

**2+1 roads
Sweden**

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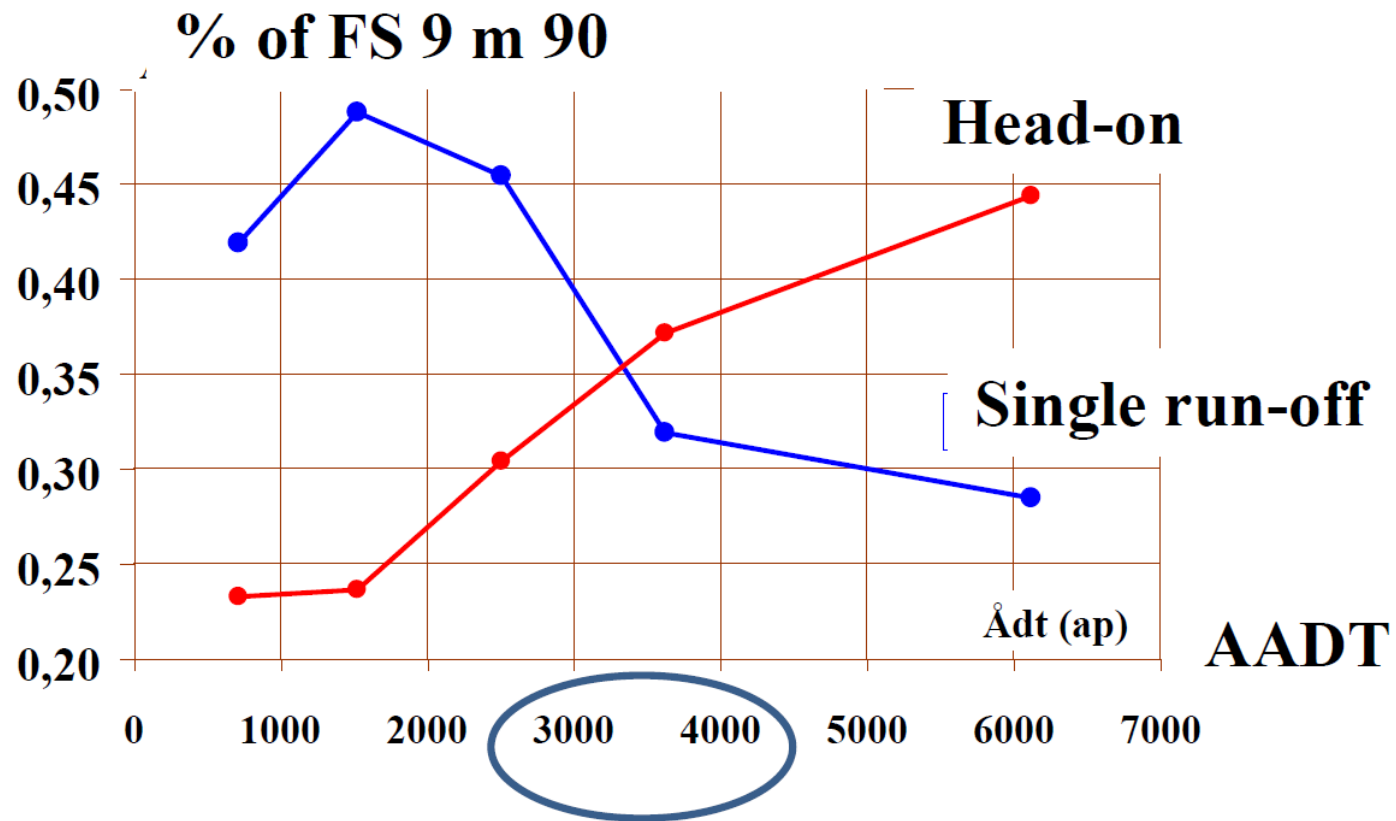
TRAFIKVERKET
SWEDISH TRANSPORT ADMINISTRATION



