

Speed management in Helsinki

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During the last 30 years, the population of the City of Helsinki has stayed around half a million. Since early seventies, the number of traffic fatalities per year has dropped dramatically in spite of the growth of the car mileage to twofold (Figure 1).

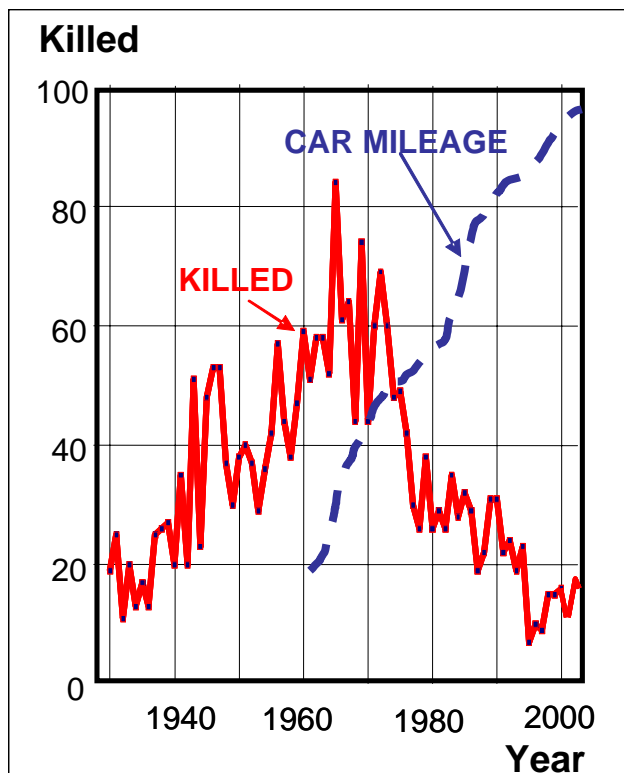


Figure 1: Killed in road traffic accidents in Helsinki from 1930 to 2003

By excluding the potential effects of all other changes in traffic, it has been evaluated that speed management has been the most important single factor behind this development.

Speed limits

For example, after the introduction of speed limits on Finnish highways in 1973, the number of pedestrian accidents was in a few years cut by half on those down-town streets in Helsinki where no safety countermeasures whatever were introduced. Thus, the reduction of speeds on highways must have had a strong positive reflection on traffic behavior and safety also on urban streets.

In 1987, 40 kph speed limits were introduced on suburban residential streets in Helsinki and in March 1992 the 40 kph limit was extended also to the city centre. In February 2004, the city decided to continue the reduction of speed limits from 50 to 40 and from 40 to 30 (Figure 2).

