

Evaluation study on Speed Limitation Devices

Draft results of the ex-post analysis (HCVs)

Stakeholder conference 10 June 2013

▶ Draft results of the ex-post evaluation (HCVs)

- Goal: assess the impacts on road safety, the environment and level playing field
- Methodology and approach
 - Builds on results survey and literature
 - Impact on speed
 - Impact on traffic safety by time series analysis
 - Impact on traffic safety by using changes in speed
 - Impact on emissions
 - Market impacts
- Questions

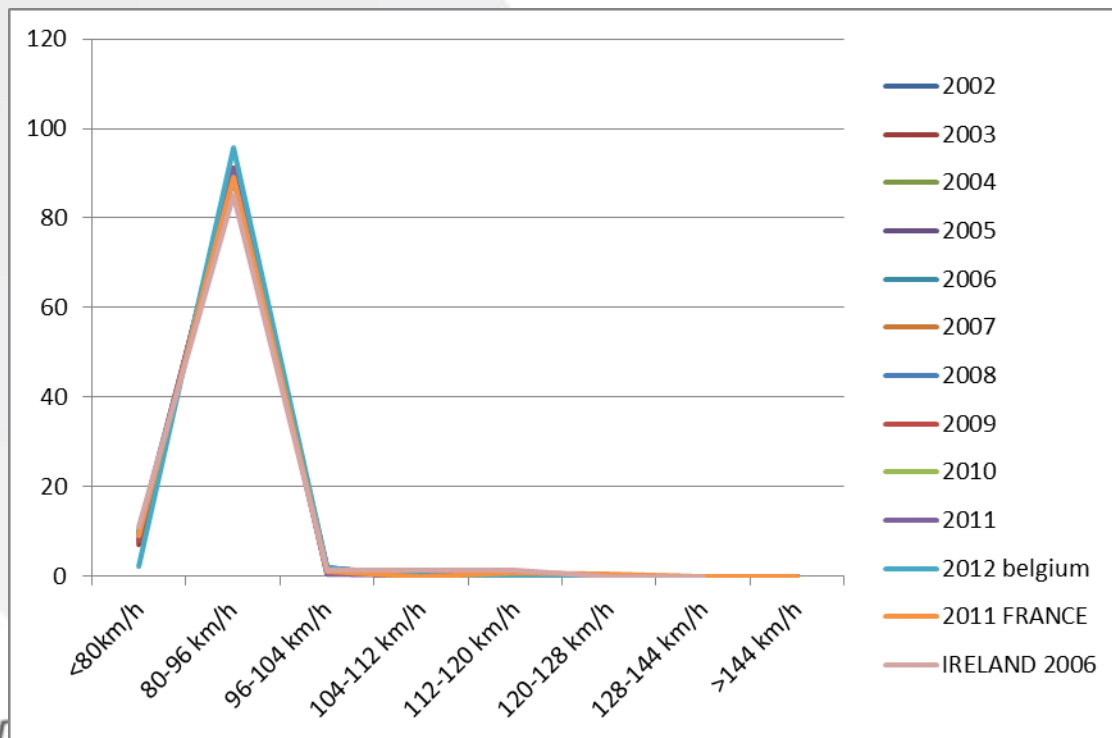
▶ Survey and literature

- Desk research of reports, articles, data,...suggested by stakeholders and own research
 - Previous assessments of speed limiters
 - Studies focussing on main crash types HGVs
- Main result relevant for ex post:
 - Not a lot of relevant assessments available
 - EC or national level: no quantitative evaluation of speed limiters
 - Transport Canada: using traffic model: maximal safety gains at 90 km/h
 - Accident studies HGVs
 - ETAC: non-adapted speed in top 3
 - TRL (2009): small proportion at top speeds

