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# Åke Larsson

## Senior Advisor, Road Safety



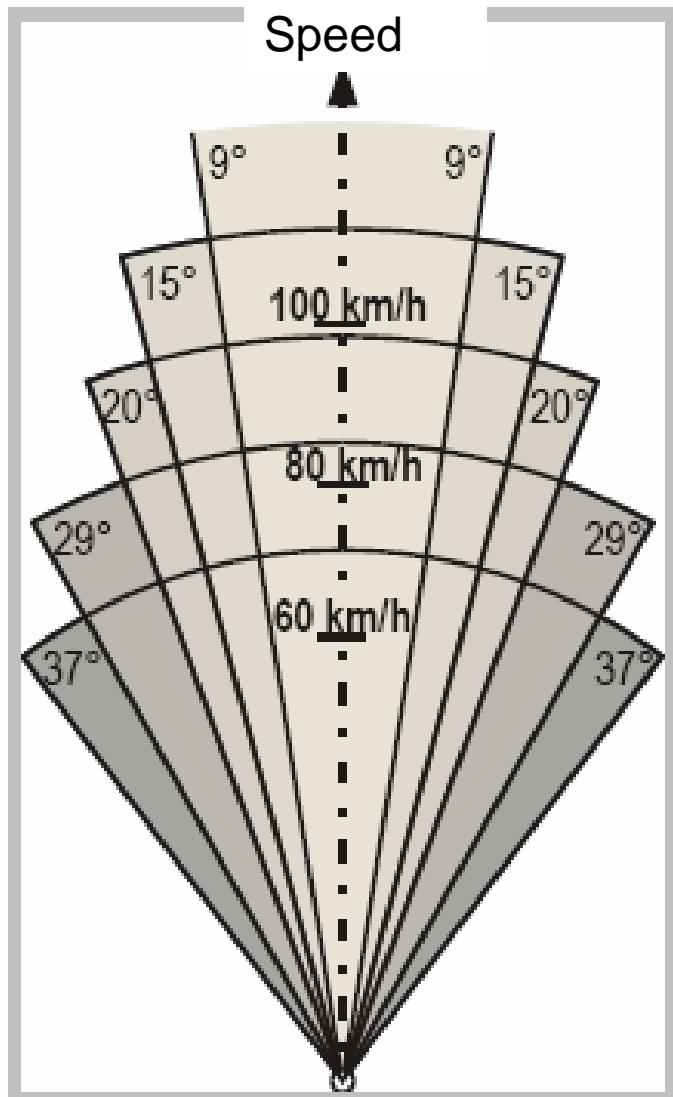


<i><b>Accident type</b></i>	<i><b>Killed per year, Swedish state roads 1995-98, %</b></i>
Run-off	30
Head-on	29
Overtake	4
Rear-end	1
Turn-off	4
Crossing	8
Bike	7
Pedestrian	8
Other	9
<b>Total</b>	<b>100</b>



