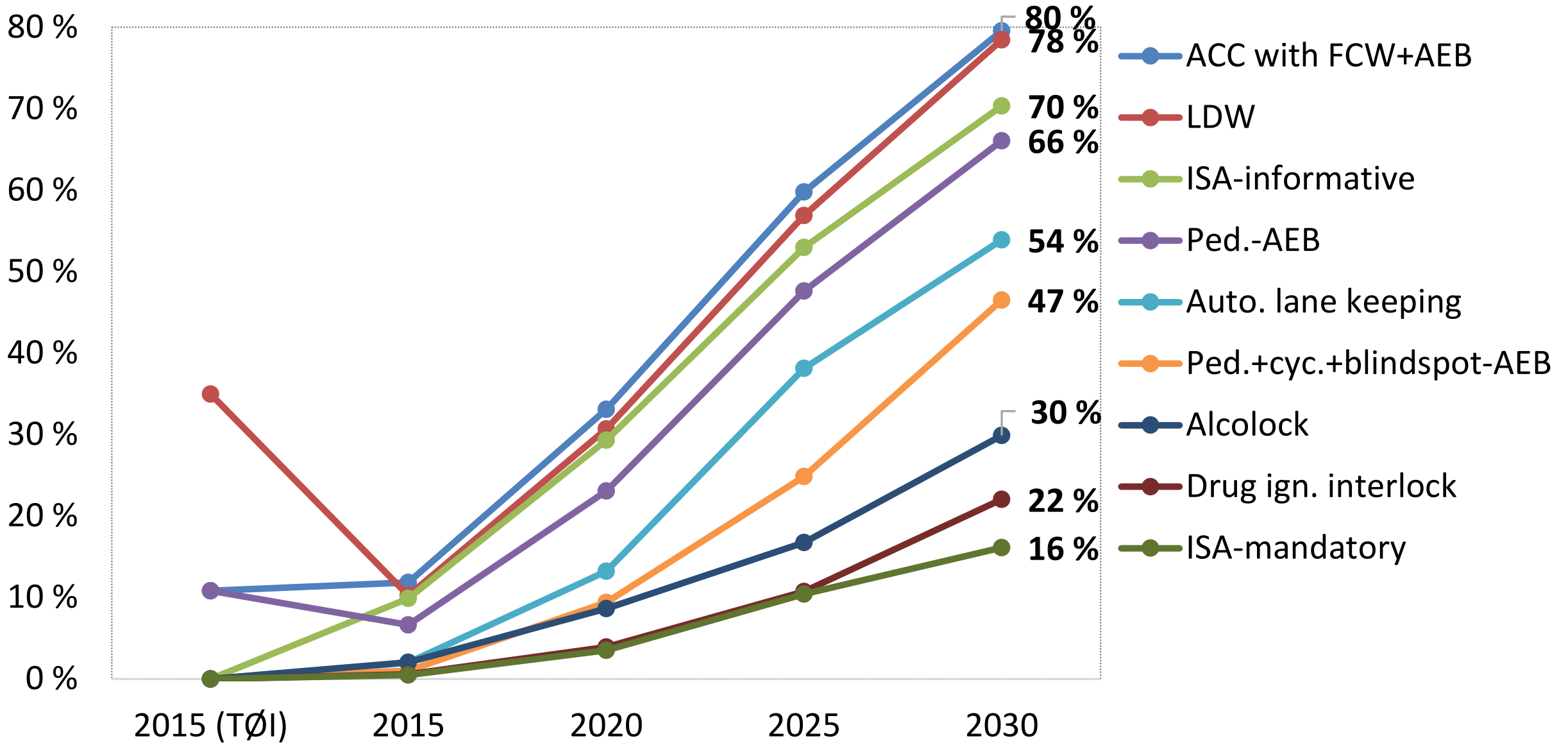
- N = 51
- 60% Norway; 30% Sweden
- 65% research; 24% administration; 6% car manufacturers
- Proportions of new cars with measure X? Mandatory?