Outline

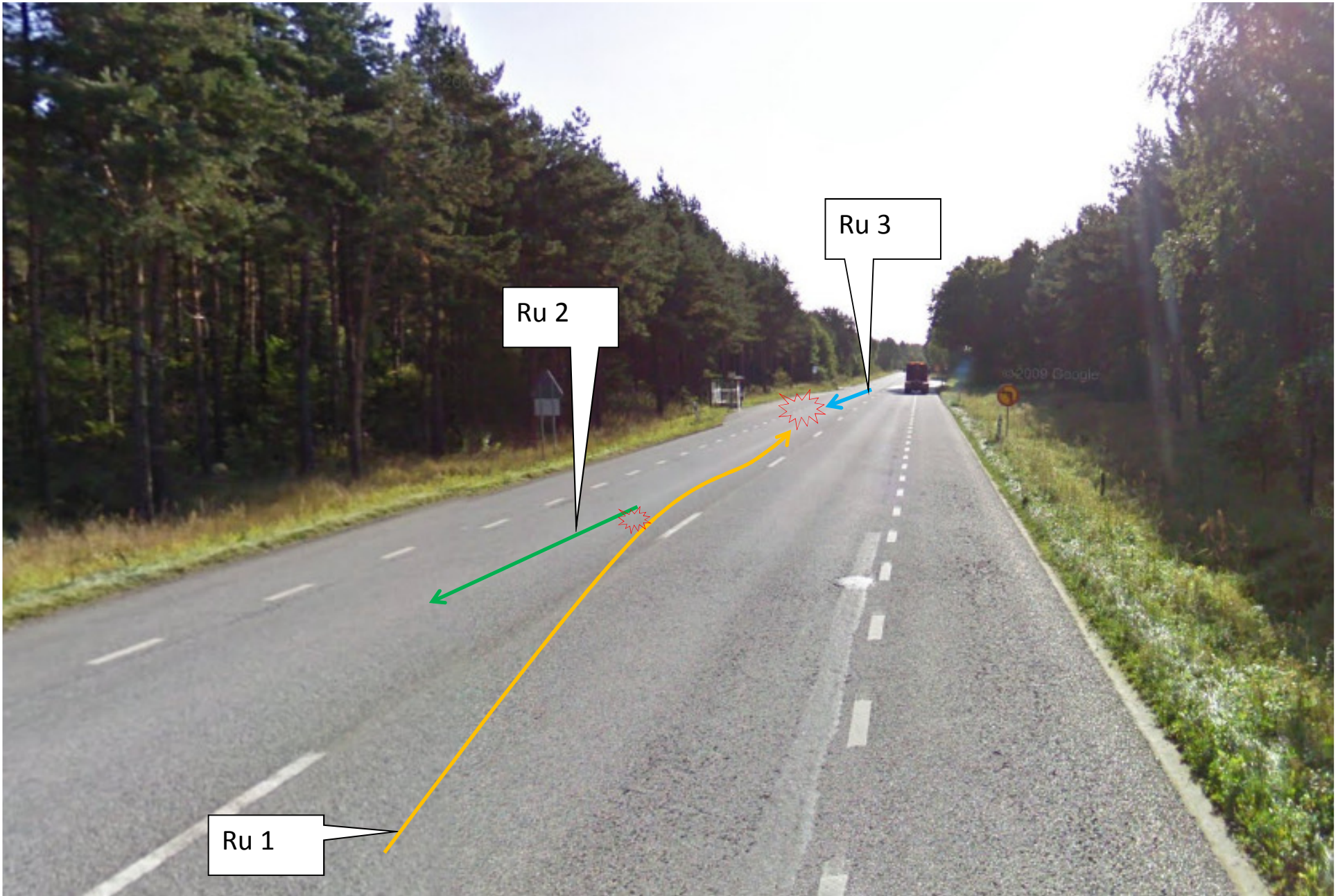
- How it all started
- Safety problem to solve
- Our 13m roads
- Safety result
- Maintenance

