Issues in the valuation of travel time changes

Paper prepared for "Trafikdage på Aalborg Universitet"
August 24–25 1998

by

Stine Gissel, Ph.D. student*
Technical University of Denmark
Department of Planning
Building 115
DK – 2800 Lyngby
email: sgissel@ivtb.dtu.dk

1 Introduction

As travel time savings often constitute a very large part of the benefit derived from investments in transport infrastructure, the quantification and valuation of these time savings are of great importance. The subject of this paper is the valuation of travel time savings. In the first part of the paper this question is approached within a micro-economic framework. It is discussed if and how the theory can give indications on the relative value of travel time elements and on the extrapolation of time values into the future. In the second part of the paper the same questions are investigated on the basis of the results of several empirical analyses.

2 Micro-economic theory

2.1 Private trips

For private trips the question of travel time values has traditionally been approached within the neoclassical utility framework.

The following model is partly based on the approach by DeSerpa (DeSerpa (1971)) — and later modifications of this model (Bruzelius (1978), The MVA Consultancy, Institute for Transport Studies University of Leeds & Transport Studies Unit University of Oxford (1987)).

The essential features of the model are the following:

*The general subject of the Ph.D. study is methods in socio-economic evaluation of rail infrastructure projects. The study is carried out as a collaboration between ScanRail Consult and the Technical University of Denmark, and it is financially supported by the Danish Transport Council.

1. utility is a function of commodities *and* the time allocated to them as well as of the time devoted to work (this allocation of time may also be seen as spending time in activities)
2. there are both a money *and* a time resource constraint
3. there are minimum amounts of time allocated to the consumption of each good as well as a minimum work time, but the individual may spend more time in an activity if he so desires

As it is travel time changes that has our attention it will be assumed that all other activities have fixed time requirements associated with them. All consumption (of goods and other activities than travel) is represented by the composite good x (at the composite price p) and the composite time requirement t_c. The utility maximization problem can be expressed as the mathematical problem stated below. Here t is the time spent travelling, t_w is the time devoted to work, w is the wage rate (which is assumed to be constant), y is unearned income, T is the total amount of time available (after time has been allocated to essential activities such as sleep) and $\bar{t}_w$ and $\bar{t}$ are the minimum time requirements for work and travel respectively.

$$\max U(x, t_c, t, t_w) \tag{1}$$

subject to

$$px = w\,t_w + y \qquad [\lambda] \tag{2}$$

$$t_c + t + t_w = T \qquad [\mu] \tag{3}$$

$$t \geq \bar{t} \qquad [\psi] \tag{4}$$

$$t_w \geq \bar{t}_w \qquad [\phi] \tag{5}$$

The variables in brackets are the shadow prices — that is, for each restriction this dual variable represents the marginal utility of slackening the restriction. Hence, λ ($\lambda > 0$) is the marginal utility of income as a scarce resource and μ ($\mu > 0$) is the marginal utility of time as a scarce resource. However, as it is impossible to increase the individual's resource time, this definition is somewhat a misrepresentation and it makes little sense at an empirical level[1]. Similarly, ψ ($\psi \geq 0$) and ϕ ($\phi \geq 0$) are the marginal utilities (or disutilities) of reducing (or increasing) the minimum time requirements for travel and work hours respectively. In the following the focus will be on travel time *savings*, but similar interpretations can be made for travel time losses.

With the above interpretations of the dual variables, the fraction ψ/λ is the marginal rate of substitution between travel time and income, and may thus be interpreted as the (marginal) monetary value of a change in travel time[2]. This is generally seen as the value of a travel time saving.

Solving the utility maximization problem implies differentiating the lagrangian with respect to the demand variables. The following expression for the value of travel time savings can be derived:

$$\frac{\psi}{\lambda} = \frac{\mu}{\lambda} - \frac{\partial U/\partial t}{\lambda} \tag{6}$$

[1] However, as The MVA Consultancy et al. (1987) points out, we can think of μ as the marginal utility of time available by reducing the time requirements for essential activities.

[2] Equivalent the fraction μ/λ may be interpreted as the marginal monetary value of time as a ressource, whereas ϕ/λ is the marginal monetary value of decreasing the minimum requirement for work hours.