▪ Second round with feedback

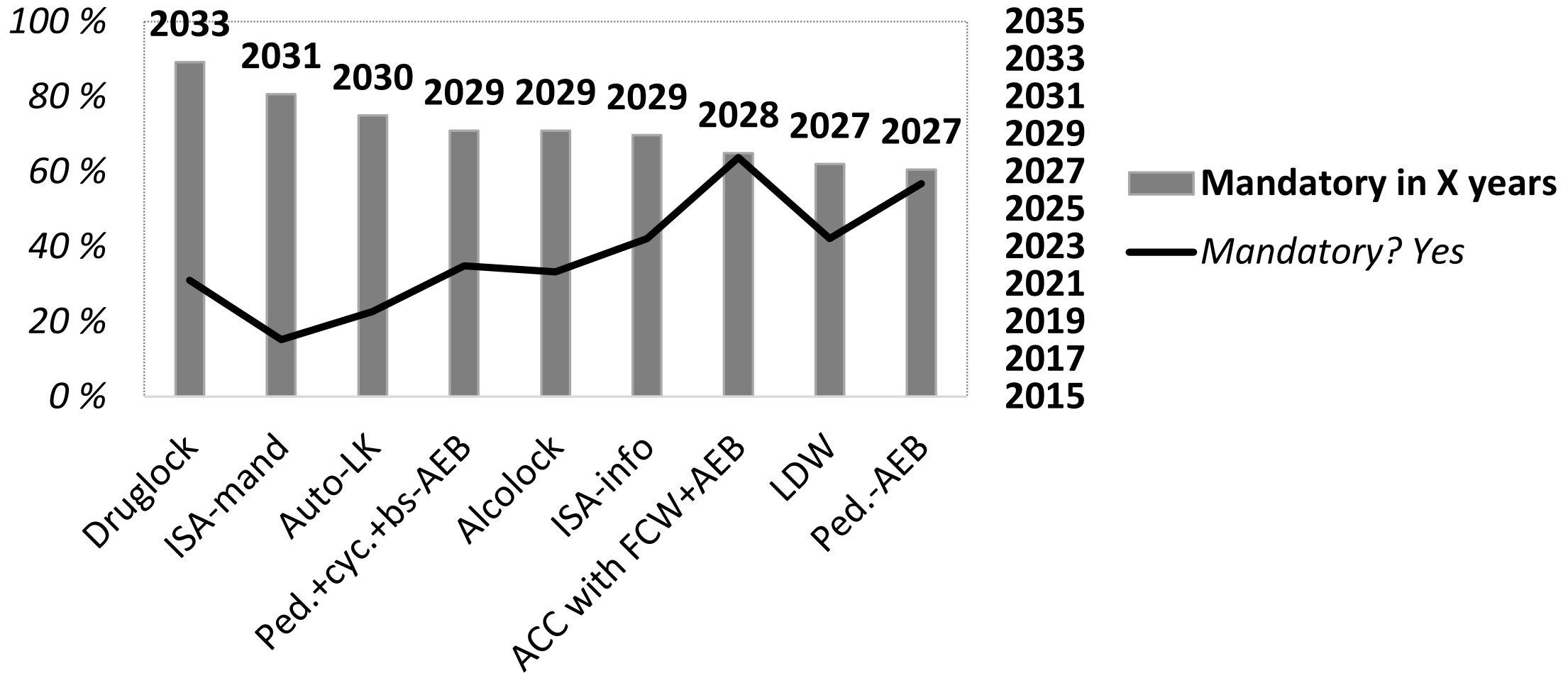
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