Head on collisions was our biggest problem



V21

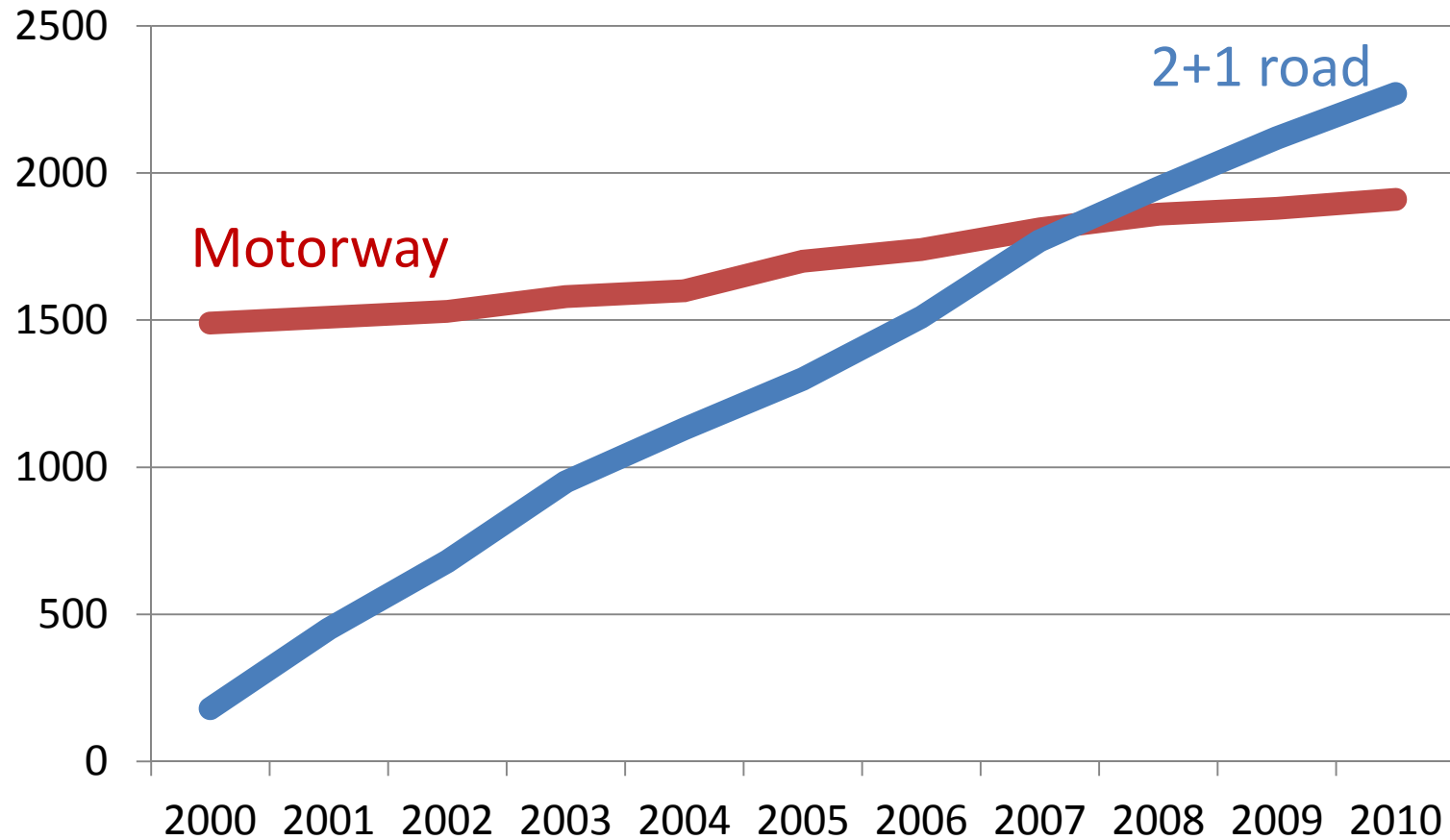








Size of the network

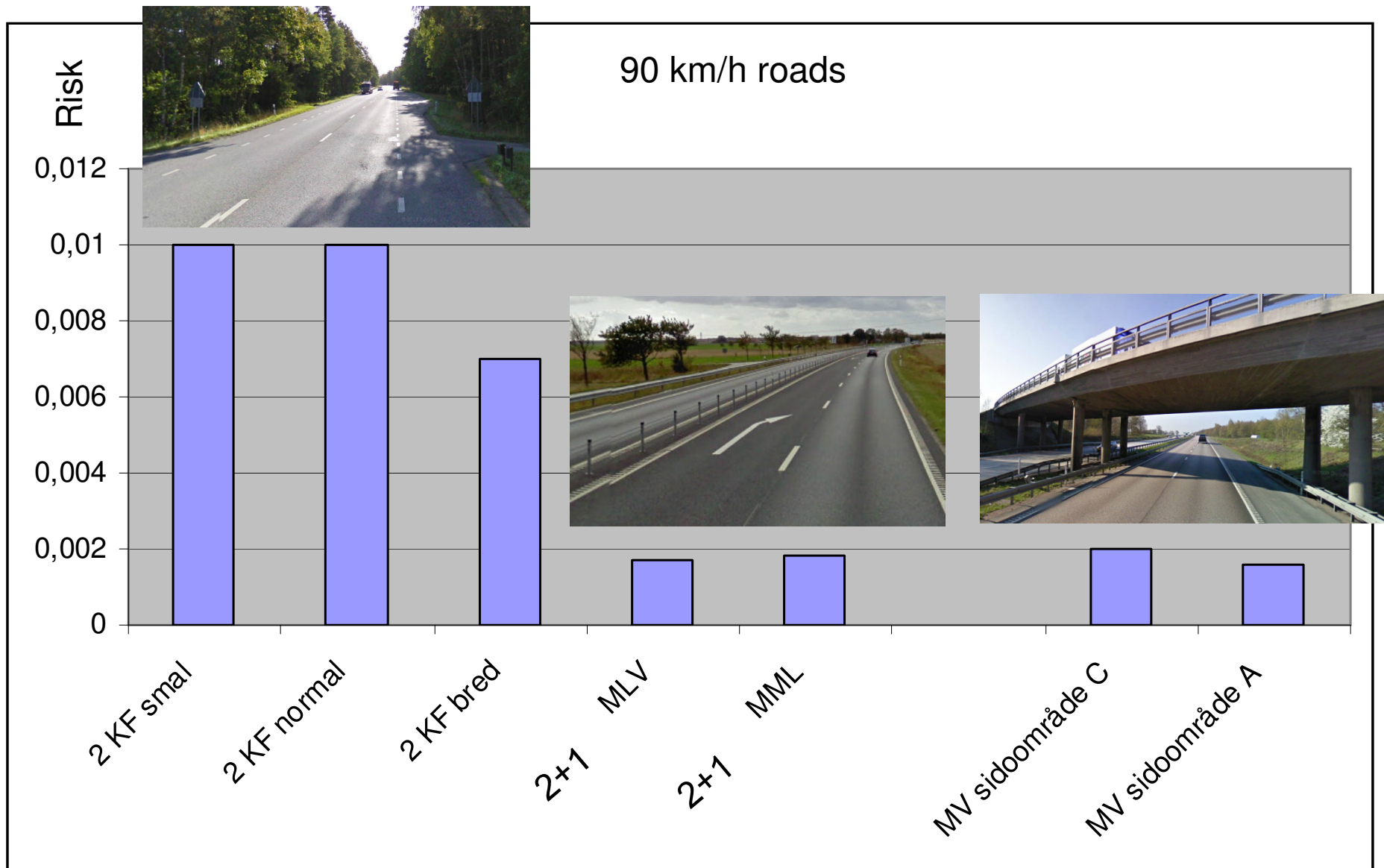


Trafiksäkerhetsåtgärder på statligt vägnät

Mötesseparerad- och mitträfflad väg, antal mil

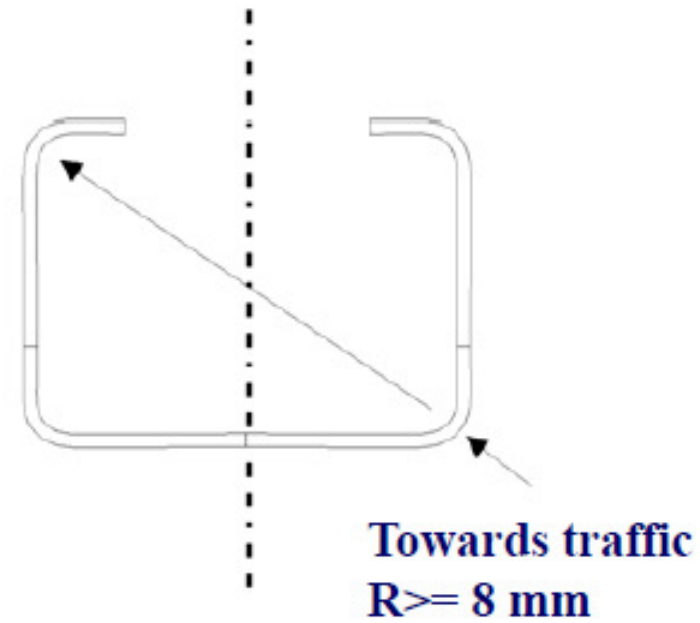
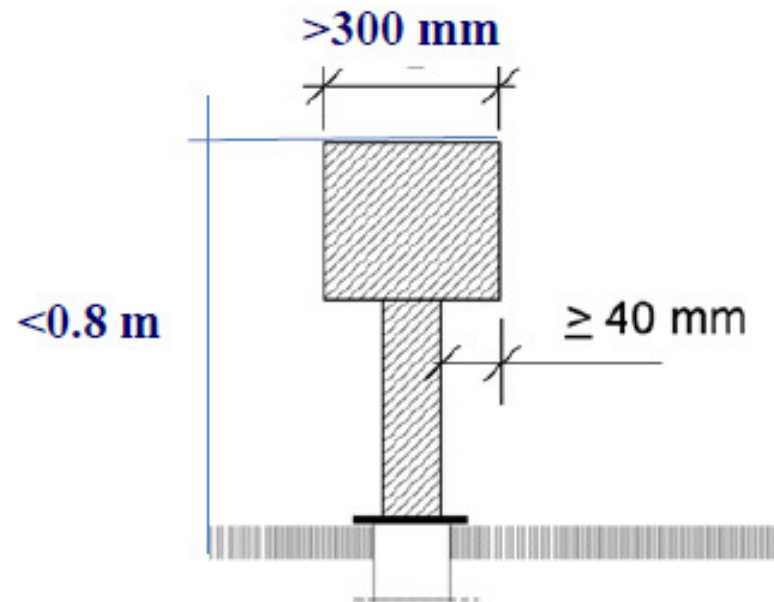
Length of roads in mil = 10km

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
