

Innovative Road Safety Measures for Cyclists and Pedestrians



11th IMPACTS International Conference, Berlin
5 June 2009

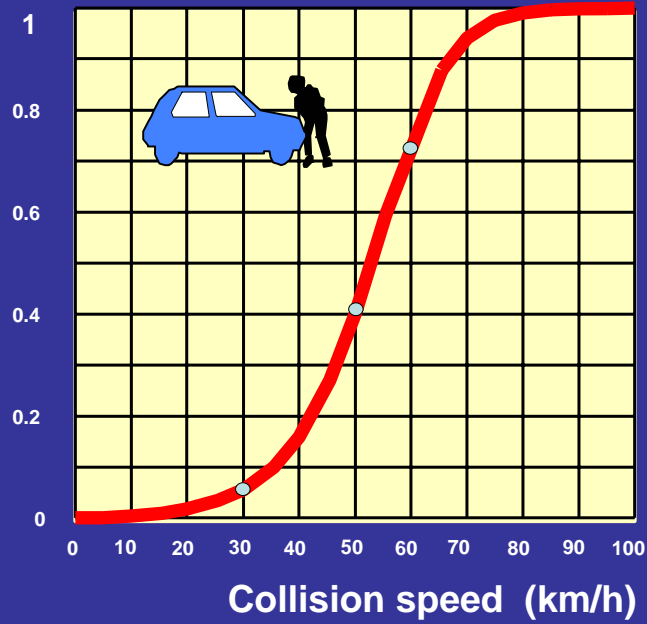
Olli-Pekka Poutanen, City of Helsinki



Street Kaivokatu



Probability of pedestrian death

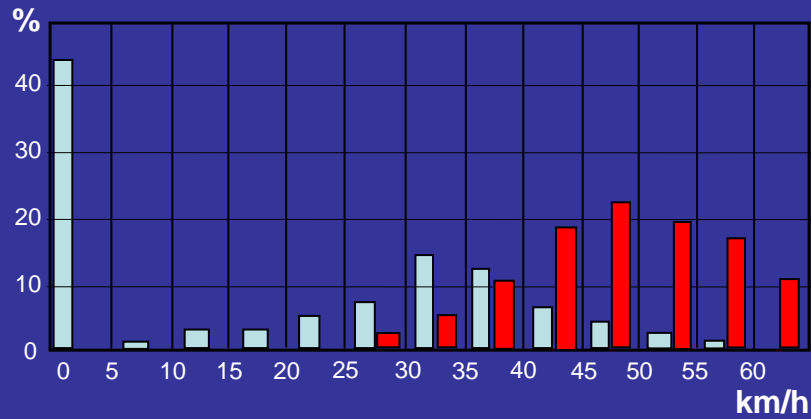


Video accidents



Speed distributions on Street Kaivokatu

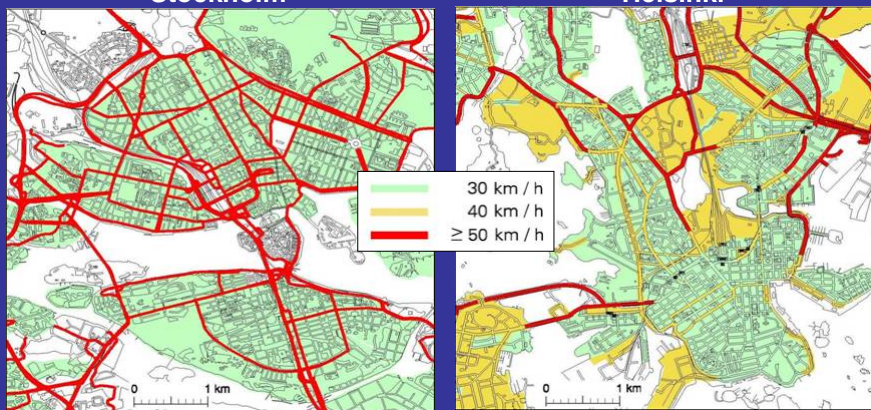
■ Travel speeds ■ Free spot speeds



Speed limits in downtown Stockholm and Helsinki

Stockholm

Helsinki



Injury accidents per 100 million vehicle kilometres



Street Kaivokatu

(30 000 vehicles per day)

