



The marketing war between promoters of steel and concrete barriers is hotting-up, with the steel lobby gaining ground after an important French research report

IN THE world of automobile marketing, one of the most quoted statistics is the acceleration of a vehicle: this GTi turbo accelerates from nought to 100 km/hr in X seconds. In the world of impact barriers, it is the reverse statistic which is currently being used - especially by proponents of flexible steel barriers. The deceleration effect caused by a rigid concrete barrier, they say, is too high. Vehicles are brought to a sudden stop, or overturned, by an impenetrable barrier, causing increased injuries to passengers. Much better, they add, to use an energy-absorbing steel barrier.

The debate between manufacturers of rival systems has been going on for as long as the rival systems have been available. One of the more outspoken critics of concrete has been Wolfgang Wink, of German steel barrier manufacturer Volkmann & Roszbach, who is also vice-president of the European road safety organisation Euroadsafe. He draws an analogy with the sporting world, and in particular with what he calls 'soft-defence' sports like judo, to illustrate the concept.

"What does a soft defence sport have to do with road restraint systems? They teach that the best way to counter an attack is move aside and use your opponent's energy against him. This is what we achieve with a steel barrier: its a question of energy absorption."

The concrete lobby counter-attacks by pointing to the virtues of permanent rigid barriers. There are situations, they observe, where the priority must be to contain an errant vehicle, to prevent it crashing into buildings or oncoming traffic. In these situations, the safety of the vehicle occupants must be a lower priority than the safety of others, whether passers-by or travelling in other vehicles. They also point to the economics of their products, citing the higher maintenance and repair costs of steel barriers.

Wink responds by saying that it is "not a question of which system to install, but where each type should be used. For most normal categories of roads, deformable, energy-absorbing barriers should be mandatory. For special cases, where the protection of third parties - chemical factories, schools, etc. - has a higher priority, then a more rigid system should be used."

"A common mistake is to consider only the major life-threatening problems, instead of the most fre-

## Deceleration Values

Comparison of major collisions on barriers

	Concrete	Steel
<b>Edges/shoulder</b>		
non-injury accidents (per km)	0.51	0.51
injury accidents (per km)	0.08	0.06
vehicle overturning	11%	11%
<b>Middle (%)</b>		
non-injury accidents (per km)	0.54	0.57
injury accidents (per km)	0.14	0.05
vehicles overturning	20%	8.4%

\* Source: INRETS study LCB 9310 'Accidents sur autoroutes A6 - A7 - A9' September 1993, France.

quent accidents. In Germany, and in other countries, the accident death rate for smaller vehicles is about 95% of the total. These are the accidents we need to control, rather than considering only the spectacular incidents."

The steel barrier lobby has been boosted by the publication of a year-long study of accidents on over 1000 km of French autoroutes. The motorways A6, A7, and A9 were closely monitored during 1992, and statistics collated regarding the frequency and severity of accidents, and the numbers of personal injuries that resulted.

The study, conducted by the French national transport safety research institute INRETS (Institut National de la Recherche des Transports et de leur Sécurité), showed (as might be expected) that there was no noticeable difference in the frequency of impacts with various types of barrier, when compared to the total length of each barrier type. It also showed that, for barriers located on the edge or shoulder of the motorway, there was little difference in the injury rates and no difference in the ratio of vehicles which overturned (11% in both cases) regarding the type of barrier installed.

The major difference the report did discover was with barriers located in the centre of the highway.

Concrete barriers in this location had an injury-causing accident rate over the twelve months of 0.14 per kilometre, almost three times the rate for steel barriers (0.05 per km). Concrete barriers also appeared to be more than twice as likely to cause a vehicle to overturn - this happened in 20% of the cases, compared to 8.4% with other barrier types.

Naturally, the steel barrier lobby is delighted with the findings, which they say support the view they have always taken.

Within Europe, the process of normalisation of standards across the EU member states is continuing, and affects most areas of life from the safety of children's toys to the construction of impact barriers. Agreement on the performance of barriers, based on parameters like the Acceleration Severity Index (ASI) may well favour flexible, energy-absorbing barrier systems for the majority of installations in the future. In fact, steel already claims the lion's share of barrier installations, accounting for between 85 and 90% of the linear metrage in the French study.

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