



Ministry of Transport, Public Works
and Water Management

Preliminary results of the Dutch valuation study

Pim Warffemius

Pim.warffemius@minvenw.nl

October 15, 2009

KiM Netherlands Institute for Transport Policy Analysis



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



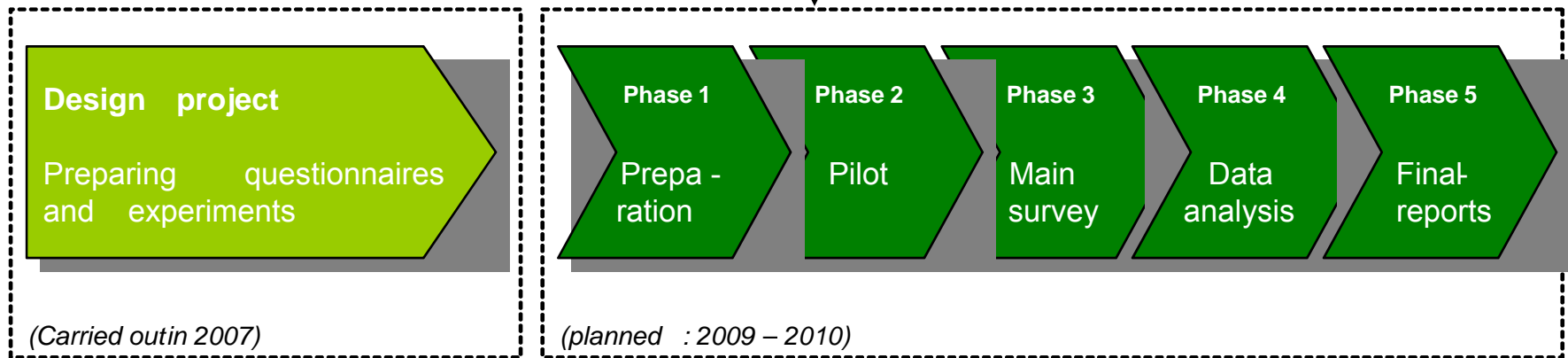
Stated Preference survey

- 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

Current status





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)

Trip A

Usual travel time:
40 min

You have an equal chance of
the following five travel times:

35 min
40 min
40 min
40 min
45 min

Costs:
€ 3,80

Trip B

Usual travel time:
41 min

You have an equal chance of
the following five travel times:

30 min
35 min
45 min
45 min
50 min

Costs:
€ 2,80



Three SP experiments

- The experiments

Attribute	Experiment 1	Experiment 2	Experiment 3
Travel time	X	X	X
Travel cost	X	X	X
Reliability		X	X
Departure/arrival time			X

- Experiment 1 is the same as the “Value of Time studies” in 1988 and 1997
- Complexity increases from experiment 1 to 3



SP experiment 1

Travel time and costs

Which trip do you prefer?

Trip A

Usual travel time:
65 min

Costs:
€ 2,80

Trip B

Usual travel time:
60 min

Costs:
€ 7,80



SP experiment 2

Travel time, costs and reliability

Trip A

Usual travel time:
40 min

You have an equal chance of
the following five travel times:

35 min
40 min
40 min
40 min
45 min

Costs:
€ 3,80

Trip B

Usual travel time:
41 min

You have an equal chance of
the following five travel times:

30 min
35 min
45 min
45 min
50 min

Costs:
€ 2,80



SP experiment 3

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:

Travel time		Arrival time
55 min	→	09:00
65 min	→	09:10
65 min	→	09:10
95 min	→	09:40
145 min	→	10:30

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:

Travel time		Arrival time
50 min	→	08:55
60 min	→	09:05
60 min	→	09:05
90 min	→	09:35
140 min	→	10:25

Usual travel time: **60 min**

Costs: **€ 7,80**



Test survey

- All 4 SP surveys tested: car, public transport, freight, recreational navigation
- Small pilot in design project
 - For each of the 4 SP surveys: 20 paper mailback questionnaires and 4 face-to-face interviews
 - Recruitment for freight difficult
 - Improvements needed for inland waterways and sea
 - Results used to estimate discrete choice models: VoTs (Value of Time) and VoRs (Value of Reliability) in plausible ranges
- Tests in survey project
 - Involve sector organizations
 - Test interviews: 5 passenger transport, 5 freight
 - Main pilot just started: passenger transport 275 interviews, freight 25 interviews



Main survey

- Passenger transport
 - Target 5,200 interviews
 - Internet survey
 - On-line panel: sample population 240,000
- Freight transport
 - Target 520 interviews
 - CAPI (computer assisted personal interviews)
- Results available in May 2010
 - VoT's and VoRs to be used in official Dutch CBAs



Also needed: volumes

- Peer, Koopmans, Verhoef: *“Prediction of Travel Time Variability in Cost-Benefit-Analysis”*
- Travel time variability as a function of mean travel time?
- 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
- Predicting travel time variability by mean travel times?
 - Yes, but with caution
 - Traffic management measures can have effects on travel time variability and mean travel time that differ considerably in direction and size → miscalculations of costs of variability
- Traffic forecasting tools need to be improved to provide estimates of changes in standard deviations and numbers of trips on links