

Norwegian Valuation Studies 2008–2010

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Contents of presentation

- Background
- Survey design
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Two valuation studies going on:

PASSENGER TRANSPORT

Commissioned by
transport authorities

Value of time,
reliability, comfort
factors, traffic safety and
environment

Car, public transport,
walk & cycle

FREIGHT TRANSPORT

Research Council of
Norway
and the Public Roads
Administration

Value of time and
reliability

Producers & retailers
Carriers

Target groups. Data collection

- Web-based questionnaire sent to...
 - Passengers: Internet panel (mainly)
 - Freight: Email database
- Passenger transport:
 - Modes: Car, public transport, air, ferry, walking, cycling
 - Trip purposes: To/from work, private errands, not business trips
 - Distances: Short (below 100 km) and long trips
- Freight transport:
 - Companies: Goods owners (shippers) and providers of transport services
 - Modes: Mainly road and rail

Approaches to travel time reliability

- Standard deviation approach

The cost of unreliability is connected to the standard deviation of travel time

$$C = \beta_1 \cdot E(T) + \beta_2 \cdot \sigma_T$$

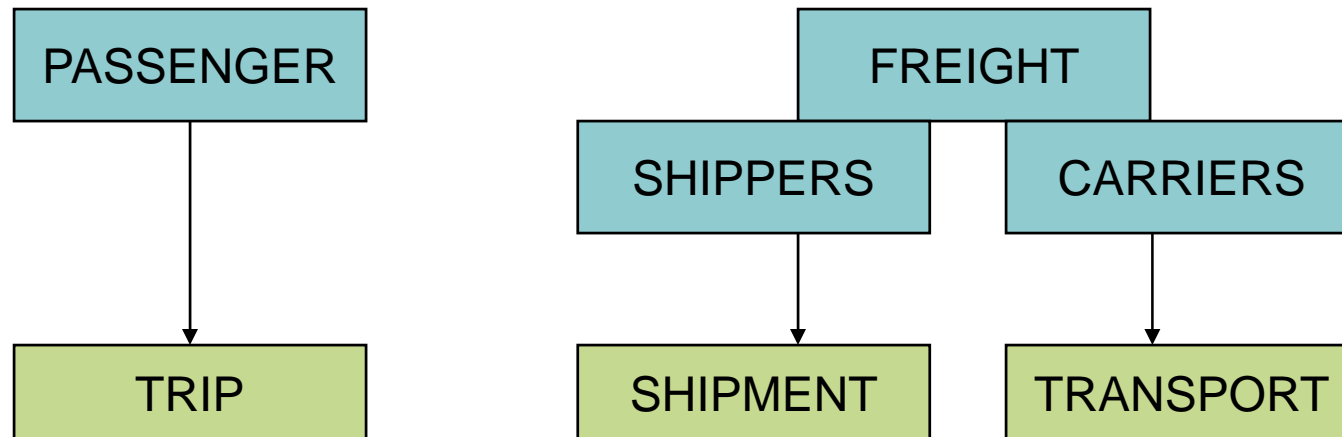
- Scheduling approach

The cost of unreliability is connected to arriving earlier or later than preferred arrival time

$$C = \alpha \cdot T + \beta \cdot SDE + \gamma \cdot SDL + \theta \cdot D_L$$

Stated Preference Technique

- Choice between two hypothetical trips / transports
- Starting point is a trip/shipment/transport undertaken by the respondent
- Attribute levels vary around the reference



Attributes

Experiment	Passenger survey (completed)	Freight survey (planned)
“Standard deviation”, test version	<ul style="list-style-type: none"> • Expected travel time • Set of five equally probable travel times • Cost 	
“Standard deviation”	<ul style="list-style-type: none"> • Set of five equally probable travel times • Cost 	<ul style="list-style-type: none"> • Set of five equally probable transport times • Cost
“Scheduling”	<ul style="list-style-type: none"> • Expected travel time • Early/late/on time arrival • Cost 	<ul style="list-style-type: none"> • Early/late/on time arrival and its probability • Cost