This expression states that the value to an individual of a travel time saving is equal to his value of leisure (or equivalently *value of time as a ressource*) to which he transfers the time saving, less the value of the (dis)utility he looses from having the travel time reduced.

With reference to the theoretical approach, the following can be concluded:

1. The utility the individual looses — or more likely *gains* — when the travel time is reduced must depend on the *nature* of the travel time saved. Therefore, values of travel time savings would be expected to vary with the nature of the time saved. However, nothing can be said about the relative size of the valuation for different time elements.

2. The value of a travel time saving is not directly related to the wage rate.

3. There is an indirect relation between the value of a travel time saving and income through λ; When an individual's income increases, the marginal utility of income (λ) will (*ceteris paribus*) decrease, implying an increase in his time value. However, the theory does *not* offer any guidance as to the form of this relationship.

4. Nothing can be said about how the travel time value develops over time. Changes in the time budget, in the onerousness of work, in the pleasure derived from consumption or changes in real prices will influence the value of a travel time saving in different directions.

2.2 Business trips

When considering travel time savings *during* work — i.e. for business trips — it seems more reasonable to in some way include the employer's interests in the model than to base a socalled social valuation of the time saving on the individual utility maximization alone. Also, there is the question of the productivity of the travel time. However, the *wage rate approach* which values travel time changes by the employer's lost production — measured by the wage — is not the solution either, as it ignores costs or benefits to the employee. This leads to the suggestion of a "social" optimization problem, where both the individual utility and the profit of the employer is maximized. For reasons of interpretation it is now assumed that the individual utility can in some way be expressed in monetary units — and hence it can be added to the employer's profit function. As most business travellers in Denmark are paid a (fixed) monthly wage (and do not receive payement for extra work hours) and with the additional assumption of flexible work hours the following social optimization problem is now considered:

$$\max U(x, t_c, t, t_w) + [p_o\, q(\delta\, t, t_w, z) - C(t, t_w, z)] \tag{7}$$

subject to

$$px = y \qquad [\lambda] \tag{8}$$

$$t_c + t + t_w = T \qquad [\mu] \tag{9}$$

$$t \geq \bar{t} \qquad [\psi] \tag{10}$$

Where t_w is now explicitly work time spent "in the office", p_o is the output price, $q(\delta t, t_w, z)$ is the production function, z is a compound input factor reflecting all other production factors than labour and the function $C(t, t_w, z)$ reflects the production costs[3]. The parameter δ is the proportion of the travel time the individual spends travelling during work. Considering travel time, t, the dual variable ψ can now be directly interpreted as the value of a travel time saving to the society (as the objective function is given in monetary units). As before, the optimization problem is solved by differentiating the lagrangian and solving the first order conditions. With the assumption that every minute of a time transfer is of equal value for the employer as well as for the employee, the social benefit of the individual transferring a proportion, r, of the travel time saving to leisure and the rest, $1 - r$, to work in the office, can be derived as:[4]

$$\psi^* = r\frac{\partial U}{\partial t_c} + (1-r)\frac{\partial U}{\partial t_w} - \delta p_o \frac{\partial q}{\partial t} + (1-r)p_o\frac{\partial q}{\partial t_w} + \frac{\partial C}{\partial t} - (1-r)\frac{\partial C}{\partial t_w} \qquad (11)$$

The first two terms on the right hand side in this equation represent the employee's part of the social value of time. The first term reflects the benefit derived from transferring part of the saving to leisure, whereas the second term represents the benefit derived from transferring the rest of the saving to work "in the office". The third term measures the employer's production loss which arises when the employee saves work productive travel time. The fourth term measures the employer's production gain following the transfer to time "in the office". The last two terms measure the change in the employer's overhead costs due to the transfer from travel time to office time. The last four terms then represent the employer's part of the social value of time, and it can be seen that the more of the travel time actually spent working and the more productive the travel time is, the lower this contribution. If the employer is a profit maximiser then the value of the marginal productivity of labour will be equal to the wage rate: $p_o \frac{\partial q}{\partial t_w} = w_E$. The wage rate is here referred to as w_E to indicate that this gross wage rate paid by the employer is not identical to the net wage rate w received by the employee[5].

