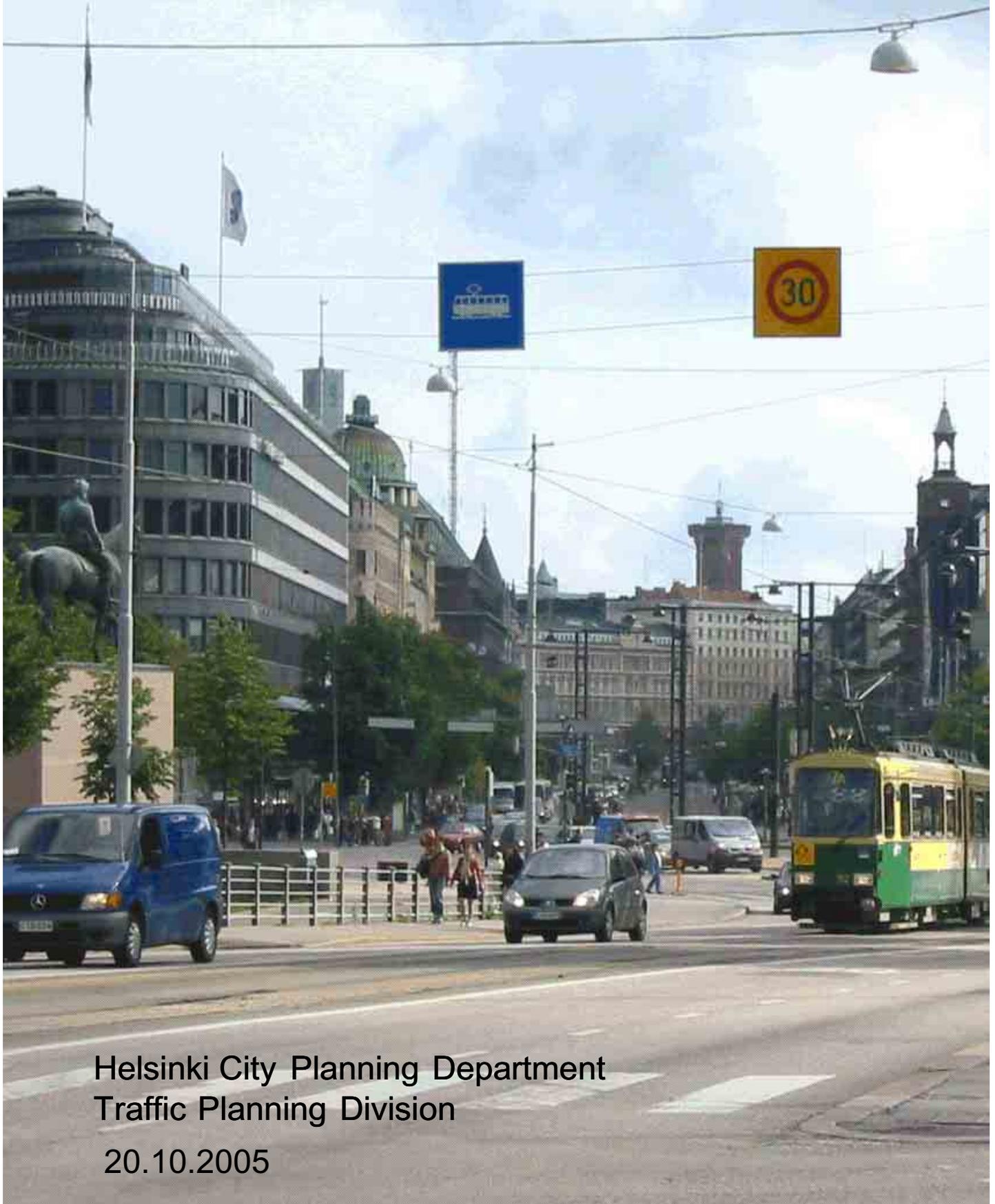


Speed limits in the City of Helsinki



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20.10.2005

Speed limits in the City of Helsinki

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In summer 2004, the speed limit of several streets in Helsinki was reduced by 10 kph. The reduction of measured average spot speeds was only 1,5 kph. However, the estimated reduction of accident costs was about 5 million euros per year. The countermeasure did not increase congestion or exhaust emission. The majority of interviewed residents was satisfied with the countermeasure.



