LONG TERM EFFECTS OF CURRENT TRENDS IN TRANSPORT ON LAND USE IN GREAT BRITAIN

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INTRODUCTION

The debate on traffic levels, congestion, and pollution has generally concentrated on urban areas. With the exception of a few sections of busy motorway it is in towns and cities that congestion is most apparent, and that pollution can be most easily sensed - the problems are felt strongest in the cities, so that is where people look for solutions.

This paper is concerned with long term trends, and in particular, the differential growth rates of traffic in urban and rural areas. It is suggested that the potential exists for large growth in car travel demand; that current trends point to such demands being made, and that if policies allow this demand to be catered for there will be far reaching effects on land use, as well as traffic levels themselves.

THE 1989 NATIONAL ROAD TRAFFIC FORECASTS

Forecasts made about the growth of traffic in the United Kingdom are nationally based, but it is apparent that the rate of growth in traffic has not been, and is unlikely to be uniform across the country. Currently, car ownership levels in Berkshire and Hertfordshire are roughly twice as high as in Strathclyde and Tyne and Wear. Population growth has been much faster in the outer South East than in other areas.

The 1989 National Road Traffic Forecasts (NRTF) predicted that between 1988 and 2025 the amount of traffic on Britain's roads would increase by between 82% and 142% (the difference between the forecasts being related to the rate of economic growth). When they were published there was much argument and discussion as to whether they were realistic or not, with many proposing that they were infeasible, since even large scale road building would not cater for such levels of growth.

The forecasts predict that between about 75% and 90% of people aged between 17 and 75 will own personal cars by the year 2025. Between 8% and 22% of the growth will be due to an increase in the average distance travelled per car. About 6% will be accounted for by population growth. Most of the growth will be accounted for by the increasing numbers of cars (60% more on the low scenario and 84% more on the high one). Freight transport is assumed to grow slightly faster than car traffic, in direct proportion to the forecasts for Gross Domestic Product.

Current government policies make reference to the need to consider the environmental aspects of transport, but most action and money seems to be directed to continuing the policy of providing road infrastructure to cater for economic led demands for growth in traffic. If these policies continue one has to ask where one could expect that traffic to grow? Our towns and cities are

generally congested, and it appears that road construction or measures such as route guidance within cities cannot lead to a great increase in traffic. If the `economic driving force' behind car ownership and use is as strong as many believe then traffic will grow, and various changes will occur which mean that it will grow outside towns and cities.

While it is generally agreed that many town and city centres are close to capacity it is impossible to predict what the absolute `capacity' traffic levels of towns and cities is, relative to current levels. However we can make calculations of traffic levels outside town and cities if traffic within towns and cities rises by differing amounts and if the traffic levels forecast in the NRTF come true.

In 1988 (the start of the forecast period) the total amount of traffic carried on Britain's roads was 376 billion vehicle kilometres (or about 15,000 kilometres per vehicle). Of these 54 billion were on motorways, and 163 billion were on non motorway built-up roads. The two forecast scenarios mean that the total amount of traffic would rise to between 687 billion and 909 billion vehicle kilometres by 2025. If, as one example, we assume that traffic on existing non motorway built-up roads increased by 50% then 244.5 billion would be carried, leaving between 442.5 and 664.5 billion to be carried on motorways and other roads.

Table 1 shows the rates of growth in traffic that would be required on non-urban roads given various scenarios of growth on urban roads and motorways. It is clear from the table that even with very strong measures taken to increase capacity in towns and on motorways rural roads are likely to experience large increases in traffic levels.

Table 1 - Consequences of differential rates of growth in traffic for the 1989 National Road Traffic Forecasts

Change in traffic levels on non rural roads	**% growth needed on rural roads to achieve `low' forecast**	**% growth needed on rural roads to achieve `high' forecast**
No increase on urban roads or motorways	203	347
Urban roads and motorways increase by 50%	130	274
Urban roads and motorways increase by 75%	94	238
Urban roads and motorways increase by 100%	57	202
Urban roads and motorways increase by 142%	-3	142
Traffic on motorways and urban roads increases by 50% and motorway network is doubled	77	221
Motorway network increased 5 fold at current traffic levels, and urban roads stay at same traffic level	61	205

Other calculations can be made. In order not to increase current levels of traffic on both urban and non-urban roads, traffic carried on the motorway network would have to increase by 6.7 times in order to accommodate all the traffic expected in the low forecast, and by 10.8 times in order to accommodate the traffic expected in the high forecast. Other possibilities for meeting the low forecast would include:

•No road building, but an increase to current urban levels on all rural roads plus a doubling of urban and motorway traffic levels

•A doubling of the motorway network with double capacity plus a 1.5 times increase on urban roads, plus an increase on all rural roads to urban levels of traffic.

