The Culture of Swedish Vision Zero

December 12, 2017
Presented by: Dr. Matts-Ake Belin
Webinar Logistics

• Duration is 9:00 AM - 10:30 AM Mountain

• Webinar – recorded and archived on website. For quality of recording, phone will be muted during presentation

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• To maximize the presentation on your screen click the 4 arrows in the top right of the presentation

• Different format today – 1 Q&A section at the end

• There is a handout pod at the bottom of the screen

• Please complete follow-up surveys; they are vital to assessing the webinar quality
Dr. Matts-Ake Belin
Swedish Transport Administration
Adj. Professor Swedish Royal
Institute of Technology
Goals of this Webinar

Once you have completed this webinar, you will be able to:

understand the tenets of Vision Zero, summarize the implementation efforts in Sweden, and discuss potential relevance to U.S. efforts.
Learning Outcomes

To achieve the webinar goal, you will learn to understand:

- the origins background of the Swedish Vision Zero.
- that Vision Zero is a policy innovation which differ from a traditional approach to road safety.
- how Vision Zero has affected working methods in Sweden, and how a safe road transport system can be created.
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### Leading causes of death, 2004 and 2030 compared

<table>
<thead>
<tr>
<th>RANK</th>
<th>LEADING CAUSE</th>
<th>%</th>
<th>RANK</th>
<th>LEADING CAUSE</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ischaemic heart disease</td>
<td>12.2</td>
<td>1</td>
<td>Ischaemic heart disease</td>
<td>14.2</td>
</tr>
<tr>
<td>2</td>
<td>Cerebrovascular disease</td>
<td>9.7</td>
<td>2</td>
<td>Cerebrovascular disease</td>
<td>12.1</td>
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<tr>
<td>3</td>
<td>Lower respiratory infections</td>
<td>7.0</td>
<td>3</td>
<td>Chronic obstructive pulmonary disease</td>
<td>8.6</td>
</tr>
<tr>
<td>4</td>
<td>Chronic obstructive pulmonary disease</td>
<td>5.1</td>
<td>4</td>
<td>Lower respiratory infections</td>
<td>3.8</td>
</tr>
<tr>
<td>5</td>
<td>Diarrhoeal diseases</td>
<td>3.6</td>
<td>5</td>
<td>Road traffic injuries</td>
<td>3.6</td>
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<tr>
<td>6</td>
<td>HIV/AIDS</td>
<td>3.5</td>
<td>6</td>
<td>Trachea, bronchus, lung cancers</td>
<td>3.4</td>
</tr>
<tr>
<td>7</td>
<td>Tuberculosis</td>
<td>2.5</td>
<td>7</td>
<td>Diabetes mellitus</td>
<td>3.3</td>
</tr>
<tr>
<td>8</td>
<td>Trachea, bronchus, lung cancers</td>
<td>2.3</td>
<td>8</td>
<td>Hypertensive heart disease</td>
<td>2.1</td>
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<tr>
<td>9</td>
<td>Road traffic injuries</td>
<td>2.2</td>
<td>9</td>
<td>Stomach cancer</td>
<td>1.9</td>
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<tr>
<td>10</td>
<td>Prematurity and low birth weight</td>
<td>2.0</td>
<td>10</td>
<td>HIV/AIDS</td>
<td>1.8</td>
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<tr>
<td>11</td>
<td>Neonatal infections and other*</td>
<td>1.9</td>
<td>11</td>
<td>Nephritis and nephrosis</td>
<td>1.6</td>
</tr>
<tr>
<td>12</td>
<td>Diabetes mellitus</td>
<td>1.9</td>
<td>12</td>
<td>Self-inflicted injuries</td>
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<tr>
<td>13</td>
<td>Malaria</td>
<td>1.7</td>
<td>13</td>
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<td>Hypertensive heart disease</td>
<td>1.7</td>
<td>14</td>
<td>Colon and rectum cancer</td>
<td>1.4</td>
</tr>
<tr>
<td>15</td>
<td>Birth asphyxia and birth trauma</td>
<td>1.5</td>
<td>15</td>
<td>Oesophagus cancer</td>
<td>1.3</td>
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<tr>
<td>16</td>
<td>Self-inflicted injuries</td>
<td>1.4</td>
<td>16</td>
<td>Violence</td>
<td>1.2</td>
</tr>
<tr>
<td>17</td>
<td>Stomach cancer</td>
<td>1.4</td>
<td>17</td>
<td>Alzheimer and other dementias</td>
<td>1.2</td>
</tr>
<tr>
<td>18</td>
<td>Cirrhosis of the liver</td>
<td>1.3</td>
<td>18</td>
<td>Cirrhosis of the liver</td>
<td>1.2</td>
</tr>
<tr>
<td>19</td>
<td>Nephritis and nephrosis</td>
<td>1.3</td>
<td>19</td>
<td>Breast cancer</td>
<td>1.1</td>
</tr>
<tr>
<td>20</td>
<td>Colon and rectum cancers</td>
<td>1.1</td>
<td>20</td>
<td>Tuberculosis</td>
<td>1.0</td>
</tr>
</tbody>
</table>

*Comprises severe neonatal infections and other, noninfectious causes arising in the perinatal period.