Background

In Helsinki, traffic safety has taken great steps during the last 30 years in spite of the rapid growth of car mileage (Figure 1). By excluding all other changes in traffic network or in traffic itself it can be stated that speed management has been the most important single factor behind this development.

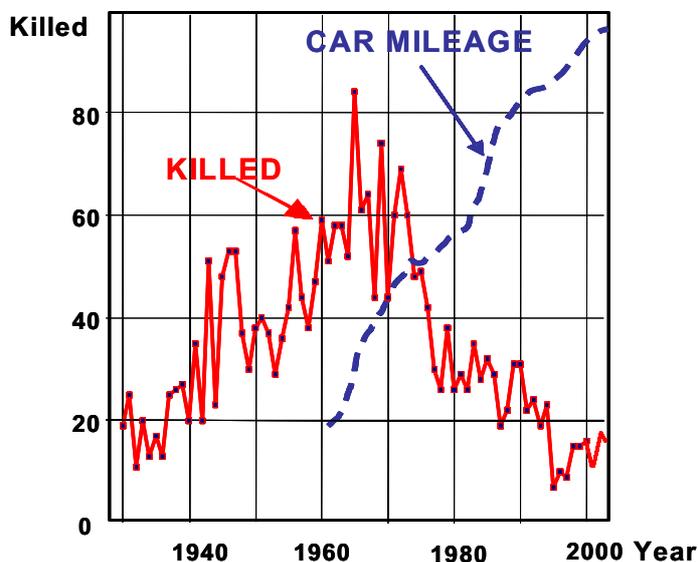


Figure 1: Killed in traffic accidents in Helsinki from 1930 to 2003

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 downtown streets in Helsinki where no safety countermeasures whatever had been introduced. So, speed limits on highways must have had a strong positive reflection on traffic behaviour of drivers also on urban streets.

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

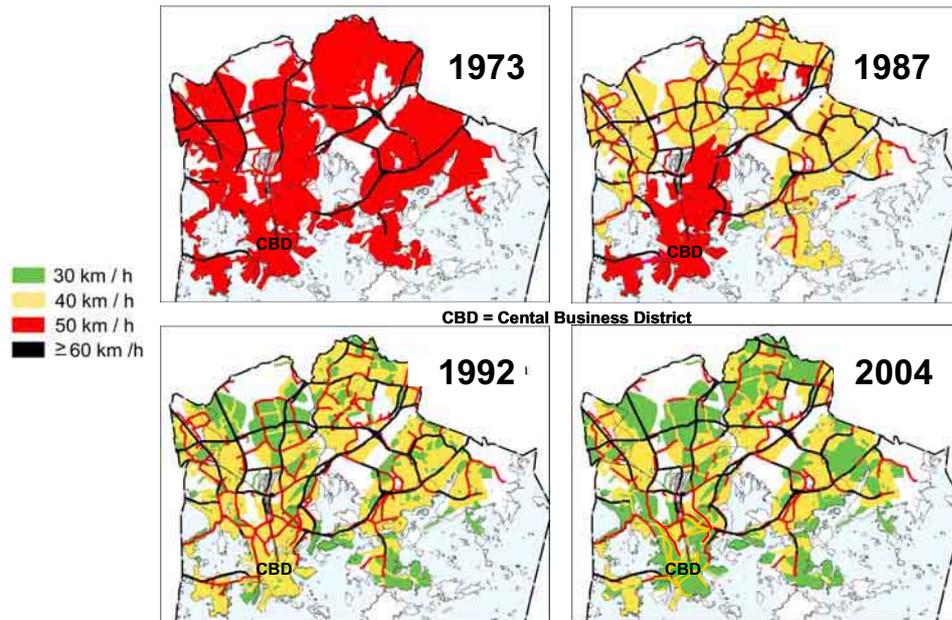


Figure 2: Speed limits in Helsinki 1973-2004.

In the spring of 2004, the Swedish City of Stockholm reduced the speed limits on all residential streets to 30 kph. Helsinki kept the 40 kph limit on suburban block house areas .

However, Stockholm kept the "historical" 50 kph limit on busy main streets in the inner city. Helsinki has a 40 or 30 kph limit also on most of this kind of streets (Figure 3). On these streets the number of injury accidents and also the accident rate is highest (Figure 4).