2+1-väg	18	45	68	95	113	130	151	177	195	212	227
Motorväg	149	151	153	158	160	170	174	181	186	188	191
Övrig mötesseparering.	21	21	22	22	23	24	24	25	20	20	23
Mötessep. total	188	217	243	275	296	324	349	383	401	420	441
Mitträffling	0	0	0	0	0	25	124	250	334	425	493



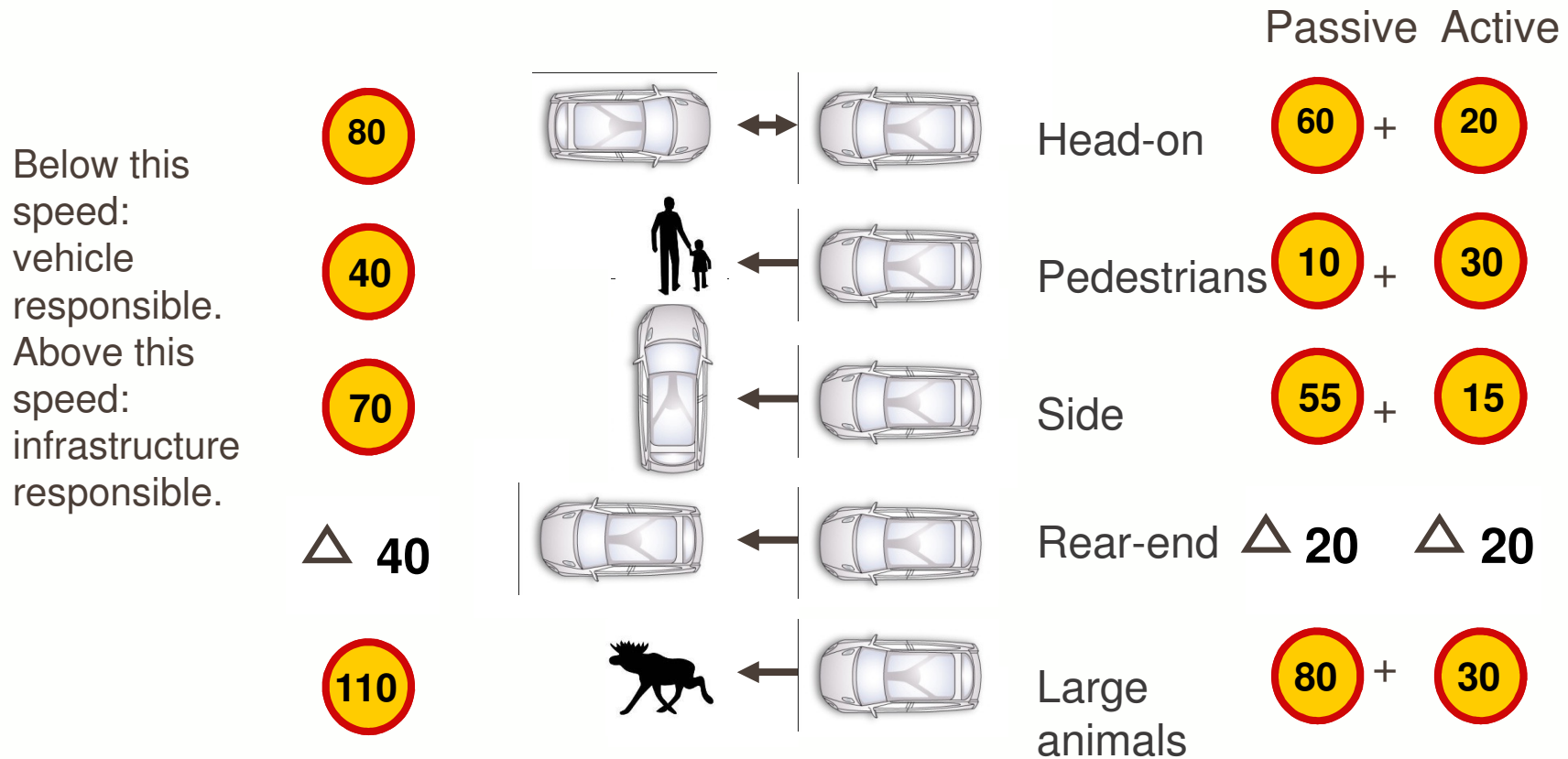


Box beam requirements



Division of Responsibilities

Example of common view on the division of responsibilities.



