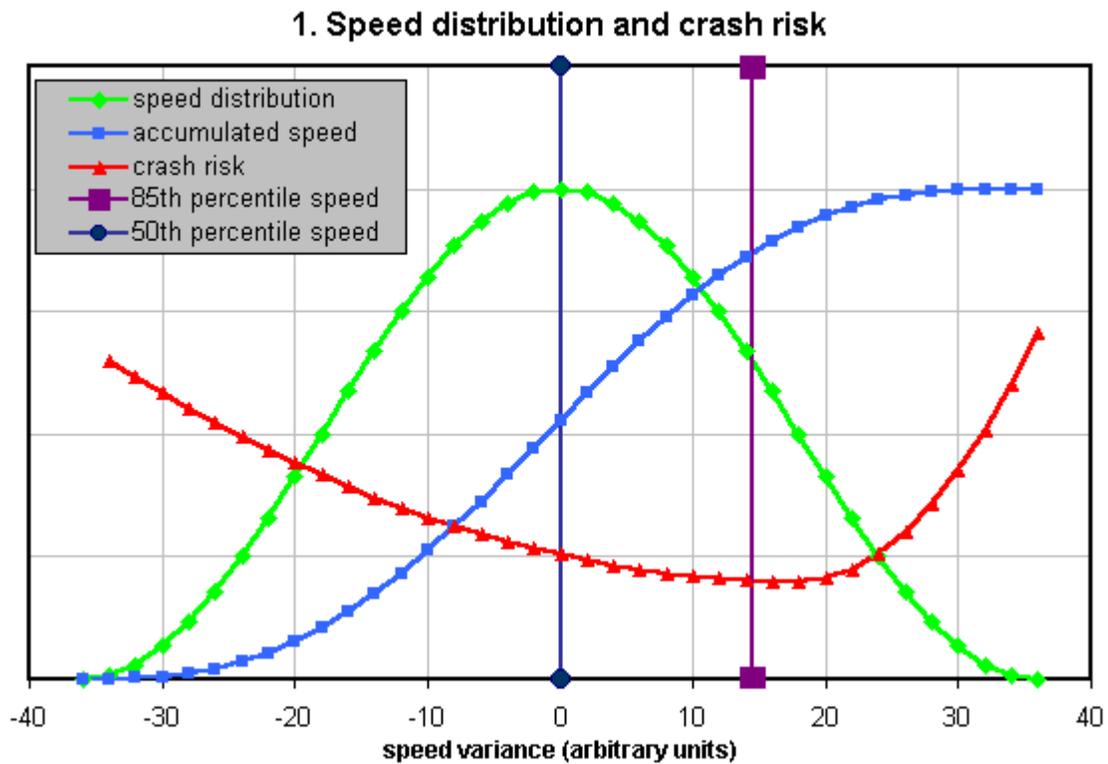


The Effects of Speed Limits on Driver Behavior

On any given stretch of road, drivers will travel at different speeds, and the spread of these speeds will take the form of a 'normal' or 'bell' distribution, as shown by the green curve in Figure 1. The vertical line through the crest of the curve represents the average or 50th percentile speed (the speed below which 50 per cent of drivers travel). Another vertical line, to the right of the graph, shows the 85th percentile speed - the speed not exceeded by 85 per cent of drivers.



The red curve shows the accident risk of drivers in relation to their chosen speed within the speed distribution. This curve is based on the results of studies in various countries of speed and accident involvement. It can be seen that, contrary to what might be intuitively expected, accident risk does not rise in a simple relationship with speed but is actually lowest for drivers travelling in the 80th to 90th percentile speed range. At speeds above the 90th percentile, accident risk rises sharply, but it also rises at lower speeds and, indeed, the slowest drivers are at similar risk to the fastest.

This is a very important phenomenon to understand: drivers who travel at around the 85th percentile speed are the safest and most competent. Among the very fastest drivers are those who tend to be the most reckless, lacking the experience or skills required to recognize the presence of hazards dictating the need for a lower speed. At the other end of the scale, the slowest drivers are the least confident and often have poor vehicle handling skills.

It is because of these findings that the 85th percentile speed is recognized by traffic engineers as the optimum level at which to set speed limits. When speed limits are set in accordance with the 85th percentile, it means that the majority of drivers, including the safest, are travelling within the law. This is an important principle, which is summed up well by the following quote:

*The normally careful and competent actions of a reasonable individual should be considered legal.*²

Speed limits based on the 85th percentile reduce the spread of the speed distribution, especially by reducing the number of drivers travelling at the highest speeds: since the speed limit has been set in accordance with the actions of the responsible majority, the remaining drivers are more likely to accept that it is reasonable. The converse is also true: if speed limits are set below the 85th percentile speed, they are largely ignored, even by the safest drivers; the reckless minority then see that the limit has no respect amongst the majority of drivers, so they ignore it altogether. Thus speeds can actually increase when unreasonably low speed limits are introduced, and can decrease when speed limits are raised.