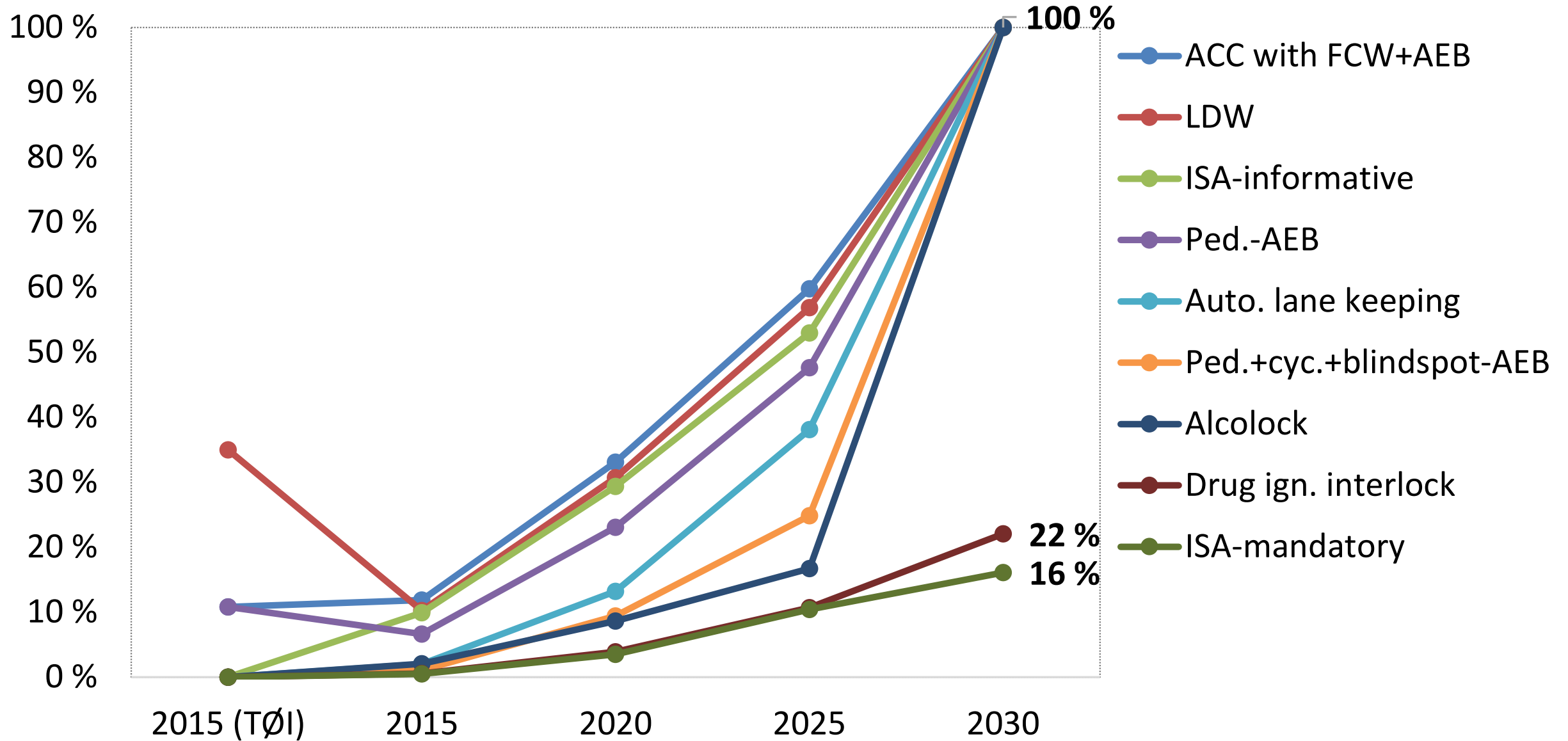
Delphi-estimated penetration rates - voluntary



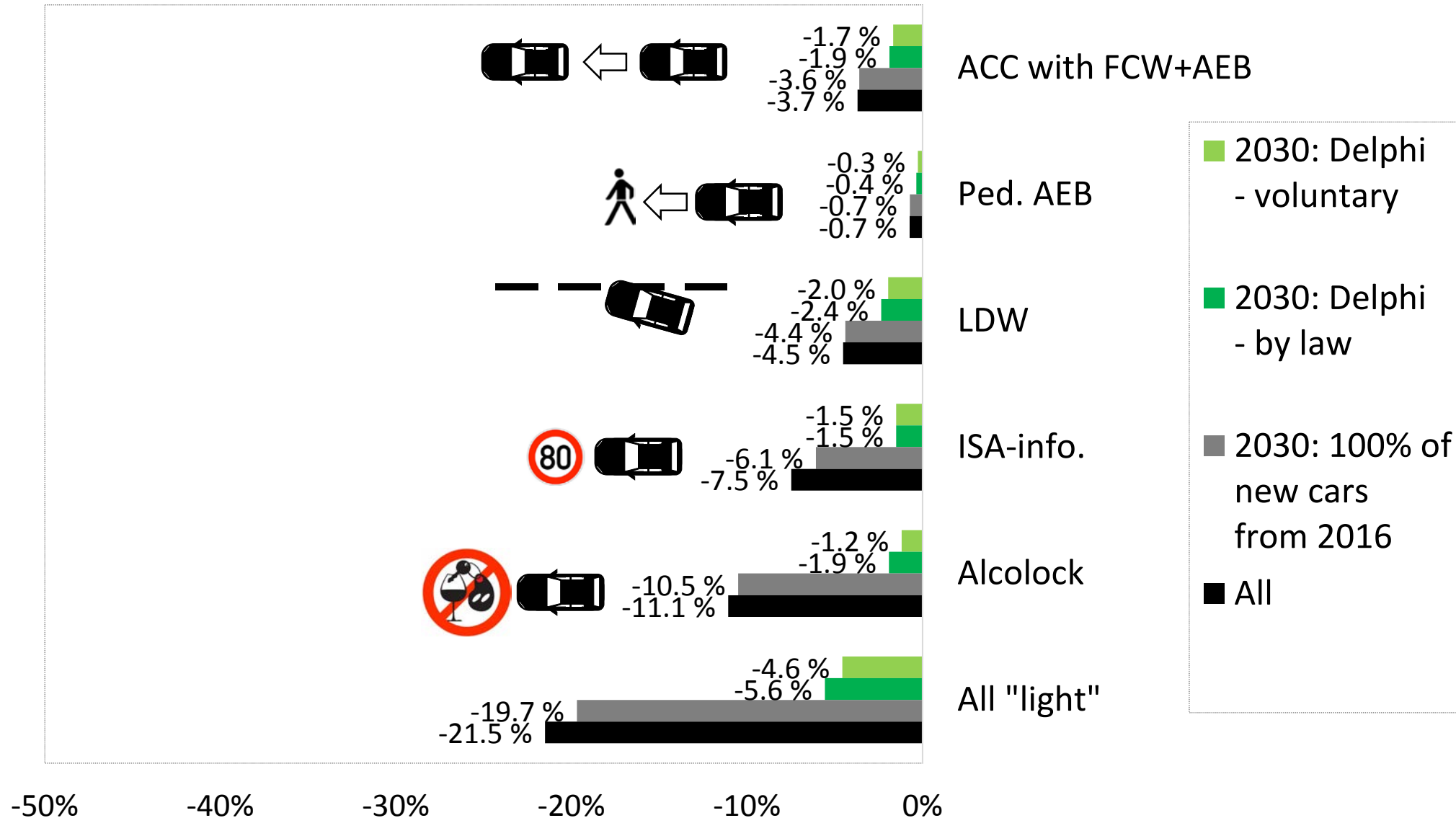