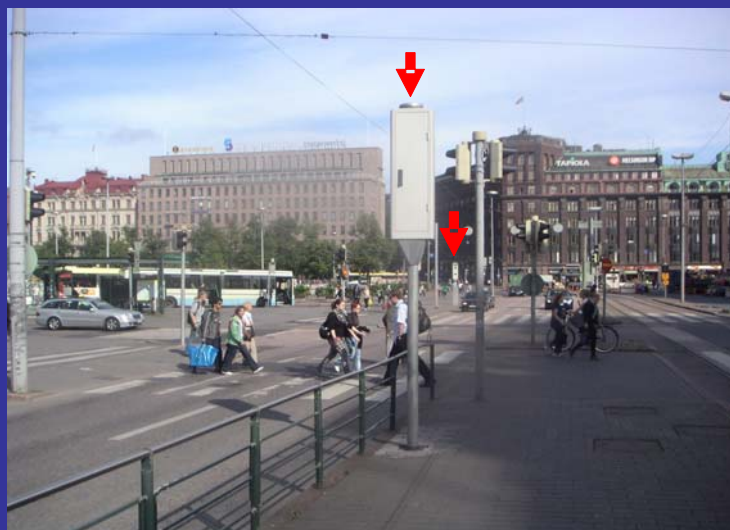


Street Mannerheimintie

(30 000 vehicles per day)



Speed and red light camera



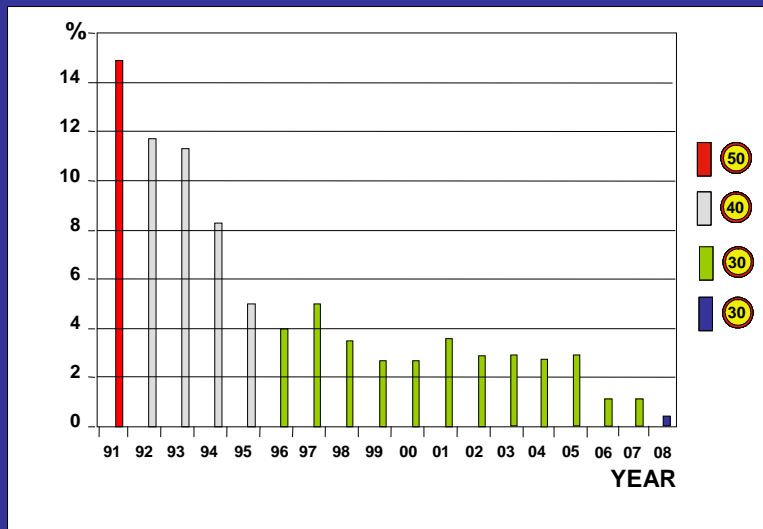
Lane controller



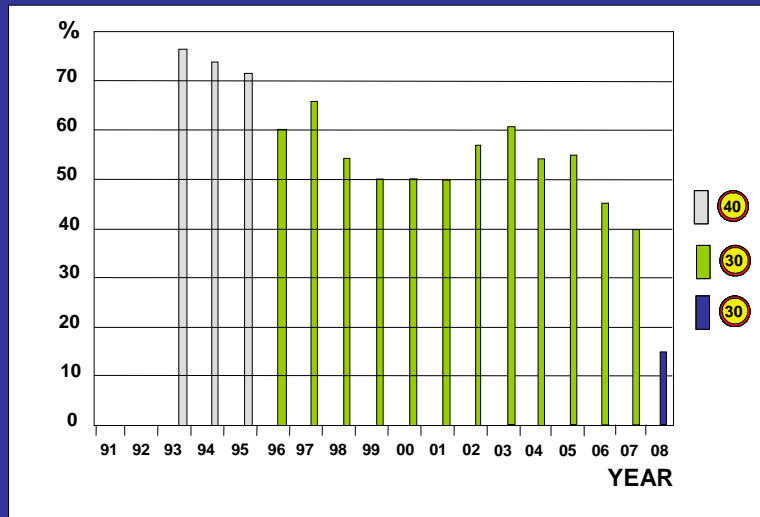
Picture of A Speeding Vehicle

Date	Time	Location	ReportLine	Direction	D1	D2	T
2007-12-13	14:39:30.1 s	FINLAND	18.0 m	Arriving	0.0	0.0	0.00
Lane	Speed	Sign speed	Redlight t.	Amber t.	Elap t.		
-	36.1 km/h	30 km/h	0.0 s	0.0 s	2.1 s		

