

Final Conference

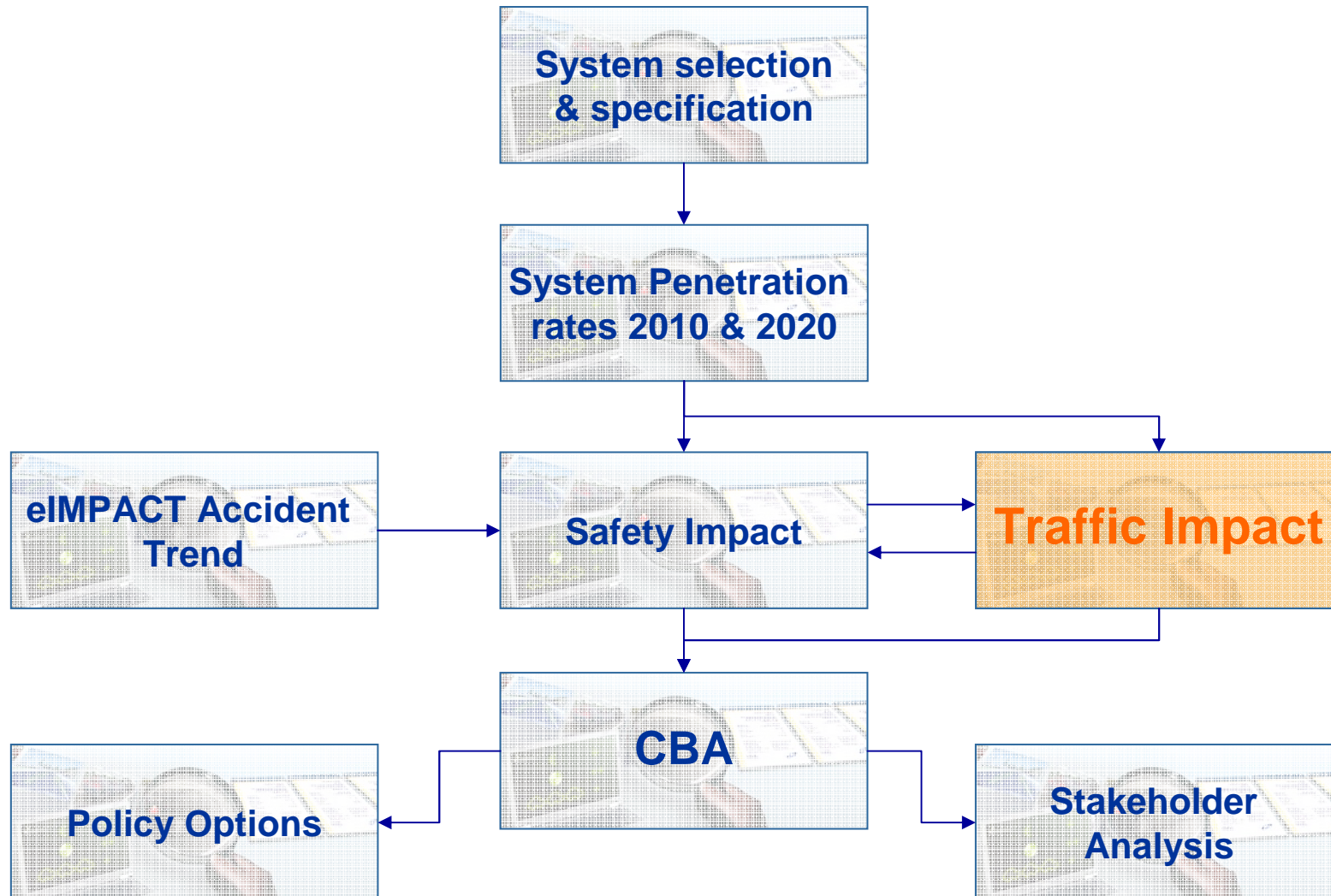
eIMPACT

Traffic impacts of IVSS

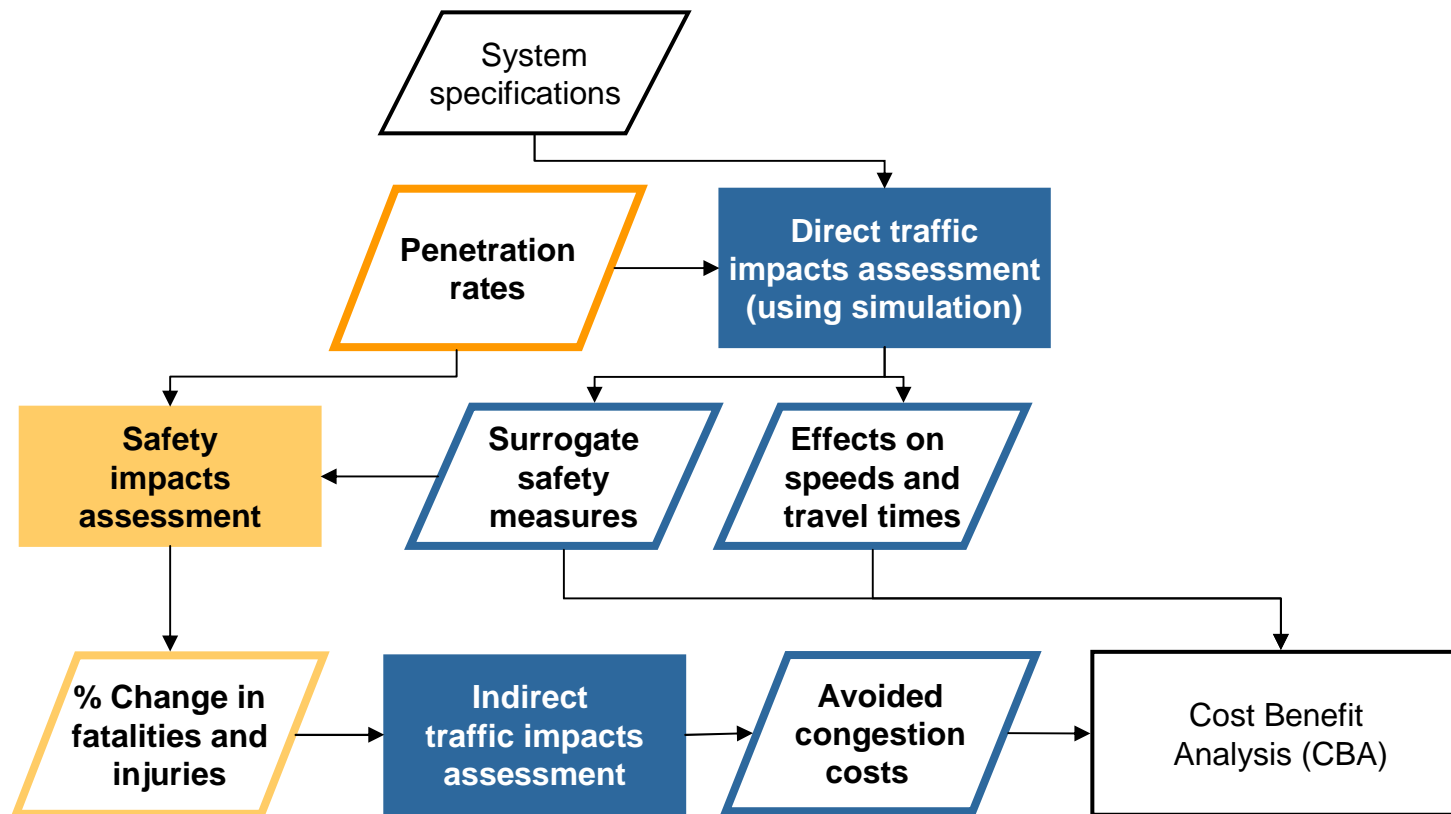
Isabel Wilmink

Paris, 26.06.2008

Traffic impact assessment in eIMPACT



Methodology traffic impact assessment



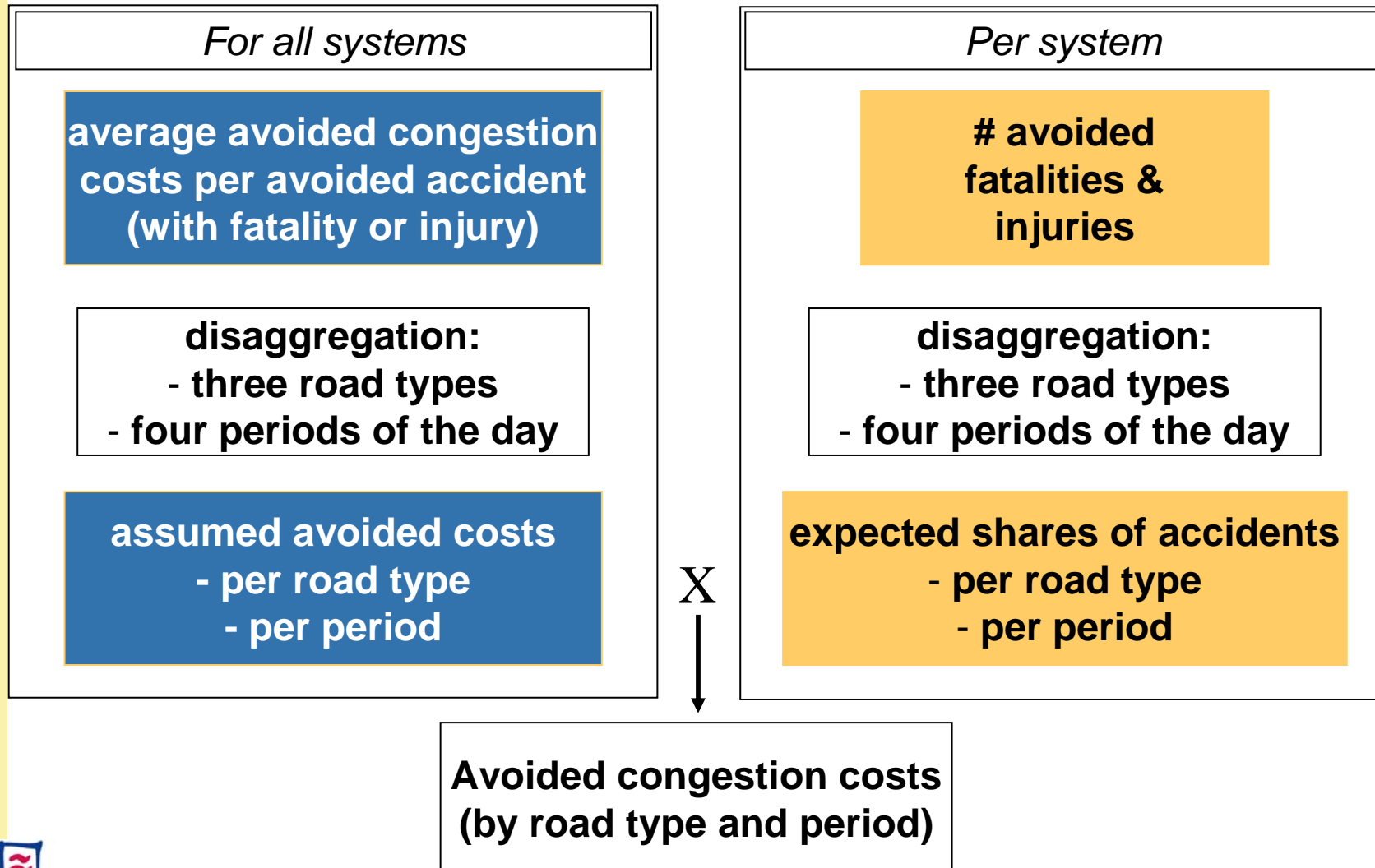
Methodology: direct traffic effects

- Based on micro-simulation of traffic flows to enable modelling of systems analysed in eIMPACT

VISSIM (PTV)	ITS modeller (TNO)
System specifications translated into models for vehicle, infrastructure and driver behaviour and communication	System specifications translated into models for vehicle, infrastructure and driver behaviour and communication
Intersection Safety	SpeedAlert
Full Speed Range ACC	Wireless Local Danger Warning
– same assumptions as in safety impact analysis	
Night Vision Warn	

- Choice of output indicators analysed are based on needs of safety impact assessment and cost-benefit analysis
 - Speeds & travel times
 - Safety indicators (time-to-collision, headways, variation in speeds etc.)

