

Speed control: future concerns

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Main focus on urban areas

Pedestrians and Bicyclists are the most **sustainable** road users, and most vulnerable:

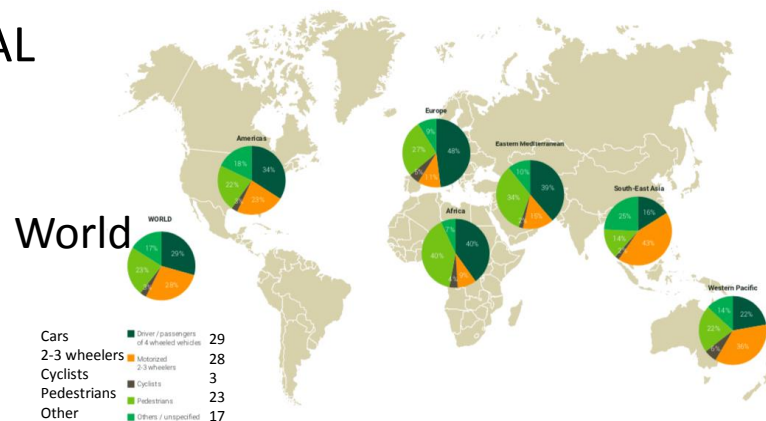
Killed Pedestrians and Bicyclists globally: 27%, Car occupants 31%.

EU Urban areas: Pedestrians and bicyclists: 52%, Car occupants: 26%

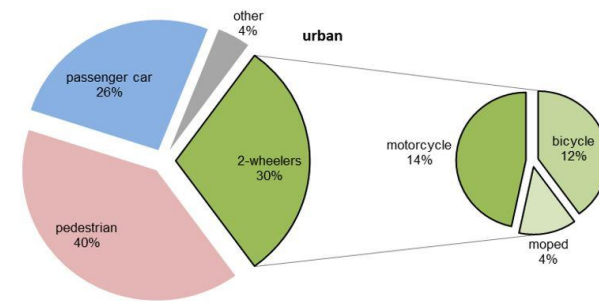
EU: **The smallest improvement is for cyclists and pedestrians,..... , especially in urban areas”.**

If a car keeps ≤ 50 km/h the risk of a car occupant being killed is close to zero.....while the risk for pedestrians and bicyclists is considerably higher

GLOBAL



EU URBAN AREAS



“Speed is at the core of the road traffic injury problem” (WHO)

Yes, but where are the results

- OECD countries – and in LMIC: typically 40–50%, and up to 80%, above the speed limit,
- From 2005 to 2019 there is little progress on reducing speeds in Europe.
- Average speeds and numbers of speed limit violations **remain high** in most of the 27 countries. Exceptions are primarily France, Belgium, Switzerland, Norway, the Netherlands
- *“Less progress has been made on adopting best practice on speed limits”.*
(GLOBAL STATUS REPORT ON ROAD SAFETY 2018. WHO)
- Only 7 out of 40 (18%) IRTAD-countries have a lower speed limit than 50 km/h in urban areas.....,

The potential is very large

100% compliance with the speed limits:

→ fatalities: **-20% to -50%**,

→ **270,000 to 675,000 lives could be saved every year**

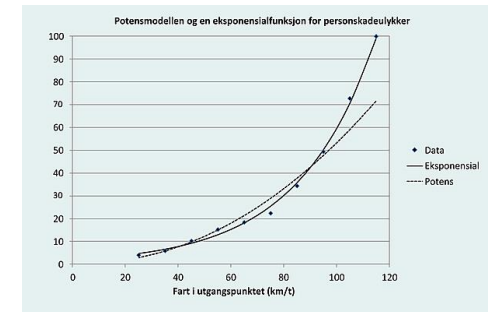
Even small reductions of mean speed produces quite significant reductions of fatalities:

Reduced mean speed by 10%:

Fatalities

Rural roads/freeways: **- 39%**

Urban roads/Res. roads **- 27%**



Rune Elvik

What do we know about different measures?

