

Time for integrated safety approaches

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Introduction

The railway and road transport sub-systems are complementary but different in the way they are organized and managed. The railway sub-system has a centralized operation compared to the loosely operated road transport sub-system, in which individuals interact. With greater emphasis on integration among transport modes through inter-modal and multi-modal models, there are a number of aspects that need to be analyzed and discussed in order to find a way to harmonize safety aspects between different transport modes.

Different safety level

According to Swedish statistic during a 10-year-period (1997 – 2006), in average 16 people per year were killed due to accidents in railway operations. During the same period, in average 508 people were killed per year, due to road traffic accidents. There is therefore no doubt that railway, in general, is a much more safe transport mode than road traffic.

Number of fatalities

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Average
Railway	16	16	8	10	13	16	24	13	22	20	16
Road	507	492	536	564	551	532	529	480	440	445	508

Different safety philosophies

Although there are several factors that could explain the differences in safety level between railway and road traffic, the most important factor is probably the underlying difference in safety philosophies and cultures, which influence the way safety problems are handled in these two different systems.

Safety, and its place in a goal hierarchy, is different between rail and road. Safety is a paramount goal within the railway sector and integrated in all aspects in rail operation. Within the road sector however, safety is, traditionally, one of many goals and has not a supreme statute. Here is safety just one aspect among many to handle.

The railway sector has always seen the safety problem as mainly a matter of design problem and safety responsibility is put on the designer of the different components in the system. In the road sector, traditionally, the safety problem is mainly defined as an individual road user behavior problem and therefore the responsibility is put on the individual road user.

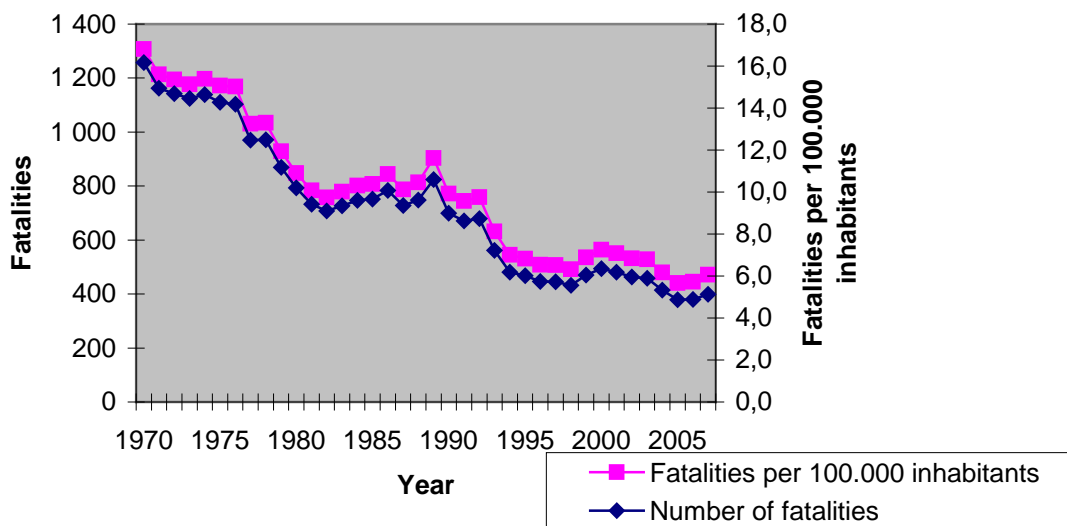
Different legislation

Within the rail sector there is a clear law structure which regulate the stakeholders' involvement in railway operations and their safety responsibility. Within the road sector however, there is no clear safety regulation of the designers of the road transport system, different components or professional users. Instead an almost strict responsibility is put on the individual road user. According to Swedish law, the road user should always adjust its behavior according to circumstances in order to avoid accidents.

These two different models of regulations are also to a great extent mirrored for example in the way accidents are investigated. According to Swedish law all serious accidents have to be reported and investigated by the Swedish rail administration and the different rail companies. This process assures that these stakeholders have information about their safety problem and thereby take necessary action to prevent future events. To know your problem in depth is an important requirement in all quality assurance system. However, within the road transport system accident investigations are mainly carried out by the police in order to find out if some one have broke a regulation. The focus is therefore mainly on individual road users and their faulty behavior. The result from these investigations is mainly an input to a juridical process, not to prevent future accidents except through a process of individual and social deterrence.

Vision Zero – a new idea that brings road safety closer to railway safety

Number of fatalities and fatalities per 100.000 inhabitants in Sweden 1970 - 2007



As you can see in figure 1 there has been a steadily down going trend in road traumas in Sweden over the last three decades, mainly as a result of implementing road safety

interventions. The Swedish society has over time become better and better to satisfy peoples' need for safety and you could imagine that the demand for more safety would decline in the same pace as the needs are fulfilled. That is not the situation and on the contrary, better safety feed demands for even more safety. In Sweden this demand has been translated to a political vision, the so called Vision Zero. It is obvious that the representatives for the Swedish people are not satisfied with the situation; they want a safe transport system. Volvo, the car manufacturer has also joined the movement and formulated a similar company vision.

New strategies

Although traditional road safety interventions, and the supporting management functions, have proven their effectiveness, Sweden is aware that "business as usual" may only be sufficient to maintain existing safety levels and is unlikely to generate significant improvements. The solutions from a Vision Zero perspective are therefore two folded. The first strategy is to design a system that takes human behavior and mistakes into account. One good example of this is the so called wire rope barriers on 2 + 1 roads. The main purpose of these barriers is to prevent oncoming traffic from head-on collisions.



A second strategy is based on the idea that behavior also can be solved technically. For example Volvo has developed a demo vehicle, equipped with a multi lock key. This key could prevent driving influenced by alcohol or not wearing seat belts and it is programmed to set the speed at, for example, a maximum of 90 km/h for new drivers.



Technologies also need a market and a process within the society

All these technical solutions described above require a strong sense of professional responsibility, from infrastructure stakeholders, vehicle manufactures or transport service providers among others. This professional responsibility already exists within the railway sector and is now slowly merging into the road sector.

In order to create a greater responsibility from system designers, new processes in the society are required. A concrete example of this is the establishing of the team carrying out in-depth studies of fatal accidents and the so called OLA process.

In-depth studies of all fatal accidents on roads and streets began in 1997 on the initiative of the Swedish road Administration. All information on the chain of events before, during and after the crash is compiled and analyzed by SRA. The summaries and analyses produced by the in-depth studies are used as basic data for road safety measures at the SRA at both a regional and central level. In 2002, OLA was introduced as a new working approach to crash prevention. OLA (ALA) is a Swedish acronym and stands for accurate data, list of solution and addressed action plans. This working approach entails systematic collaboration between different organizations, companies and authorities that have a stake in a single crash or in a specific safety problem. One example of this is an OLA carried out in 2006 which contributes to safe level crossings.

New regulations and new agencies

In 2008 the European Parliament adopted the first directive ever on road infrastructure safety management. This is an important step to harmonize safety procedures between different transport modes. In 2009 a new agency has been established in Sweden. The Swedish Transport Agency is working with rail, air, sea and road transport and has an overall responsibility for drawing up regulations and ensuring that authorities, companies, organizations and citizens abide by them.