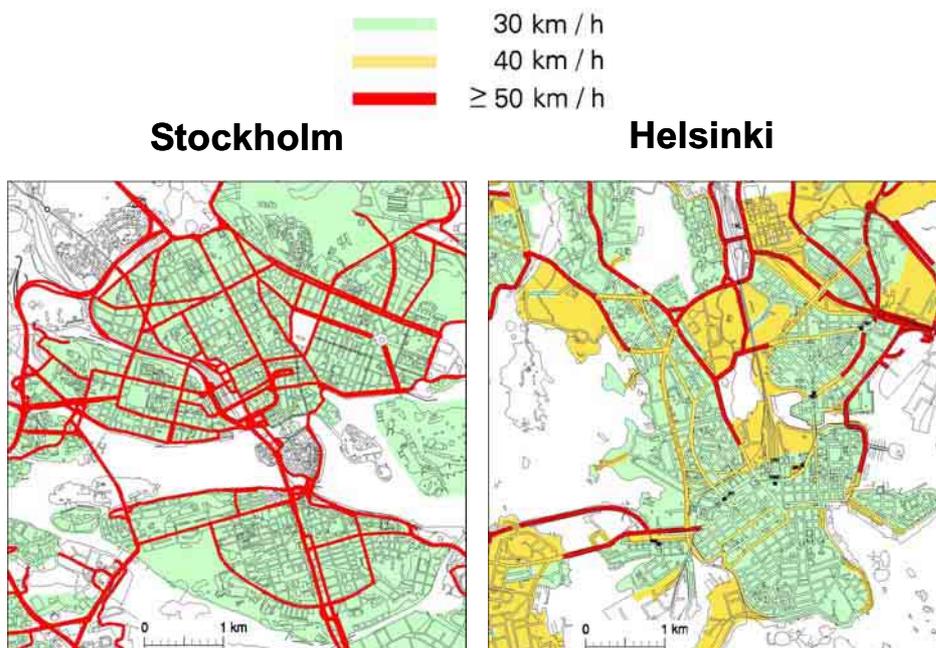


Figure 3: Speed limits in the inner city of Stockholm and Helsinki

Downtown traffic and traffic on residential streets in Helsinki is much more dangerous than traffic on highways. Driving speeds are far too high for the prevailing conditions. We can not and often we don't even want to reconstruct the environment more suitable for present high speeds. Therefore, speed management is the best measure to improve traffic safety on wide central and residential areas.

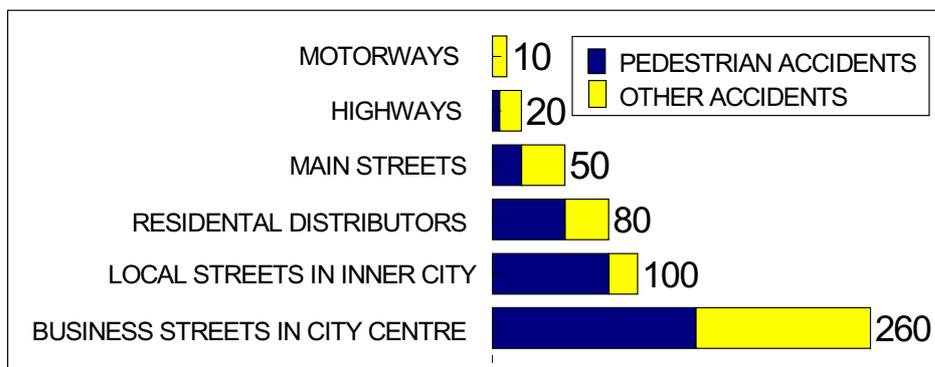


Figure 4: Injury accidents per 100 million vehicle kilometres in Helsinki

Results from changes in 2004

In February 2004, the City Board decided to reduce speed limits on many residential streets and busy downtown streets from 50 to 40 and from 40 to 30 kph. The new speed limits were put into effect during the summer of 2004.

Spot speeds

In May 2004 and June 2005, the distribution of free speeds was measured on ten streets with HiStar detectors placed on the surface for one day.

The average spot speed was reduced by 1.5 kph (*Figure 5*).