Results of meta analysis and similar comparative studies
– 5 areas

Polising (2 studies)

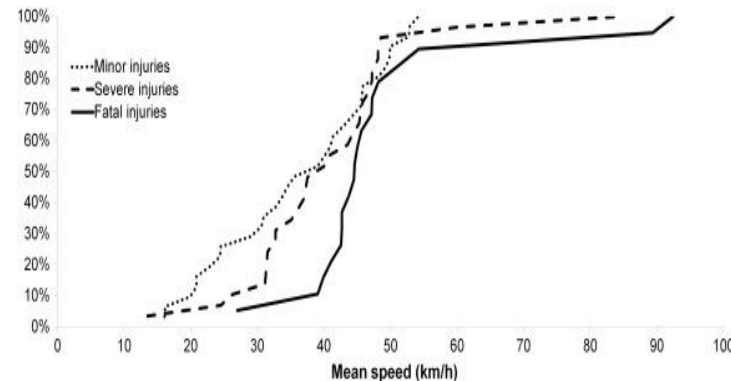
- A reduction in crash frequency and speed, and an increase in speed compliance.
- Caution is required wrt behaviour and sensitivity to penalties in **different countries and drivers', particularly there is a lack of studies representing less motorized countries.**

30 km/h zones (2 studies)

When speed limit is reduced from e.g. from 40 to 30 km/h, there is a **clear reduction of injuries/fatalities**.

However, even though average speeds goes down, they remain clearly above 30 km/h, and **non-compliers is normally above 50%**

Speeds of 30 to 50 km/h
are critical for pedestrians



Area wide Traffic calming – 2 studies

- **Significant reductions of injuries and fatalities.** Quite a heterogeneity though
- Speed results are missing
- **No positive effect for pedestrians and bicyclists,**
- **The results are not very impressive** in view of the great potential effect with individual measures like humps and roundabouts
- A "complete" TC-strategy needs speed reducing measures continuously over the area.
- **Traffic Calming is almost never applied on high class roads in urban areas with speed limit of 50 km/h or more.** That is where the majority of injuries occur, including pedestrians and bicyclists.

Camera Enforcement – 4 studies

- Highest attention
- Reductions of Killed and Seriously injured (KSI) by up to 71%
- The effect declines with increasing distance from the camera location.
- **Section control** was found to have a greater crash reducing effect than speed cameras, including positive effects up to 3 km in each direction
- Despite the methodological limitations.... **speed cameras are a worthwhile intervention**

ISA - Intelligent Speed Adaptation – 2 studies

- ISA is reducing speeds significantly - and **improves driving performance**
- Two scenarios, one **market driven** which advise or warn drivers whenever they exceed the speed limit.
- **authority driven** where it is impossible to override the speed limit.
- **Market driven:** reducing fatalities by **19-28%**, (EU-PROSPER)
- **Authority driven:** reducing fatalities by **26-50%** (EU-PROSPER)
- Benefit to cost ratios ranging from 2.0 to 3.5 (market driven) and 3.5 to 4.8 (authority driven) were calculated for the two scenarios (EU-PROSPER).
- The market driven system can be implemented much faster, while the authority driven is least acceptable to drivers.
- All the findings cannot be strongly supported due to lack of statistical tests.

What are the main Evidence Gaps in view of Vision Zero - 1

- **Regarding polising: the effect of large scale** use and the effect of non-visible controls.
- Endurance, e.g. police in Sweden has cut more than 50% of their activities over the last years. What about other countries?
- **Regarding 30 km/h zones: is 30 km/h without any other measures worthwhile.** What is the "cost" of diluting the respect for speed limits, having more drivers who are not complying with the speed limits.
- Can it be used as a starting point for a strategy where further activities to reach 30 is a natural continuation.