The overhead costs as well as other variable costs on labour can be assumed to be fixed in the short run implying the cost function to be irrelevant for the social maximisation problem. This would lead to an expression for the social value of time equal to the expression derived by Hensher (1977) which is often used in deriving values of time for business trips. Hence, it can be seen that the Hensher expression can be derived from a neoclassical social optimization problem.

With reference to the theoretical approach the following may be concluded for business trips:

1. The work efficiency of the travel time element influences its value — the more work efficient the travel time element is, the lower the value of a saving (other things being equal).
2. The value of travel time savings is dependent on the wage rate if the employer is a profit maximiser in a market with perfect competition.
3. As for private trips nothing can be said about the value of time *over time*.

[3]As the employee receives a fixed monthly payment, the wage is not assumed to be represented in the cost function — which seems reasonable enough in this business trip context as only in the longer run will wages be variable. Instead the cost function represents "other variable production costs" as well as (variable) overhead costs of labour.

[4]The problem is solved first under the assumption that all of the saved travel time is transferred to work, and then, second, under the assumption that all of the time saving is transferred to leisure. The two expressions of the time value are then combined to give (11).

[5]Here nothing is said about company tax — such a tax will reduce the employer's gain!

3 Results from empirical analyses

3.1 Empirical evidence on the value of time *over time*

When investigating for the value of time *over time* in empirical analyses, often the relationship between the value of time and income is approached, and the obtained cross-sectional elasticities are used as a measure of the change in the value of time over time. The 1994 British value-of-time study says about this approach: *"The arguments for the use of the cross-sectional elasticities are simply those used for all cross-sectional models — that as population groups grow or shrink over time, those in a particular group in the future will tend to behave in ways similar to those in that group at the present (other factors being equal)."*[6]

Since far most studies of the value of time over time have concentrated on the estimation of income elasticities, a few of these cross-sectional studies will be reviewed in this section. It proved very difficult to find time series analysis on the value of time, but some results of two recent studies will be given.

In the British value-of-time studies reported in 1987 and 1994 respectively (The MVA Consultancy et al. (1987), AMR & HCG (1996)) the variation of the estimated value of time figures with income is investigated. In both studies as well as in the Dutch value-of-time research (see Gunn & Rohr (1996)) a relationship between the value of time and income was found. However, *no constant proportionality* was found — in fact in the 1987 UK study it was concluded that: *"... the value of time as a proportion of income is a decreasing function of income, rather than a constant as has hitherto been assumed."*[7] The 1994 UK study reported a stronger relationship between the value of time and income; again, the value of time is monotonically increasing with income — but *not* directly proportional.

In the 1994 UK study, estimates of income elasticities for the average value of time (for different trip purposes) were generated. These elasticities, as it is claimed, can then be used to approximate the impact on average values of time of overall changes in income, e.g. over time. The elasticities reported in the study are given in table 1[8]. In fact, both the hypothesis of the

Trip purpose	Income elasticity
Business (employee only)	0.45
Commuting	0.65
Other	0.35

Table 1: Average income "elasticities" for the 1994 UK values of time.

values of time growing *proportional to growth in earnings* and the hypothesis of them growing with factors corresponding to the income elasticities were tested in the 1994 UK study. This was done by comparing the 1994 average values of time with values in 1994 prices — under both assumptions — of the average values of time from earlier studies conducted in the UK (both

[6] AMR & HCG (1996) p. 271.
[7] The MVA Consultancy et al. (1987) p. 136.
[8] The table is reproduced from AMR & HCG (1996) p. 259, and the figures apply to car drivers and passengers.

