

Final Conference

eIMPACT

CBA – The results

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Procedure of CBA

Assumptions for 2010 / 2020

Vehicle stock
Vehicle mileage
Discount rate
Lifetime

D3

Accident data
Penetration rate (two scenarios)
Share of driven mileage

D4

Physical impacts – benefits

Safety (fatalities, injuries)
Direct traffic effects (average velocities)
Indirect traffic effects (congestion)

D4

Cost-unit
rates

$\frac{\text{Benefits}}{\text{Costs}} = \text{BCR}$

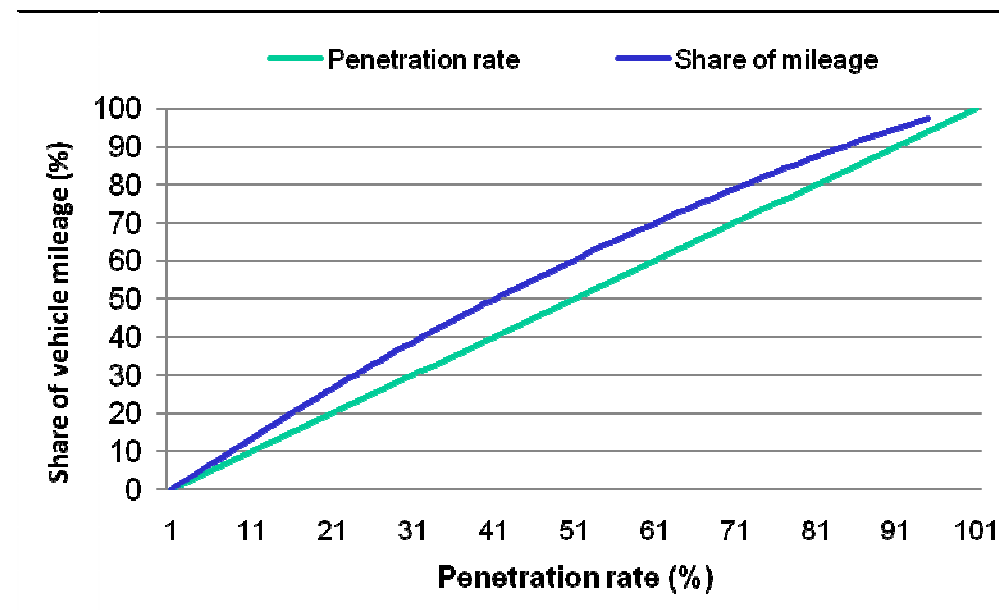
Costs

Penetration rate **D4** * Vehicle stock **D3** * System costs

Sensitivity analysis

- Discount rate (3 % vs. 8 %)
- Lifetime (12 years vs. 16 years)
- Safety impact (most probable vs. optimistic vs. pessimistic)
- Accident trend

The benefits are dependent from the share of driven mileage



Newer vehicles have a higher mileage on average; IVSS are bought by drivers with a high mileage.

Main assumptions (cost-side)

- Cost side is determined by system costs and - where applicable - costs of infrastructure equipment (Intersection Safety / eCall)
- No cost economies of scale within one year (scenario low vs. high)
- The costs per system are decreasing by between 8 % and 21 % from 2010 till 2020.

Main findings

- CBA methodology successfully applied to twelve IVSS
- All systems contribute to the societal goal of improving road safety
- The clear majority of investigated IVSS is profitable from the society point of view
- The development of the total benefits is mainly driven by the safety effects which contribute the largest share to it
- Benefits resulting from indirect traffic effects represent an add-on to the safety benefits
- Costs go down from 2010 to 2020 because of economies of scale, learning effects and sharing of components (costs will however not vary between low and high in a considered year)
- BCR's tend to go down mainly due to general safety progress, this will be different when we do not consider safety progress

The results – overview of the BCR

	2010		2020	
	low	high	low	high
ESC	4.4	4.3	3.0	2.8
FSR	n.a.	n.a.	1.6	1.8
EBR	n.a.	n.a.	3.6	4.1
PCV	n.a.	n.a.	0.5	0.6
LCA	3.1	3.7	2.9	2.6
LKS	2.7	2.7	1.9	1.9
NIW	0.8	0.9	0.7	0.6
DDM	2.5	2.9	1.7	2.1
ECA		2.7		1.9
INS		n.a.		0.2
WLD	n.a.	n.a.	1.8	1.6
SPE	2.2	2.0	1.9	1.7

n.a. not available

For *eCall* and *Intersection Safety* only the potential case is given.
This is due to their infrastructure requirement.

Decreasing BCR with the time do not mean that the systems are getting less efficient.