Share of Speeds over 50 km/h on The Street Kaivokatu in 1991-2008



Share of Speeds over 30 km/h on The Street Kaivokatu in 1993-2008



Mobile speed cameras



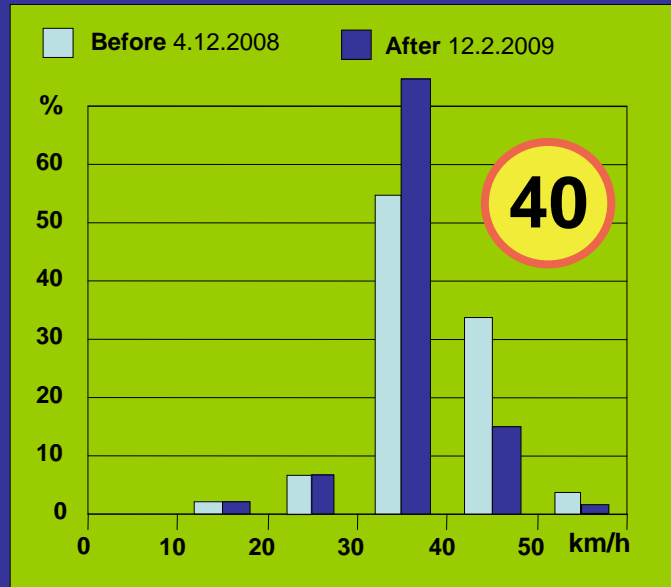
Speed displays



Speed displays



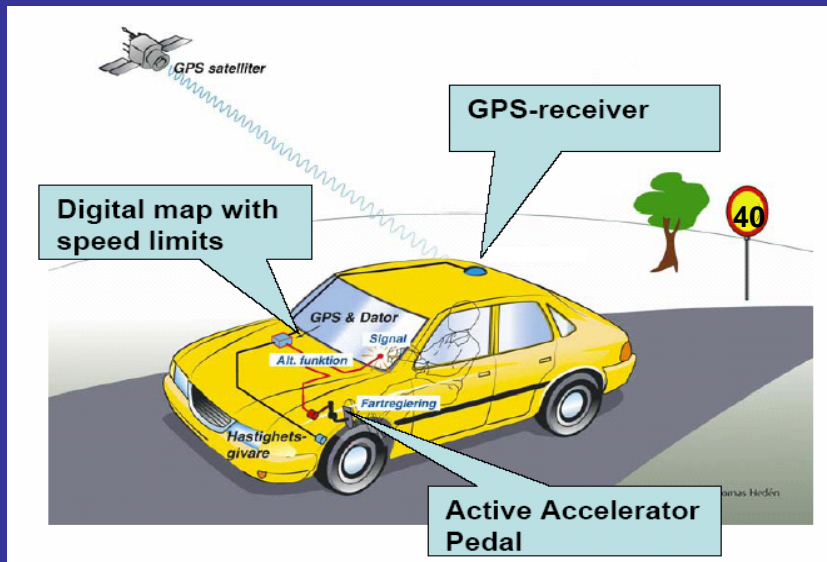
Speed distribution before and after speed display in the Street Kontulankaari