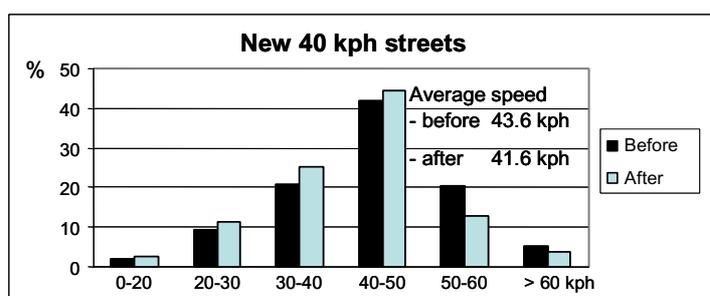
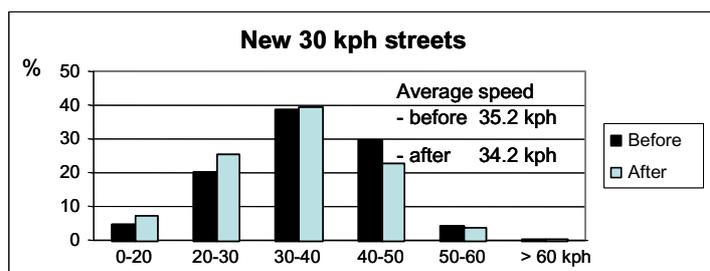


Figure 5: Distribution of spot speeds before and after the speed limit reduction

The effect of the speed limit reduction was very modest on downtown business streets. But on some residential streets (*Figure 6*) the result was rather good.

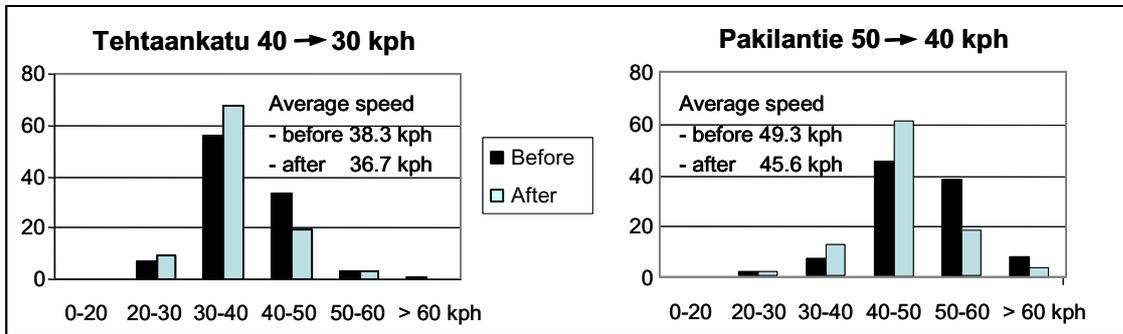


Figure 6: Distribution of spot speeds on two residential streets

Control measurements were made on three streets, where the speed limit was not changed. On these streets the average spot speed was reduced by 0.3 kph.

Traffic safety

The reduction of speeds is most powerful against the most serious accidents (*Figures 7 and 8*).

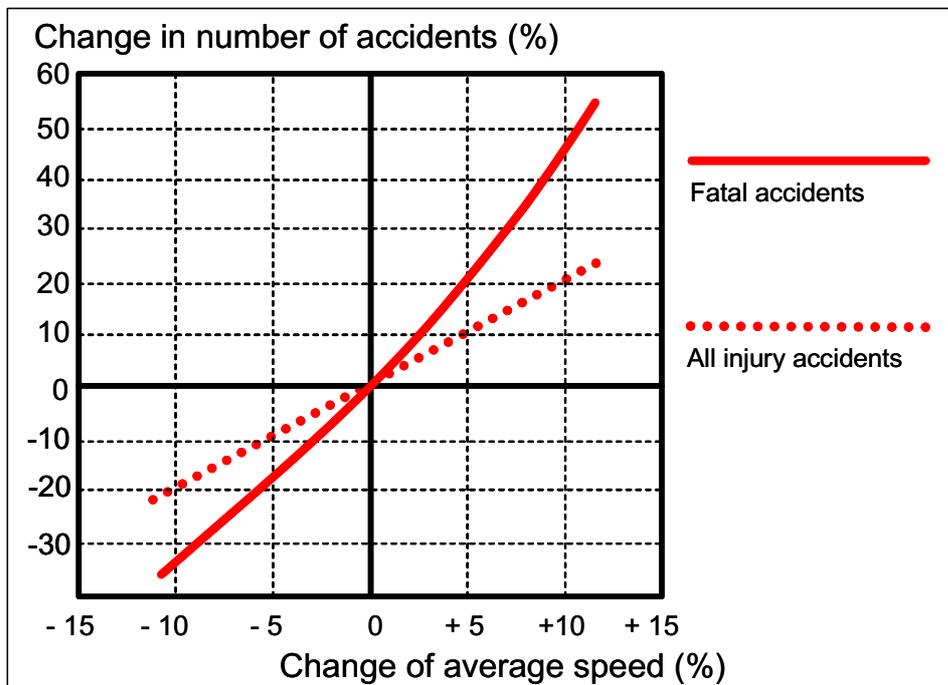


Figure 7: The connection between driving speeds and traffic safety (Andersson & Nilsson 1997).