Study report	Survey year	1985 reported values 1985 car [p/min]	confidence [+/-]	Values in 1994 prices Mean estimate [p/min]	Under full income growth [p/min]	Under income elasticities growth [p/min]
Tyne RP (1985)	1985	5.2	50%	7.9	9.7	9.1
Tyne SP (1985)	1985	3.6	4%	5.5	6.7	6.3
WY RP (1985)	1981	3.7	74%	5.6	7.6	6.9
Ortuzar RP (1980)	1974	1.7	125%	2.6	3.5	3.2
Daly RP (1977)	1975/76	1.9	70%	2.9	3.9	3.5
Quarmby (1967)	1964/65	1.6	85%	2.4	4.4	3.7
Experiment 1 (SP)	1994			5.4	5.4	5.4
Experiment 3 (SP)	1994			5.4	5.4	5.4
Newcastle SP1	1994			3.8	3.8	3.8
Newcastle RP	1994			4.0	4.0	4.0

Table 2: Comparison of 1985 results, other study results and 1994 results for commuter values of time (given in pence per minute).

studies reported in the 1987 study and earlier studies[9]). To illustrate the manner in which this comparison was made, the tables 2, 3 and 4 have been reproduced from AMR & HCG (1996)[10]. The real income growth has been estimated from the average earning index deflated by the retail price index.

Neither of the two hypotheses were strongly supported, but given a belief that the *long-distance* results reported in the 1987 study (the 1985 figures) were biased upwards as compared to a more representative bundle of trip lengths, the authors of the 1994 report end up recomending the use of cross-sectional income elasticities when there is a need to adjust for changes in income distributions. However, at the same time they note the inherent difficulties of comparing the time values obtained from the different studies — because of site-specific effects, changes in the level of congestion (both in time and according to site) and because of the large confidence intervals for the values given in some of the studies.

As a matter of fact a third hypothesis assuming *no* income induced growth in the time values is not commented on, although it is in fact represented in the tables (comparing the 1994 UK values with the values in 1994 prices from the earlier studies). This hypothesis is also not strongly supported *but* from the given comparisons it seems that the hypotyhesis *cannot* be dismissed either — especially not for non-work trips!

However, concluding the 1994 study the authors say: *"The findings of this study, supporting those reported in The Netherlands, are that VOT is indeed related to income, but the relationship is* **not** *one of proportionality. Rather, income elasticities of around 0.5 have been found ..."*[11]

In the Swedish value-of-time study (see Algers, Dillen & Widlert (1996)) the variability of values

[9] These are: Ortuzar (1980), Daly & Zachary (1977) and Quarmby (1967).
[10] AMR & HCG (1996) pp. 268–269.
[11] AMR & HCG (1996) p. 31. For a description of the Dutch study see Gunn & Rohr (1996).

Study report	Survey year	1985 reported values		Values in 1994 prices Mean estimate [p/min]	Under full income growth [p/min]	Under income elasticities growth [p/min]
		1985 car [p/min]	confidence [+/-]			
Tyne SP (1985)	1985	4.5	9%	6.8	8.4	7.5
Experiment 1 (SP)	1994			11.9	11.9	11.9
Experiment 3 (SP)	1994			8.0	8.0	8.0
Newcastle SP1	1994			6.0	6.0	6.0
Newcastle RP	1994			11.3	11.3	11.3

Table 3: Comparison of 1985 results, other study results and 1994 results for employer's business (self-reported) values of time (given in pence per minute).

Study report	Survey year	1985 reported values		Values in 1994 prices Mean estimate [p/min]	Under full income growth [p/min]	Under income elasticities growth [p/min]
		1985 car [p/min]	confidence [+/-]			
Tyne RP (1985)	1985	3.7	51%	5.6	6.9	6.1
Tyne SP (1985)	1985	4.5	7%	6.8	8.4	7.4
LD SP (1985)	1985	3.8	10%	5.8	7.1	6.2
Experiment 1 (SP)	1994			4.4	4.4	4.4
Experiment 3 (SP)	1994			5.8	5.8	5.8
Newcastle SP1	1994			3.6	3.6	3.6
Newcastle RP	1994			9.5	9.5	9.5

Table 4: Comparison of 1985 results, other study results and 1994 results for "other purpose" values of time (given in pence per minute).

of time with income was also investigated. Here some of the problems of using household income without considering the composition of the household was accounted for by considering different household categories. The relationship between the value of time and income is positive but fairly week — though when individual income is used the relationship seems more pronounced. The household income elasticity of the value of time is 0.46 for single person households and ranges from 0.07 to 0.24 for 2 person household (with and without children respectively). The individual income elasticity ranges from 0.23 to 0.42 for 2 person households (with and without children respectively)[12]. It was recommended to continue with the restrictive assumptions that had been set out in the previous guidelines for project evaluation. In these guidelines it was suggested *not* to make any economic growth adjustments in the value of time.