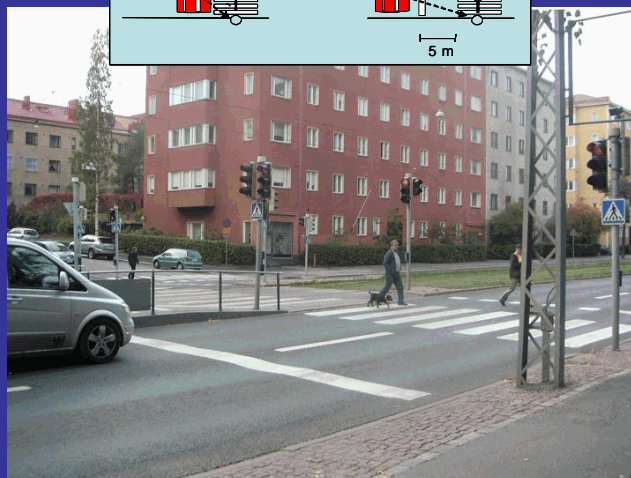
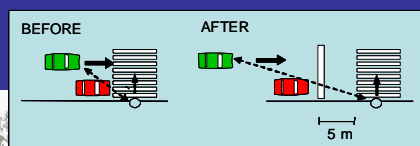
Physical speed reducing measures



ISA Intelligent Speed Adaptation



Recessed stop lines



Intelligent Low Cost Traffic Control for Cyclists and Pedestrians

- Special Traffic Signals for Cyclists
- Tram Attention Stripes for Pedestrians
- Tram Warning Control for Pedestrians
- Extra Long Green for Small Folk



All traffic control concepts mentioned above are developed in good co-operation with the *Ministry of Transport and Communications*

Most of these are already or will be later included in the national Traffic Signal Code on the basis of the experiments and studies executed in Helsinki



BePolite Special Traffic Signals for Cyclists



Cyclists are controlled by the vehicle or bicycle signal heads.

Problem: Cyclists must stop during the long (sometimes 30 sec) pedestrian stage - *who really cares...*

BePolite concept



Cyclists have *BePolite* signal heads. Cyclist must stop only during the start of the pedestrian stage. After few seconds cyclists can ride during the **flashing yellow signal** "politely" yet pedestrians still have the green signal

Signal sequence of *BePolite*
= **B**icycle **P**ass **o**ver **T**he **S**top **L**ine **T**echnique

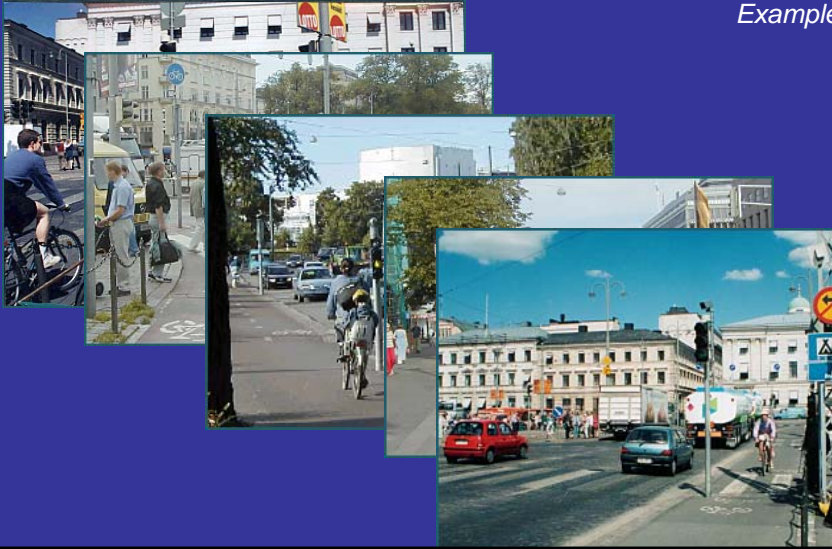


Flashing Yellow

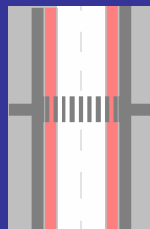


BePolite Special Traffic Signals for Cyclists

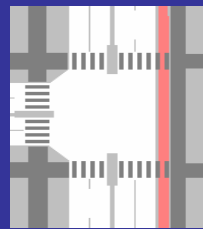
Examples



Where you can use BePolite- signals...