Delphi-estimated years in which systems become mandatory



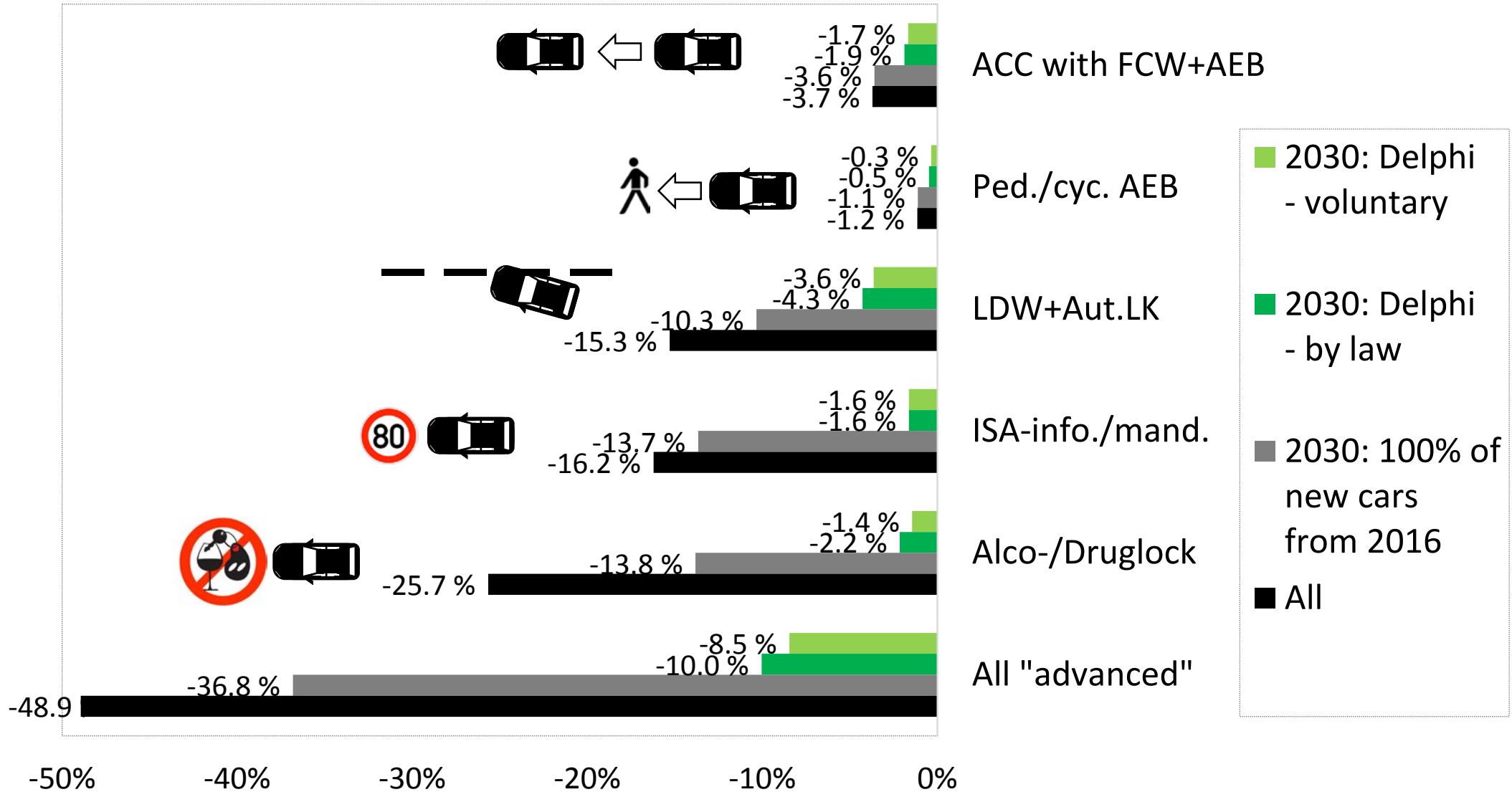