A similar approach was taken in the Norwegian study (see Ramjerdi, Rand & Sælensminde (1996)) — which was in fact co-ordinated with the Swedish study. No explicit elasticities are given in the paper but the same conclusions as in the Swedish study apply: The value of time increases with income, and the effect is more explicit when individual income is used.

Looking at evidence across countries, Waters II (1995) reviewed 56 value-of-time studies conducted mainly during the sixties, seventies and eighties in a variety of countries. All time values are given as a percentage of the average wage rate and hence it should, in theory, be possible to estimate wether values of time are proportional to income (given by the wage rate) — if this is the case the values of time as a proportion of wage rate should approach some constant. However, as also noted by Waters himself, the analysis is not very enlightening. On the comparison of time values across countries AMR & HCG (1996) notes: *" ... relative* **disposable** *incomes are a function not only of relative gross incomes, but also of tax rates and regimes, life styles and several other factors. As a result it is not at all straightforward to propose a method to translate average values of time across borders [...] A second problem is that values of time can be shown to be functions of many characteristics of travellers, their households, the types of trips they make and the conditions of the roads and transport systems they use. All of these factors can vary considerably between countries and can change over time. When comparing values from different countries and/or years, we must be sure we are comparing values for similar types of travellers in similar journey contexts."*[13] A scatter plot of the time values in Waters II (1995) shows extremely wide variation (even with some outliers removed) — and although there seems to be a slight upward time trend (though only significant at the 90% confidence limit) one should (with the above warnings in mind) be careful about making *any* conclusions on the basis of this very rough analysis.

In Wardman (1997) and Wardman (1998) one of the most comprehensive quantitative reviews of the valuation of a wide range of travel attributes has been conducted. 132 studies — giving a total of 532 in-vehicle time valuations — were reviewed, and all of the reviewed studies had been conducted within the UK. Given the fact that the studies had been conducted over a range of years made it possible to investigate for a GDP effect in the values of time. However, the t statistic for including the GDP in the model was very low, and there was quite a significant correlation with the constant term. Including instead a linear time trend provided a slightly better fit, and this model was therefore chosen. The linear time trend denoted that the values of time grew on average 1% per year corresponding to a GDP elasticity of 0.49. Thus, this estimate on how the values of time vary with real income over time (based on an extensive amount of studies) appears to be highly consistent with the (UK) cross-sectional evidence on the variation of time values across income groups.

[12] Algers et al. (1996) p. 10.
[13] AMR & HCG (1996)

Concluding the evidence on the variation of values of time with real income in UK, The Netherlands, Sweden and Norway it was clear that no empirical evidence of a proportional relationship between the value of time and (cross-sectional) income could be found, nor did the times series analysis conducted by Wardman (1998) show a proportional relationship between the value of time and growth in GDP. On the contrary the empirical evidence for UK indicates that over the past 20 years the values of time have grown at a constant average rate corresponding to an income elasticity of around 0.5. (Much the same value as the income elasticities in the UK cross-sectional analyses.) Thus, (the sparse) empirical evidence seems to justify the hypothesis of using cross-sectional income elasticities in the calculation of values of time over time. It must again be emphasized that the relationship between values of time and income does *not* appear to be on of proportionality, as all the cross-sectional analyses reviewed produced income elasticities less than 0.5.

3.2 Relative values for travel time elements

In this section different studies[14] are compared with respect to the valuation of the different time elements constituting a trip. To compare the values, which are derived from studies different in time and geographic location, the values of other travel time elements are related to the value for in-vehicle time (IVT) in the specific study. This means, that the figures for values of wait time, transfer time etc. given in this section are weights for the given time element compared to in-vehicle time.

3.2.1 Late time

In most of the studies values of late time compared to in-vehicle time can be found. These are illustrated in figure 1 (with a few outliers removed).