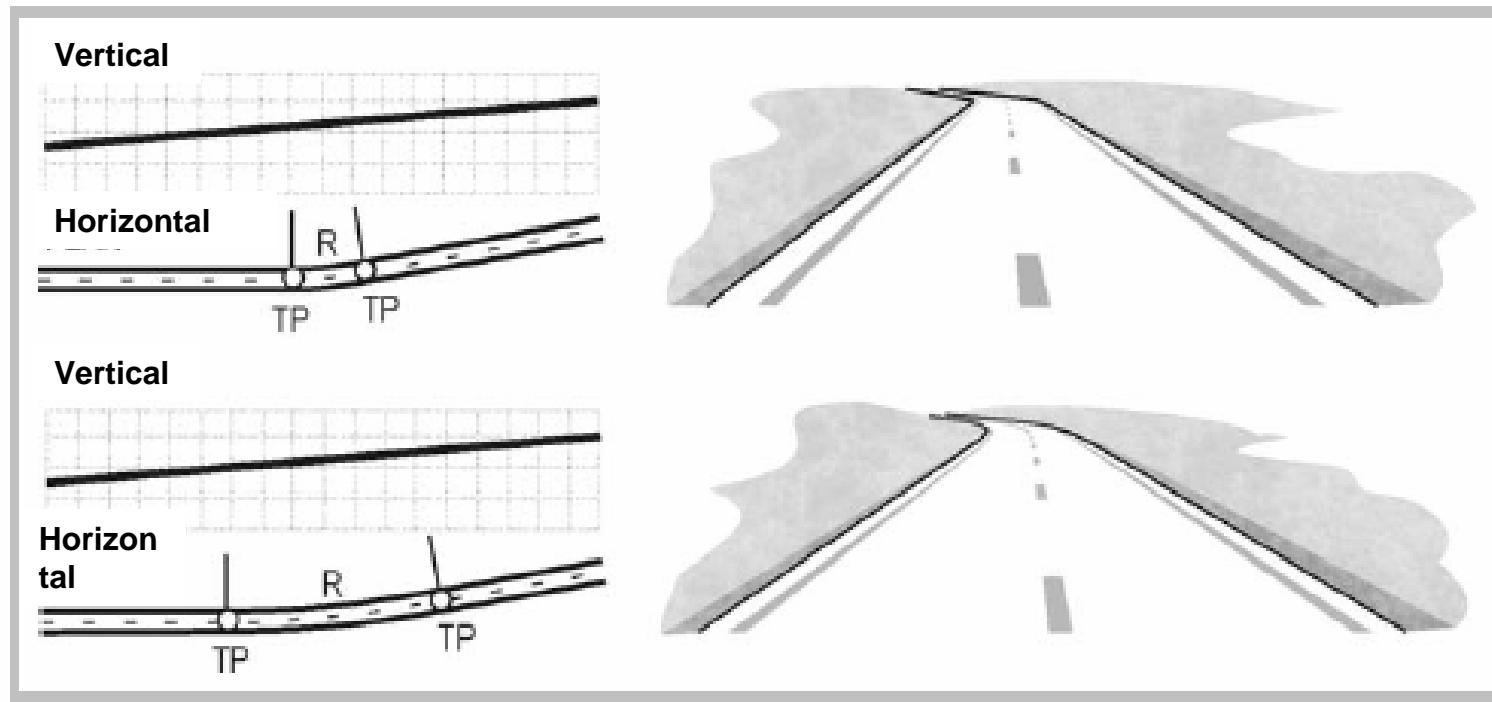
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The field of vision is decreasing at higher speed





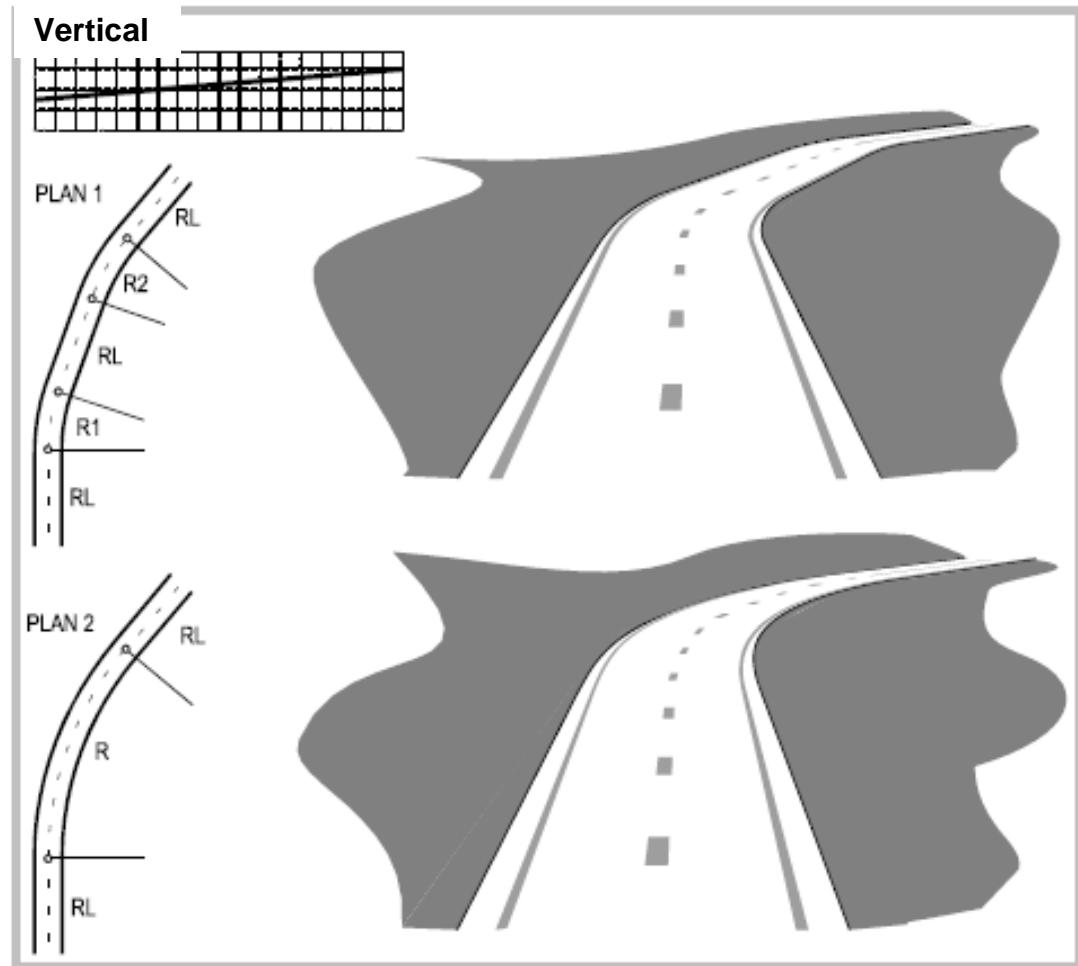
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At direction changes the bend must be long enough to achieve harmonic alignment.