► Impact on speed

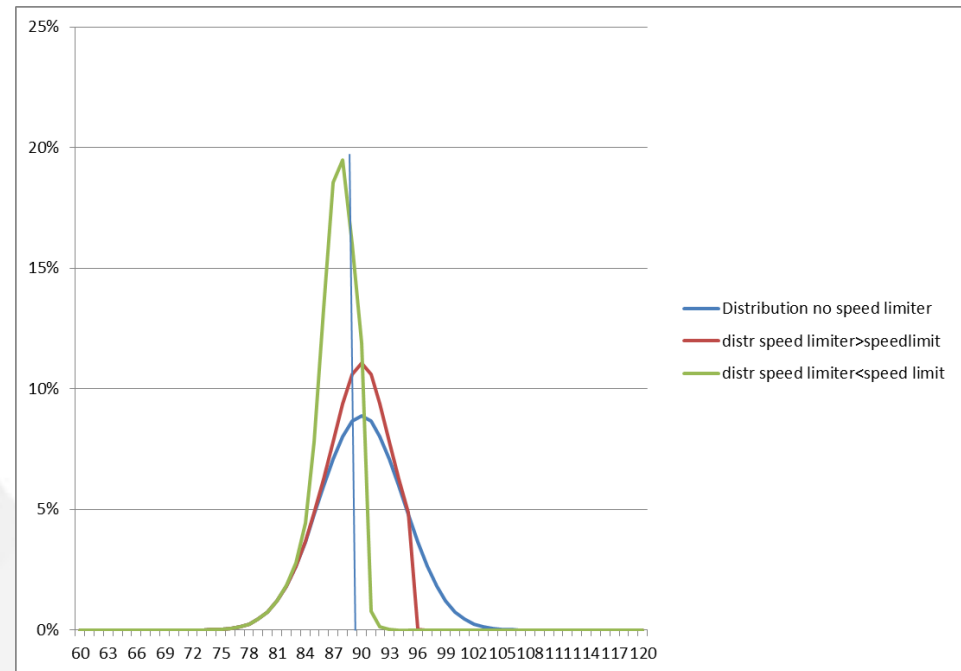
- Focus average speed and speed distribution
 - With and without speed limiters (before and after ?)
 - Using available EU data: UK most info, but rough disaggregation

Figure 1: Distribution speed HGV- 5 axles UK and HGV Belgium, France, Ireland.



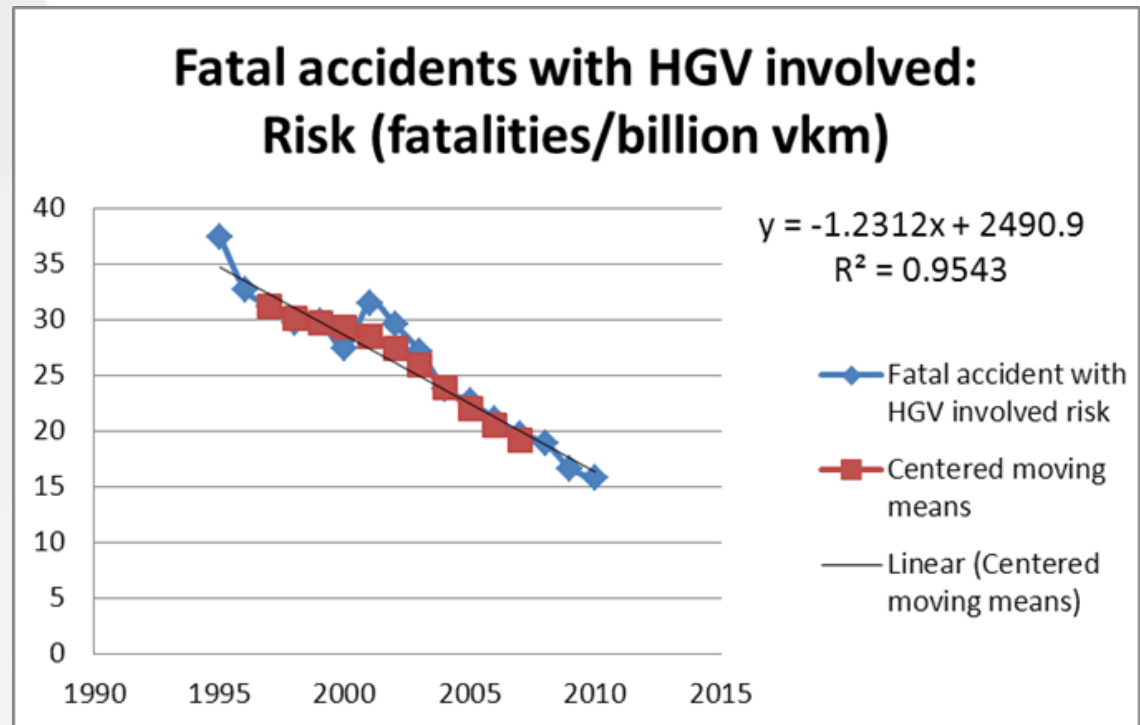
► Impact on speed

- In real life no shift to be seen
- Use of theoretical distributions:
 - Three relevant distributions
 - Distribution if no speed limiter
 - Distribution if speed limiter, but speed limit < speed set by limiter
 - Distribution if speed limiter, and speed limit = or > speed set by limiter
 - Differentiated for the different countries as speed limits differ
 - Focus on motorways