For the upper limit to be met would require changes such as:

•A doubling of the motorway network with traffic at double current levels, plus rural trunk roads with traffic at the current motorway levels, plus rural principal roads having 1.3 times as much traffic as urban trunk roads currently carry.

In general it is apparent that the growth in traffic which is likely in urban areas means that traffic would have to grow much faster in non-urban areas if the forecasts were to be met.

TRENDS IN TRAFFIC ON DIFFERENT ROAD TYPES

The idea that traffic is likely to grow faster outside cities is backed up by experience over the last ten years or so. Table 2 summarises increases in traffic flow, road length, and total traffic carried over the ten year period, and compares them with average daily flows. Data is for 1977 to 1987 since this was the last period for which breakdowns for built-up and non-built-up roads are available for all classes of road.

Table 2 - Ten years growth in volume of traffic on different road types

	Vehicle Flow		Road Distance		Annual Traffic	
	1987 flow	% change 77-87	1987 kms	% change 77-87	1987 veh kms (billions)	% change 77-87
Motorways	44	+62	2980	+28	48.34	**+108**
Built-Up	3	+11	145225	+10	137.02	**+22**
Non Built-Up	2	+44	204087	+2	131.41	**+47**
All Roads	2	+34	352292	+5	316.71	**+41**

Source - Transport Statistics 1977-1987

Looking at the total traffic growth figures (in bold type) it can be seen that traffic grew at the fastest rate on motorways, but also at a much faster rate on non-built-up roads than on built-up roads. There are other variations (not shown in the table) with the non-major roads in built-up areas taking more of the growth. On non-built-up roads it was the primary roads which experienced more growth. The category with the fastest growth in traffic density was for unclassified non-built-up roads (79%). This may point to the increase in use of minor roads as `rural rat runs'.

There are differences in growth rates depending on whether one looks at average flows on roads, or the total volume of traffic carried per year. This is explained both by road building and by the reclassification of roads. The motorway building programme accounted for the largest proportional change, with a 28% increase in road distance accompanied by a 62% increase in traffic flows per mile of motorway, leading to a 108% overall traffic growth. Over the ten year period the total mileage of dual carriageways rose by 30%, which also increased road capacity.

Trunk roads are often declassified as parallel motorways are built, and there were many changes of classification between intermediate levels. The bulk of road distance increase is due to the building of unclassified roads in new built-up areas - the total road length increased by 5.3% (17,500 kms) while that for built-up unclassified roads rose by 12% (12,000kms) over the ten year period.

The motorway building programme combined with much heavier traffic levels on motorways allowed 27% of the total traffic growth over the ten year period to be carried on motorways, while a further 27% was accommodated on roads in built-up areas, while 46% of the growth occurred on non built-up non-motorway roads.

If these trends were to continue over thirty years, in 2019 urban roads would be carrying about one and a half times their 1989 level of traffic, while rural main roads would be carrying over three times as much traffic. These trends match fairly well to the high NRTF forecasts being met with a 50% growth on urban roads and motorways (see Table 1).

IS SUCH A PATTERN OF GROWTH LIKELY TO OCCUR

Against the indications of the previous two sections stands the seemingly logical obstacle that about 80% of people in Britain live in towns and cities, and car ownership is much lower in these towns and cities, so the potential for growth is much greater in urban areas. It would therefore seem likely that either traffic growth will slow in towns and cities as congestion worsens (and few people in cities will change to a car using lifestyle), or activity patterns and locations will alter in order that these increases may occur. There are several trends occurring in society which imply that it is likely that a traffic growth scenario could occur. These include:

Counterurbanisation

In the past rural depopulation was considered a problem. More recently the phenomenon of counterurbanisation (a term coined by Champion et al (1987)) has occurred in which the growth of city regions, accompanied by the decentralisation of the city region leads to what were rural areas surrounding a built-up city area becoming functionally part of the city, yet remaining rural in visual character. Champion et al conclude that it is an ongoing process which seems set to continue in Great Britain. Current trends in some parts of the country, especially the Golden Belt (Hall, 1990) from Dorset to East Anglia, show population increases well in excess of 25% per ten years. National forecasts over thirty years are difficult but one could envisage the rural and small town population (towns up to 25,000 populations) rising from around 32% in 1986 to over 50% by 2025 - the implications for land use are important here.

