

Summary:

Value of time, safety and environment in the transport sector – supplementary study of the values of time

Travellers' valuation of travel time appears to be higher for longer trips. In this supplementary study, we distinguish between short and long trips at 50 kilometres instead of 100 kilometres, which was the dividing line used in the original estimations. As an example, this causes a reduction in the value of travel time savings from 51 to 47 NOK for short trips using public transport, and from 146 to 99 NOK for long trips by train. The unit prices for the values of reliability and comfort are also affected by the change in definitions of short and long trips.

When possible, we have used the same methods in the new estimations as in the original value of time study. However, we could not do this in all cases because the data for short and long trips in the value of time study were collected using differing questionnaires. We have therefore used some alternative methods. Many of the new unit values are calculated as weighted averages of the results for trips of length 50-100 kilometres and of those longer than 100 kilometres.

In some cases, we conclude that the results of the original estimations and the new estimations are so similar that the original results can be applied also when using the new definition of short and long trips. We also recommend this in some cases where we regard the original results as more reliable.

Our recommendations concerning the values of access and egress time, waiting time and transfers are the same in this report as in the original study (report 1053B). The reason for this is that these unit values are based on the Swedish value of time study, and not on our own data.

A main finding in this supplementary study is that the value of time is increasing with trip length, and that this relationship is quite consistent when comparing the values of time for trips shorter than 50 kilometres, trips of length 50-100 kilometres, and trips longer than or equal to 100 kilometres. This causes the values of time for long trips to be substantially lower with the definition used in this study than when the original definition is used, because trips with a length between 50 and 100 kilometres dominate among the long trips.

The tables below show the results of the study.

The value of travel time savings

The values of time for car trips represents the driver's valuation. In line with earlier recommendations, we propose using the same value for passengers. According to calculations based on data from the Norwegian Travel Survey (RVU), the average occupancy is 1.52 persons per vehicle for short car trips (less than 50 kilometres) and 1.86 for long car trips (50 kilometres or more).

Short trips

Table 1: In-vehicle values of time (2009 NOK/hour) for short trips by mode and trip purpose.

	Car driver	Public transport	Ferry	Speed boat
Trips to and from work	84	56		
Other private trips	70	44		
All private trips*	73	47	126	91
Business trips	380	380	380	380
All trips*	81	54		

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*Aggregated using shares from the Norwegian Travel Survey 2005. For ferries and speed boat, the sample sizes in the travel survey are too small to allow disaggregated values.

The weights in table 2 give the value of waiting time, access and egress time and transfers as shares of the value of expected in-vehicle travel time.

Table 2: Recommended weights for waiting time*, access and egress time, and transfers. Short public transport trips.

	Short public transport trips
Weight factor for waiting time 0 - 5 min	2,30
Weight factor for additional waiting time 6 – 15 min	1,88
Weight factor for additional waiting time 16 – 30 min	0,92
Weight factor for additional waiting time 31 – 60 min	0,56
Weight factor for additional waiting time over 60 min	0,28
Weight factor for access/egress time	1,0
Fixed cost per transfer	2 - 10 min

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*Defined as half of headway at the start of a scheduled trip and as actual waiting time by transfers.

Long trips

Table 3: In-vehicle values of time (2009 NOK/hour) for long trips by mode and trip purpose.

	Car driver	Railway	Bus	Air	Speed boat
Trips to and from work	151	88	56	288	
Other private trips	130	63	52	180	
All private trips*	136	76	53	204	137
Business trips	380	380	380	445	
All trips*	157	99	70	305	

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* Aggregated using shares from the Norwegian Travel Survey 2005 for car, rail and bus; for air trips using the Air Travel Survey 2007, with adjustments using Air Travel Survey 2009.

The weights in table 4 give the value of waiting time, access and egress time and transfers as shares of the value of expected in-vehicle travel time.

Table 4: Recommended weights for waiting time*, access and egress time, and transfers. Long public transport trips.

