Economic Costs of Road Traffic Accidents in Germany

Dr. Thomas Kranz
Federal Highway Research Institute (BAST)
• Allocation of scarce resources in transport policy
• Project Appraisal
• Safety reporting
• Internalisation of external costs
• Updated Accident Cost data necessary for decision makers (last updated in the 1990s)

Problem

Transport Policy

Infra-structure

Road user

Vehicle

Road Safety

Accident Costs in Germany
Empirical Cost Inquiry

- Calculation of Economic costs of road traffic accidents based on an empirical inquiry of data about accident related damages
- Data has been used as input for calculation models to estimate up to date accident costs in Germany
- Empirical survey of personal damages of the year 2005:
  - Health insurances and vehicle liability insurances (9,469 personal damages)
  - Special evaluations of the German statutory accident insurances (184,541 personal damages)
- Empirical survey of property damages of the year 2005:
  - Data exclusively gained by personally evaluated files at vehicle liability insurances
  - Evaluation of 786 accidents
  - Official police data about estimated property damages
- Additional input data raised for the calculation models (police processing time, adjudications about compensation payments)
Costs of personal damages

- Direct reproduction costs
  - Costs of hospital treatment
  - Costs outpatient treatment
  - Rehabilitation costs
  - Costs for care/nursing
  - Costs of ambulance services
  - Costs of ambulatory rehabilitation
  - Costs vocational rehabilitation

- Indirect reproduction costs
  - Costs of police operations
  - Justiciary costs
  - Administrative costs of insurances
  - Costs of job replacements
  - Funeral expenses

- Costs of resource losses
  - Duration of temporary disability
  - Duration of hospital treatment
  - Duration of rehabilitation
  - Reduction of fitness for work

- Costs of outer market resource losses

- Humanitarian costs

- Travel time losses
Costs of property damages

- Costs of vehicle repair
- Costs of vehicle replacement
- Costs of other property damages
- Other costs caused by property damages

Direct reproduction costs
- Reproduction costs
  - Indirect reproduction costs
    - Economic costs of property damages
      - Costs of resource losses
      - Costs of outer market resource losses
      - Travel time losses

- Costs of police operations
- Justiciary costs
- Administrative costs of insurances

- Vehicle utilisation (business, private)
- Repairability
- Necessary time for repair or replacement
Economic costs of road traffic accidents in Germany in 2005 (bn. Euro)

Property damages 16.251
Personal damages 15.226

Severe injuries 8.146
Fatalities 5.461
Slight injuries 1.619

Accident Costs in Germany
## Costs per personal and property damage

### Personal damage per injury in 2005

<table>
<thead>
<tr>
<th>Injury Type</th>
<th>Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatality</td>
<td>1,018,064.51</td>
</tr>
<tr>
<td>Severe injury</td>
<td>105,476.98</td>
</tr>
<tr>
<td>Slight injury</td>
<td>4,304.70</td>
</tr>
</tbody>
</table>

### Property damage per accident in 2005

<table>
<thead>
<tr>
<th>Accident Type</th>
<th>Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident with fatalities</td>
<td>38,343.72</td>
</tr>
<tr>
<td>Accident with severe injuries</td>
<td>18,386.27</td>
</tr>
<tr>
<td>Accident with slight injuries</td>
<td>12,326.42</td>
</tr>
<tr>
<td>Serious accident with only property damage</td>
<td>17,883.82</td>
</tr>
<tr>
<td>Other accident with only property damage</td>
<td>5,277.53</td>
</tr>
</tbody>
</table>
Cost structure of personal damage costs in 2005

- Travel time losses
- Humanitarian costs
- Outer market resource losses
- Costs of resource losses
- Indirect reproduction costs
- Direct reproduction costs

Accident Costs in Germany

8
Cost structure of property damage costs in 2005

Accident Costs in Germany
Positive development of the number of accidents?

- Estimation of costs and share of very severe injuries as well as other severe injuries
  - 23.59% of severe injuries are very severe injuries
  - 395,063 Euro per very severe injury
  - 10,631 Euro per severe injury
  - => Approx. 24% of severe injuries are related to 37-times higher costs than the remaining other severe injuries.
Costs of accident related travel time losses

- Calculation of travel time losses on german motorway per accident
- Monetary assessment of travel time losses with calculation model of the accident cost analysis (ressource losses etc.)
- Result: Cost per accident to calculate the total costs of accident related travel time losses on German motorways with updated number of accidents
- 21.369 Million hours travel time exclusively caused by accidents on German motorways
- Value of these travel time losses: 304 Million Euro (Costs of vehicles and inmates).