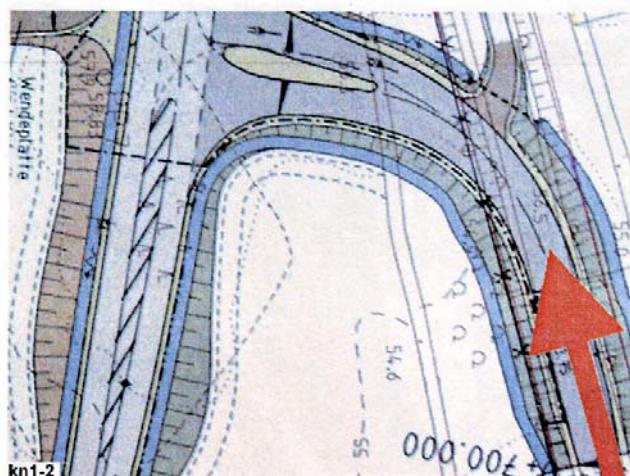
The effect of two circular bends with a short straight between (upper picture) and the same situation with only one continued circular bend with bigger radius (lower picture)





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Good optical guidance and visibility is very important. Do not lead the traffic the wrong way!





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# Clearly visibility/recognizability from all approaches

example of a junction in Romania with insufficient visibility





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As head-on  
collisions and  
run-off  
accidents are  
very common  
the use of  
median- and  
road side  
barriers are  
most important

