



MANAGING SPEED ON ROADS

Road accidents are a leading cause of death and injury around the world. Each year, nearly 1.2 million people die and millions more are injured due to road crashes. In India, 1,05,749 people reportedly died in road accidents during the year 2006-07. In other words, one accident occurs every minute and an Indian dies every five minutes on our roads. Most of the people affected belong to low income group. Reportedly, our roads are the biggest killer in the world.

Excessive speed accompanied with reckless driving is the most significant factor contributing to the road accidents in most countries. The requirement of stopping distance increases with speed and as such, higher the speed, greater is the stopping distance requirement and, therefore, increased risk of a crash. Speed Management is, therefore, being considered internationally as a very important tool for improving road safety. Speed has been identified as a key risk-factor in road traffic injuries particularly, with the severity of the injuries that result in fatalities. Modern research has established that the most vulnerable (unprotected) road users could survive, if hit by a car traveling at 30 km/h. It has also been established by research that the majority are killed, if hit by a car traveling at a speed of 50 km/h or more. Pedestrians, according to research, incur a risk of being killed (about 80%) at a collision speed of 50 km/h. For car occupants, wearing seat-belts and using well-designed cars normally can provide protection up to a speed of 70 km/h in frontal collision and up to a speed of 50 km/h in case of side impact. Higher speeds can thus, be allowed only when geometric standards are adequately provided to ensure proper interface between the road infrastructure and the vehicles. This requires well-designed and protective crash barriers on sharp curves of road side barriers at a minimum lateral clearance of 2 m, free from objects like poles, buildings, structures, etc. Similarly, higher speeds, in case of mix traffic, without segregation as is the case in India cannot be allowed without inviting the risk of fatal crash.

Unfortunately, most road systems throughout the world allow much higher speeds notwithstanding the road conditions and environmental concerns, at least in case of developing countries. It is common to find that drivers choose to operate the vehicles at a much higher speed than the prescribed design speed/speed limit particularly, during lean hours. Many times, higher speeds do lead to fatal accidents during such lean hours because of unpredictable nature of human behavior in a complex traffic environment. In Indian context, heterogeneous nature of traffic comprising slow moving vehicles, pedestrians, cyclists, less protective two-wheelers/three-wheelers share the same common space with heavy motorized vehicles like trucks without any segregation. Keeping in view the traffic mix in India, it is desirable to construct separate pedestrian pathways, cycle tracks or motor cycle tracks separated by railings, depending upon their volume and composition in the traffic mix. This has not been done because we have blindly followed Western models of transport development. Even the industrialized countries, with very low volume of slow moving traffic like pedestrians and cyclists, are trying to segregate them to reduce the fatal accidents. Appropriate segregation needs to be attempted on our highways too, considering traffic mix operating on specific highways. We should not permit higher speeds on the pattern of industrialized countries, without such segregation.

With increasing motorization, there is an increasing demand throughout the world to build roads to higher standards i.e. to cater for higher speeds in order to reduce the journey time and congestion. Statutory National Speed Limits were imposed twice in US history, both during times of national crisis. A federal speed limit of 35 mph (56 km/h) was imposed during World War II. During the energy crisis of 1973, USA Congress established the maximum speed limit of 55 mph (89 km/h) to reduce reliance on imported oil. In both cases, the objective was to reduce energy costs rather than transportation costs. Safety benefits were





simply a by-product. In 1995, this maximum speed limit legislation was repealed in USA and as a consequence, many State Legislatures in USA raised the speed limits. This, according to subsequent studies, increased the accidents. The current design and economic analysis trend is to construct the roads for higher speed limits, similar to those of the industrialized countries, totally ignoring our heterogeneous traffic mix and inadequate geometrics like lateral clearances, proper curves, proper crossing points for pedestrians & cyclists, inadequate to nil segregation, etc. and inadequate enforcement. Drivers choose the speeds without considering these inadequacies. The World Report on Road Traffic Injury Prevention in its report has demonstrated that while fatalities in high income countries will fall by 27% over the period 2000-2020, globally there will be an increase of 67%. In South Asia (which includes India) this increase is predicted to be 144%. This is mostly due to higher speed limits without adequate provisions on the roads to absorb such speeds. This is an alarming observation which should not be ignored by the highway and transport planners of the country.

One key factor responsible for over-speeding by drivers is the capability of the present day vehicles to operate at much higher speeds than the design speeds. In a recent research study conducted in France, it has been observed that in 1967, the percentage of vehicles which could travel at a speed of 150 km/h was barely 10%. In 2006, 100% vehicles had the capacity to operate at a travel speed of more than 150 km/h. There is definitely a need to regulate the design of vehicles to prevent over-speeding. Various case studies conducted in many countries have demonstrated that by reducing the speeds of vehicles on highways, accidents can be reduced substantially. This has been validated during various studies conducted on changes in speed limits in several countries like South Africa, Belgium, Finland, France, U.K., Germany, USA and Netherlands. It was observed in USA that when the speed limit was increased from 65 to 70-75 mph, the road crash deaths rose by 35-38% vis-à-vis the fatality levels in the States that did not change their speed limits.

In different countries, speed limits are viably used to define acceptable speed. It is this speed limit which can be enforced. Speed limits are thus, a basic indicator to the road users of the mix speed allowed under the law. The concept of speed limit has evolved over time and it depends upon how different countries

have set different priorities for their road systems. In 1960's, the speed limits were set using the 85th Percentile speed which was perceived to reflect drivers' actual behavior in choosing the speed. In such cases, only 15% of the drivers were judged as over-speeding. This concept is still being erroneously followed in many countries. It is, therefore, considered appropriate to set the speed limits by taking into account road geometrics like sight distance, curvatures, etc. and then applying the economic trade-off between gains in time saving and accidents' cost. Whereas, most cost analyses of road projects use estimates of the values of time saved to justify investment in road projects which, in turn, requires roads with faster speeds. Such analyses ignore the savings in accident costs. The current emerging philosophy of Vision Zero has accordingly emerged.

The Government is to determine its appropriate priority. If the Government wishes to reduce the deaths and injuries on roads, then a safe system approach needs to be adopted. Such an approach could be developed by considering a mix of drivers' behavior (85th Percentile), accidents related criteria, socio-economic criteria and injury related criteria. In many countries, safe system approach is being adopted. The South Asian countries, like India, should consider very seriously, a safe system approach for the appropriate development of highway transportation system because for our country we cannot slowly go after speeds. We will have to limit the speeds in order to ensure better safety on our roads, along with taking many appropriate measures of segregation.

Our transport planning has to consider different types of roads. We can conceive a pyramid on our hierarchy. We have to classify our roads on function and activity basis in a pyramidal hierarchy pattern particularly, both for our rural and urban roads with arterial at apex, sub-arterial or collector roads in the middle and a thick pack of local roads at the bottom. The design criteria for them should be flow distribution and access respectively. The safe system approach should govern the flow with proper enforced speed limits, with adequate segregations between slow moving and fast moving vehicles.

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