PROBABILITY OF DEATH

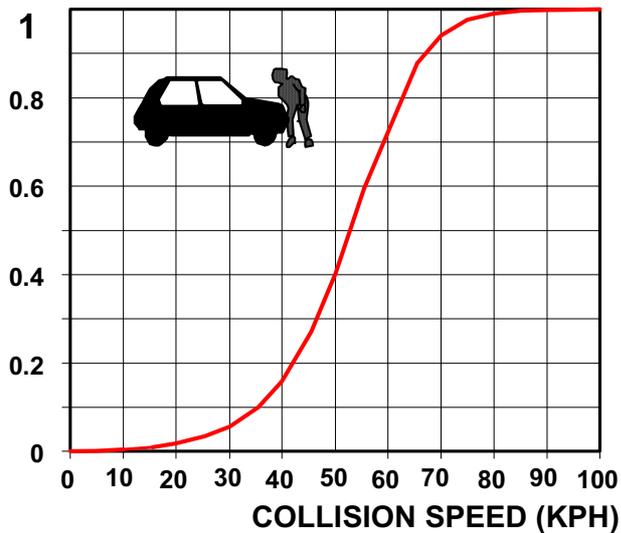


Figure 8: The effect of the collision speed on the probability of pedestrian death (Pasanen 1991).

When the number of accidents is reduced by speed management, also the severity of remaining accidents is mitigated because of reduced collision speeds. It can be roughly estimated that the reduction of total accident costs is close to the reduction of fatal accidents.

On those streets in Helsinki, where the speed limit was reduced in the summer of 2004, the spot speed was reduced on the average by 4 percent. This means that fatal accidents and accident costs respectively ought to be reduced by 15 percent. The reduction of total accident costs is about 5 million euros per year.

The cost of new traffic signs and road markings was about 0.3 million euros.



Congestion

In public discussion and in many statements of interest groups it was claimed that the reduction of speed limits increases congestion and exhaust emission. It was even suspected that the countermeasure would ruin the commercial downtown business world.

Theoretically, cutting the highest speeds does not create congestion because the lower is the speed, the lower is the distance between successive vehicles. From the point of view of capacity, it looks like optimal speed in downtown traffic is somewhere between 30 and 40 kph (Figure 9).

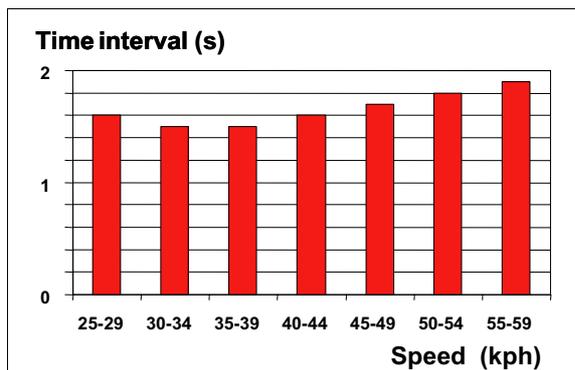


Figure 9: The effect of the driving speed of the leading car on the time interval (distance/speed) to the following vehicle on signalised downtown streets.

In 1992, measurements made by the Helsinki Traffic Planning Division showed that the reduction of speed limits from 50 to 40 kph did not increase congestion or fuel consumption.

In 2004, a new research method was available. Since October 2002, the Finnish Technical Research Centre (VTT) has recorded the speed behaviour of seven cabs in a private taxi company operating in Helsinki area. The SPEEDAUDIT system consists of a small on-board unit, which includes a GPS for vehicle location and speed measurement, memory for data logging (speed, time and position) and GSM for data transfer.