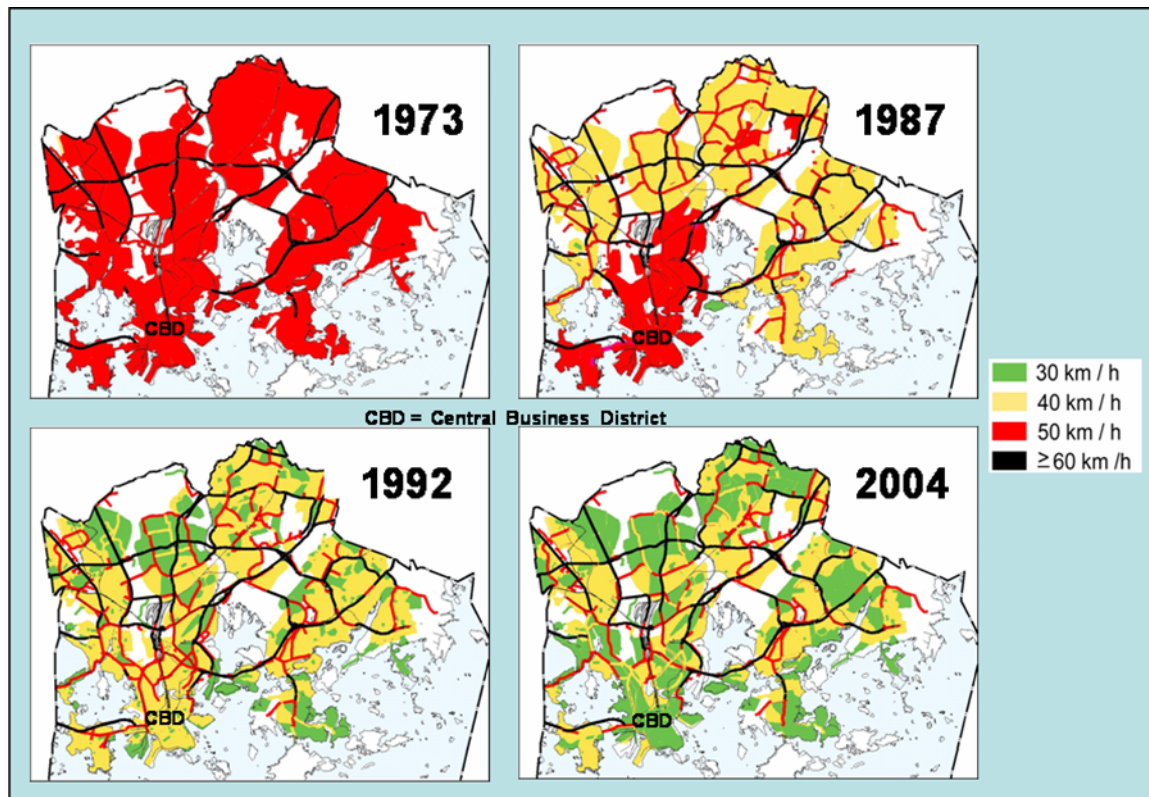


Figure 2: Speed limits in Helsinki 1973-2004.

At present, 30 kph speed limits exist on many main streets with a traffic volume up to 30 000 vehicles per day (Figures 3 and 4).



Figure 3: Mannerheimintie (Mannerheimvägen) in the city centre

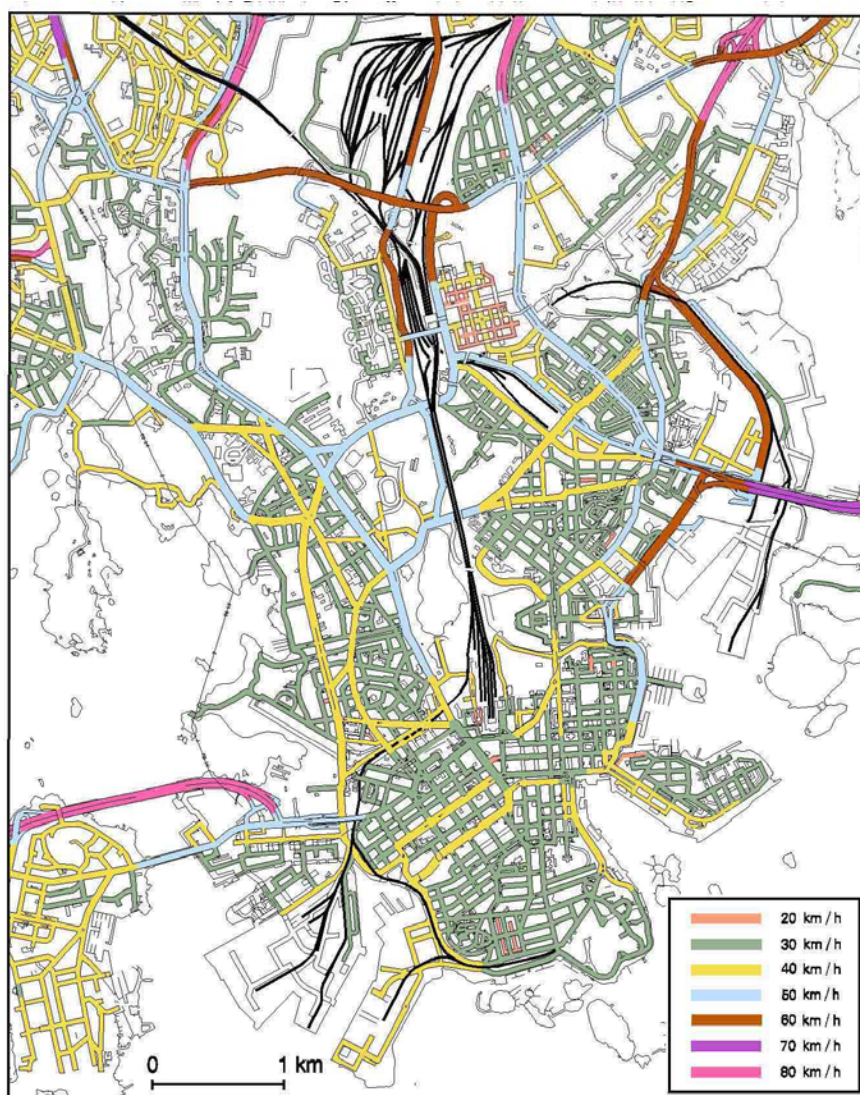


Figure 4: Present speed limits in the inner city.

It can be shown that the reduction of speeds on urban streets produces safety benefits (savings in accident costs), which are 10-fold compared to the measurable negative effects (time losses).

It is somewhat difficult to give scientific monetary values to the mental sufferings caused to drivers forced to drive slower than they would like to. So far, this evaluation has to be left to the politicians.

