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Determinants of travel demand - exploring the future of society and lifestyles in the UK

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Abstract

This paper considers how changes in the fabric of society and its values, a subject usually considered to be outside the conventional scope of the transport profession, can have a profound impact on travel demand. The paper stems from the Transport Visions Network, a unique activity involving young professionals from academia, consultancy and government. It raises awareness of the diversity of factors that influence travel and transport. The paper offers an overview of existing trends and projections for the future before presenting a series of different future scenarios. Suggestions on the consequences for transport are then put forward.

Keywords: Scenario Planning; Travel demand; Society and lifestyles

1. Introduction

Fig. 1 presents recent historical trends in UK travel demand as measured by passenger distance travelled annually. The decline in use of bus and coach falls far short of accounting for the huge increase in use of the private car. The total amount of travel has increased dramatically. In the UK between 1945 and 1998 government policy was to expand transport supply to meet current and projected requirements, an approach known as 'predict and provide' (Banister et al, 2000). This resulted in a massive expansion of the road network. With the publication of its

1

Transport White Paper in 1998 (DETR, 1998) the UK Government recognised that this approach was no longer tenable and that there was a need to manage travel demand. The Government's Ten Year Plan is a £180 billion spending plan to transform the UK's transport infrastructure (DETR, 2000a). The Plan notes:

'A number of the problems we face are deep-rooted and cannot be solved within a decade. Some are problems of growth in an expanding economy with rising incomes. In the longer term our new planning policies aim to produce more sustainable and less dispersed patterns of development, and should help reduce the need to travel. Social and technological changes will also alter patterns of behaviour in unforeseen ways. But in the meantime this Plan sets out a realistic strategy based on much higher levels of investment over the next decade.'

With the change of policy from 'predict and provide' to demand management and planning to reduce the need to travel there is a clear need to understand the determinants of future travel demand. Society and lifestyles are responsible for the demands placed on our transport systems. It is therefore important to consider the current and changing nature of society and lifestyles to provide a context for future decisions concerning transport. This paper seeks to do this.

Figure 1

The paper has arisen from the work of the Transport Visions Network (http://www.trg.soton.ac.uk/research/TVNetwork). The Network is an international virtual community of young professionals based in academia, consultancy and government with an involvement in transport. Over three years the Network is exploring the future of transport in the 21st century. Eight transport themes are being addressed, the first of which has been 'Society and

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Lifestyles' (Lyons et al, 2000). This theme saw over 250 email messages exchanged in a structured on-line debate followed by a one-day workshop. For the Network, the theme sets a context for later consideration of visions and solutions for transport. It explores the nature of the society that transport might be expected to serve in the future.

2. Methodology

A multiplicity of possible futures lie ahead dependent upon the consequences of a complex series of interacting factors. A number of approaches might be used to explore the socio-economic and technological factors that will influence the future demand for travel. Fig. 2 from Ling (1998) illustrates the range of recognised techniques that can be employed when engaging in the study or prediction of the future. The method used is highly dependent upon the context that is being studied. If the context is simple, predictable and largely controllable then the employment of planning methodologies such as forecasting and extrapolation from known trends may be appropriate. However, the more complex and unpredictable the environment under study the less useful and appropriate such methods become. An alternative approach in such circumstances is that of scenario planning. Table 1 emphasises the value of scenario planning by comparing its attributes with those of forecasting. In essence, the benefit of scenario planning is that it recognises that when studying or predicting the future, to start with certainties is to end with doubts (Government of Queensland, 2000).

Figure 2

Table 1

Scenario planning is usually associated with a forward oriented approach where alternative scenarios are developed for a desired time horizon from the present situation. The aim

is to develop distinctive, divergent depictions of the future. For the area of concern in a scenario planning exercise a number of issues and driving forces will be identified. These may be social, economic, political, environmental, scientific, technological etc. By making different assumptions about these driving forces or key influences, different 'stories' are formulated about how they interact. The scenarios are effectively these stories.

In identifying key influences it is common to use axes of influence. If one axis is used then two polarised scenarios can be developed. If two axes are used then these can be presented orthogonally and the quadrants used to identify four very different futures. The four scenarios are extreme cases with 'business as usual' sitting near the origin of the two axes. Diagrams such as Fig. 3 are schematic only - any suggestion of precision in terms of the position of a scenario on the plot is illusory. Whilst scenario planning seeks divergent depictions of the future the qualitative nature of the method precludes any certainty that a set of scenarios are positioned equidistantly in relation to the axes of influence.

Figure 3

The Transport Visions Network adopted a scenario planning approach for exploring the future of society and lifestyles. The first step was to examine driving forces and to discuss their implications. This was structured under headings of (i) population and households, (ii) employment, (iii) lifestyles, (iv) politics and social organisation and (v) environment. Consequently three uncertain driving forces were identified as determining the direction in which society moves. These were used as the basis for developing three pairs of polarised scenarios as illustrated in Fig. 4. For each pair of scenarios a continuum of scenarios exist between (and beyond) the extreme opposing ones identified.

Figure 4

In the next section driving forces are considered. Facts and figures are presented on trends in various aspects of society and lifestyles. In the subsequent section the paper summarises each of the six scenarios that were developed. Implications for transport are then drawn out.

3. Driving forces

By definition the topic of society and lifestyles embraces a large and diverse set of issues relating to factors that impact (directly or indirectly) on the future of transport and travel demand. A selection is considered below and presented in Table 2.

Table 2

An important determinant of travel demand (though by no means the only one) is the number of (potential) tripmakers, i.e. population size. For the UK, this is set to increase but with a longer term expectation of decline. Population change in part is the net effect of trends in birth rate and life expectancy which are also giving rise to an ageing population. Consequently, for economic stability the UK may need to rely upon a net inward migration to maintain a viable size of workforce. A more telling determinant of travel demand is perhaps the way in which total population disaggregates into households, the latter commonly treated as a tripmaking unit. Such tripmaking units are decreasing in size and increasing in number and are expected to continue doing so with 3.8 million new units anticipated between 1996 and 2021 (DETR, 2000b). Such trends can be attributed to smaller families, single parent families, couples living together longer before having children, young people living on their own, older people being able to live in their own homes longer and the purchase of second homes. 80% of the UK population live in urban areas. However, the numbers living in Metropolitan areas declined from 38.6% in 1982 to 37.1%

in 1997 (National Statistics, 2000). Access to car use coupled with the increased ability to communicate by means other than face-to-face contact has allowed for more dispersed households and living patterns.

The nature and stability of relationships is changing which has contributed to changing household sizes and numbers but which also, in line with the changing role of women in society, gives rise to changes in the way children are integrated into daily activity and travel patterns. Divorce and separation of cohabiting couples averaged about 70,000 a year in the early 1990's and accounts for 35-40% of the estimated annual average increase in all households (DETR, 2000c). Female participation in the workforce has increased in recent years. As a result, childcare has increasingly moved outside the household with a substantial growth in the number of childminders and all-day nursery places. Fragmented families and a growing workforce can be equated to a growing incidence of activities outside the home requiring trips.

The nature of employment is changing. In 1975 the average job lasted six years one month and now it is five years six months. School leavers will have an average of 11 jobs over their lifetime, compared to today's retired population who averaged seven jobs. As individuals' workplace locations change more frequently, travel patterns become increasingly dynamic. Output of the service industries in the UK increased by over 8% between 1990 and 1997 with more than a 2% increase in 1996/97. In contrast, manufacturing output increased by less than 2% between 1990 and 1997 (National Statistics, 2000). With the number of agent positions in UK call centres expected to grow to 274,000 by 2002, more people will work in call centres than in farming and teaching combined (Datamonitor, 2000). Throughout Europe there has been a decline in the traditional manufacturing industries during the last decades. The service industry forms the most significant sector of employment in European countries. Growth in service

industry employment is signalling a decline in the importance of the fixed workplace location with substantial growth in the numbers of people who work from home on a full or part-time basis.

The UK Government Statistical Service lists the following items as indicators of (material) standard of living: average weekly earnings; retail prices index; and percentage of households having use of a: car, television, washing machine, video, home computer etc. (National Statistics, 2000). Each of these indicators show standard of living is increasing. Increasing affluence has led to dramatic growth in the leisure activities of the population. In 1971 British residents took seven million holidays abroad. In 1997 they took 27 million (National Statistics, 2000). Almost 33% of men and 38% of women between the ages of 50 and 65 do not work. Within an ageing population this time rich and sometimes cash rich section of the population will grow in social and economic significance (Brindle and Quinn, 1999) and is likely to influence the relative proportion of work/business travel and leisure travel.

Medical and technological advances offer great potential to tackle disease and illness yet modern lifestyles are having a negative influence on the nation's health. For many, the daily journey to work and the tasks undertaken whilst at work require little physical exertion. As an increasingly sedentary society it seems we are now looking to attain/maintain physical fitness through leisure activity rather than it being a by-product of the types of necessary tasks we engage in or our means of travel. Clubs operated by the leisure company Fitness First doubled in number from 1998 to 1999 with a national membership of over 125,000 (Finch, 1999).

Set against this background a number of possible future scenarios are considered within which such trends either continue or are broken. It should not be inferred that the scenarios are

mutually exclusive in their content. Elements described within a particular scenario may also apply in others.

4. Societal values

4.1 Community oriented society

This scenario depicts a revival in the importance of family and community life. For some this will mean a revival in the popularity of marriage or similar forms of legal union. There will also be a significant increase in the popularity of various forms of community living reflecting society's primary concern for sustainability, relationships and quality of life. Fertility rates will increase to at least two children per woman although parenthood will typically begin later in life. These demographic changes will be stimulated by a shift in social values. Quality of life will replace a purely material standard of living as the key test of a society's success.