What are the main Evidence Gaps in view of Vision Zero - 2

- **Regarding Area-wide Traffic Calming:** New trials with **strategies based on well-defined design criteria with individually proven safety effect** of producing "Zero Vision speeds".
- Primarily these new trials, however, must be based on the whole network in urban areas, i.e. must include **all the streets where pedestrians and bicyclists appear, i.e. Including high-class roads with 50 km/h (60?)**.
- **Regarding camera enforcement,** **Effect of enhanced time of operation of the cameras, synergies via many cameras along the same route, same area, etc.**
Besides there seem to be almost no coverage of built-up areas in many countries

What are the main Evidence Gaps in view of Vision Zero - 3

We know almost nothing about **the use of a Speed Limiter**

We know very little about the **effects of low speeds**

ISA-studies are mainly based on data from few specific European countries such as Spain, The Netherlands and Sweden. Although this is a good sample for general trends in developed countries, there is a **lack of studies representing less motorised countries.**

General conclusions - 1

- Actual speed changes are not very convincing..... There is a need of a restart.
- Analyses are not designed to meet demands on generality or transferability.
- A few cases have to be selected, focussing on some promising measures, promising from a speed point of view, not from an implementation point of view.
- LMIC are missing almost entirely.
- Often Costs and Benefits are not sufficiently presented...

General conclusions - 2

- The most powerful measures in relation to Vision Zero is **Camera Enforcement, Traffic Calming and Speed Limiter**.
- All three are theoretically interesting, because they are **more or less forcing drivers to keep the speed limit**, even though often in a rather limited scale to-day
- Traffic Calming could have a considerably greater potential, because it is strongly linked to topics like the **attractivity of the city**. That makes it very feasible to invest considerably more than to-day,
- Enhancement of camera enforcement strategies is quite possible both in **quality and quantity**, which can make it a logical back up of a Speed Limiter
- The greatest potential lies with the Speed Limiter concept, which can be in operation in most cars in a relatively short time

Can we still ignore research on Speed Limiter?

- First research in the 1970-ies in France
- First – and only – empirical trials in private cars with a Speed Limiter took place more than 25 years ago:
- Tilburg, the Netherlands (20 passenger cars)
- Eslöv, Sweden (25 cars)
- Leeds, UK (1 car with two modes)
- Even though small – **comprehensive assessment** was made

Even though small scale, **indications** from interviews, and behavioural studies were mostly positive and rarely negative

- More harmonised speeds at or below speed limit
- Improved, interactive behaviour
- Drivers thought the system was very useful, except for some malfunctions
- Drivers experienced the Speed Limit function as a “support” or “safety device””
- More positive to the Speed Limiter after having used it, than before
- Drivers could think of having one
- The most negative aspect was that drivers felt “hunted” by drivers coming from behind...

What has happened since?

- New research on ISA was initiated, however with the important precondition that Speed Limiter was not part of the new research
- ISA was – and still is – built on a **voluntary basis**. The driver can activate the Speed Adaptation system if she/he wants to.
- New research focussed a lot on **technical aspects**, while results in terms of actual use of ISA - and actual speed changes – seemed to be less important.
- Authorities seemed almost as uninterested as industry

A perfect starting point: Everybody is saying
"Vision Zero → 30 km/h"

- Swedish Government 1997 – Zero Vision – and Swedish Transport Administration: "would be maximum 30 km/h at times and places where pedestrians and bicyclists are mixed with motorised traffic"
- UN 2019 The Academic Expert Group wants to reduce urban speeds to 30 km/h unless it can be proven that a higher speed is safe
- WHO 2017: Best practice suggests that when motorized traffic mixes with pedestrians and cyclists, travelling speeds should be under 30 km/h
- Research: see e.g. Kröyer (Almost no fatalities at travel speed of 30 km/h or lower)

How do we transform these lofty ambitions, into action?

