

Commuting – a further stress factor for working people: evidence from the European Community

I. A review

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Summary. About 100 million workers in the European Community commute to and from work daily. A review of the available data shows that commuting has increased in recent decades as rising car ownership has produced a more dispersed pattern of residential and job locations. In general, average commuting durations are falling, although average commuting distances are increasing as a result of faster commuting modes. However, the number of very long duration journeys have also increased, albeit from a small level. Up to now most research has focused on transport and land use issues, while very few studies have dealt with its impact on health, safety and social life of the workers. The available data indicate commuting to be a stress factor not only because of transport modes, but also by its interference with living and working conditions: namely, reduction of time available for discretionary leisure activities and increased absenteeism at workplace. Long-term effects on health have not been adequately investigated. Well integrated policies and strategies concerning the different aspects of this problem (transport, health, work organisation, residential planning) must be developed both at the local and international levels to facilitate adequate solutions for this stressful condition.

Key words: Commuting – Stress – Absenteeism

Introduction

In every complex industrial society a geographical separation of homes and workplaces has become

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quite normal, so that daily travel to and from work is a characteristic feature of life.

Travel demand and its effect on transport and land use planning have been subjects of major concern and research activity in all member states of the European Community (EC) in recent years, while little work has looked at the implications of commuting on the health and safety of workers and the broader interrelationships of commuting with living and working conditions.

Commuting directly or indirectly affects the lives of all European citizens. The scale of commuting within the twelve EC member states is vast. In 1984, approximately 124 million people were employed in the EC: of these workers, approximately 100 million had to travel to and from work, indeed commuting journeys comprised just over a quarter of all passengers journeys made within the EC.

Commuting trends in a European context

Commuting is not a stable phenomenon. The changes in settlement patterns that have accompanied rising car ownership have had a radical impact on commuting patterns within all member states of the EC.

Trends in the locations of homes and jobs

Population densities have shown a continual reduction in the inner cities and a growth in the suburbs. City populations have also declined relative to a growth in the populations of the surrounding areas.

In turn, these smaller towns are beginning to develop their own small "repopulated" rural hinterlands of urban commuters as the next phase of population movement (Drewett et al. 1984; Fielding 1985). In the Netherlands, for example, the proportion of overall population residing in urban municipalities fell between 1960 and 1983 from 55.4 to 51.5% and also fell in rural municipalities from 21.8 to 11.7% over the same period. In contrast, urbanised rural municipalities increased their share of the total population from 22.8% in 1960 to 36.8% in 1983.

Within cities, the dispersal of population from the inner city to the suburbs is occurring at different rates in different member states. The development of faster, more flexible, commuting modes has enabled some workers to improve their residential opportunities by moving to suburban areas at the expense of increasing their commuting requirements (cost and distances). Many cities in the EC are still characterized by high population densities in the inner city and marked reductions in population density between city centre and suburbs. This is a result of a more common use of apartments for residences than individual family dwellings. Many of these cities support fashionable city centres and inner city areas: the residences of workers with above average incomes. In contrast, those inner city areas which were traditionally the centre of manufacturing employment, and which had resident workers of below average incomes, have suffered a considerable decline (European Conference of Ministers of Transport 1986).

The movement of population to suburban areas has been followed by jobs; both firms moving from inner cities and new companies setting up there. Those jobs created in the suburbs have mainly been in new manufacturing industries and, more recently, large retail outlets which have made use of the cheaper land on the urban fringe, local supplies of labour and good links to the strategic road network. In contrast, an increase in service and office sector activity in city centres has occurred alongside a decline in the traditional inner city manufacturing base. This has resulted in high unemployment in those inner cities and a trend among some resident workers to commute out to new light manufacturing jobs created in suburban areas. For example in London, 12% of workers resident in the inner city areas commuted to suburban locations to work (Fryer 1978).

Despite this trend, the large scale commuting of office and service workers to urban centres from the suburbs and surrounding towns remains (see for example Del Sole 1987). The trend for offices and services to relocate in suburban sites in the centres of smaller towns within conurbation hinterlands is significant though slow (see for example Daniels 1980).