Separate
midblock
pedestrian
signals,

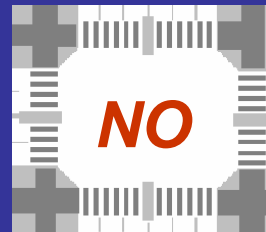


T-junctions if
bicycle lane
is along the
main street,

...and in small
X-junctions



...but not
in large X-
junctions



Results of Follow-up Studies

- Signal control concept is well understood by almost all of the cyclists
- Delays at BePolite signals are always shorter than at conventional signals
- Majority of cyclists prefer BePolite signals to the conventional signal control
- Some cyclists think BePolite signals might be dangerous as cyclist are not familiar with the traffic code - however, cyclists seem to know the rules
- Cyclists don't stop at red signal if they don't see any reason to do this - that is why we need BePolite signals



Tram Attention Stripes for Pedestrians

Yellow flashing signals are used in Helsinki as tram attention (warning) lights

Problem: Signal control will not help pedestrians; in most cases pedestrians do not notice signals at all.

Attention stripes for pedestrians

- High visibility LED stripes are located just in front of the tramway
- Mounted on the surface of the pavement
- LED colour is **amber** (yellow)
- Actuated functions – stripes are flashing when the tram is approaching and the flashing terminates instantly, when the tram has passed the crossing point
- Vehicles have normal signal heads



LED stripe concept is manufactured by **Marimils**, Finland



VAROVA

Tram Warning Control for Pedestrians

In Finland pedestrian crosswalks over tramway must be controlled if the crosswalks over vehicle lanes are controlled with traffic signals

Problems:

- 1) Pedestrians normally violate red light when no trams are approaching
- 2) Green light can not be used only in the tramway crosswalk, because some pedestrians may misunderstand signal heads on each crosswalk

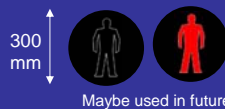


VAROVA –signal heads over tram crossing

- **Red light** only when tram is approaching
- Strengthened with a strong audible signal
- Otherwise signals are dark
- Two parallel signal heads now – in future one great (300 mm) signal head with the white contour around the figure



Now in use

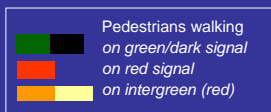


Maybe used in future



Results of pedestrian video recordings and interviews

Red walking over tramway decreased clearly

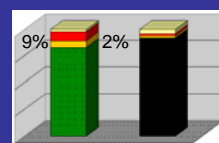


Red walking over vehicle lanes slightly increased, especially just before the end of the tram green extension

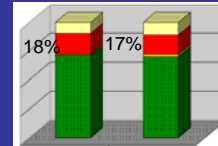
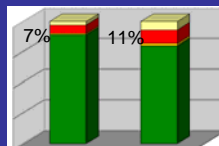
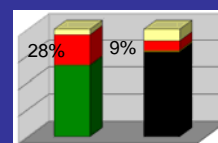
Most pedestrians (54%) preferred new VAROVA control to traditional control

Tram drivers preferred the traditional control, but accepted new VAROVA installations but not in the crosswalks with heavy pedestrian volumes

Main Post House



Finlandia House



■ VAROVA is better
■ Conventional is better
■ Mixed
■ No opinion



Extra Long Green for Small Folk

(and Senior Citizens as well)



Smart card taken under the pedestrian push button

Group of school children must daily cross a street with heavy traffic when going to their sports trainings

Problem: The pedestrian green is not long enough – it should be **twice** as long as normally

Extra long green concept

1. The teacher has a smart card
2. The smart card is taken near the pedestrian push button,
3. The bright spot on the corner of the signal head blinks – the teacher is confirmed that everything is OK
4. ... and the next pedestrian green is long enough for all the children crossing the street



bright spot blinks

The new advanced long green concept (remote control, no push buttons) is manufactured by **TJ-Yhtymä, Finland**



Figure by courtesy of Swarna Finland



Why has nobody told me about it



Drivers frustrated on the long red time have - after they have been informed about the objective and functions of the extra long pedestrian green – unexceptionally supported the solution, and some of them even praised it: *...then I have never to wait unnecessarily in these lights*

Intelligent control
= the right matter, in the right place, at the right moment



Extended green phase for pedestrians



Thanks for Your
Attention !