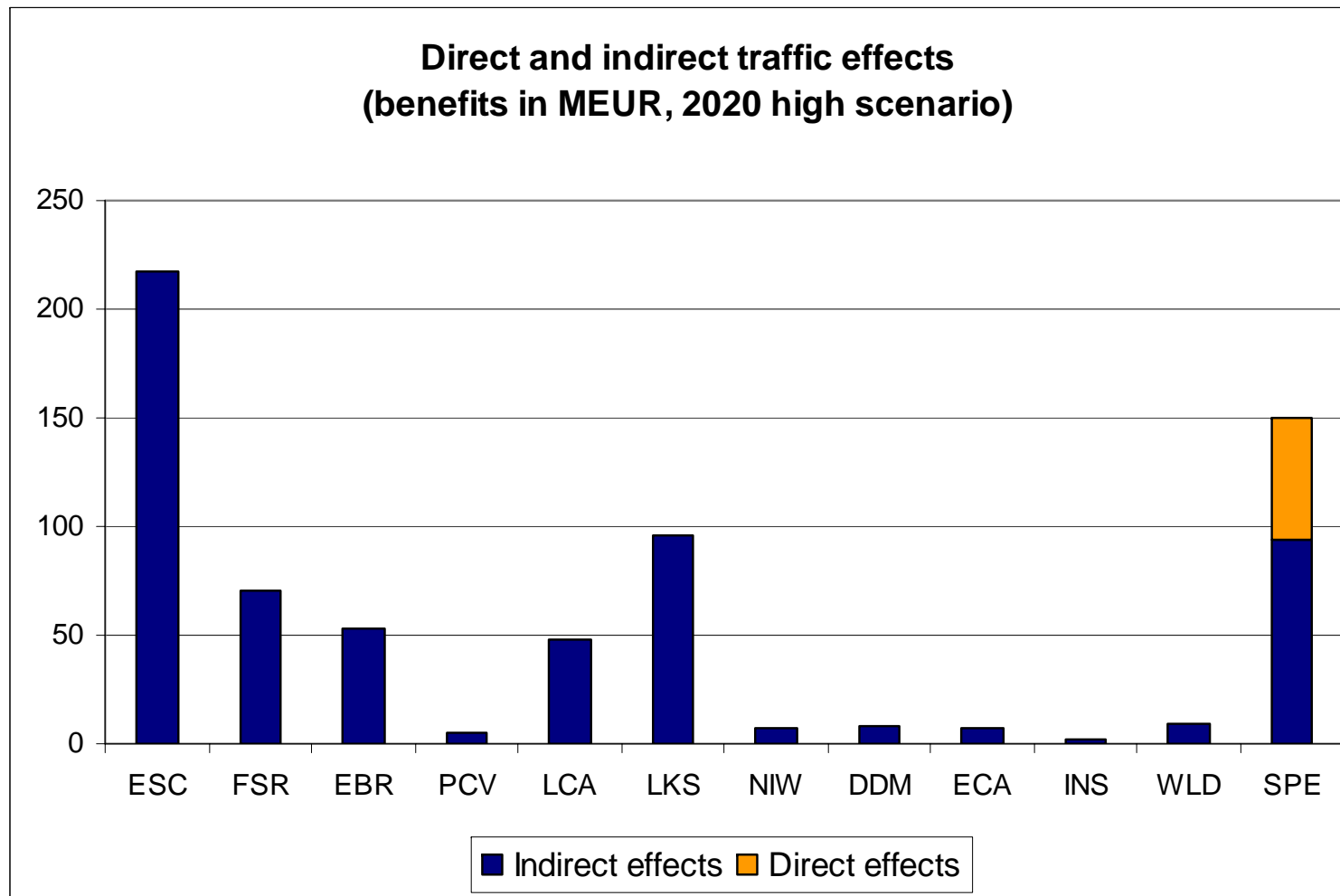
Methodology: indirect traffic effects



Main results

- Direct traffic effects (for the entire fleet, at the estimated penetration rates):
 - No noticeable effects on travel times expected, except for SpeedAlert
- Indirect traffic effects (at estimated penetration rates):
 - Effects expected for all systems
 - Relatively high effects for systems that are effective on all road types (especially motorways) and in high density traffic (when accidents are most likely to cause congestion)
- Traffic impacts modest compared to safety impacts
 - at the estimated penetration rate
- This is logical because the systems are primarily designed to improve traffic safety

Direct and indirect effects (MEUR)



Simulation results (direct effects)

- All simulated systems have effects locally (at a cross-section)

Change in speed

SPE
WLD
FSR
NIW

Earlier braking

WLD
FSR
NIW

Fewer small headways

FSR
(SPE)