Global status report on road safety 2009
Number of road traffic death per 100,000 population by country income status + Sweden (WHO global status report on road safety 2015)
The road safety culture ladder within a society

It is up to every individual to survive in a harsh environment.

Acceptable levels: We have to accept some victims.

Vision Zero: It can never be acceptable that people are killed or seriously injured.

- **Pathological**: Fatalities inevitable part of the system.
- **Reactive**: Institutions/Programs/Legal framework.
- **Calculative/Bureaucratic**: Campaigns/reactive interventions.
- **Proactive**: Safety performance/Continuous improvements.
- **Generative**: Maintain a safe system.

Time

The ladder applied in road sector by Dr Belin based on:
Vision Zero – a Swedish Contribution to the Global Community

In October 1997, Vision Zero was passed by a large majority in the Swedish Parliament.

“It can never be ethically acceptable that people are killed or seriously injured when moving within the transport system.”
Vision Zero, Safe System, Road to Zero…. "We Have Many Names for the Things We Love!"
The Swedish Vision Zero - Policy Innovation

Traditional | Vision Zero
---|---
Accidents | Fatalities and serious injuries
Human factors | Humans make mistakes
Human factors | Humans are fragile
Individual road users | System designers
People don’t want safety | People want safety
Peoples demand for road safety? | Optimum number of fatalities and serious injuries
What is the appropriate goal? | Eliminate fatalities and serious injuries
Image Courtesy of: Swedish Transport Administration
Probability of Pedestrian Fatality by Impact Speed

Figure 2: Probability of Pedestrian Fatality by Impact Speed. Derived from the Interdisciplinary Working Group for Accident Mechanics (1986) and Walz, Hoefliger and Fehlmann (1983)
Urban safety
Rural safety
Rural Safety

![Graph showing rural safety trends over time. The x-axis represents years from 2000 to 2016, and the y-axis represents safety incidents. Two lines are plotted: blue for 2+1-road and red for ATC. The graph indicates an increase in safety incidents on both types of roads, with a notable rise post-2007.]

Source: Trafikverket, Swedish Transport Administration
Setting the speed limits – what criteria?

Figure 1.6 Major factors determining speed limits, Sweden, 1960–1990

-important speed limit criteria
- injury-related criteria
- social economic criteria
- accident-related criteria
- drivers' behaviour 85 percentile

Source: (24)

The book that rocked
an industry and continues
to shock the nation!

Unsafe at
Any Speed

The Designed-In Dangers
of the American Automobile

by Ralph Nader

The new version of
Ralph Nader's classic indictment
of the auto industry
Division of Responsibilities/ Boundary Conditions

- Head-on
- Pedestrians
- Side
- Rear-end
- Large animals
Vision Zero

Methods to make things happen

Road safety interventions

Road transport system

Number of fatalities and serious injuries
Figure 1: Factors affecting the outcomes of the implementation process
Governments three basic tools
Choose between two major strategies
“A large number of people exposed to a low risk is likely to produce more cases than a small number of people exposed to a high risk. In business the same principle underlies the mass market: profits are larger when small amounts are taken from the masses than when large amounts are taken from the few rich people; and this principle of the mass market applies to many community health hazards.”

"The prevention game"

Drivers exceeding the speed

Police increase their visibility in traffic

Less people exceeding the speed

Police lower their visible activities

Figure Courtesy of: Dr Belins interpretation from Can road traffic law enforcement permanently reduce the number of accidents, Tokel björnskau Rune Elvik Accid.Anal. & Prev. Vol 24. No 5 pp 507-520. 1992
The different components in the program theory

<table>
<thead>
<tr>
<th>Question</th>
<th>Victoria (1991)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What main problem does the speed camera program try to solve?</td>
<td>The problem is that a large proportion of drivers are continuously exceeding the speed limit and thereby creating road safety problems</td>
</tr>
<tr>
<td>What does the program try to achieve?</td>
<td>The main purpose is to create a feeling among these drivers that speeding can be detected at any time and in any place in the whole road system</td>
</tr>
<tr>
<td>What does the intervention mechanism look like?</td>
<td>The main chain of influence is to catch a large proportion of those drivers who exceed the speed limit so that they experience the consequences and avoid re-offending and, in their turn, will tell other drivers that they have been caught</td>
</tr>
<tr>
<td>How is the program intended to achieve road safety effects?</td>
<td>A large number of drivers will be deterred from speeding. Excessive speeds and the average speed will decrease and the number of fatalities and injuries will decrease in the whole system</td>
</tr>
</tbody>
</table>

