Dutch Value of Time Study

Methods, obstacles and study progress

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Context

- Cost-benefit analysis (CBA)
- Important benefits infrastructure projects
  - Travel time savings
  - Improved travel time reliability
- Literature study (2004)
  - Main conclusion: Reliability is of substantial importance and should not be neglected in CBAs
- International expert meeting (2004)
  - Common definition of reliability that fits well in CBA framework
  - Standard deviation of travel time distribution
  - Provisional values of reliability that can be used in CBA
  - New empirical research needed to replace these provisional values
  - SP survey methodology set up in international cooperation
Stated Preference survey

- Measuring the value to society of travel time benefits and travel time reliability benefits
- Four SP surveys
  - Car
  - Bus, tram, metro, high-speed train, air travel
  - Freight transport by road, rail, inland waterways, sea, air
  - Recreational navigation
- Values meant to be used in official Dutch guidelines for CBA
Set-up of the project

Design project
Preparing questionnaires and experiments
(Carried out in 2007)

Phase 1
Preparation

Phase 2
Pilot

Phase 3
Main survey

Phase 4
Data analysis

Phase 5
Final reports
(planned: 2009 – 2012)

Current status

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SP structure

- Two alternatives
  - Trip A
  - Transport A
- Trip B
  - Transport B

- Four attributes
  - Travel time
  - Travel costs
  - Reliability
  - Arrival time
Presentation reliability attribute

- Eight formats tested
- Through 30 face-to-face interviews
- Which format was understood best?
- Special attention to the effect of education level
### Presentation reliability attribute

Best format (better than “bars” or “clockface” presentation)

<table>
<thead>
<tr>
<th>Trip A</th>
<th></th>
<th>Trip B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Usual travel time:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 min</td>
<td></td>
<td>41 min</td>
</tr>
<tr>
<td></td>
<td>You have an equal chance of</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>the following five travel times:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35 min</td>
<td>30 min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 min</td>
<td>35 min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 min</td>
<td>45 min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 min</td>
<td>45 min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45 min</td>
<td>50 min</td>
<td></td>
</tr>
<tr>
<td>Costs:</td>
<td>€ 3,80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Costs:</td>
<td>€ 2,80</td>
</tr>
</tbody>
</table>

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Three SP experiments

- The experiments
- Experiment 1 is the same as the “Value of Time studies” in 1988 and 1997

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Experiment 1</th>
<th>Experiment 2a</th>
<th>Experiment 2b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel time</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Travel cost</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Reliability</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Arrival time</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
SP experiment 2A

Travel time, costs, reliability and arrival time

### Trip A
- **Departure time:** 08:05 h
- You have an equal chance of the following five travel times and therefore of arriving at any of the following times:

<table>
<thead>
<tr>
<th>Travel time</th>
<th>Arrival time</th>
</tr>
</thead>
<tbody>
<tr>
<td>55 min</td>
<td>09:00</td>
</tr>
<tr>
<td>65 min</td>
<td>09:10</td>
</tr>
<tr>
<td>65 min</td>
<td>09:10</td>
</tr>
<tr>
<td>95 min</td>
<td>09:40</td>
</tr>
<tr>
<td>145 min</td>
<td>10:30</td>
</tr>
</tbody>
</table>
- Usual travel time: **65 min**
- Costs: **€ 2,30**

### Trip B
- **Departure time:** 08:05 h
- You have an equal chance of the following five travel times and therefore of arriving at any of the following times:

<table>
<thead>
<tr>
<th>Travel time</th>
<th>Arrival time</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 min</td>
<td>08:55</td>
</tr>
<tr>
<td>60 min</td>
<td>09:05</td>
</tr>
<tr>
<td>60 min</td>
<td>09:05</td>
</tr>
<tr>
<td>90 min</td>
<td>09:35</td>
</tr>
<tr>
<td>140 min</td>
<td>10:25</td>
</tr>
</tbody>
</table>
- Usual travel time: **60 min**
- Costs: **€ 7,80**
Main survey

- Passenger transport
  - Internet survey
  - Within on-line panel: 5,700 interviews (finished)
  - Outside on-line panel: 1,400 interviews (finished)
- Freight transport
  - CAPI (computer assisted personal interviews)
  - 800 interviews (finished)
- Results available summer of 2012
  - VoTs and VoRs to be used in official Dutch CBAs
Also needed: volumes

- Empirical research using Dutch highway travel time data
  - Strong relationship between mean and standard deviation of travel times
  - Other explanatory variables (time varying as well as invariant) are significant but hardly improve predictive power
- However, traffic management measures can have effects on travel time variability and mean travel time that differ considerably in direction and size
  - Insight in the effects on variability is lacking
  - Miscalculation of benefits and costs
- Traffic forecasting tools need to be improved to provide estimates of changes in standard deviations and numbers of trips on links
  - Research into behavioral responses of travelers/ shippers/ carriers is needed