Newman and Kenworthy (1989) discuss the `Anglo-Saxon pastoral or anti-urban tradition' describing how English speaking cultures never seem to have embraced urbanism and civic pride to the same extent as non-English speaking European cultures. They suggest that urban revitalisation policies are not so likely to succeed in English speaking countries as they are in other European countries.

The size and location of facilities

Economies of scale favour larger facilities such as shops, hospitals, schools, and workplaces. Accessibility is the key to forecasting patronage of facilities such as shopping centres. Locations at motorway (or other fast road) junctions fairly close to urban areas become prime locations for

shopping developments, workplaces, and increasingly, facilities such as hospitals. While these offer benefits to car users they take trade away from established centres whose catchments are now mainly served by walk and bus. It is possible to envisage a situation similar to that described by Gardner and Sheppard (1989): - "In the United States, many cities have experienced ... the `doughnut effect' - the economic collapse of the city centre due to retail expansion on the urban periphery."

In the 1980s a loosening of development control allowed planning permission for the number of hypermarkets in Great Britain to increase from 230 to 640 between 1983 and 1989. Since 1989 there have been several important refusals for planning permission by the Secretary of State for the Environment, and it is envisaged that the growth in the number of new hypermarkets and out of town shopping centres will slow somewhat. What has not slowed is the development of `retail parks' with cheap buildings housing DIY and other bulky goods products. These are being built, typically on the edges of towns. However, with the current power granted to the Secretary of State in these matters, long term stability in planning permission expectation cannot be regarded as guaranteed. With increasing traffic congestion and a car based transport policy there could be renewed calls for new out of town stores and shopping centres.

The links with road building are made apparent by Headicar (1991): - "Many of the `edge of town' developments ... were attracted by the accessibility offered by major improvements in the *national* highway network. Because these highways contain a margin of spare capacity to allow for future growth, significant land use change and local traffic generation can take place without apparently incurring the costs of major new highways. However such `gains' are short lived and do not contribute to a viable long term strategy. They merely bring forward the date when traffic conditions on the *inter-urban* network become seriously congested, prompting proposals for a second round of major highway building."

The trend towards road freight

In 1990 81% of freight weight lifted and 63% of freight tonne kilometres moved was by road in Great Britain. Rail and water each carry a significant part of the rest. The long term trend has been to increase the amount of, and proportion carried by road. This has been for a number of reasons.

Firstly, containerisation was not accepted in Britain as readily as in some other countries, which reduced the scope for mixed-mode transport. Secondly, with improved telecommunications `just-in-time' deliveries have become more common, whereby production is more closely related to demand, and warehouse space is saved by immediate distribution. This kind of distribution requires high speed delivery which only road transport can offer. It also tends to favour smaller (and therefore more) vehicles.

The building of the channel tunnel could alter the situation. The longer distances involved in mainland Europe as well as other factors have ensured that rail has maintained a higher share of freight transport. A high proportion of freight from mainland Europe will therefore arrive in Britain by rail, and the opportunity exists to continue at least part of the journey by rail. On the other hand current signs are that little effort is being made to ensure easy access by rail beyond the tunnel entrance into Britain.

Rising incomes

Many have pointed to the very strong relationship that has existed between income and car ownership and use. Much of the rapid increase in car travel in the late 1980s can be ascribed to rapidly increasing incomes especially in the south east of England. With recession in 1990 and 1991 traffic growth has slowed markedly. Another period of economic growth would almost certainly be accompanied by increasing car traffic.

In 1985/6 42% of mileage travelled was for social/ entertainment, and leisure, and this figure had increased to 44% by 1988/9. (Social Trends, 1991). Many suggest that this proportion will rise for a number of reasons. Firstly the long promised shorter working week may arrive allowing extra leisure time. Secondly the service economy may in a sense `demand' that people spend more money to `support' the economy, and leisure is an area of the economy in which expansion can easily take place. Thirdly, residential movement and higher mobility may increase social visiting to relatives.

Automobile dependence

The car obviously has practical advantages for many journeys in terms of speed, comfort, and cost, but there are several other factors which imply that people use cars even when their practical advantages are not so apparent.

Marsh and Collett (1988) have described the intensity of attachment of people to cars which is popularised as the `love affair with the car'. Research on the actual nature and measures of the strength of attachment is thin on the ground but there is agreement that it is difficult to dissuade people from using cars where other modes are available (Stokes, Kenny, and Hallett, 1991).

The focus upon the individual, as opposed to the community, in society is a comparatively recent phenomena (when viewed in macro-historical terms), and may be seen as partly causing the desire for personal transport. Jean-Pierre Orfeuil (INRETS, 1989) describes the process occurring in relation to transport policy. These ideas relate closely to the sociological descriptions of urban and rural society put forward by Ferdinand Tonnies in *Gemeinschaft und Gessellschaft* in 1887 where rural society is characterised by relationships and social control based on kinship, locality and neighbourliness, whereas in urban life as Wirth (1938) comments "competition and formal control mechanisms furnish the substitutes for the bonds of solidarity that are relied upon to hold a folk society together". It is maybe a feature of counterurbanisation that these modes of conduct are becoming more common in rural areas. One of the less often stated reasons for car travel and the associated desire not to use public transport is the desire to separate oneself from others in society, as opposed to enjoying the company of strangers on public transport. (It may be argued that it is, to a large extent, the motor car which has allowed many of the aspects of individualism to develop - without it people were forced together to a much greater extent).

Fears for personal security when travelling are incomprehensible to some, but cause very real problems for others. Atkins (1990) suggests, from several surveys, that between about 50% and 70% of women are frightened of going out after dark in cities. The implications of this are serious, both from a psychological welfare point of view, and from a transport point of view. Either these people will not go out on their own in the evening, or are likely to seek to purchase a car.

These are all factors which encourage car ownership and car travel, although not all of them specifically encourage car travel outside towns and cities. But if people become dependent on their cars (or even feel trapped into relying on them) their future locational decisions will help

move them and their travel away from cities.

THE EFFECTS OF INCREASING TRAFFIC - WHAT ARE THE PRESSURE POINTS

We have described forces leading to increased car ownership and mobility, and have predicted greater congestion as being likely to occur. There is, in some sense, a conflict in the predictions here - as congestion increases, mobility should diminish. Past experience points to changes occurring which would maintain congestion as a relatively constant but controlled problem, but allow for greater mobility - the spread of traffic away from congested areas is one of the more obvious.

Road capacities are generally measured for straight, horizontal roads running at capacity, and for junctions. It is rare that congestion first manifests itself on roads without junctions since junction capacity is generally much lower. Even on motorways it is the capacity of junctions (or incidents such as accidents and road works) that causes capacity problems. The building of roads and the improvement of junctions will ease congestion in some places, but each journey has an origin and a destination. Mass motorisation demands that designs at these places will require more road capacity, and more parking space. As traffic levels increase and congestion increases several other `side effects' are experienced.

- The growth in the number of cars means that the extra cars have to be parked, both at home and for work, for shopping, and other purposes. It is regarded by many that pressures on parking will lead to policy or residential choice and behaviour changes before pressures on moving traffic do.

- The character of roads changes. Roads become social barriers as they become busier, and they are perceived as less safe. Streets become viewed as places to avoid when one is not in a car. Traffic calming has recently become a major strand of transport policy aimed at reducing these effects.

- People will travel to different places in order to avoid congestion (or where they perceive congestion to occur), and to places where they have the foreknowledge that parking will not be problematic. This causes pressure for development in new areas, and is one cause of the pressure for housing and development to spread outside cities.

These `pressure points' all imply that the spatial structure of society will change before mass congestion or `gridlock' ever forces the issue into public awareness. The increasing demands for road transport could be met, albeit not by the glossy brochure images of brand new empty highways, but at the loss of much of Britain's countryside, very high costs of pollution, and further removal of people from direct contact with the environment.

Analysis of cities in America, Europe, and Australia by Newman and Kenworthy (1989) points to strong correlations between the density of urban areas and car ownership and use. Analysis of cause and effect is not possible, but historical tracking of data shows that for most of these cities densities have fallen at the same time as car ownership and use has risen. Table 3 shows some comparisons in travel patterns between London, Los Angeles, and Houston. It is apparent that if British cities were to reach the levels of car ownership prevalent in the USA (which is basically what is forecast), and if there were to be enough space to allow the cars to be parked and used, then a major restructuring of parts of our cities may have to take place, and/or urban densities will have to fall radically.

To compare London with Los Angeles, the current area of Greater London would house some three million people (against seven million now), or if it were to become like Houston with relatively free flowing traffic it would house more like one or two million. These comparisons are somewhat fanciful since it is apparent that with differences in land prices, and with car ownership in London already at over half the level of Los Angeles, and there are ways of accommodating some growth other than lowering the density, it is unlikely that densities would have to fall by that amount. Also, looking at England as a whole, London has a higher population density over a larger area than most cities so the problem would be less acute elsewhere outside the inner city areas. Nevertheless, a conservative view of such comparisons again points to traffic increases leading to more development in currently rural areas.

Table 3 - Transport characteristics of London, Los Angeles, and Houston (1981)

	London	Los Angeles	Houston
Total vehicles per 1000 people	356	667	797
Passenger cars per 1000 people	288	542	603
Parking spaces per 1000 CBD workers	130	524	370
Length of road per person (metres)	1.9	4.5	10.6
Vehicle kms per km of road ('000s)	1747	2211	1092
Average road network speed (kph)	31	45	51
Urban density (persons per hectare)	56	20	8.9
Inner area density (persons per hectare)	77.9	29.6	20.6

Source - adapted from Newman and Kenworthy (1989)

POSSIBLE POLICY STRATEGIES

Assuming that growth in traffic is forecast there are three main policy strategies for dealing with that prediction. These broad groups of strategy are:

- **To cater for the growth.** One can accept the forecasts as being inevitable, and carry out measures to allow for growth. This would involve making changes so that the predicted growth in traffic could be accommodated with relative ease, allowing for near universal car ownership and use. Policies coming under this heading would include road building, suburban development, car park and other tourist provision, while encouraging development to less environmentally damaging sites.

- **Damage limitation strategies.** One can accept that the pressures will grow and alleviate the worst effects. This would generally involve the use of policies which discourage car ownership or use by fiscal or other pricing means, or by legal rules and regulations. Examples of such policies would include mitigation policies, environmental pricing, road pricing etc.

- **Trend reversing strategies.** One can try to ensure the forecasts do not come true. These policies would generally involve encouraging a situation where people have an alternative to

car dependence which gives them a similar or better quality of life. Examples of policies coming under this heading include the improvement of public transport, and the halting of urban decay.

These policy strategies are not mutually exclusive, but it is unlikely that the trend reversing strategies could be used in conjunction with the policies of catering for the expected growth.

TRANSPORT POLICY SUGGESTIONS

It is the view of the author that catering for the growth is not a sensible strategy to follow. Most of this paper has been concerned with the consequences of such a strategy - if one adds in uncertainties on environmental grounds (such as CO2 and other emissions), and the implications if the western world cannot offer the third world the ability or the `right' to equal levels of mobility, one has to look at ways of slowing the growth (or reversing it). However, it is fairly obvious that the people of Britain would not take kindly to immediate harsh restrictions on the use of cars (but maybe less so than the people of Eastern Europe, Asia, China, Africa, and South America would like being told that they should not own cars in order to preserve the environment).

What follows are some ideas for policy which could be implemented by a government which was committed to ensuring that our society did not become `terminally' dependent upon the car. They are aimed at halting the desire of people to change their lifestyles to ones where they become dependent upon cars. They are not designed as restrictive in any serious ways - it is possible that much more restrictive measures may be needed in future if steps are not taken now. Few of the ideas are particularly new.

General. Overall policy could be to encourage rail travel where possible, and on roads to encourage public transport where possible, and finally to keep private road transport on a key network of roads. Measures could be taken to ensure that day to day activities can be carried out with as little need for a car as is feasible. National policy could aim to redress the balance of attractivity of town and country so as to reduce the desire for people to flee the cities. It could also aim to reduce fears for personal security.

Modal splits. Subsidies could be given for freight rail goods to the extent that location close to rail lines for heavy industry is seen as an advantage. Container distribution depots for rail to road could be encouraged at locations where railways cross motorways, close to large urban areas.

Interurban passenger rail transport could be improved and subsidised, with the emphasis on low cost, high capacity, a larger network and reliability, rather than profit maximisation and high speed. Many argue that rail currently carries a small percentage of traffic (about 4% of passenger trips) and that a doubling of current capacity would have little impact on road traffic. However, in 1985/6, for journeys over ten miles, people made, on average 1.16 car journeys per week, and 0.16 rail journeys. If rail journeys of this length had doubled there would have been a 15% reduction in car trips in this length band.

Road based public transport could be encouraged and subsidised. Housing, retail, and industrial development could be in places and at concentrations for which public transport can be usable. Standards of service for public transport could be defined in rural areas. As an example each settlement of over, say, five hundred people might have an hourly bus service to a centre with all usually required facilities. These routes could be planned by local authorities to enable the level of service for all villages. In all situations where congestion occurs priority ought be given to

buses.

Walking and cycling should be encouraged. In villages and small towns most facilities should be easily reachable by walk or cycle. This could be encouraged by traffic calming, and the facility provision policies.

Roads. Interurban traffic could be concentrated on key routes; motorways and trunk routes as much as possible, followed by strategic A roads.

The bypass programme could be continued but limited to special cases on trunk routes only. Design speeds for interurban roads should not be fast; the strategy could be to facilitate frequent overtaking (eg. by alternate overtaking lanes on three lane roads, or a `if ten cars behind then pull in' rule). The priority of design should be to ensure drivers perceive that there will be few jams, but that high speeds will not be possible. For long journeys a short drive to a rail station should be perceived as a quicker and cheaper option.

Traffic should be encouraged off smaller roads which are unsuitable for traffic. Bottlenecks could be built in to such roads, (although villages should have a reasonably quick access route to the neighbouring town, or to the higher speed road network). There could be a new classification of road as `rural byway' on which through traffic should be positively discouraged to enable local traffic to move freely and to enable people using non-motorised modes to travel unhindered. A system of local automatic electronic keys to gates could be introduced to help ensure other traffic does not rat-run. Slower than present speed limits could be enforced using radar and number plate detectors. Speed limits on smaller roads could be variable.

Towns and villages should be traffic calmed. `Gateways' to settlements should be defined with bricked speed tables (and narrowings if necessary) with 20 mph limits in settlements. Towns and villages could be traffic calmed so as to give the impression that the traffic is driving through living space rather than the buildings and people are disrupting the road.

In the semi-rural areas with high populations restrictions may be needed to ensure that the transport system can function properly. This could include road pricing, combined with commitment to traffic calming, public transport, and walking and cycling, and urban design to reduce the need for travel. Road pricing in cities alone should almost certainly be resisted, as this alone would only serve to encourage motorists to travel outwards from towns instead on inwards. Schemes would have to cover entire urban regions, and be combined with measures to ensure other modes are more attractive than cars.

Tourism. Tourism is likely to grow in the countryside. Current policies on the management of tourism at the overall scale would seem likely to continue, with general encouragement in the national parks, and concentration only at specific sites in other more genuinely living rural areas. The prospects of heavy congestion imply different policies for the national park areas and for the isolated tourist sites.

National Park areas could have large car parks created on major roads running through or close to the areas, with public transport services, and cycle hire available together with good information about travel possibilities within the area. It would be possible to encourage use of such transport by realising the advantages of high frequency (say 15 minute services) public transport with possibilities for different starting and finishing points for walking. Smaller parking sites for more localised visiting should be created with traffic congestion in mind. Information as well as good

levels of public transport, and disincentives for cars (including tolls) is important. Tourists should be able to feel that they can have a better `tourist experience' without their car than with it.

For isolated tourist sites (large houses, national trust properties, theme parks etc) park and ride should be considered where possible, from a nearby major road, or town. For sites with lower numbers of visitors routes to and from major roads could be limited.

People could be encouraged to walk up to 1km from suitable parking facilities to tourist sites to reduce traffic congestion. Cycling and walking could be encouraged for `green' tourism. Cycle hire at railway stations and towns should be encouraged, as could the carrying of cycles on railways. Quiet country lanes could be kept quiet to encourage cycling in safety.