Table Courtesy of: Matts-Åke Belin, Per Tillgren, Evert Vedung, Max Cameron, Claes Tingvall, Speed cameras in Sweden and Victoria, Australia—A case study, Accident Analysis & Prevention, Volume 42, Issue 6, 2010, Pages 2165-2170, ISSN 0001-4575, http://dx.doi.org/10.1016/j.aap.2010.07.010.
The different components in the program theory | Sweden (2006)

What main problem does the speed camera program try to solve? | The main problem is that on a large proportion of the road network the speed exceeds the speed level which the roads from a safety point of view are designed for

What does the program try to achieve? | The main purpose is to support and create a new social norm among drivers that it is easier and better to follow the speed limit

What does the intervention mechanism look like? | The main chain of influence is to inform (through signs and open cameras) the drivers that a large proportion of the traffic network (large proportion of the traffic) is covered by cameras

How is the program intended to achieve road safety effects? | It will prevent most of the drivers from speeding. The average speed will decrease, as too will the number of fatalities and injuries.

Table Courtesy of: Matts-Åke Belin, Per Tillgren, Evert Vedung, Max Cameron, Claes Tingvall, Speed cameras in Sweden and Victoria, Australia—A case study, Accident Analysis & Prevention, Volume 42, Issue 6, 2010, Pages 2165-2170, ISSN 0001-4575, http://dx.doi.org/10.1016/j.aap.2010.07.010.
Effects on speed distribution (90 km/h) – Nudge effect

Figure Courtesy of: Automatisk trafiksäkerhetskontroll (ATK)
– En studie av effekterna på fordonshastigheter Automatic speed cameras – A study of the effects on vehicle speed
Evolution of strategies and speed compliance

- Road user behaviour
- Awareness
- Norms and manual enforcement
- Technology and enforcement
- In vehicle technology and traffic calming

Time
Vehicle technology
Implementation strategies in order to influencing adoption and acceptance of new vehicle safety systems

- There is a developed safety technology that could benefit road traffic users but is not reaching the market, is too slow in reaching the market, or only reaches a minority that can afford it.
- While there is a demand, the technology is too expensive or profits are too low.
- There is a demand and the technology is economically feasible but the market lacks knowledge.
- In order to increase the knowledge, the Government implements information initiatives.
- The Government implements various material incentives or disincentives in order to reduce costs and increase profits.
- In order to coerce the automotive industry to provide available safety technology, the Government regulates access to the road transport network.
- The safety technology becomes the industry standard and all road traffic users will benefit from it.

Strategy 1 and 2 – Alcolock (%) Public Procurement

- Swedish Government fleet
- Drink and driving offenders
- Buses
Strategy 3 – Consumer information

Strategy 3 - Dissemination of scientific results

1. Scientific study of effects
2. Dissemination of findings through media
3. Important buyers change their demands on new vehicles
4. Importers and producers offers ESC as standard
ESC new cars fitment rate 2009
Number of deaths in road traffic accidents per 100 000 population in Sweden (1997-2016)
Renewed commitment to Vision Zero

- Firmly establish and reinforce work that is already delivering results
- Clearer leadership and coordination of the work is important
  - Swedish Transport Administration – The Lead Agency
  - Quantified Targets
  - Collaboration among different stakeholders
- Focus on vulnerable road users
- Utilize automation and digitalization for safety
To create a safe mobility is a process which ought to be managed

- Learning by doing
- Trial and Error/Success
- We need more systematic learning!!
Directing Your Questions via the Chat

1. Chat pod is on left side of screen between attendees pod & closed caption pod

2. Type your question or comment here

3. Answers will appear here unless addressed verbally
Learning Outcomes

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Upcoming Webinars

• Pedestrian Treatments for Uncontrolled Locations

  Thurs. Jan. 18, 11:00 AM – 12:30 PM Mountain

Archived Webinars

Access the webinar archives
FHWA Office of Tribal Transportation Webinar

• Proven Safety Countermeasures

*Tues. Jan. 23, 2018 11:00 AM Mountain*

https://survey.max.gov/416797
Contact Information

*If you have any questions related to this presentation, please contact the instructors at:*

**Dr. Matts-Ake Belin -** matts-ake.belin@trafikverket.se

*To learn more about the National Center for Rural Road Safety: