Abstract

Travel undertaken in the course of work, or ‘business travel’, is a feature of many types of employment. Currently UK government guidance for transport appraisal assumes that time spent travelling in the course of work is, at least partially, unproductive and that a reduction in this time will result in a conversion to productive time. For the assumptions to remain appropriate it must first be understood what constitutes productive travel time before assessment can be made as to whether this time will be affected by a reduction in journey time. Approaches designed to improve the productivity of manual workers (such as Taylorism) would appear to support the appraisal assumptions. However, there are an increasing number of employees in the UK engaged in knowledge work, for which the issue of productivity is seen very differently. For this growing minority of business travellers it is questionable whether travel time savings will reduce only unproductive time. This paper examines what constitutes productive and unproductive time for these travellers, and discusses how the PhD entitled ‘Time Use of the Business Traveller’ is attempting to answer the questions raised throughout this paper.

1. Introduction

This paper is based upon a three year PhD study entitled ‘Time Use of the Business Traveller’. It is investigating how business travellers use their time whilst travelling in the course of work and the relationship of travel time with time use in the remainder of the working day. An important aim of the PhD is to compare the findings of the research with the current assumptions used in UK transport appraisal which, as discussed in the next section, places monetary values on business travel time savings based on the assumption that it will result in a conversion of unproductive time to productive time.

In their report for the Department of Transport (DfT) on the Value of Travel Time Savings in the UK, Mackie et al. (2003), separated those travelling on business into three categories:

**People whose job is travelling:** This would include people who are employed to travel such as bus or train drivers.

**People who work at varying remote locations:** This group is characterised by people who have to travel as part of their job, but whose actual productive activity is at the destination (such as service engineers).

**‘Briefcase’ travellers:** This category includes all the business travellers that do not fit in either of the previous categories; meaning their work activity is not ‘driving’, nor are they constrained to a remote location.

For the majority of business travellers in the first of these categories and a substantial proportion of those in the second UK transport appraisal’s assumptions are likely to be appropriate. For example, it is easy to see how a reduction in travel times for someone delivering goods will allow for an increased number of goods to be delivered, therefore reducing the unproductive time and converting it to productive time. However, the same logic is not as easily applied to business travellers falling into the last of the three categories. As will be looked at in this paper, there are a number of factors that indicate that travel time may not be unproductive which in turn may mean that a reduction in travel time does not result in as significant an increase in productivity as assumed. These will be looked at in Section 3, before this Section 2 will look at the appraisal
assumptions more closely. Section 4 will then look at the steps taken by the PhD to answer the issues raised throughout the paper.

2. Is UK business travel officially unproductive time?

The UK Department for Transport, in its current guidance for economic appraisal, states:

"Time spent travelling during the working day is a cost to the employer's business."  

(DfT, 2004: 2).

Transport appraisal is a tool used to evaluate the merit of proposed transport schemes. Often a significant proportion of the economic benefits of these schemes are in the form of reductions in the travel times. For example, one option for a recently proposed high-speed railway line from London to the north was estimated to cost £8.4bn, this was offset however by benefits of £11.8bn, £8.8bn of which were "primarily journey time savings to users" (Atkins, 2004: 37-38) and due to the nature of the scheme (high speed rail link) it is likely that a large proportion of the business travellers will fit into the 'briefcase traveller' category described above and of particular interest to this paper). As this example indicates, the travel time saving benefits are expressed as monetary values. In order to calculate these monetary values, assumptions have to be made as to the travel time use before and after the travel time saving:

"It is assumed that savings in travel time convert non-productive time to productive use…"  

(DfT, 2004: 2)

The guidance then continues to explain how this potential gain in productive time is assigned a value:

"...in a free labour market, the value of an individual's working time to the economy is reflected in the wage rate paid. This benefit is assumed to be passed into the wider economy and to accrue in some proportion to the producer, the consumer and the employee, depending on market conditions."

(DfT, 2004: 2)

The actual values used are modal averages, based on individual incomes of travellers on each mode obtained from the National Travel Survey 1999-2001 and the 2002 New Earnings Survey, with a 21.2% mark-up for non-wage labour costs (such as national insurance) (DfT, 2004).

If taken literally, due to the guidance being the same regardless of the size of the time saving, it must be assumed that the entire journey is unproductive (so that the appraisal assumptions remain applicable up to a complete removal of the journey). Similarly, as the value assigned to every minute is the same (the wage rate), then all of the time not spent travelling must be assumed to be equally productive as shown in Figure 1.

Although Figure 1 clearly shows how a reduction in travel time would result in a conversion of unproductive to productive time, it also shows how it is unlikely that these assumptions would hold true on an individual level in reality. However, a divergence from Figure 1 does not necessarily mean the assumptions are inappropriate, as it is sufficient that it is correct on average (Mackie et. al. 2003). For example, although some travel time savings may not result in productivity valued at the wage rate (and so not fitting in with Figure 1), this can be offset by savings resulting in productivity valued above the wage rate.
The one area where the use of averages does not deflect criticism fully though is the one of most interest to this paper, that of productive, or indeed unproductive, travel time. This is due to it already being considered to be completely unproductive, meaning any productive use would lead to a divergence from the assumption. However, it has been argued that the travel time savings dealt with in appraisal are sufficiently small, as is the travel time spent being productive, that the two need not overlap (Fowkes, 2001), and the traveller will most likely arrange their time to ensure this as shown in Figure 2:

Figure 2 being an effective argument for the suitability of appraisal assumptions relies on two factors: one is that the travel time savings do not effect the productive travel time use, only remove unproductive time, and initially more importantly, that it is clearly understood what constitutes productive time, and therefore the unproductive time. If the factors affecting productivity are not understood, it is impossible to make the distinction between productive and unproductive time seen in Figure 2. Therefore we do not know the affect the time use has on productivity and the effect
reducing this time (with travel time savings) will have. This in turn calls into question the time use assumption made in appraisal.

3. Productivity, work activities, interruptions and travel.

As discussed in the introduction, this paper is concerned mainly with individuals who have a fixed place of work and fall into the ‘briefcase traveller’ category. For these individuals it is likely that the majority of productive work activities are conducted at the fixed work location; yet despite advances in new technologies (such as the internet and videoconferencing) that could potentially reduce or even remove the need for certain journeys there are still occasions when they need to travel away from their ‘fixed’ work environment. This is often due to the advantages to be gained by meeting face-to-face (Brown and O’Hara, 2003; Graham and Guy, 2002; Laurier and Philo, 1998; Newell et al., 2002; Urry, 2003) and exacerbated by the increased dispersal of businesses. Barring the invention of teleportation, this need to travel will result in a period of enforced time without physical access to either the fixed place of work or the expected benefits at the destination. What this section will look at is whether this lack of access to productive opportunities while travelling means travel time is intrinsically unproductive or whether there are opportunities for productivity.

Productivity is defined, in economics terms, as:

“The amount of output per unit of input achieved by a firm, industry or country. This may be per unit of a particular factor of production, for example labour employed, or per unit of land in agriculture, or ‘total factor productivity’ may be measured, which involves aggregating the different types of factors. Productivity per worker can be increased by longer hours, more effort, or improved skills on the part of the labour force, or by more capital equipment, improved technology, or better management”

(Black, 2003: 372)

Using this definition of productivity, the following can be inferred from the assumptions of transport appraisal: time spent travelling results in a decrease in the workers’ output while the employer’s input remains constant. A decrease in this travel time would then be the equivalent to the business traveller working longer hours. The definition above states that this will lead to an increase in productivity.

The way we view productivity today, as shown in the above definition, owes much to the work of F.W. Taylor. In 1911 Taylor first published ‘The Principles of Scientific Management’ (reprinted in Taylor, 1972) which introduced the idea of breaking manual labour into its component parts (or motions) in order to remove those which were not necessary and rearrange the remaining components so that they were conducted in a more efficient manner and achieve greater productivity. It also resulted in a complete removal of workers’ autonomy. A similar approach was taken by Henry Ford for car production lines a few years later. These approaches meant a simplification of productivity measurement, with output easily measured against the clock, or in Taylor’s case, the stopwatch.

With Taylor’s method in mind, it is easy to see how business travel would be seen as wasted time in terms of output for the employer. With each motion carefully planned out, and no flexibility for the employee to re-arrange activities, or even think about the best way of achieving tasks, there would be little opportunity to conduct work activities on the move, and due to the way productivity was measured, as outputs against the clock, any productive travel time would be easily identified.

The two factors identified at the end of the previous section as important for the suitability of the appraisal assumptions are what constitutes productive travel time use and to what extent this occurs. For the workers looked at by Taylor and Ford, it is unlikely that business travel time would have been put to productive use, which would have been easy to confirm due to the clear divide between productive and unproductive time use developed from Taylor and Ford’s principles. This
clear divide between productive and non-productive time use would seem to have influenced the clear divide implicit in appraisal assumptions and illustrated in Figure 2.

Over the past few decades however, there has been a move away from the sort of work that Taylor and Ford’s principles were developed for, as described by Sellen and Harper, (2003):

“One of the great changes of the past few decades has been the shift away from manufactured goods towards knowledge-based products and services. Whereas our grandparents may have worked in factories making anything from ships to textiles, today we are more likely to work in an office where we use our skills to produce and analyse information. […] Workers are becoming less likely to be using their hands and more likely to be using their minds to monitor, manage, and control the flow of information. There are now more knowledge-based activities within organizations than ever before. […] Predictions are that the proportion of work that is knowledge-based will continue to increase significantly into the new millennium.”

(Sellen and Harper, 2003: 51)

The category of briefcase traveller then is becoming increasingly populated with those whose job involves a degree of knowledge work (which is not necessarily restricted to ‘knowledge workers’). The fact that knowledge work is becoming increasingly common across the workforce in the UK may also affect those in the second category of business travellers, those working at remote locations.

The shift towards knowledge work has seen a shift in views on productivity as well, and as Taylor did for manual workers, Peter Drucker, who was credited with first coining the term ‘knowledge worker’ in the late 1950s (Cortada, 1998) developed a number of principles for improving the productivity of knowledge workers. Whilst acknowledging the importance of Taylorism, Drucker also recognised that the factors affecting knowledge work productivity are very different, and in some cases the exact opposite (Drucker, 1999). Six factors identified by Drucker (1999) as determining knowledge work productivity are shown below:

1. The knowledge worker needs to decide themselves what their the task is;
2. knowledge workers have to manage themselves, have autonomy, and be made accountable for their productivity;
3. continuing innovation has to be part of knowledge work;
4. knowledge work requires continuous learning and continuous teaching on the part of the knowledge worker;
5. knowledge worker productivity is primarily a matter of quality of output, not quantity;
6. The knowledge worker must be seen by management as an asset rather than a cost. It requires that the knowledge worker wants to work for the organisation in preference to all other opportunities.

1 This paper does not wish to give the impression that knowledge work itself is a new phenomena, in fact it has been around for thousands of years in various forms (Cortada, 1998) and it could be argued that all types of work use ‘knowledge’ in some way (Noon and Blyton, 2002). Blackler (1995) identifies five distinct types of knowledge: embrained (abstract and conceptual knowledge used for creative problem solving); embodied (practical knowledge learned from experience), encultured (organisational knowledge or shared understanding); embedded (knowledge allowing routine operations to be conducted with little or no thinking); and encoded (information communicated via signs and symbols, such as books or the internet). The knowledge work developments discussed in this paper (as reported by Blackler, 1995 and Frenkel et al., 1995 cited in Noon and Blyton, 2002:206) relate to the increasing emphasis across the work force on embrained knowledge rather than the more traditional embodied and embedded. This also avoids the more contentious discussions of what actually constitutes a knowledge worker (see Noon and Blyton 2002: 202-212).
These six points illustrate how there is a much greater chance of business travel time providing an opportunity for productivity, due to both the autonomy that needs to be afforded to those conducting knowledge work (specifically points 1 and 2) and the more cognitive nature of the work (specifically points 1 to 4). This in turn increases the chances of travel time savings encroaching on this productive time.

However, any increased opportunity for productivity whilst travelling can produce its own set of organisational challenges. This is highlighted by the first of Drucker’s points, which acknowledges that the choice of task for those undertaking knowledge-work is often less clear than for those undertaking manual work. For example for a university academic, tasks can include teaching, publishing papers, consultancy, managing/supervising, administration, being a spokesperson and possibly many others. The overall productivity of the individual will rely on how these duties are organised, and whether some are sacrificed in order to achieve others. Due to only some of these activities being possible whilst on the move, productive travel time may affect the balance of activities, leading to a potential bias towards those possible whilst travelling and a reduction in the available time for those that are less mobile. This also highlights the possibility that due to the arrangement of activities, and the historical perception that productive activities cannot be conducted whilst travelling, it may be that travel time is unproductive due to a failure to organise activities to fully take advantage of the time, rather than travel time being inherently wasted.

Empirical evidence can help assess the degree to which business travel time is used productively. Although this provides the methodological problem of expanding the data collection to encompass the questions of whether the reason for time spent travelling and not undertaking work related activities is due to factors intrinsically linked to the travel (such as the need to multitask, distractions, anxiety) or a lack of preparation. It will also need to identify whether conducting work activities whilst travelling had any effect on the balance of activities in the working day and whether this helped or hindered the aims of the job. This is discussed in more detail in Section 4.

The collection of empirical evidence is complicated however by the second factor affecting the validity of Figure 2, that of understanding what constitutes productive and unproductive time. Taylorism depicted unproductive time as any spent away from the main work activity and not producing a tangible output; for those conducting knowledge work, this time away from their main work activity is likely to be the result of interruptions which, as identified by (Jett and George, 2003), can take one of four forms:

- Intrusions: unexpected encounters initiated by another person, such as visitors or telephone calls, which results in a temporary stop to the current task;
- Breaks: planned or unplanned stoppages to working activities (often dependent on work progression) to ‘accommodate personal needs and daily rhythms’;
- Distractions: psychological reactions caused by competing activities or environmental stimuli resulting in a loss of concentration.
- Discrepancies: perceived inconsistencies between the expected and the observed causing attention to be redirected to the source of the inconsistency.

Although each of these can initially lead to a lack of output and a seemingly negative effect on productivity, as expected in Taylorism, each can also have positive consequences and a subsequent increase in, or prevent a loss of, productivity (providing they occur in appropriate frequencies and lengths). Using breaks as an example of this, an experiment that required the subjects to refrain from any activities that could be considered ‘play or ‘noninstrumental’ for forty eight hours led to increased feelings of tension, irritability and fatigue and a substantial decrease in creativity (Csikszentmihalyi, 1975: 161). Although an extreme example, it demonstrates the need
for non-work activities, both for the general wellbeing of employees (and therefore Drucker’s sixth point, leading to increased productivity) and for creativity which in contrast to Taylor’s manual work, is essential for knowledge work (see footnote 1, regarding ‘embrained’ knowledge).

Creativity is assisted by these interruptions, and specifically by breaks, partly by providing periods of time for what is referred to as ‘incubation’ which can be essential in the formation of ideas and problem solving:

“During incubation, while the conscious mind is idle, the subconscious mind repeatedly attempts to combine elements of an idea until it becomes stable and coherent enough to emerge back into consciousness (Csikszentmihalyi & Sawyer, 1995).”

(Jett and George, 2003: 499)

Business travel time can often provide a suitable opportunity for some of these interruptions to occur, resulting in many of the same (intangible) benefits. Taking this a step further, due to individuals increasingly using their busyness to signify high status (in contrast to past trends which have seen increased leisure time as a sign of status), combined with the notion that those conducting knowledge work are more likely to enjoy their work (Gershuny, 2000), it is possible that activities are rearranged so that business travel time is the only opportunity for these breaks to occur. In these cases the ‘unproductive’ time in Figure 2 may be as essential as the ‘productive’ time, further bringing into question the validity of the appraisal assumptions. Obviously raising questions such as this is the aim of this paper, however the PhD study is aiming to provide answers, the following section describes the steps needed in order to achieve this.

4. Towards an understanding of the use and value of business travel time.

Any research in the area of business travel time use will first need to identify what was done with the time while travelling and whether it was used for work activities or non-work activities. Obviously the answer may very well be a combination of the two, in which case it is important that it is recorded how the time was divided. Much of the work in this area has involved using questionnaires to find values to populate a formula developed by Hensher (1977) which attempts to quantitatively account for factors not considered in the current appraisal approach (see the Proceedings of the 1996 Easthampstead Conference referred to in Gunn, 2000 as well as AHCG, 1999; Fowkes, 1986 and Fowkes, 2001). However, although these values assist in determining the proportion of travel time spent conducting work activities in the traditional sense, they do little to develop any understanding of why other times were not spent productively or the role and value of the time in the context of the rest of the working day. These are the issues that will be investigated by the ‘Time Use of the Business Traveller’ PhD, using a combination of interviews and time use diaries to obtain the information described below.

For the purposes of this paper work and non-work related travel time activities will be looked at separately, with work discussed first. As was discussed earlier, employees’ whose job requires a degree of knowledge work are likely to have a number of activities that could be conducted at any one time, although with some seen as more important in terms of achieving the job’s aims than others. The first step then is to identify what activities the employee feels are necessary to satisfactorily meet their job requirements (i.e. Drucker’s first point, discussed previously, ‘what is the task?’). To assist with this it may be helpful to categorise work activities (although due to the wide variety, it may be easier to do this after the data has been collected). Below is an example of activity categories for knowledge work (adapted from Millen and Fontaine, 2003):

- **Searching:** looking for, accessing, or acquiring information from relevant sources.
- **Processing:** processing, evaluating or analysing information.
- **Decision-making:** solving problems and making decisions using job relevant information.
- **Interacting:** interacting or communicating with colleagues and associates.
Coordinating: coordinating, training, managing or advising others.

Using the above examples, an individual may feel their job is primarily about processing information and decision-making, and in order to be as productive as possible need to spend the largest proportion of their time involved in those two activities. Yet in reality they may find themselves spending large amounts of time searching for information, coordinating and advising others. If the work activities are recorded throughout the day when the business travel occurs, with an indication of how satisfactorily they were completed and why, it can be determined whether the business travel resulted in a shift towards or away from the most productive working activity balance. For example, using the information-processor/decision-maker from above; if the individual had to travel by car for work purposes, they may spend the hour before the journey analysing documents pertaining to an important decision that needed making, and then spending the travel time contemplating this decision away from the intrusions (such as colleagues needing advice) experienced at the office. In this case the individual may feel this resulting in a shift towards the preferred, and possibly more productive, activity balance. An alternative scenario is one in which the analysing of the documents had not been completed, or the decision had already been made, meaning the travel time could not be used for work related activities due to a lack of opportunities (which could be attributed to poor organisation).

If the travel time was used for non-work purposes, there are three possible sources of value: as a break from work, reducing fatigue and preventing a decrease in productivity; as a break from work improving wellbeing and leading to an increase in productivity at the workplace; and as a time to conduct personal business. The relative values of the first two rely on a combination of the number of breaks already taken throughout the day (collected at the same time as the data on work activities conducted throughout the day) and the experience of the travel time itself. However, collecting data on the actual effect of these is probably the most challenging due to the lack of comparable data (using a day without travelling is an option, but the likely variety in activities would make comparisons difficult), and must therefore rely on the travelling employee’s perception. The third option, conducting personal business, may have value in a similar way to the previous two, although it should also be determined whether any work activities were sacrificed in order to conduct the activity and equally whether at other times (such as at home) any work activities were conducted at the expense of personal business. It is only time that does not fall into any of the categories that can be considered truly unproductive and reduced without effect as is shown in Figure 2.

5. Conclusions

The economic appraisal of transport schemes in the UK involves an assumption that a reduction in business travel time will result in a conversion of unproductive to productive time. Although it has been argued that small periods of productive travel time use will not affect the validity of the assumption, it still relies on productive travel times not being effected by any potential reductions in travel time, which in turn relies on an understanding of what constitutes productive time. In the past this issue has been more easily resolved due to the dominance of manual work which, due in part to Taylorism and Fordism, provided a clear divide between what constituted productive and unproductive time use, and provided little opportunity for work to be conducted whilst travelling. In the past few decades however, there has been a rise in the number of employees conducting knowledge work. This in turn leads to an increase in the opportunities for business travellers to make productive use of their time, which includes time, such as time spent thinking, that in Taylor’s day would have been considered unproductive. It also raises the question of why some travel time is not used for transferable work activities; the paper suggests two alternatives (whilst acknowledging there are a number of other possibilities): that they use the time as a break from work activities, which in turn may assist in maintaining or even increasing productivity, or that to have done work whilst travelling would have required a degree of organisation that did not occur. These issues will be explored further in the PhD, ‘Time Use of the Business Traveller’.
References