The increasing spread of home and work locations has been a result of the flexibility provided by the private car, something not common to public transport which operates most efficiently in corridors of high passenger demand. The growth in suburban jobs has increased the number of commuting journeys across suburbs not served by conventional public transport routes. More workers have therefore found it necessary to commute by car. Over time, car use for commuting journeys has increased more rapidly than for other journey purposes. For example, in a sample of seven French cities between 1966 and 1974 the increase in car commuting was twice as much as for other purposes. In 1966, 34% of work journeys were made by car relative to 29% for all purposes, but by 1974, 48% of work trips were made by car compared with 37% for all other purposes (European Conference of Ministers of Transport 1986).

Outside the heavily populated regions, commuting patterns in the rural periphery of the EC are generally localised with a strong agricultural base. To stem rural-urban migration, new industrial centres have been established as part of regional economic policy for the deep rural areas. This has produced patterns of longer distance commuting from wide labour catchments. These patterns are superimposed on traditional farming cultures, indeed many of these commuting manual workers also maintain a rural smallholding (see for example Cawley 1980 for Ireland, and ECOTER 1983 for Italy). In those rural areas within reasonable access of urban jobs, there has also been the recent influx of middle class non-manual workers into "commuter villages" (described in Pahl 1975).

Trends in commuting patterns

A recent review of commuting patterns in the EC (Pickup and DiMartino 1987) has outlined the important effects which rising car ownership has had on commuting behaviour. To summarise:

- (i) About three quarters of European workers live within 30 min commuting time of their place of work.
- (ii) About 20% of European workers live within 10 km commuting distance of their place of work.
- (iii) About 1 in 2 European workers now travel to and from work by car, either as driver or passenger.
- (iv) Average commuting speeds have been maintained by increased investment in road building, road improvements and advances in traffic management; although some city centres do face congestion problems.
- (v) The amount of time the average commuter spends travelling from home to work has fallen.

(vi) The average length of commuting journeys has increased.

(vii) The small proportion of workers making very long duration journeys to work has also increased: 5% of EC workers commuted for one hour or more in each direction in 1973.

(viii) In 1985, a quarter of a million workers commuted across the frontiers of EC member states.

Common working hours mean that commuting journeys will form travel peaks. These peaks actually have social advantages because everyone has similar periods for home and working life. However, traffic peaks impose considerable environmental and social costs on the community at large. Not only have traffic volumes and congestion increased in recent years, but also the structure of traffic peaks has changed. Greater flexibility in working hours has reduced the size, though spread the duration of the peak. In many EC states, the smaller lunchtime peak has also reduced as workers have chosen to remain at work (Pickup and Town 1983).

These trends have had varied impacts on different groups of workers. With the exception of commuting journeys made on foot, it is the use of private cars that best distinguishes between the commuting modes used by workers in different socio-economic groups. In general, manual workers, as a result of lower incomes, rely more on public transport to commute than do intermediate non-manual, professional or managerial workers (see for example Town 1980). In addition the commuting options of young workers are generally constrained by low incomes and the need to seek work from the parental home. The options for women workers are also limited by the pressures of their domestic role and lower car availability relative to men. As a result they tend to choose jobs closer to home than do men (Madden 1977; Pickup 1985).

Commuting as an element of lifestyle

Time cost

It is self evident that any journey to work will consume a certain amount of time and will require some expenditure of effort on the part of the worker.

One of the main effects of long journeys is to compress the amount of time available for discretionary leisure activities (Szalai 1966; Vidakovic 1980, 1983; Wigan and Morris 1981), although there are also marginal reductions in the time spent asleep (Palmer et al. 1980; Wigan and Morris 1981). The reductions in disposable time appear more likely to result in a reduced set of activities being carried out rather than in less time being spent on the same range of ac-

tivities. The "lost" activities are more likely to be out-of-home than within-home (Marotel 1980).