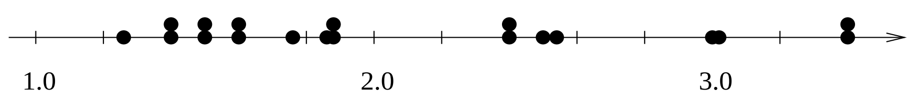

Figure 1: Weights for the value of late time compared to IVT.

The figure does not given a clear picture of the weight on late time compared to in-vehicle time, but a value between 1.5 and 3 seems most likely.

3.2.2 Walk time

Figure 2 illustrates the weights on walk time compared to in-vehicle time, and it indicates that a value of walk time twice the value of in-vehicle time might be to high. Rather, the value should lie somewhere between 1 and 2.

[14]These are: Algers et al. (1996), Ramjerdi et al. (1996), Kjærstad & Renolen (1996), The MVA Consultancy et al. (1987), Friberg & Holmberg (1974), Lindh & Widlert (1989), Wardman (1998) and Gunn & Rohr (1996)

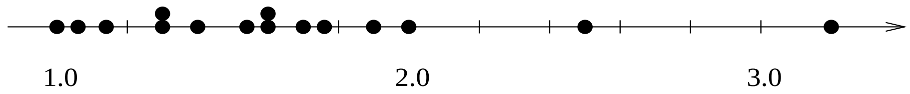

Figure 2: Weights for the value of walk time compared to IVT.

3.2.3 Transfer time

Finally, weights on transfer time compared to in-vehicle time are illustrated in figure 3.

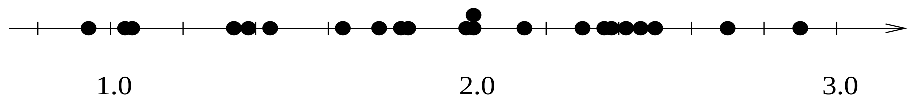

Figure 3: Weights for the value of walk time compared to IVT.

Here too, the picture is not clear — the weights are distributed rather evenly between 1 and 3.

3.2.4 Headway

In the Swedish study (Algers et al. (1996)), headway was divided into intervals of 30–60, 60–120 and more than 120 minutes between departures. The valuations (per time unit) of these headway intervals compared to in-vehicle time are shown in figure 4. It is clear that the longer

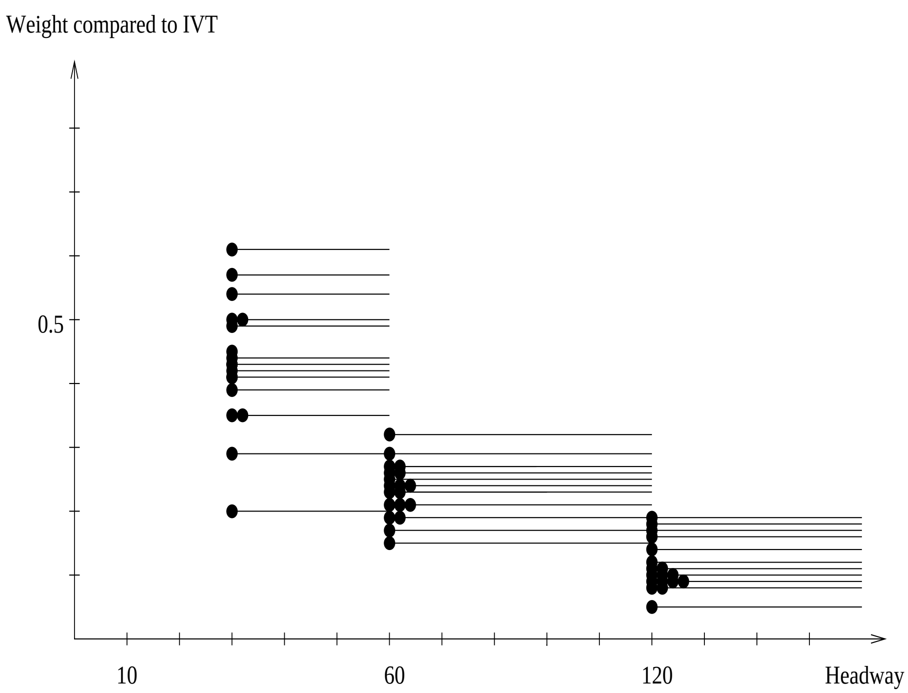

Figure 4: Weights for the value of headway compared to IVT.