At present, it can be stated that the optimal speed limit on an urban street is the lowest limit the political decision makers can accept. In this context, the proposals made by the Helsinki Traffic Planning Division in 1992 and 2004 have succeeded perfectly. The City Board accepted the both proposals by a narrow margin of eight votes against seven.

Resistance

Both in 1992 and in 2004, the suggestions of speed limit reductions met hard resistance especially from the business circles. It was claimed that the reduction of speed limits would jam the whole traffic-system and ruin conditions for commercial activities in the city centre. It was also claimed that the amount of exhaust emission would increase dramatically.

There was a rather embarrassing false reasoning behind these claims. Everybody knows that congestion causes slow speeds. However, this does not mean that low speed limits cause traffic jams.

The capacity of a given lane depends on the time-intervals between successive vehicles. The slower the leading car drives in front of a queue, the closer follows the next car. From the point of view of capacity, it looks like the optimal speed level in urban street network is somewhere between 30 and 40 kilometers per hour (figure 5).

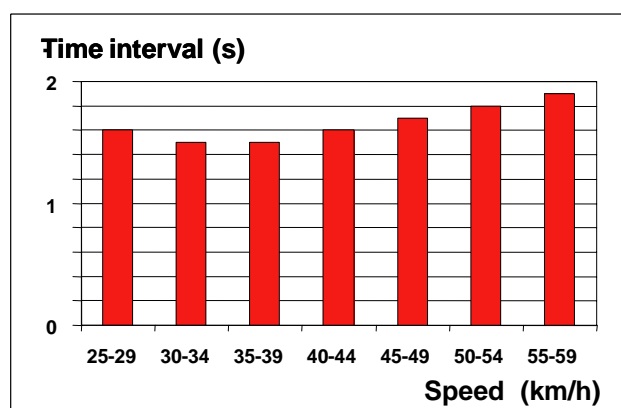


Figure 5: The effect of the driving speed of the leading car on time-interval (distance/speed) between successive cars in queues on three signalized main streets in Helsinki.

‘Besserwissers’ also seemed to be very eager to inform traffic planners that driving faster on higher gear and with lower revs reduces fuel consumption and exhaust emission. They skipped the fact that in urban, discontinuous traffic the decisive component is the strength of acceleration. Research in many countries has shown that the reduction of highest speeds in urban traffic does not increase exhaust or noise emission.

Free vehicles

A very common misconception of drivers is that driving speed does not play any role in the safety of streets in city centre. “You can’t drive fast even if you want to!”.

A unique system of video-recording real-life accidents in the city centre of Helsinki has highlighted a very important feature in urban traffic safety. Pedestrians or other crossing traffic do not collide with cars in queues.

The reduction of highest speeds in urban traffic concerns especially those few free-flowing dangerous vehicles which can freely choose their speed. The effect on the travel times of the majority driving in queues and stopping every now and then is rather small.

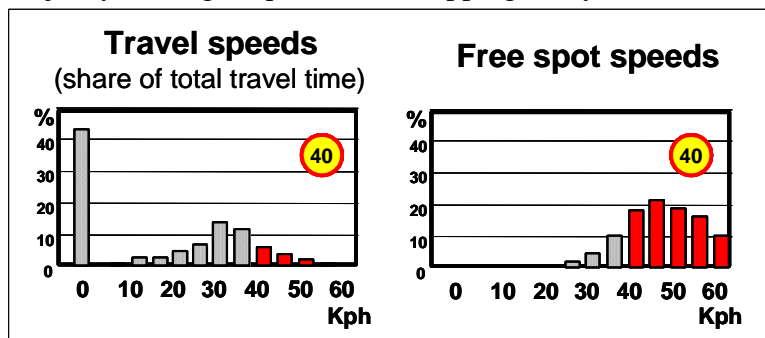


Figure 6: Two speed distributions on a signalized main street with a traffic volume of 30 000 vehicles per day.

The video-recording of traffic accidents has also been very educational for drivers and decision makers. They can see how pedestrians really fly in collisions with cars driving “only” 50 kilometers per hour.

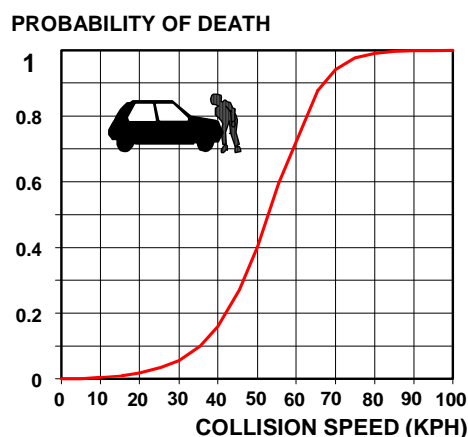


Figure 7: The effect of the collision speed on the probability of death of a pedestrian.