Commuting stress

It might be expected that car drivers travelling in busy traffic conditions would experience more stress and fatigue than those whose journeys are confined to quiet rural roads. Furthermore, the use of crowded public transport would be more tiring than travelling in a nearly empty vehicle with plenty of empty seats. Both of these factors need to be linked to journey duration because a longer journey might increase the likelihood with which the traveller encounters situations where these conditions occur. Research findings which refer directly to commuting are very limited; however, that which is available confirms a relationship between commuting stress and journey duration.

Goodwin (1976), reviewing a number of physiological studies, noted that drivers had a higher heartbeat rate when overtaking or carrying out complicated manoeuvres; heart rate was also affected by the level of noise experienced. For public transport, and drawing from various sources, the changes in heart rate for various travel activities were analysed. The results showed that those changes related to walking were likely to reflect the effort involved, while those related to other modes appeared to be more a result of the tension involved. A study of rail travellers in Stockholm pointed to significant increases in catecholamine excretion with high levels of crowding (Lundberg 1975): the author suggested "that stress in travelling by train depends more on social and ecological conditions during the trip than on its length and duration".

A study of a village population of Oxfordshire (Palmer et al. 1980) found that people who reported that they were "rushed on their way to work" spent slightly less time sleeping. A statistically significant relationship between the length of journey to work and arterial blood pressure has been demonstrated in a group of employees of industrial plants by Fisch et al. (1976).

A study of premature births among French women found that their incidence appeared to increase where the mothers had been making a daily work journey of over 90 min (Papiernik 1981); this appeared to result from the extra physical effort involved in making interchanges, and prolonged exposure to vibration on the Metro, rather than from the psychological stress.

Several studies have pointed to the overriding importance of reliability and punctuality over other service attributes such as comfort and cleanliness (Hoin-

ville and Johnson 1972; Consumers Association 1981; Cram 1981). Levels of crowding are also an important factor, although it is only for long journeys that the ability to get a seat becomes a major aspect of passenger comfort (Hoinville and Johnson 1972).

Although it is apparent that certain commuting conditions can lead to stress reactions, it is not possible to identify any clear thresholds from existing knowledge. The duration of travel, particularly by public transport, does not in itself appear to be a big problem; some people have reported that such journeys are a relaxing interlude between the activities of home and workplace, and make profitable use of time by reading (Young and Willmot 1968).

The "knock-on" effect of stressful commuting journeys

If long or difficult journeys do produce identifiable responses in the worker's health and well-being, it may be expected that they will be shown in behaviour at the workplace. In the short term, stress induced by the journey to work may result in reduced productivity, higher rates of industrial accidents, higher levels of absenteeism or late arrival. Stress and fatigue resulting from commuting may in the longer term affect the supply of labour, since various categories of worker's may be reluctant to work in locations where difficult commuting journeys would be involved. Very few studies on this topic are available in the literature and their results are not always consistent and conclusive.

The only area of research where significant relationships between commuting and workplace behaviour are found is the analysis of worker absenteeism. Many studies have found a positive relation between length of the journey to and from work and absenteeism (Vernon et al. 1931; Wyatt et al. 1943; Jones 1971; Taylor and Pocock 1972; Luculescu et al. 1977). A study in Central London by Taylor and Pocock (1972) examined the sickness absence records of a sample of 2000 office workers; they found that the complexity of the commuting journey (measured by the number of stages travelled) was the most important factor affecting both certified and uncertified sickness absence. Neuloh and Beig (1973), in a study of long distance commuters in Saarland, reported that commuters making journeys of longer duration were absent from work on sickness grounds more often and suffered accidents at work more often than did commuters residing closer to work. Similarly, Juetner (1976) and Euler (unpublished) work appear to have found a clear correlation between long distance commuting and both the incidence and causes of sickness. However, in contrast, other research which has examined the relationship between sick-

ness absence and journey duration appears to be less conclusive (Liepmann 1944; Buzzard and Liddel 1963; Taylor 1968).