Impact on traffic safety using time series analysis

- Focus on evolution accident rate over time:
 - Is there a change before and after implementation Directive?
 - EU aggregate and per country analysis
 - HGV versus buses



▶ Impact on traffic safety using time series analysis

- No change to be seen
 - Not “one” date of implementation
 - N2/N3 and M2/M3, retrofitting, accession countries, etc.
 - Influence national traffic safety policy
 - Influence European Directives (driving and rest times, digital tachograph, etc.)

Impact on traffic safety by using changes in speed

- Relationship speed - accidents from literature
 - Compare results with and without speed limiter
 - Given distributions: calculate average speed with and without speed limiter
 - Start from accidents on motorways

Accidents from CARE database on motorways						
	Total accidents		Fatal accidents		Serious accidents	
	percentage of total		percentage of total		percentage of total	
Total	52562	100%	1645	100%	9318	100%
HGV involved	9479	18%	491	30%	2100	23%
Bus involved	471	1%	27	2%	88	1%

- Used power function Elvik: relates traffic safety to average speed
- Given changes in average speed, calculate changes in accident rate, injury rate and fatality rate

Impact on traffic safety by using changes in speed

- Differentiate
 - Low: speed limit = 80 km/h (HGVs) and 90 km/h (buses), speed limiter set at 90 km/h (HGVs) and 100 km/h (buses)
 - High: speed limit is 90 km/h and 100 km/h buses

Table 1: Impacts on accidents rates on motorways in Member States with high or low posted speed limits (based on Elvik, 2009)

Average Member State with low speed limits	Average Member State with high speed limits
Ex-post results	Ex-post results
<u>Trucks</u>	<u>Trucks</u>
change in average speed	change in average speed
Nilsson: Injury accidents - all	Nilsson: Injury accidents - all
Nilsson: Fatal crashes	Nilsson: Fatal crashes
Nilsson: Serious injury crashes	Nilsson: Serious injury crashes
<u>Buses</u>	<u>Buses</u>
change in average speed	change in average speed
Nilsson: Injury accidents - all	Nilsson: Injury accidents - all
Nilsson: Fatal crashes	Nilsson: Fatal crashes
Nilsson: Serious injury crashes	Nilsson: Serious injury crashes

Impact on traffic safety by using changes in speed

- Uncertainty speed if no speed limiter
 - Central estimate assuming small change in speed (cf. historical data)
 - What if speed is 5 km/h higher if no limiter

Table 1: Impacts on the number of accidents on motorways in Member States with higher assumed vehicle speeds for the case without speed limiter (based on Elvik, 2009)

	Results analysis		Speeds 5 km/h higher	
	Accident reduction	% reduction	Accident reduction	% reduction
All injury accidents	-166	-2%	-606	-6%
Fatal accidents	-28	-5%	-95	-18%
Serious injury accidents	-62	-3%	-224	-10%

▶ Impact on emissions

- Using VERSIT+ vehicle emission model
- Also starts from theoretical speed profiles
- Work in progress
- First preliminary results suggest:
 - In Member States with relatively low posted speed limits (80 km/h for HGVs and 90 km/h for buses): no significant impacts
 - In Member States with posted speed limits higher than the speed limitation speed: few percent reduction

▶ Market impacts

- Qualitative, based on literature and survey
- Relevant impacts
 - shifts between vehicle categories, in particular HCV-LCV.
 - compliance costs
 - cost of transport
 - vehicle design
 - administrative costs, enforcement and fraud
- With respect to possible shifts
 - Comparison trends in stocks (but no full dataset):
 - no relationship found
 - Some indications for Bulgaria and Latvia
 - None of the respondents believed in relationship stock and Directive
- Compliance and fraud
 - Up to now no evidence of a problem

▶ Questions

1. What additional information sources could be included in the ex-post evaluation?
2. Can you agree with the main conclusions drawn from the draft results of the ex post evaluation?
3. Do you see other elements which could complement the conclusions of the ex post evaluation?