Vision Zero, a Cornerstone for Livable Cities

Anders Lie
Why me?

• Vision Zero
• Euro NCAP
• Global NCAP
• ISO 39001
• (Chalmers Univ.)
The road transport system is an open and complex system

- Infrastructure
- Vehicles
- Road users
- Transports of goods and passengers
- Road users on duty
- Companies and organisations

- Rules and regulations
- Enforcement
- Etc.
The road transport system is an open and complex system that is killing many people

- 1.25 Million Globally
- EU – 25,250 (2017)
- USA – 40,100 (2017)

Source: Index Mundi
In the early 1990s there was a sense of urgency
The Vision Zero Swedish parliament 1997

- Long term target is that no one should be killed or receive long term disability
- Injury outcome instead of crashes
- Holistic approach in which system designers play an important role
- Tolerance to human failures
- Mobility a function of safety

The Vision Zero European Commission 2011

“By 2050, move close to zero fatalities in road transport. In line with this goal, the EU aims at halving road casualties by 2020. Make sure that the EU is a world leader in safety and security of transport in all modes of transport.”
Many have followed
UN Global Goals (with important road safety impact)

- By 2020, halve the number of global deaths and injuries from road traffic accidents

- Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

- By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

- Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

- Promote public procurement practices that are sustainable, in accordance with national policies and priorities
Traditional system

- Educate
- Inform
- Motivate

- Rules and regulations
- Enforcement
- Etc.

- Efficiency before safety
Vision Zero

- Educate
- Inform
- Motivate

- Rules and regulations
- Enforcement
- Etc.

- Adapt the system to the failing human
- Safety before efficiency
Need for change (new strategies build on old ones?)
Vision Zero ≠ Zero Fatalities (at least not only)
Vision Zero = 5 Dimensions (or more?)

1. ethical platform
2. vision for many stakeholder
3. driving force for change
4. shared responsibility
5. safety philosophy
Vision Zero Safety Philosophy

1. Severe injuries not crashes
2. People make errors, mistakes and misjudgements (Violations are something else)
3. Humans have biomechanical tolerances
4. Energy control is key
5. Eliminations is the target (back casting)
The key is the road transport system as a whole
Vision Zero model for safe traffic

The vehicle:
- High NCAP score
- ESC

The road:
- Four stars EuroRAP

The driver:
- Use the seat belt
- Comply with speed limits
- Not drive when impaired
Road / Vehicle / Speed limit

80: Head-on
40: Pedestrians
70: Side
Δ 40: Rear-end
110: Large animals
2+1 roads

- First built in 1998
- Built on existing 13m wide roads
- Around 80% reduction in fatalities
- Popular among road users
The importance of safe cars

- Focus and knowledge in industry
- NCAP programs
- Stability control ESC
- Seat belt reminders
Big things are happening around vehicles!

- Focus and knowledge in industry
- NCAP programs
- Stability control ESC
- Seat belt reminders
- Lane departure warning
- Low speed AEB

- Motorcycle ABS

- 85% lower fatality risk 1980-2010
- 70% lower fatality 5 stars to 2 stars
- 25% fewer serious crashes (-97.5% LOC)
- 80% fewer unbelted (traffic and fatal)
- 50% reduction single and head on
- 40% reduction rear end crashes

- 50% reduction in fatality risk
Crashworthiness - fatality risk for car occupants

Cars with year of introduction 1995-2004 colliding with other cars

Relative risk of fatality

- 1985-1994
- 1995-2004
- 2005-2014

Year of introduction

-43%
-76%
-86%

Folksam
There is more coming
Key behaviour

Individuals & Organisations
Traffic safety is one dimension in almost all processes, we have to work in an inclusive way.
**ISO 39001 Process**

- Policy
- Safety Performance Factors
- Objectives and targets
- Operations
- Measurements and follow up
- Continual improvements

**Performance factors**

- Intermediate safety factors
  - Road design
  - Use of appropriate roads
  - Personal safety equipment
  - Safe speed
  - Fitness of drivers:
    - fatigue, alcohol, distraction
  - Journey planning
  - Vehicle safety
  - Appropriate authorisation
  - Removal of vehicles and drivers
  - Post crash response
In the early 1990s there was a sense of urgency. What has happened?
Fatalities per 100 000 population 1950-2016
Sweden Max 17 min 2.6
International perspective
Figure 1.2. Road fatalities per 100,000 inhabitants, 2015

Data from Cambodia, Jamaica, Mexico, Malaysia, Morocco, Serbia, South Africa and Uruguay as provided by the countries and not validated by IRTAD.
International perspective (source International Transport Forum)

Figure 1.3. **Road fatalities per billion vehicle-kilometres, 2015**

The chart shows the road fatality rates per billion vehicle-kilometres for various countries in 2015. The countries are listed from left to right: Norway, Sweden, United Kingdom, Denmark, Ireland, Switzerland, Germany, Iceland, Australia, Finland, Netherlands, Canada, Austria, Israel, France, Japan, Slovenia, United States, Belgium, New Zealand, Czech Republic, and Korea.
Sweden to USA comparison

USA
Canada
Sweden

Fatalities / 100 000 population


25 years
Fatal Collision Rates
Alberta 2012 - 2016

Per 10,000 Population

2016 0.6
2015 0.7
2014 0.8
2013 0.8
2012 0.8

VISION
ZERO
EDMONTON
Status of Road Traffic Fatalities

- Fatalities absolute numbers (2002-2017)
Targets for fatality reductions

- Sweden approximately 220 in year 2020 (50% reduction/10 years)
  - (decided by the parliament)
- Proposal for another 50% reduction 2020-2030
- 50%--25%--12.5%--6.3%--3.1% (50 years)
- Close to Zero?
Target 2020