The difficulty of studying this topic is compounded by the fact that it is the long commuting journeys that are most likely to produce adverse effects on worker health and safety and such journeys are in a minority at any single workplace. Since most studies of industrial performance are workplace based, the length or duration of journey to work would therefore only be a significant influence on performance in a minority of cases, and may be overlooked by researchers in preference to other variables which are more widely distributed across the population studied. However, it is also plausible that a certain selection could take place among these commuters travelling for long durations, particularly among those with impaired health or whose journeys are particularly difficult.

The effect of poor quality commuting journeys may be indirect, namely they simply present an extra deterrent to attendance for someone who is not feeling altogether well. Most of the limited amount of other research that examines the relationship between absence and travel to work characteristics seems to point to this conclusion. An extensive review of research in various countries on employee absence by Steers and Rhodes (1978) cites a number of studies which identify some sort of relationship between commuting and absence, but the researchers expressed this in terms of the problems associated with getting to work, rather than the effects on health that the journey itself generates. Several other studies (UK Department of Employment 1974; Chambers 1981) take a similar view. The UK Department of Employment study (1974) suggested that the main reason for the relationship between absenteeism and long journeys was that fewer alternative transport modes were available for longer journeys so that the act of missing the bus was to convert a late arrival to an absence. Other work by Taylor (1968) has confirmed this, noting that levels of absenteeism correlated with late arrival. Where flexible working hours have been introduced, they have been shown to reduce absenteeism (Golembiewski and Proehl 1978).

If the available research on absenteeism is seen as illustrating the more general connections that one might expect to find between commuting, stress and health, two conclusions can be drawn. Firstly, the relationship between journey duration or journey difficulty and stress is not linear: measurable differences in behaviour occur prevalently with very long or difficult journeys. Secondly, it appears that long journeys may not induce illness by themselves, but rather that commuters experiencing marginal ill health

would be more reluctant to come to work if they faced a long journey in addition to a full day at work.

Conclusions

Although commuters travelling for very long durations are a minority group of all workers, they comprise several millions of workers in Europe as a whole; therefore we are facing a large scale problem. In addition, the amount of workers making long journeys to work has increased in recent times, showing a trend towards aggravating rather than lightening the problem. This "social problem" thus requires adequate policies and strategies.

In view of the complexity and the different aspects of the question, reconsidered in a recent International Conference (Reale et al. 1987), the following main points should be taken into greater consideration:

(a) Transport policies: (i) increasing the quality of transport for commuters (comfort, reliability, etc.); (ii) providing special transport services for particular categories of workers/commuters at higher risk, such as night-workers and people consigned dangerous jobs; (iii) promoting technological innovations and improvement of the means of transport.

(b) Social action: (i) providing social services for certain groups like women, particularly vulnerable to commuting problems; (ii) developing policies to reduce social imbalances related to commuting.

(c) Health policies: (i) introducing medical preventative measures for long-term commuters; (ii) providing special medical assistance to the categories of commuters at higher risk at work.

(d) Workplace policies: (i) introduction of flexible working schedules and/or staggered starting and finishing times; (ii) introduction of special rest periods for long-term commuters, especially those involved in heavy physical work and shiftwork.

(e) Participation policies: the potential for involving commuters in decision-making, through trade unions, consumer groups and other pressure groups, has not been adequately explored. However, if a positive approach is adopted, relevant information provided and a proper forum created, participation could lead to successful policies, especially in the medium and long term.

(f) Innovative policies: the value of experiments such as car pooling, dial-a-ride schemes, etc., need to be assessed with a view to extending those have been successful. The social use of technological innovations, particularly in the area of telework, may also have a significant impact on commuting.

(g) Planning policies: co-ordinated industrial, urban and land-use planning is important, as many of

the problems associated with commuting are the result of changing land-use patterns which have developed without regard to organic structure (e.g. migration to suburbs, dormitory towns, clustering of industry in large industrial estates).

An "integrated" approach to the development of all these policies at local, regional, national and international level appears to be essential. An effective and coherent integration can only be achieved through the preliminary identification of priorities for intervention, the co-ordination and harmonization of various initiatives and competences, the concentration of efforts and resources to precisely defined targets aimed at improving the quality of life and work of the commuters.

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