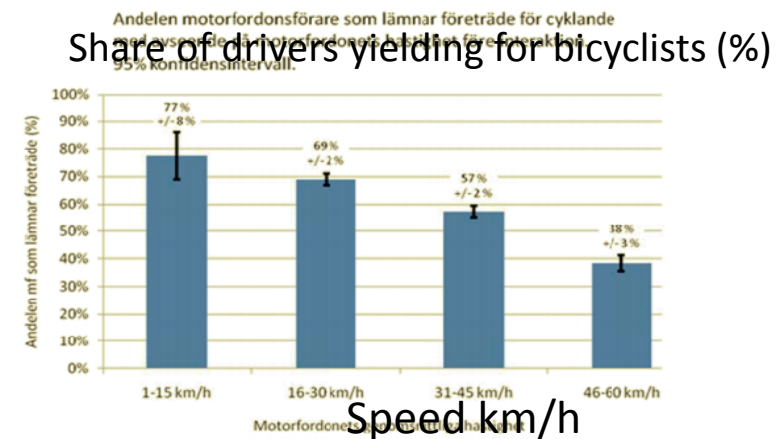
Beyond Vision Zero

Vision Zero is the important first step. However, we need to go beyond...

Coexistence is then the key word – the coexistence between different kinds of road users, expressed in terms like equality and equal rights and opportunities for different kinds of road users.

If road users have a fair chance to see each other in ample time, the hypothesis is that then they will react in a proper - **and** - safe, way

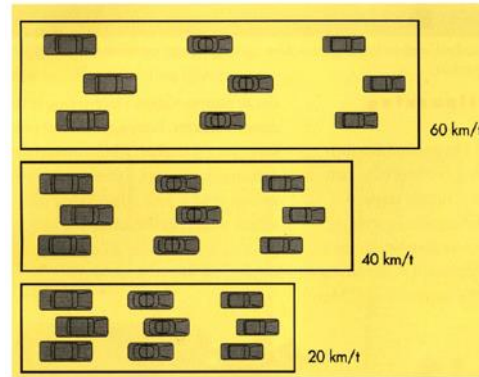
Coexistence is very speed dependent



Figur 2: Andelen motorfordonsförare som lämnar företräde för cyklande med hänsyn taget till motorfordonets hastighet. Källa: Pauna m.fl. (2009)

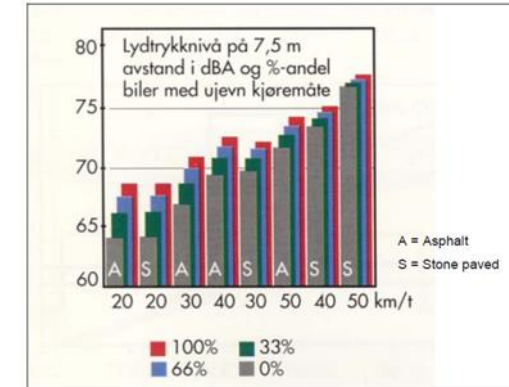
Lots of potential synergies with low speeds (20-30 km/h)

- Less Area Demand
- (-50% possible)



- Less air pollution
- Less Particles
- Esthetics
- More feeling of safety
- Securer

- Less noise
- (-9 dB(A) possible)



- Attractive for peds and bicyclists
- Higher mobility for peds and bic
- More VRUs
- Less cars
- More relaxed

”Coexistence” with the environment

We need to change paradigm

The old paradigm

How can we convince drivers to comply with the speed limits?

The new paradigm

How will drivers behave when they can't overrule the speed limits? And what consequences – behaviour, safety - will it have generally?

First step is to do a research plan that has the **Speed Limiter** as starting point.

How is the continued procedure with ISA/Speed Limiter?

The target speed for individual cars/vehicles should always be **the prevailing speed limit**, not some intermediate speed.

- We (almost) have the system already
- Transfer from a "non- speed limiter system" to a "speed limiter system"?
 1. Start with a "**partly voluntary system**", introducing a gradually "stricter" Speed Limiter (cf how to increase belt use)
 2. Introduce a **Mandatory Speed Limiter in parts or whole of urban areas** where the prevailing default speed (= speed limit) is 50 km/h or 30 km/h
 3. Combine it with **Geofencing**
 4. Assessment should be based on behavioural and attitudinal criteria and they should always be assessed in view of the target speed.