Delphi-estimated penetration rates - by law

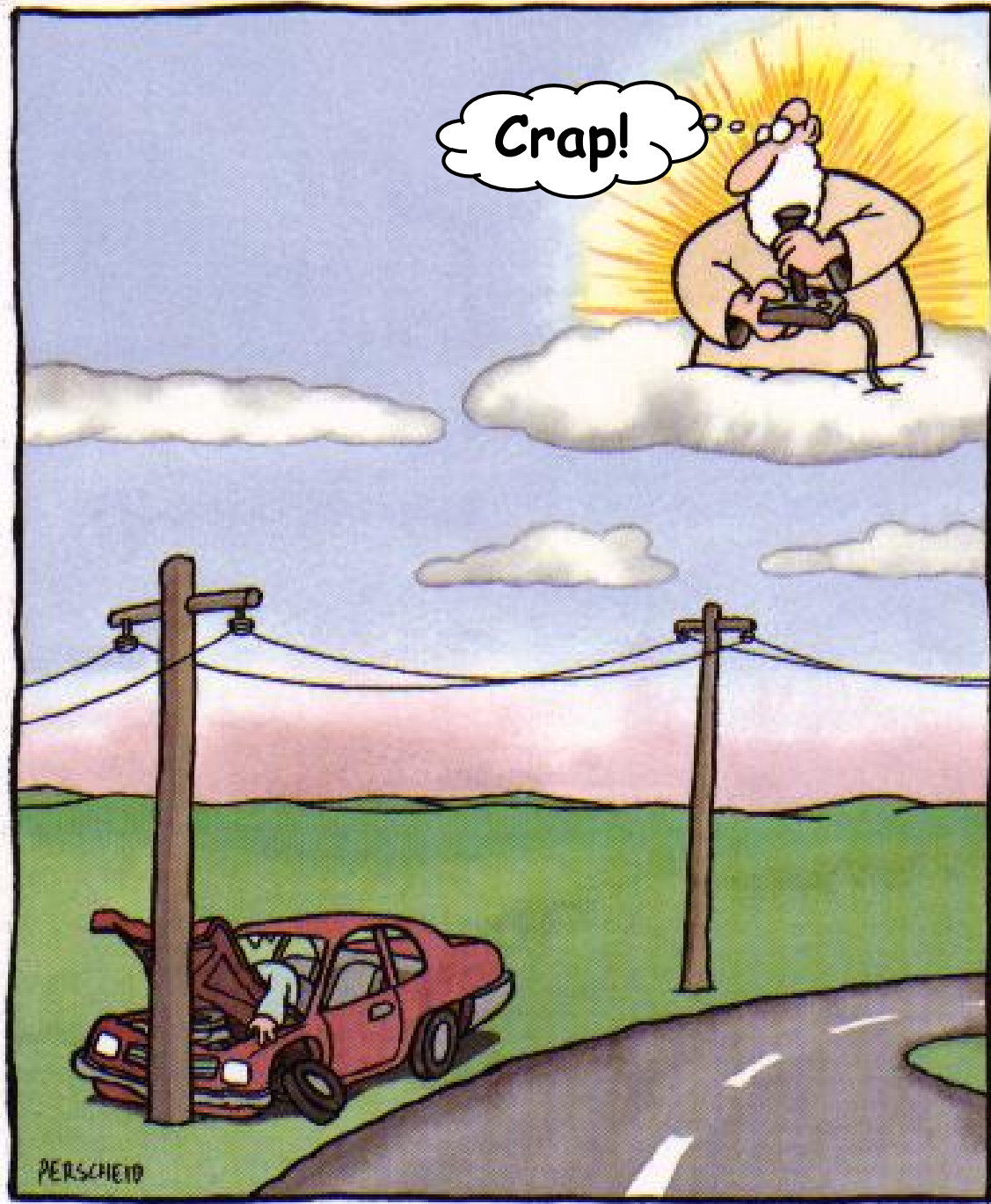


Effects on KSI of increased deployment - light



Effects on KSI of increased deployment - advanced





Crap!

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