Speed violations

Unfortunately, the reduction of a speed limit always increases the number of speed violations. However, this does not mean that the existing speed limits on central and residential urban streets are too low. Traffic is much more dangerous on urban streets than on highways.

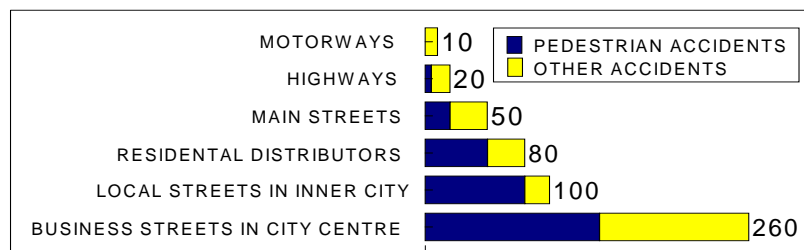


Figure 8: Injury accidents per 100 million kilometers on different type of roads in Helsinki.

At present, driving speeds are far too high for the prevailing conditions on urban streets. Speed management is absolutely the most effective and also the most realistic way to improve safety on urban streets.

A reduction of a speed limit by 10 kph reduces the average of free spot speeds only with a few kilometers per hour. However, this modest looking result is not insignificant, because the effect on the highest speeds is significant.

Figure 9 contains the whole traffic flow. The speed reduction of the dangerous free vehicles has obviously been much stronger.

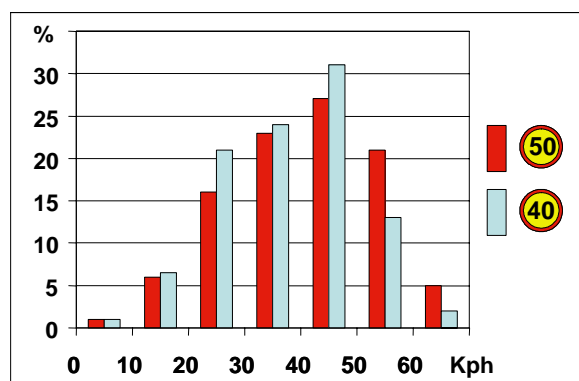


Figure 9: Speed distributions before and after the reduction of the speed limit from 50 to 40 on a signalized main street.

Speed enforcement

The definition of acceptable risks, caused to other people in traffic, is definitely a task of the community, not of the individual driver. The community shows it's will with speed limits but the community also needs tools to make sure that the rules are followed.

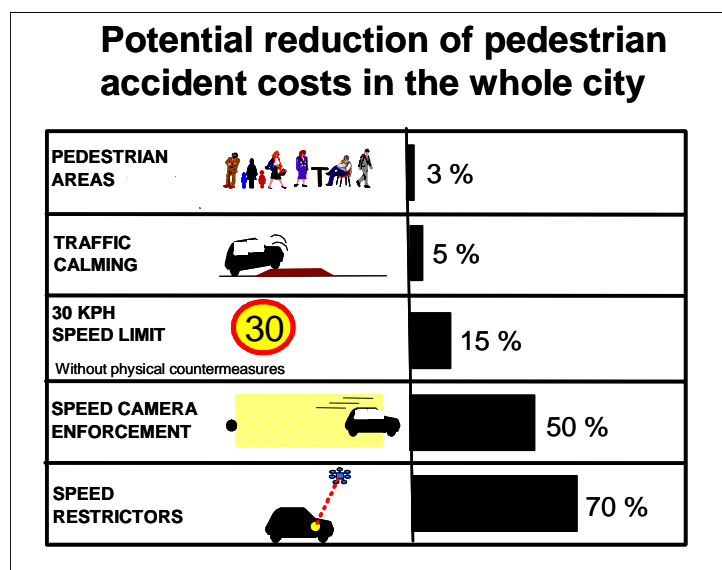


Figure 10: Potential effects of some speed reducing countermeasures.

At present, the Finnish legislation concerning speed camera enforcement is the most primitive in the Nordic countries. The City of Helsinki has fought for years for a legislation based on the responsibility of the vehicle owner. This would allow municipal speed enforcement. After reaching this, we promise to reduce traffic accident costs in Helsinki (at present 250 million euros per year) by at least 50 % with only a few mobile speed camera units.

Unfortunately, this goal may fly to a distant future because of a bunch of lawyers defending the noble principles of criminal law. They refuse to see that traffic is the only area of human activity where most people brake laws all the time or at least occasionally. The system is not equipped to handle that many 'criminals'.

Traffic safety has lost some battles against these lawyers but the war is not over. We don't give up.