Generating attribute levels

Attribute	Passenger survey (completed)	Freight survey (planned)
Travel time	<ul style="list-style-type: none"> • Five levels • Change in minutes, depending on reference 	<ul style="list-style-type: none"> • Percentage change in cost drawn from intervals • VoT drawn from intervals • Change in T computed
Cost	<ul style="list-style-type: none"> • Five levels • Percentage change depending on reference 	
Set of five travel times	<ul style="list-style-type: none"> • Five levels • Defined as fractions of travel time 	<ul style="list-style-type: none"> • Five levels • Defined as fractions of travel time
Early / late arrival	<ul style="list-style-type: none"> • Five levels • Deviations from preferred arrival time 	<ul style="list-style-type: none"> • Value drawn from intervals • Deviation computed

≈ Standard Deviation Approach: Presentation

TRIP A

Travel time variation:

These 5 travel times have an equal chance of occurring

28 min.
40 min.
40 min.
50 min.
56 min.

Cost: 62 kroner

Trip A

TRIP B

Travel time variation:

These 5 travel times have an equal chance of occurring

39 min.
49 min.
49 min.
57 min.
59 min.

Cost: 50 kroner

Trip B



Preliminary results: Implicit valuation of mean and standard dev.

Segment	N	Mean travel time		Std.dev. of travel time	
		NOK / hour	Euro / hour	NOK / unit	Euro / unit
Car, short	1597	127.94	15.41	0.39	0.05
Car, long	603	254.98	30.72	0.48	0.06
PT, short	194	66.87	8.06	0.35	0.04
Bus, long	443	150.30	18.11	0.49	0.06
Train, long	551	268.34	32.33	1.09	0.13
Air, long	812	521.97	62.89	0.80	0.10
Ferry, short	333	194.4	23.42	0.60	0.07
<i>High-speed boat, long</i>	55	223.1	26.88	0.91	0.11
<i>High-speed boat, short</i>	25	77.2	9.30	0.58	0.07

≈ Scheduling Approach: Presentation

TRIP A

Expected travel time:
1h 30 min

Arrival:
20 min. late

Cost: 150 kroner

Trip A

TRIP B

Expected travel time:
1h 48 min

Arrival:
On time

Cost: 180 kroner

Trip B



Preliminary results: Valuation of early or late arrival

Segment	N	1 minute reduction in early arrival		1 minute reduction in late arrival		Dummy: Lateness
		NOK	Euro	NOK	Euro	
Car, short	1597	-0.42	-0.05	2.22	0.27	13.07
Car, long	603	-0.64	-0.08	2.58	0.31	143.5
PT, short	194	[0.08]	[0.01]	1.35	0.16	1.09
Bus, long	232	[-0.68]	[-0.08]	5.27	0.63	171.46
Train, long	251	-0.40	-0.05	2.32	0.28	54.6
Air, long	388	-3.67	-0.44	7.92	0.95	[13.44]
Ferry, short	333	0.74	0.09	2.11	0.25	12.08



Preliminary results:

Valuation of early or late arrival (2)

Segment	N	1 minute reduction in early arrival		1 minute reduction in late arrival		VoL / VoT	
		NOK	Euro	NOK	Euro	Ratio	
Car, short	1597	-0.42	-0.05	2.22	0.27		
Car, long	603	-0.64	-0.08	2.58	0.31	2.2	
PT, short	194	[0.08]	[0.01]	1.35	0.16	3.1	
Bus, long	232	[-0.68]	[-0.08]	5.27	0.63	2.4	
Train, long	251	-0.40	-0.05	2.32	0.28	1.6	
Air, long	388	-3.67	-0.44	7.92	0.95	2.3	
Ferry, short	333	0.74	0.09	2.11	0.25	1.2	

Preliminary conclusions

- ... about design
 - Omitting expected travel time from the attributes that are shown:
Trade-off between unreliability and cost
 - Remind respondents about PREFERRED arrival time
Freight: PLANNED arrival time?

- ... about valuation
 - Reliability has been valued higher on long trips (100 km and above)
than on short trips
 - However: Long trips also have a higher VoT
 - Reliability relative to VoT can be higher on short trips (PT)



Next steps

(after

- analysis of data from passenger survey
- data collection for freight survey)

- Indicators for travel time variation and quantification of effects
- Possibly a railway project focusing on punctuality and freight



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Thank you

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