Land use policies

Local facilities. Levels of service for facilities for settlements should be defined. (e.g. A village of maybe a thousand people should have a post office, food shop, chemist, cafe/pub, and visiting health doctors, dentists etc), as well as public transport. Such facilities could be provided by subsidised franchise if not provided by the open market. Retail price maintenance could be reintroduced on essential items (to discourage car trips to cheaper supermarkets).

Housing development. Housing development should be related to workplaces in country areas. Housing markets could be encouraged to operate such that people can move to where employment is with ease; at the same time regional policy should try to ensure that there is a good range of employment in local areas to encourage stability of population. A balance should be found between stability of communities, and a lower need for commuting travel. Development should be concentrated in towns where possible, and smaller towns and villages in rural areas.

Business development. Retail and employment sites should be planned with transport considerations in mind. Development should only be allowed where planning authorities consider that a high proportion of their use could be met by public transport or other non-car modes. For bulky goods facilities, if car borne access is thought necessary all such facilities in an area should be concentrated to reduce travel needs for goods comparison.

Urban policy. Britain suffers from its attitude to urban living. Cities are seen as the worst places to live - urban pride is very low. These are long term problems although recent policy has exacerbated the situation. Policy must aim at encouraging a love for towns and cities. Housing, social, and economic policy should reduce poverty and conflict in cities, and create an environment which is perceived as being clean and safe.

New towns and settlements should be considered, but only if they are high density, and can be designed in such a way as to be generally self contained (along the original garden city ideas).

CONCLUSIONS

There are several trends which imply that car ownership and use is likely to increase, and that people will alter their situations in order to ensure that they are able to use their cars. This idea implies a kind of reverse logic; that the car is controlling the economy and the social and spatial organisation of society, rather than the other way round. That is not intended to be the message of this paper. Rather it is that the changes which society has undergone in order to accommodate the demand for private car travel imply that unless very strong policy changes are made to alter the situation, the forecasts may well be met. Furthermore the ways in which they are likely to be met

will lead to large alterations in the urban rural balance. To slow or halt this process requires that urban social policy be altered to encourage people to see benefits in living in towns.

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REFERENCES

Atkins S (1990) **Personal Security as a Transport Issue: A State of the Art Review.** Transport Reviews, Volume 10 No 2 (April-June 1990).

Champion, A.G., A.E. Green, D.W. Owen, D.J. Ellin, and M.G. Coombes (1987) **Changing Places: Britain's Demographic, Economic and Social Complexion.** Edward Arnold, London.

Department of Transport (1988) **Transport Statistics Great Britain 1977-1987**, HMSO: London.

Department of Transport (1989) **National Road Traffic Forecasts (Great Britain)**, HMSO: London.

Chandler, B (1991) **The good parking guide - London's best and worst.** Report in London Evening Standard, 4th December 1991.

Gardner, C., and J Sheppard (1989) **Consuming Passion: The Rise of Retail Culture.** Unwin Hyman, London.

Hall, PG (1989) **London 2001.** Unwin Hyman, London.

Headicar, P (1991) **Urban Transport Planning - Will the Regional Pressures Prove Too Great?** Transportation Planning Systems, Volume 1 No 2.

Institut National de Recherche sur les Transports et leur Sécurité (INRETS) (1989). **Un Milliard des Déplacements par Semaine.** La Documentation Française, Paris

Marsh, P. and Collett, P. (1986) **Driving Passion - The Psychology of the Car.** Jonathan Cape, London.

Newman, P.W.G., and J.R. Kenworthy (1989) **Cities and Automobile Dependence: A Sourcebook.** Gower Technical, Aldershot.

Stokes, G., F. Kenny, and S. Hallett (1991) **The Love Affair with the Car - Wedlock or Deadlock.** Paper presented at PTRC Summer Annual Meeting, Brighton, September, 1991. (Transport Studies Unit Ref 642).

Stokes, G., Goodwin, P.B., and F. Kenny (1992) **Trends in Transport and the Countryside - The Countryside Commission and transport policy in England.** Countryside Commission

Technical Report CCP 382. Countryside Commission, Cheltenham.

Wirth, L (1938) **Urbanism as a Way of Life.** American Journal of Sociology, 44, pp1-24