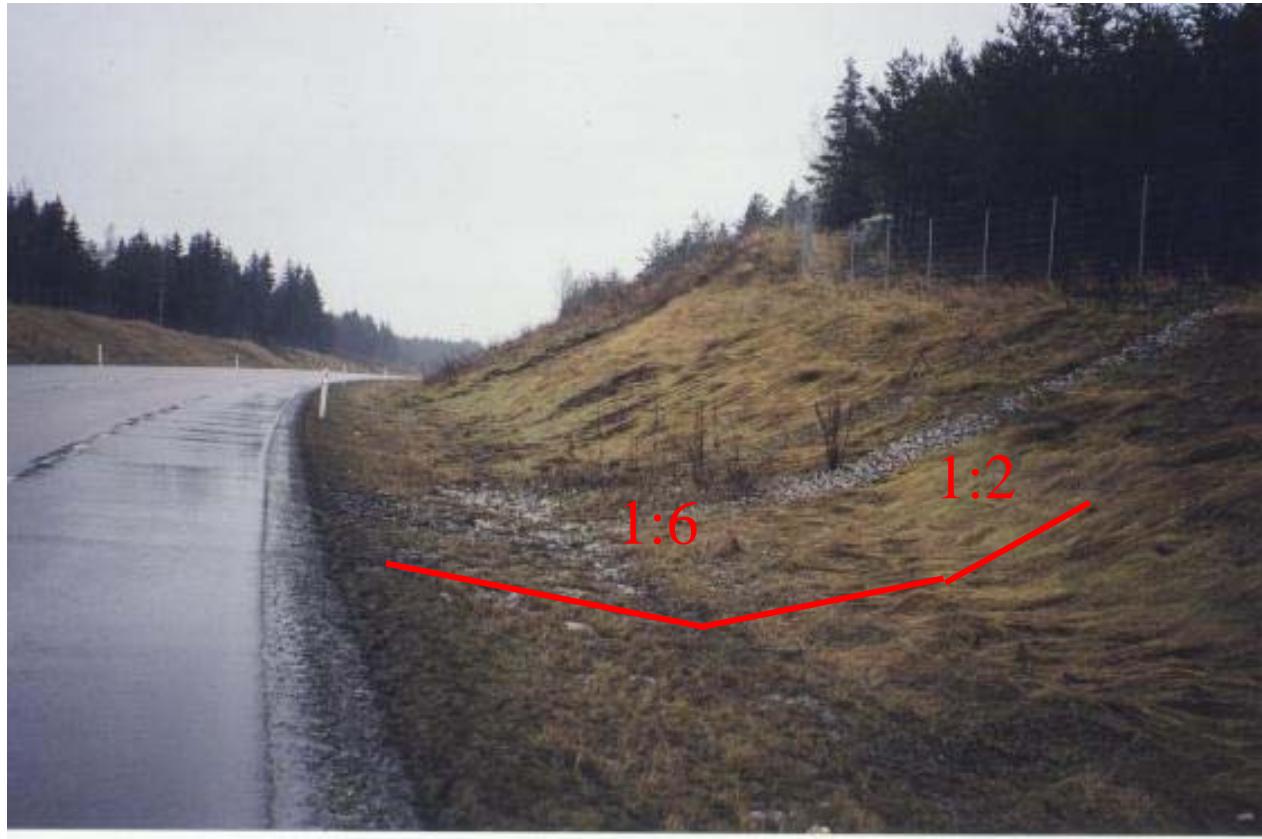




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An example of a bad method for separation of traffic directions! The concrete barrier is too low and it has been several vehicles vaulting over it. A steel beam barrier had to be added to get the necessary height.



## Safety zone

(high standard)

70 km/h >7 m

90 km/h >9 m

110 km/h >10 m

Flat slopes and no obstacles.