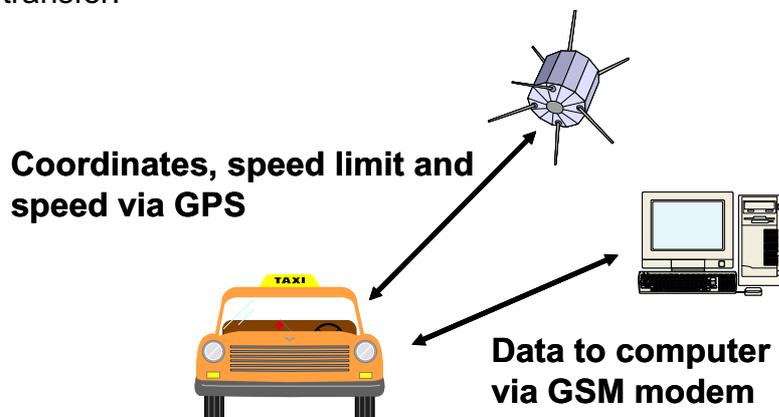


Figure 10: The SPEEDAUDIT system.

The Traffic Planning Division utilized the SPEEDAUDIT data to evaluate the effect of the downtown speed limit reduction on travel times. The study, made by VTT, showed that the low speed limits did not increase congestion.



The opinions of the residents

Soon after the latest speed limit decision in Helsinki, the opinions of interviewed residents were rather favorable for the low 30 kph limits.

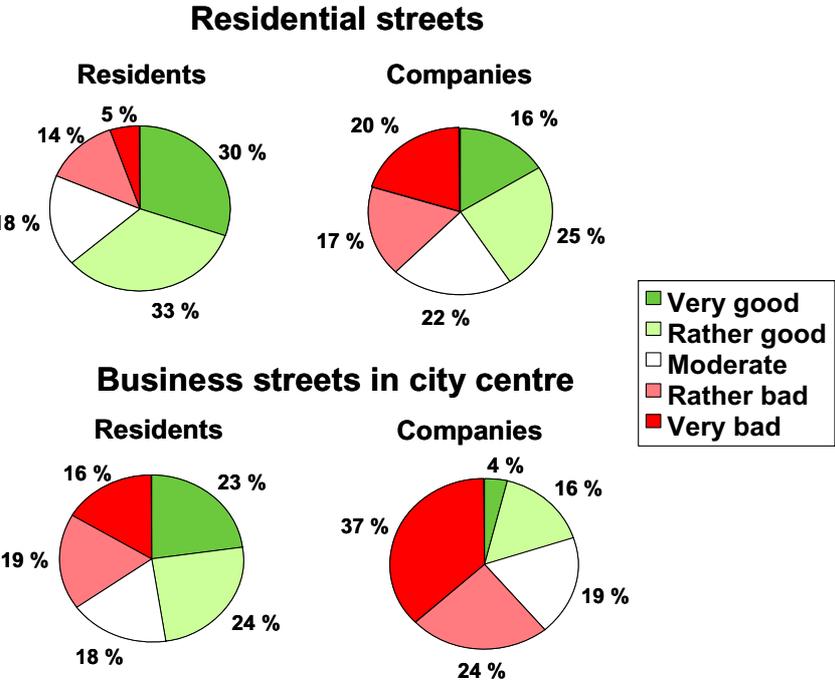


Figure 11: The opinions of the residents and companies on the new 30 kph speed limits.

Conclusions

The reduction of speed limits in 2004 had an expected effect on driving speeds and traffic safety. The benefits of the countermeasure were multiple compared to the costs. However, there is still much to do to improve compliance with the speed limits.

Obviously the speed limit system, integrated by the street environment, is not as clear-cut to drivers as to traffic planners. Therefore, the use of informative road markings should be extended.

However, the basic problem is that many drivers do not even want to follow the speed limits for their own reasons.

The City of Helsinki has worked for several years for a national legislation based on vehicle owner's responsibility in speed violations. This would allow a municipal participation to the speed camera enforcement and release the limited resources of the police for true police work. Just like the practise has been in parking enforcement in Finland since 1972.

It has been estimated that by effective speed camera enforcement the City could cut by half the accident costs in its whole area (by more than 100 million euros per year). Unfortunately, the needed changes to the legislation are not going to be enforced on the national level in the near future. Therefore, the City of Helsinki has made a proposal of a 3-year experimental regional legislation, which would cover the Helsinki area.

An alternative policy is to radically increase the use of physical speed reducing countermeasures like humps, elevated pedestrian crossings and small roundabouts).