	Bus	Railway	Air	Ferry	Speed boat
Weight factor for waiting time 0 - 30 min	1,04	1,04	2,00	2,00	1,04
Weight for additional waiting time 31 – 240 min	0,54	0,54	1,00	1,00	0,54
Weight for additional waiting time over 240 min	0,40	0,40	0,80	0,80	0,40
Weight factor for access/egress time	1,36	1,36	1,36	1,36	1,36
Fixed cost per transfer	10 min	10 min		10 min	10 min

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*Defined as half of headway at the start of a scheduled trip and as actual waiting time by transfers.

Weight factors for driving in heavily congested conditions

The weights in table 5 give the value of time spent driving under heavily congested conditions as a share of the value of expected in-vehicle travel time.

Table 5: Weights for driving in heavily congested conditions

	Short car trips	Long car trips
Weights	3,7	2,7

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Travel time variability

The weights in table 6 give the value of a reduction (increase) in the standard deviation of travel time as a share of an equivalent reduction (increase) in expected travel time. Hence a reduction in the standard deviation of ten minutes for short car trips to and from work is valued by the 84 NOK value of time multiplied by (10/60) and by the weight 0.45. This yields 6.01 NOK per car trip.

Table 6: Preliminary valuation of travel time variability by mode

Mode	Weight factor
Short trips	
Car	0,45
Public transport	0,67
Speed boat	1,50
Ferry	0,45
Long trips	
Car	0,36
Bus	0,42
Railway	0,72
Air	0,20
Speed boat	0,55

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Comfort factors

As expected, the value of having a seat on short trips with public transport seems to depend strongly on the length of the trip. The unit values presented in table 7 can hence be regarded as better estimates for short trips with public transport than those provided in report 1053B, since standing is rarely an alternative for trips of length 50 kilometres or more.

Table 7: The value of having a seat on short public transport trips if the base case was having to stand on the whole trip. NOK/trip.

	Short public transport trips
Seat on a quarter of the trip	2,6
Seat on half of the trip	8,7
Seat on most of the trip	15,3
Seat on the whole trip	17,4

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Value of time when changing transport mode

The tables 8 and 9 show how the values of time change when one changes from one transport mode to another for trips to and from work and for other private trips, respectively. Table 10 shows the results for long trips, not segmenting by trip purpose.

Table 8: Change in value of time when changing transport mode. Short trips (less than 50 km) to and from work.

Original mode of transport	Value of time, NOK/hour	Change to...	Value of time, NOK/hour	Total % change	% change related to	
					User type	Transport mode
Car	84	Public transport	72	-13.7	2	-16
Public transport	56	Car	105	86.6	42	32
		Other public transport mode	47	-1.6	-6	-11

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Table 9: Change in value of time when changing transport mode. Other private short trips (less than 50 km).

Original mode of transport	Value of time, NOK/hour	Change to...	Value of time, NOK/hour	Total % change	% change related to	
					User type	Transport mode
Car	70	Public transport	69	-1.7	10	-10
Public transport	44	Car	58	3.7	17	13
		Other public transport mode	39	-12.2	-6	-6

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Table 10: Change in value of time when changing transport mode. Long trips (less than 50 km), both trips to and from work and other private trips.

Original mode of transport	Value of time, NOK/hour	Change to...	Value of time, NOK/hour	Total % change	% change related to	
					User type	Transport mode
	136	Bus	123	-9.8	5	-14
Car		Railway	136	0.08	16	-16
		Air	261	91.9	10	75
	53	Car	69	31.0	9	20
Bus		Railway	51	-4.0	-3	-1
		Air	79	49.0	-15	75
	76	Car	106	38.9	24	12
Railway		Bus	72	-5.3	-6	1
		Air	118	55.0	9	42
	204	Car	150	-26.6	2	-28
Air		Bus	88	-56.9	-17	-48
		Railway	95	-53.3	-24	-38

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