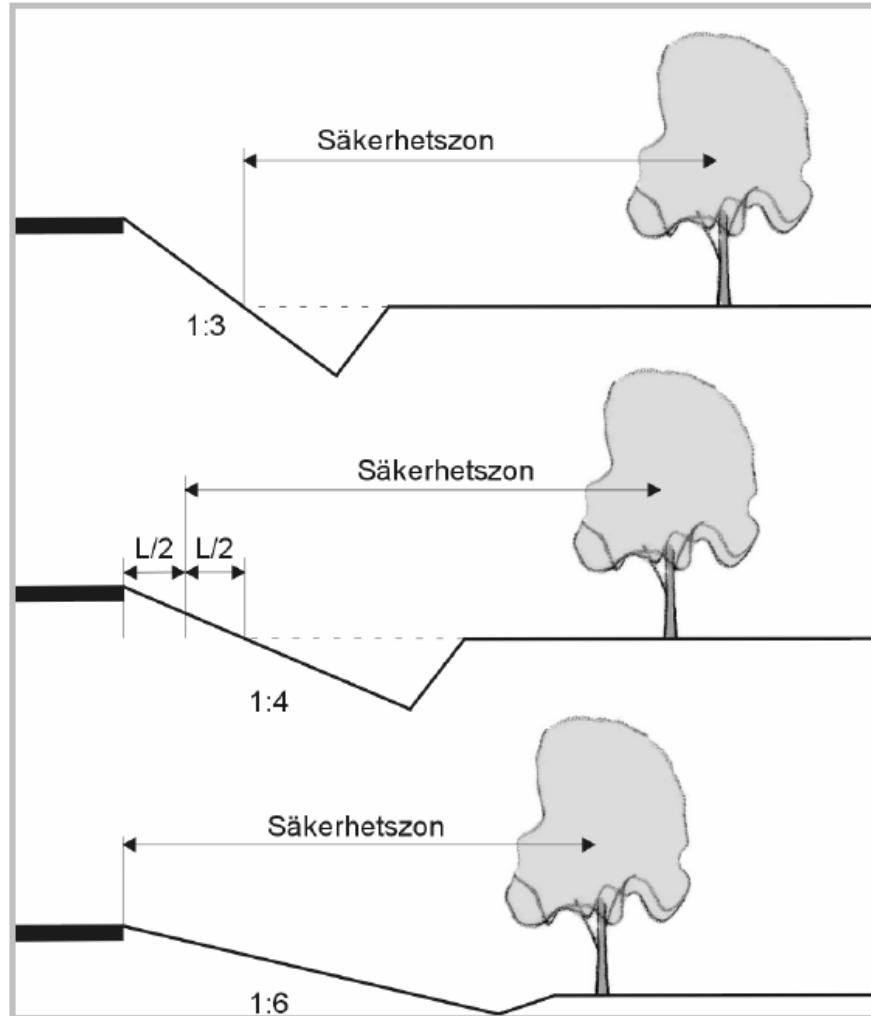
## Safety zone

(high standard  
radius  $\geq 1000$  m)

70 km/h  $> 7$  m

90 km/h  $> 9$  m

110 km/h  $> 11$  m





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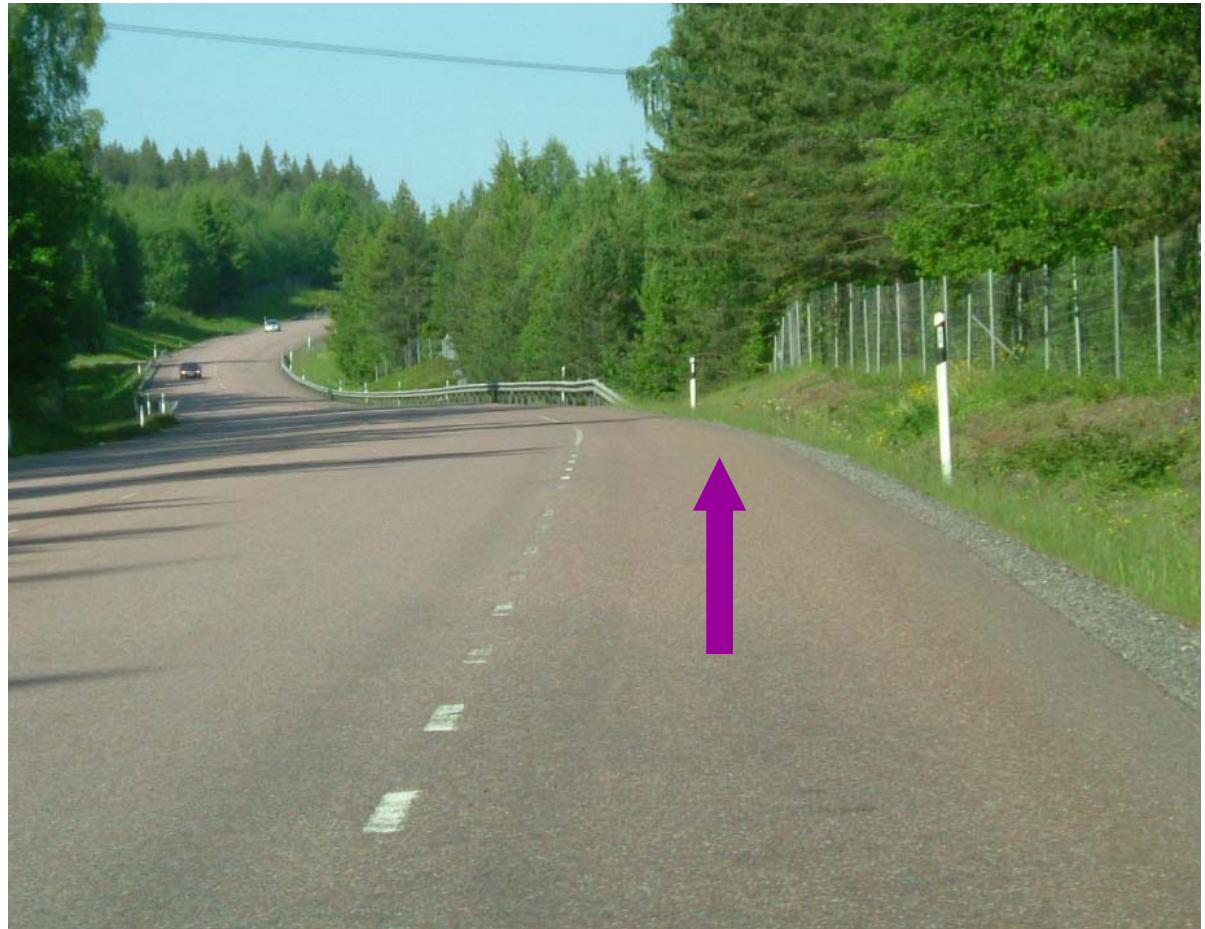


The road side barrier must be founded in such a way that a driver not will get behind it!