Safety Performance Indicators

- Speed compliance, state roads
- Speed compliance, municipal streets
- Sober drivers
- Seat belt use
- Bicycle/MC helmet use

- Safe passenger cars
- Safe state roads
- Safe municipal streets
- Safe pedestrian and bicycle crossings
- High quality maintenance for pedestrians and bicycles
- Systematic work with ISO39001
<table>
<thead>
<tr>
<th>Indikator</th>
<th>Utgångsläge</th>
<th>2017</th>
<th>Mål år 2020</th>
<th>Utveckling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antal omkomna i trafiken</td>
<td>440</td>
<td>253</td>
<td>220</td>
<td>I linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Antal allvarligt skadade i trafiken</td>
<td>5 400</td>
<td>4 400</td>
<td>4 100</td>
<td>I linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Andel trafikarbete inom hastighetsgränser, statligt vägnät</td>
<td>43 %</td>
<td>45 %</td>
<td>80 %</td>
<td>Ej i linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Andel trafikarbete inom hastighetsgränser, kommunalt vägnät (startår 2012)</td>
<td>64 %</td>
<td>67 %</td>
<td>80 %</td>
<td>Ej i linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Andel trafikarbete med nyktra förare</td>
<td>99,71 %</td>
<td>99,74 %</td>
<td>99,90 %</td>
<td>Ej i linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Andel bältade i framsäte i personbil</td>
<td>96 %</td>
<td>98 %</td>
<td>99 %</td>
<td>Ej i linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Andel cyklister med hjälm</td>
<td>27 %</td>
<td>44 %</td>
<td>70 %</td>
<td>Ej i linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Andel mopeder med rätt använd hjälm</td>
<td>96 %</td>
<td>98 %</td>
<td>99 %</td>
<td>Ej i linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Andel trafikarbete med högsta Euro NCAP-klass</td>
<td>20 %</td>
<td>72 %</td>
<td>80 %</td>
<td>I linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Ökad regeleťerlevnad bland motorcyklister</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Måts inte ännu mål saknas</td>
</tr>
<tr>
<td>Andel trafikarbete med mötesseparering på vägar över 80 km/tim, statligt vägnät</td>
<td>50 %</td>
<td>76 %</td>
<td>90 %</td>
<td>Ej i linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Andel säkra gång-, cykel- och mopederpassager</td>
<td>19 %</td>
<td>27 %</td>
<td>35 %</td>
<td>Ej i linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Andel av kommuner med god kvalitet på underhåll av gång- och cykelvägar</td>
<td>18 %</td>
<td>36 %</td>
<td>70 %</td>
<td>Ej i linje med nödvändig utveckling</td>
</tr>
<tr>
<td>Systematiskt trafiksäkerhetsarbeten i linje med ISO 39001</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Måts inte ännu mål saknas</td>
</tr>
</tbody>
</table>
Fatalities in vehicles (Sweden)
Fatalities among protected and unprotected road users
Number of seriously impaired road users (PMI 10+) in Sweden divided by road user category.
There is a shift in focus going on

Vulnerable Road Users

Rural

Urban

Car Occupants
It is not only about traffic safety

- Revival of city centres
- High degree of urbanisation (all over the world)
- The younger generations are not buying cars?
Edmonton (www.edmonton.ca)

Downtown Bike Routes
Learn everything you need to know to comfortably ride, walk and drive the Downtown Bike Network.

Quarters
The city is breathing new life into a long-neglected area of downtown, and the future looks bright.

Edmonton’s Downtown Story
Something big is happening here, and it’s like nothing that’s come before. It’s a total transformation, and change of this scope takes an entire community.
A new cycling nirvana: A thousand miles of safe cycling and walking routes are to be created in Greater Manchester, and the region’s walking and cycling commissioner is “absolutely unapologetic” that these plans would take space away from cars.
Hamburg European Green Capital

Hamburg embraces the multi-mobile age by promoting cycling
Paris: inauguration d'un parc piétonnier sur les voies sur berges
Who are we planning for?
Who are we planning for?
Challenges in the city

- Threat to the climate
- Bad air quality
- Particles
- Noise – affects health
- Energy consumption

- Un-equal
- Inactive, does not promote health
- Dangerous - crashes
- In-efficient – vehicles are used <2% of the time
Where is Vision Zero going

By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.
A mega-city mobility system

CDMX in numbers

- 8.8 million inhabitants
- 20.1 million inhabitants

23 million daily trips:
- Public Transport (67.58%)
- Private Transport (31%)
- Others (1.37%)³

5.5 million cars circulating

73% of federal budget for car oriented infrastructure

42% of real estate development for parking³
Global megatrends

Digitalisation

Shared economy

Urbanization

Ageing population

Electrification in transport

Liveable cities

Mobility as a service

Car sharing / public transport

Multimodality - public transport is backbone

Automated transport or automated functions

Cars, pods and logistics

Liveable cities

Source: Drive Sweden

Source: White Architects
Mobility and logistics
Urban and rural mobility

There are differences

Children killed in traffic 1956-2016
Children killed in cars 2003-2016, “Close to Zero”
Thank you!

Gordon Moore in 1965 said; "Change will never be this slow again"

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