Road Safety Management in Germany

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The European Union must, over the next 10 years, pursue the ambitious goal of reducing the number of deaths on the road by half; this by way of integrated action taking account of human and technical factors and designed to make the trans-European road network a safer network.

WHITE PAPER

European transport policy for 2010: time to decide
• Road Safety Impact Assessment
• Road Safety Audits
• Safety Ranking and Management of the Road Network
• Safety Inspections

• The Directive shall apply to roads which are part of the trans-European road network, whether they are at the design stage, under construction or in operation.
Brussels, 20.7.2010
COM(2010) 389 final


Towards a European road safety area: policy orientations on road safety 2011-2020
• "Although the initial target is not likely to be met by the end of 2010, the Road Safety Program has been a strong catalyst of efforts."

• "In view of achieving the objective of creating a common road safety area, the Commission proposes to continue with the target of halving the overall number of road deaths in European Union by 2020 starting by 2010."
The German Approach

Fatalities in Germany 2008

- Motorways: 28%
- Rural roads: 11%
- Urban roads: 61%

motorways  rural roads  urban roads
The German Approach

Fatalities per billion vehicle kilometres in Germany 2008

- Motorways: 2.2
- Rural roads: 10.9
- Urban roads: 5.9

motorways  rural roads  urban roads
The German Approach

New Roads

Redesigned Roads

Prevention

Road Safety Impact Assessment (RIA)
- network level, master plans
- single infrastructure

Road Safety Audit (RSA)
- feasibility stage
- preliminary and detailed design stage
- before and/or after opening

Road Safety Inspection (RSI)

Existing Roads

Reaction

Black Spot Management (BSM)

Network Safety Management (NSM)
Benefit-cost analysis are obligatory in the planning process for motorways and federal roads. Benefit-criteria are:

- operation costs
- travel time
- road safety
- etc. (noise, pollution,...)

Similar methodology is used for the German "Federal Transport Infrastructure Plan"
Guidelines for Road Safety Audits issued 2002

- numerous pilot audits in the 1990s
- they showed typical safety deficits
- introduction of safety audits as a systematic and independent investigation of safety deficits for road construction projects
- outside and inside built-up areas
- practised in most federal states and a lot of municipalities
Road Safety Audit

Audit Phases

- Preliminary Planning
- Preliminary Design
- Detailed Design
- Traffic Opening (before and shortly after traffic opening)

Audit Process

Checklists

Examples for Audit Reports
Auditors

- auditors must have extensive knowledge and experience in design and safety evaluation
- university education and several years experience
- additional qualification by a specific further training
- certification (external institutions or internal by road authorities)
- 3 years validity
- conditions for renewal:
  - realisation of at least 1 audit per year
  - participation in at least 2 continuation courses in road safety
Specific Further Training for Auditors

- obligatory curriculum was issued 2009
- 2 basic modules and 5 subject modules (motorways, rural roads, cross-town links, major roads, development roads)
- methodology: lessons, exercises, presentations, home projects, test
- duration: 7 days presence
- costs: about 4000 €
- a list of further training institutions and a list of auditors with certificate is published on the website of the German Federal Highway Research Institute (www.bast.de)
## Road Safety Inspection in Germany

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Subjects</th>
<th>Road Categories</th>
<th>Intervall</th>
</tr>
</thead>
<tbody>
<tr>
<td>regulary</td>
<td>Regular RSI</td>
<td>signs, hazards at road side</td>
<td>major roads, motorways</td>
<td>2 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>minor and municipal roads</td>
<td>4 years</td>
</tr>
<tr>
<td>thematically</td>
<td>Night-Time</td>
<td>signs, lighting of crossing points</td>
<td>major roads, motorways</td>
<td>4 years</td>
</tr>
<tr>
<td></td>
<td>Railway Crossing</td>
<td>signs and traffic devices</td>
<td>all roads</td>
<td>4 years</td>
</tr>
<tr>
<td></td>
<td>Tunnel</td>
<td>signs and lighting</td>
<td>all roads</td>
<td>4 years</td>
</tr>
<tr>
<td></td>
<td>Destination</td>
<td>direction signs</td>
<td>all roads</td>
<td>4 years</td>
</tr>
</tbody>
</table>
Black Spot Management

Guidelines issued 2003

- Evaluation
  - accident spots
  - accident lines
  - accident areas

- Managing
  - "accident commission"
  - accident-site inspections
Black Spot Management

Accident-type Maps

<table>
<thead>
<tr>
<th>Worst accident consequence (accident category)</th>
<th>One-year map 1-YM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal accident (1)</td>
<td>● ○□ = 8 mm/10 mm</td>
</tr>
<tr>
<td>Accident with seriously injured persons (2)</td>
<td>● ○□ = 8 mm</td>
</tr>
<tr>
<td>Accident with slightly injured persons (3)</td>
<td>● ○□ = 6 mm</td>
</tr>
<tr>
<td>Accident with seriously material damage in the narrow sense:</td>
<td></td>
</tr>
<tr>
<td>- (Criminal) offence reported, (4) vehicle not operational</td>
<td>● ○□ = 4 mm/6 mm</td>
</tr>
<tr>
<td>- Other accident with material damage (6) under the influence of alcohol</td>
<td>● ○ = 4 mm</td>
</tr>
<tr>
<td>Other accident with material damage (5)</td>
<td>● ○ = 4 mm</td>
</tr>
</tbody>
</table>
Black Spot Management

Evaluation

1 - Year map

Spots (FAS)

Lines (FAL)  Areas (FAA)

3 - Year map (SI)  3 - Year map (I)
Evaluation

accident spots

<table>
<thead>
<tr>
<th>Accident-type map</th>
<th>Limit value No. of accidents</th>
<th>Observation period [Months]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Year map</td>
<td>5 (of comparable nature)*</td>
<td>12</td>
</tr>
<tr>
<td>3 - Year map (I)</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>3 - Year map (SI)</td>
<td>3</td>
<td>36</td>
</tr>
</tbody>
</table>

accident lines

- 3 years seriously personal injury accidents
Guidelines issued 2003

- calculation of accident cost densities (ACD) by accident analysis
- calculation of safety potentials, avoidable accident costs

Safety Potential
SAPO = ACD - bACD

basic accident cost densities are calculated by accident cost rates for roads with a design of average safety in accordance with the design guidelines
## Basic accident cost rates

<table>
<thead>
<tr>
<th>Evaluated accident categories</th>
<th>I,SD Cat. 1-4 and 6</th>
<th>I,D Cat. 1-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Motorways</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Rural roads*</td>
<td>28</td>
<td>35</td>
</tr>
<tr>
<td>Major urban roads</td>
<td>29</td>
<td>51</td>
</tr>
</tbody>
</table>

* Rural roads not including motorways

Price level 2000
Network Safety Management

- efficiency analyses and priority lists
- just applied for the German Motorway Network
- first pilot applications for large rural road networks
Network Safety Management

Motorway Network

Sicherheitspotenzial in Tsd. Euro je km:
- unter 50 (n=3.319)
- 50 bis 105 (n=1.131)
- 105 bis 250 (n=416)
- 250 und mehr (n=65)
Thank you for your attention

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