The vehicle of the future - Just like the farmer's horse:

- Can be steered actively and in full control by the farmer **but**
- It can handle a situation where the farmer falls asleep and still find its way home **and**
- It will not accept being steered into a tree or off a cliff



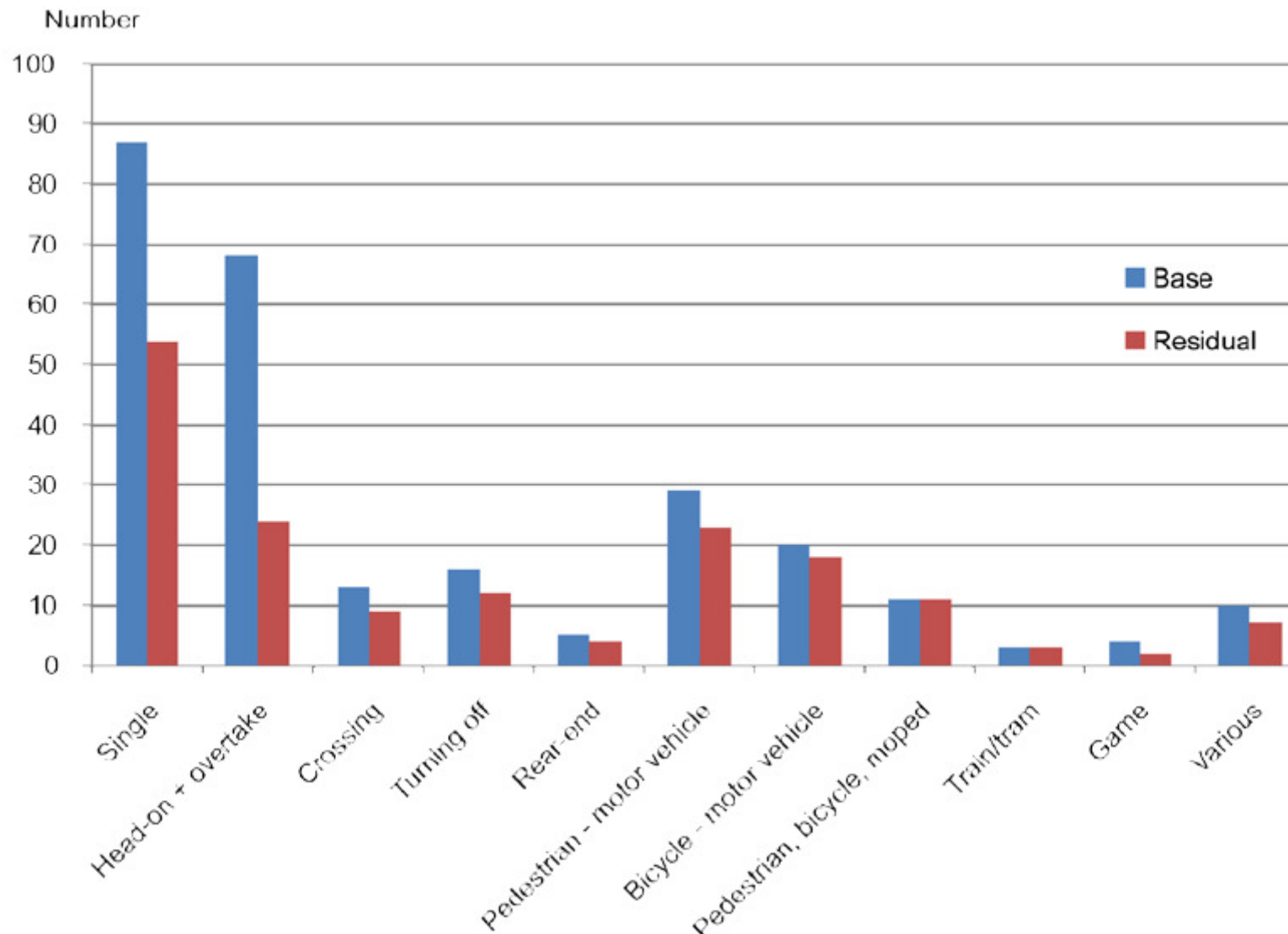
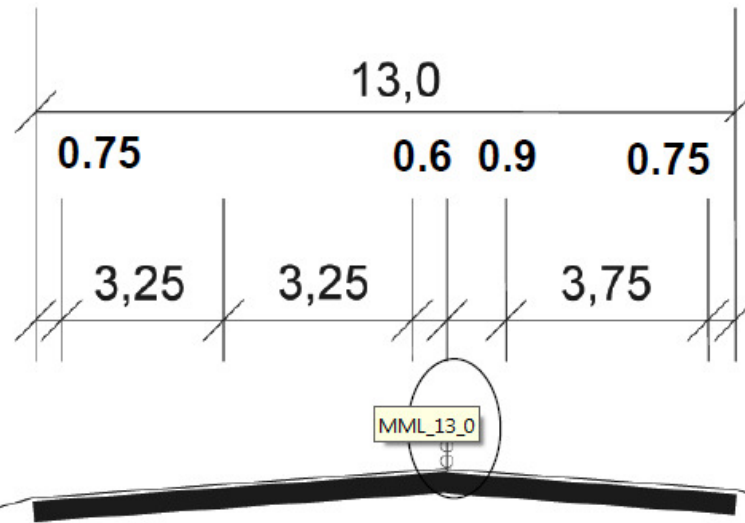


Figure 4.4. Prediction for fatalities in 2020 by type of accident based on projection of vehicle and infrastructure technology trends. Source: In-depth studies of fatal accidents.

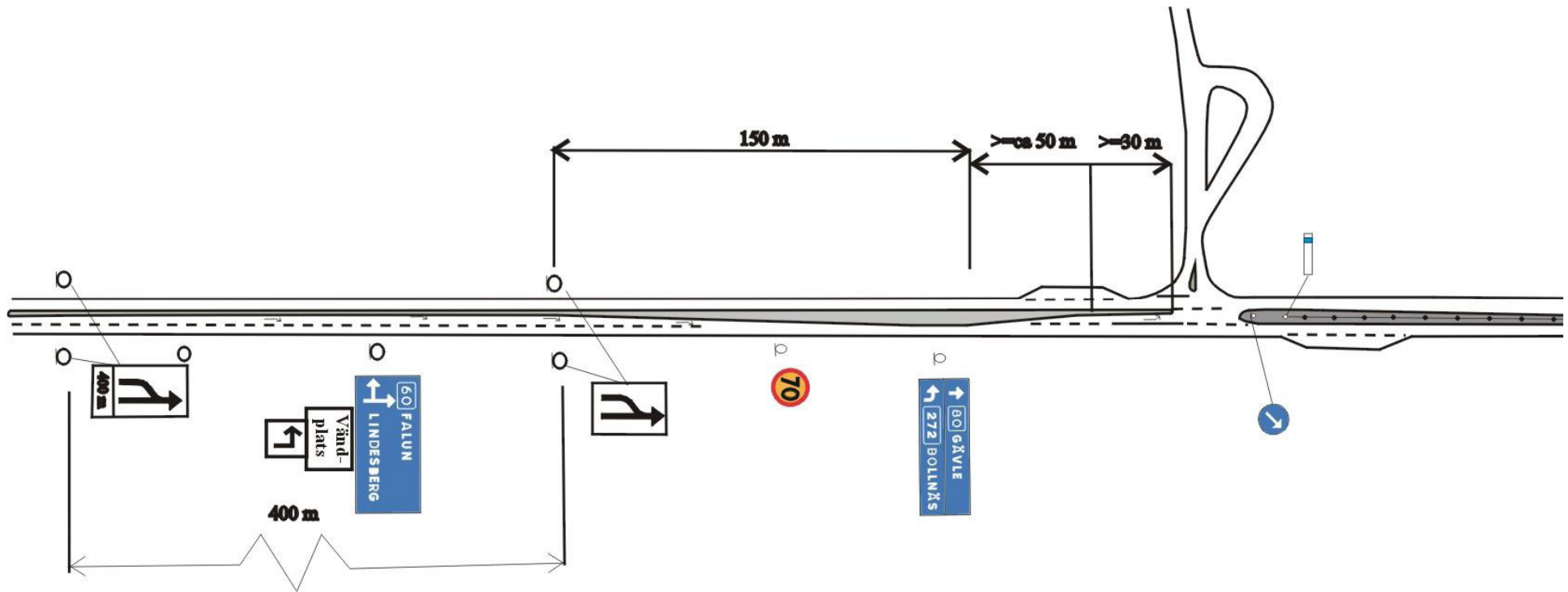
Cross – section optimisation ?



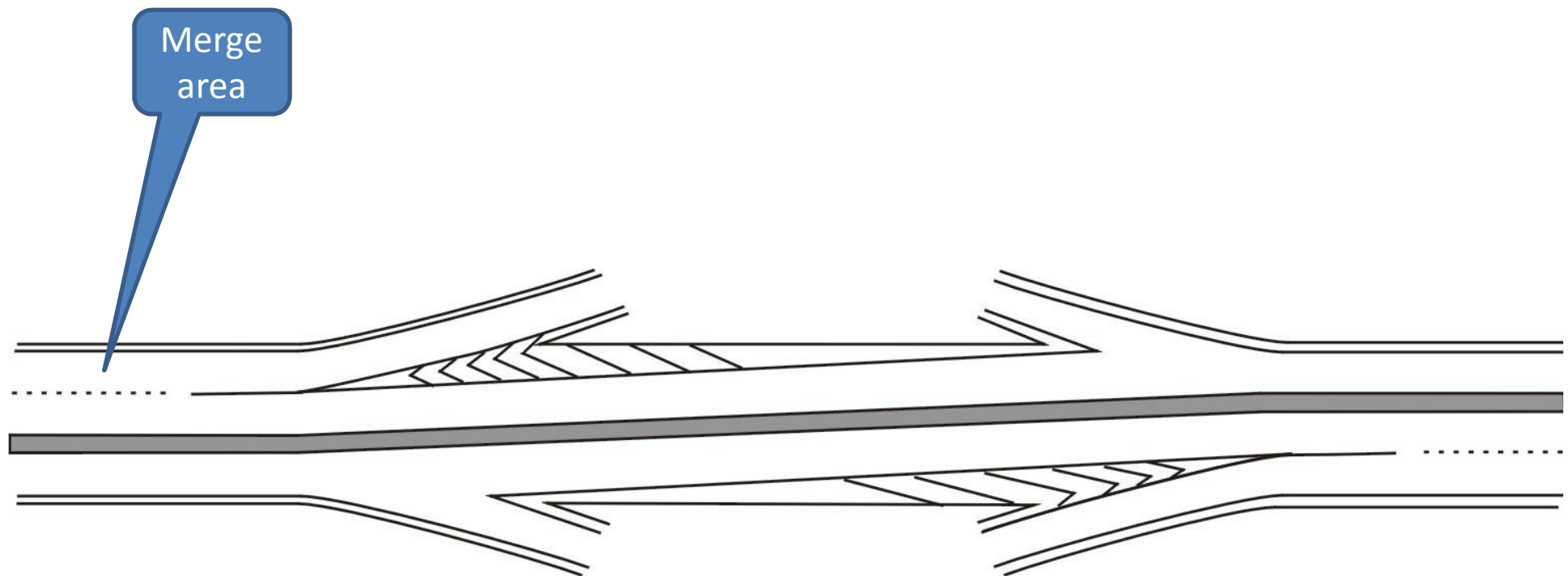
Barrier N2 W5 = 100/110/900/1500/20/1.7m



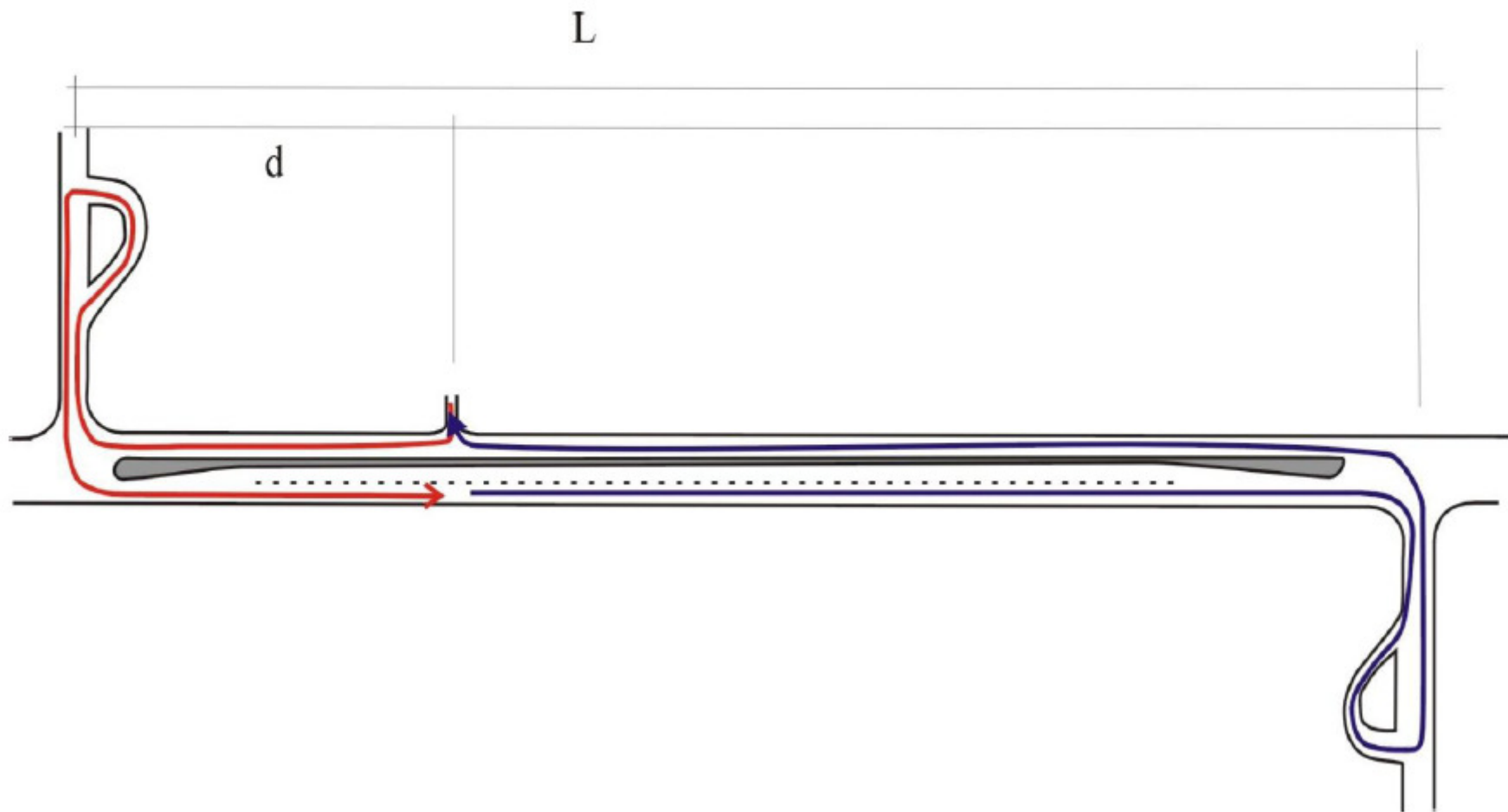
One lane in



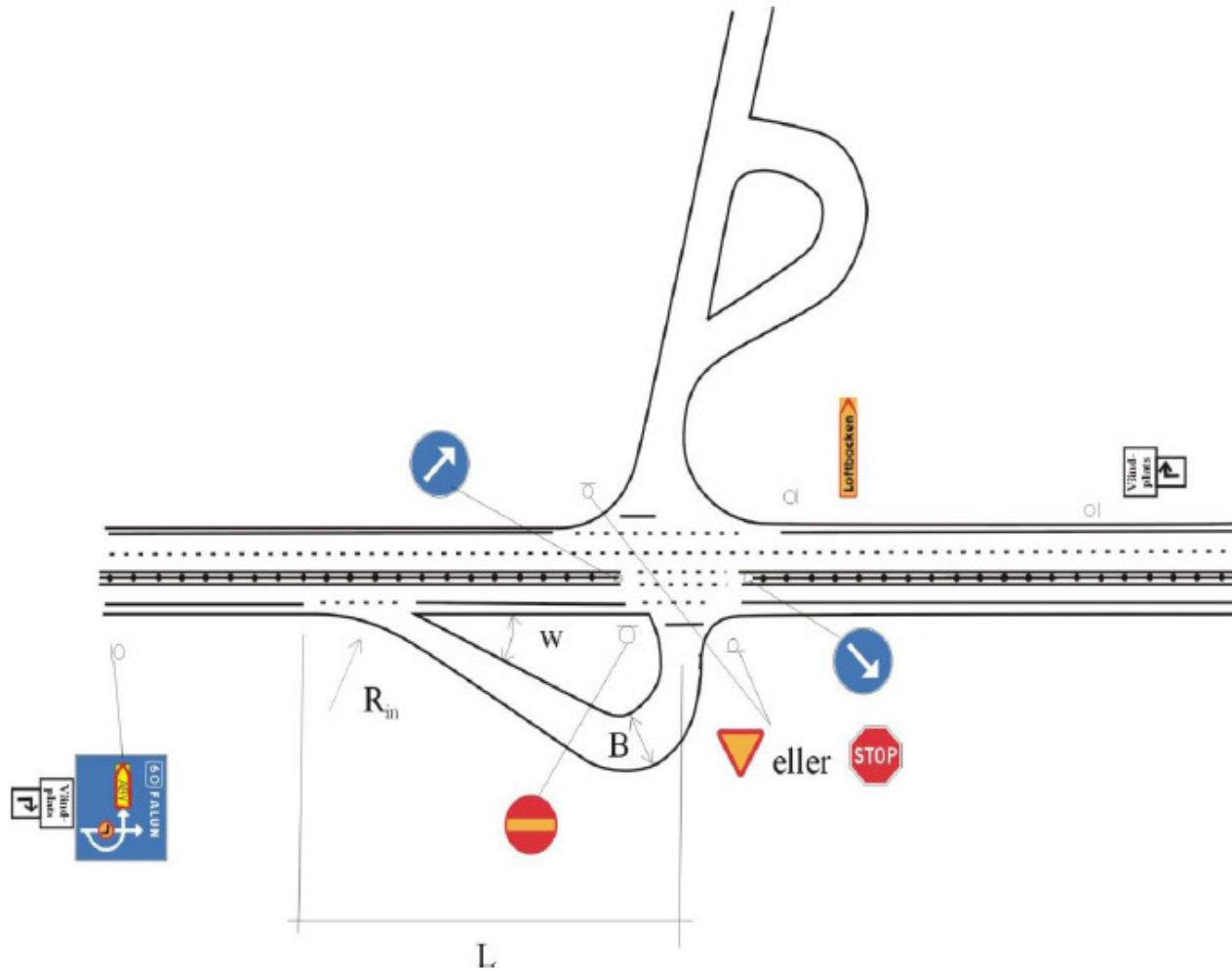
1 lane in and 2 lanes out



”Right-turn accesses”



Right-turn access design



Farmer's crossing



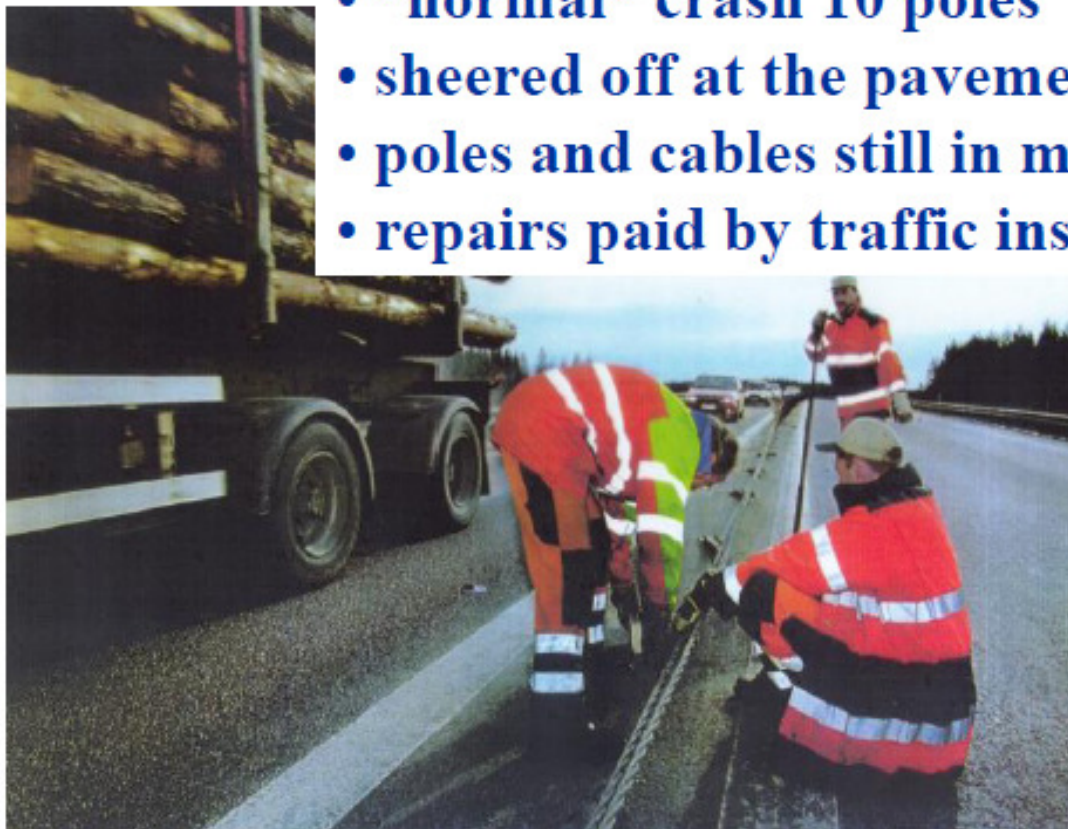
Approved for CEN N2 –900/1550 kg 120/110 kph 20 degrees





Barrier repair work zone treatment

- “normal” crash 10 poles
- sheered off at the pavement
- poles and cables still in median
- repairs paid by traffic insurances



Almost 2000 repairs/year