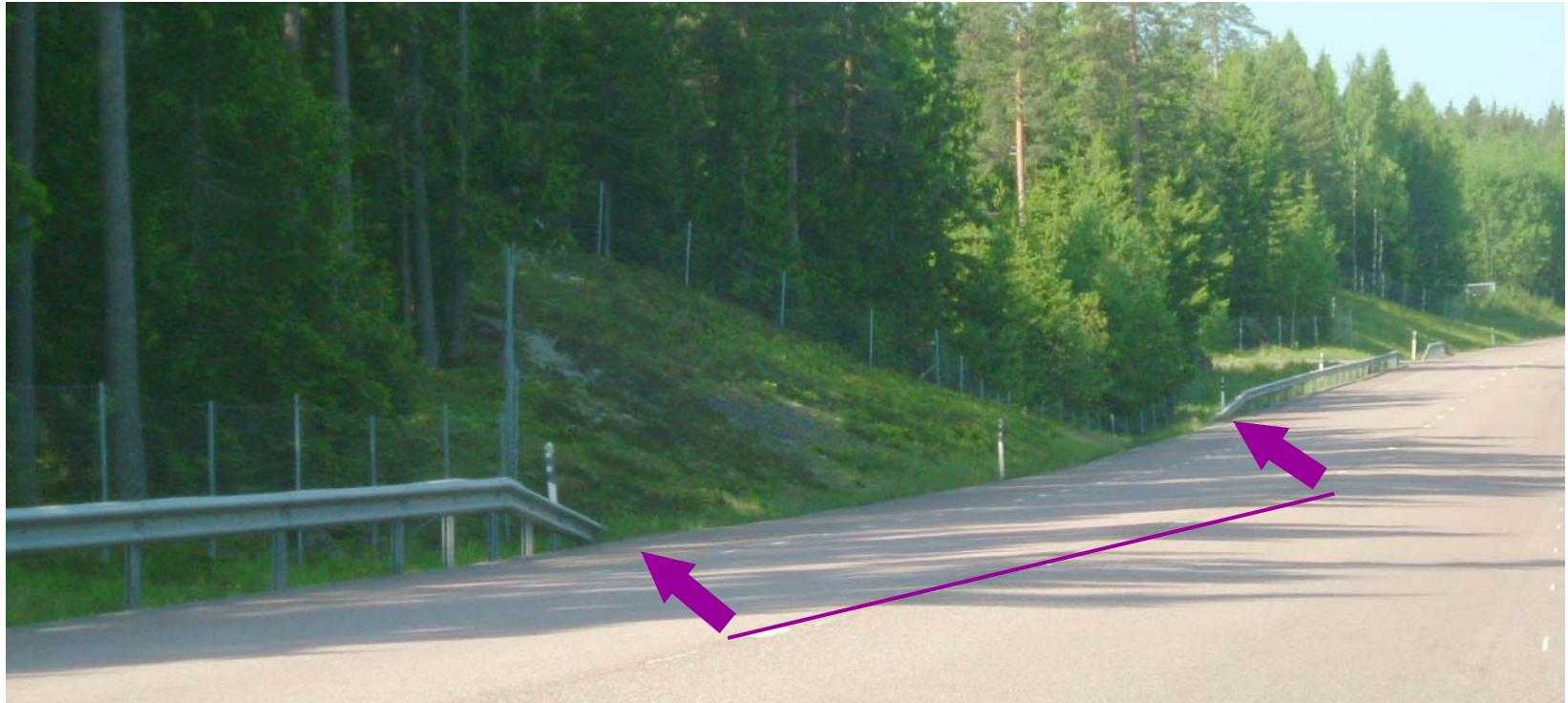
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The road  
side barrier  
must not  
leave a  
window  
open.





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Do not leave a short gap in the road side barrier!



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A rock cutting is as hazardous as a steep slope!



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- Separated laned in different directions
- Non-hazardous road-side areas
- Speed management



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