Change in gap acceptance

INS

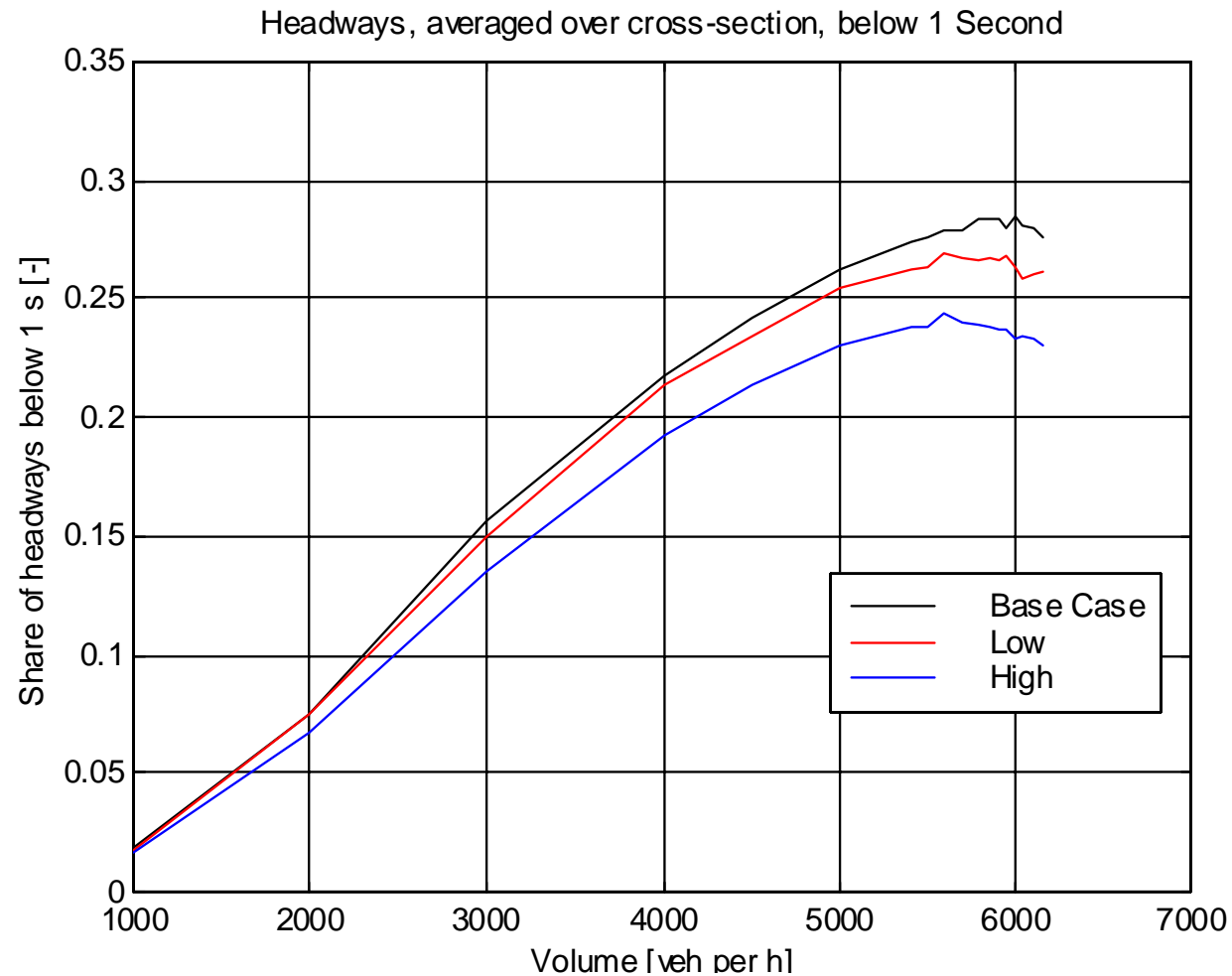
- Effects on network level are very small to negligible
 - low penetration rates
 - “rare” events
 - local effects of IVSS cancelled out by other traffic flow characteristics (e.g. delays at traffic lights)

Example: effects of SpeedAlert

- Effects on cross-section clear:
 - lower speeds
 - lower standard deviation of speed
 - less speeding (7-43%)
- Effects on network level are small to negligible
 - travel time effects only for rural roads
- There are environmental benefits due to lower speeds
- Indirect effects larger than direct effects

animation of
speed distribution
becoming narrower

Illustration of effect FSR-ACC (3 lane motorway)



Conclusions & recommendations

- Traffic impacts positive (→ benefits) for all selected systems
 - mainly due to indirect effects
 - no effect on traffic flow, at the estimated penetration rate
- Traffic impacts modest; systems designed for safety effects
- Empirical data from FOTs can be used to improve the traffic impact assessment

For further information: www.eimpact.eu

isabel.wilmink@tno.nl

Deliverable 4:
**Impact assessment of
Intelligent Vehicle Safety Systems
(WP3000)**