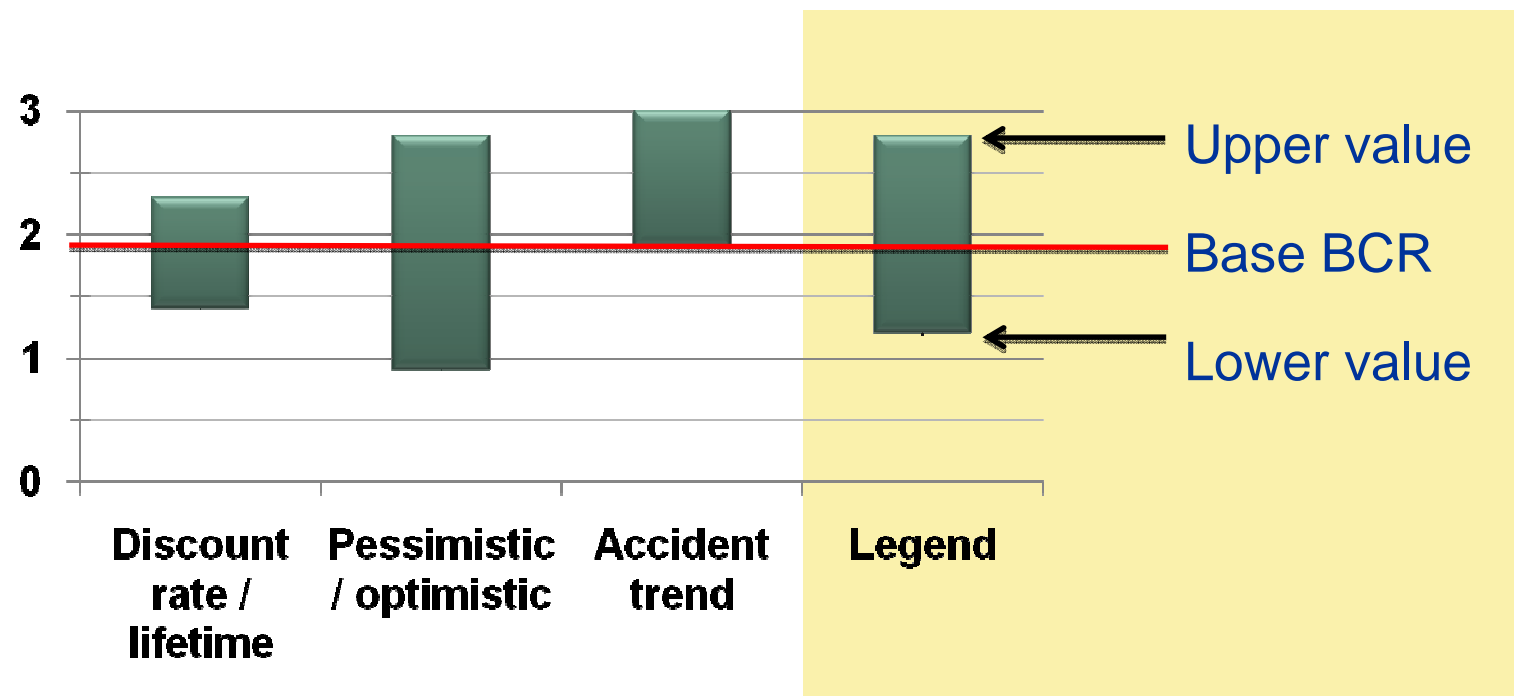
This can be shown by a shift-and-share analysis. In this analysis the accident data base for 2010 is fixed for 2020:

	2010		2020	
	low	high	low	high
ESC	4.4	4.3	4.6	4.4
FSR	n.a.	n.a.	2.6	2.9
EBR	n.a.	n.a.	5.8	6.6
PCV	n.a.	n.a.	0.9	1.0
LCA	3.1	3.7	4.8	4.3
LKS	2.7	2.7	3.0	3.1
NIW	0.8	0.9	1.2	1.0
DDM	2.5	2.9	2.8	3.5
ECA		2.7		3.1
INS		n.a.		0.3
WLD	n.a.	n.a.	2.9	2.6
SPE	2.2	2.0	3.0	2.8

n.a. not available

The sensitivity analysis displays
how stable the results are.

BCR of *SpeedAlert* 2020 scenario high



The BCR information has to be enriched with other information available from CBA.

Halving the number of road deaths by 2010.
(European White Book on Transport)

1. Calculate the BCR for each IVSS for two scenarios:
penetration rate low and high. (done)
 2. Calculate a figure which shows the effectiveness in terms of
avoiding fatalities: $\text{costs} / \text{avoided fatalities}$
This figure should be less than the cost-unit rate for fatalities
- With this information a ranking is possible.

Now a ranking of the IVSS is possible.

In terms of BCR – increasing the safety level on roads (BCR>1).



In terms of reducing the number of road fatalities.



ESC EBR* ECA LKS DDM SPE WLD* LCA FSR

* not available in 2010

For further information: www.eimpact.eu

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Deliverable D6:

**Cost-Benefit Analyses for stand-alone and co-
operative Intelligent Vehicle Safety Systems**
(WP2300/2400)