the headway the lower the weight per unit of time. Presumably, the high values for short headways — i.e. high service frequencies — partly reflect that passengers arrive at departure points at random. For longer headways however, this is not likely to be the case, and the weights for these headway intervals simply reflect the inflexibility of the transport system with respect to departure times.

4 Concluding remarks

The following remarks are made on the questions approached in this paper:

1. The theory does not give any indications on how the value of time should be extrapolated over time. Even so, in the empirical analyses a relationship between the value of time and the growth in real income is indicated. These empirical results lead to the careful suggestion of extrapolating the time values into the future with no more than half the growth in real income.

2. The theory indicates that the more anoying the travel time element the higher the time value attached to it. This is clearly confirmed in the empirical results, where late time, walk time and transfer time are all valued significantly higher than in-vehicle time. No unambigous weights for these travel time elements compared to in-vehicle time can be derived from the studies, but the distribution of the weights indicate that savings in transfer time are generally valued higher than for walk and late time.

References

Algers, S., Dillen, J. L. & Widlert, S. (1996), 'The national Swedish value of time study', Paper presented at the Value-of-time Seminar, PTRC 1996.

AMR & HCG (1996), Prepared for Department of Transport by Accent Marketing & Research and Hague Consulting Group.

Bruzelius, N. (1978), *The value of travel time theory and measurement*, number 3, Nationalekonomiska Institutionen Stockholms Universitet.

Daly, A. & Zachary, S. (1977), 'The effect of free public transport on the journey to work', Transport and Road Research Laboratory Supplementary Report SR 338, Crowthorne, Berkshire.

DeSerpa, A. C. (1971), 'A theory of the economics of time', *The Economic Journal* **81**.

Friberg, G. & Holmberg, B. (1974), *Metod för standardbeskrivning av kollektiva transportsystem*, Nordiska Institutet för Samhällsplanering. Samkolt Rapport Nr. 2.

Gunn, H. & Rohr, C. (1996), 'The 1985–1996 Dutch vot studies', Paper presented at the Value-of-time Seminar, PTRC 1996.

Hensher, D. A. (1977), *Value of business travel time*, Pergamon Press.

Kjærstad, K. N. & Renolen, H. (1996), Bedre kollektivtransport — trafikantenes verdsetting av ulike kollektivtiltak, *in* 'Trafikdage på Aalborg Universitet'.

Lindh, C. & Widlert, S. (1989), *SJ-resenärernas kvalitetsvärdering — med avseende på information, punktlighet, restid, styv tidtabell och turtäthed*, Kungliga Tekniska Högskolan.

Ortuzar, J. d. D. (1980), Modal choice modelling with correlated alternatives, PhD thesis, Institute for Transport Studies, University of Leeds.

Quarmby, D. A. (1967), 'Choice of travel mode for the journey to work: Some findings', *Journal of Transport Economics and Policy* **1**.

Ramjerdi, F., Rand, L. & Sælensminde, K. (1996), 'The Norwegian value of time study — some preliminary results', Paper presented at the Value-of-time Seminar, PTRC 1996.

The MVA Consultancy, Institute for Transport Studies University of Leeds & Transport Studies Unit University of Oxford (1987), *The value of travel time savings*, Policy Journals.

Wardman, M. (1997), 'A review of evidence on the value of travel time in great britain', Working Paper 495, Institute for Transport Studies, University of Leeds.

Wardman, M. (1998), 'A review of British evidence on the valuations of time and service quality', Draft of final report prepared for Department of the Environment, Transport and the Regions; Office of Passenger Rail Franchising and Passenger Demand Forecasting Subscription Service.

Waters II, W. G. (1995), Values of travel time savings in road transport project evaluation, *in* '7th WCTR Proceedings', Vol. 3.