The Government will adopt policies to influence how we live together. Single people will be encouraged to live in one or two bedroom flats rather than five bedroom detached houses, thereby making appropriate housing stock available for families and groups. Communal living through house/flat share arrangements will be increasingly popular. The UK will follow Denmark and Israel in the introduction and popularity of co-housing. Neighbourhoods of homes with shared resources such as dining areas, kitchen, communal living areas and shared childcare will meet the desire for community/family living. Urban design will reflect these aspirations taking lessons from office design in how to ensure provision of multi-use during the life of the building. Houses and flats will have at least two bathrooms and moveable internal walls for changing family structures so that young adults can have flats in their parent's homes.

Emphasis on local communities will see children educated at the school nearest their home. Technology will not replace real schools with virtual equivalents as it is increasingly recognised that only the former can properly offer young children the opportunity to acquire vital social skills. Technology and the information exchange opportunities it offers will encourage local communities to use their local schools by reducing the variability in (perceived) quality of education between schools. The education which school children receive will reinforce the values of community and quality of life.

The workplace environment will change to reflect the values of family and community. This will lead to an increase in teleworking in its various forms. A cultural realignment will take place by which loyalty between employer and employee will be restored on a large scale. Companies will invest in their staff's long term needs providing family oriented facilities including accommodation and community buildings. Businesses will remain competitive within the family orientated model as a balanced work and home life will be seen to be more productive and effective. Indeed the community centred outlook will lead the UK to produce a high quality service industry sector in the global economy. The UK will not pursue such an economic strategy in isolation. There will be a complete overhaul in international trading institutions and policies as the world will consciously pursue sustainable community living. Europe will become more unified and work effectively as a community and attempts to emulate its success will be undertaken globally.

4.2 Individual oriented society

In this scenario a trend of increasing individualism is envisaged. Those belonging to higher social classes, with increased financial independence will choose to have (less) children

later in life and those from lower social classes with taught/enforced low expectations will continue to become parents at a young age. These trends will be reinforced by a moral and social climate that values individual choice and personal freedom most highly. This will include widespread public acceptance of different lifestyle choices and less social pressure to have children. The option of later parenthood will mean more years with greater mobility, freedom and increased possibilities of changing home and work locations including living and working overseas. Marriage will continue to decline in popularity and transience will become the norm.

With the whole span of life extended (to in excess of 100 years for men and women in the latter half of this century) people may have their first child aged 35-40 when financially secure. They could choose, through the assistance of medical advances, to have children when aged 50 or even over 60. Alternatively, with the stigma of illegitimacy and single parenthood a thing of the past, people may have children while young and marry later when the children have grown up. Medical advances will deliver the prospect of longevity for some sections of society (notably the wealthy) but long-life will also demand attention to personal fitness, particularly amongst those over 60. This age group will have more leisure time and resources to pursue fitness. Independence in old age will be prolonged by technological support. For example, an electronic chip implanted in the body will monitor health and detect any serious deterioration, automatically alerting appropriate parties.

Consequences for housing occupancy, density and ownership of an individually oriented society are difficult to determine. Emphasis upon the values of choice, freedom and material standard of living may cause stigma to be attached to high-density living. Aspirations to own rather than rent may remain strong. People crave the security and freedom of their own place and their own kind and resist sharing. Alternatively, an individual oriented society could lead to a

mixture of low and high housing densities. If people are more individual, flexible, transient and mobile the future may be one of renting and low cost, high-density living. People may be located closer to their place of work if they are not reliant on accommodating the conflicting workplace constraints of a partner. This could lead to a socio-economic segregation in housing. Inner urban areas may be primarily populated by single people of working age who may move around on efficient public transport while families and older people may live on the suburban and rural periphery and be more car-dependent.

Technology used in education will facilitate a culture of individuality from an early age. Telecommunications will see 'distance learning' become commonplace. Internet access will facilitate personal advancement from an early age, although the social interaction provided at schools will see the continuation of traditional venues of learning. Virtual university education will prove popular because of the increasing costs of traditional university education. The facility will aid life-long learning as demands for flexibility in the workplace render the acquisition of new skills essential.

Longer lifespans will lead to a restructuring of lifestyles and conventional expectations. People will use time in their younger life to pursue leisure interests knowing that their careers will be much longer affording time to pay off debts incurred. Retirement age may be raised to 70 or higher. Technology will make physical attributes less important. Those formerly considered of retirement age will have the experience/social skills deemed vital commodities in many industries and particularly in the service sector. Working practice will accommodate individuality. Company loyalty will be replaced by the notion that everyone is effectively self-employed at work with personal control over their career path. Workplace flexibility will be reflected in working hours. In a global economy nine to five working will be deemed

anachronistic. The escalation in efficiency and productivity demands to retain profit margins will pass increasing pressures onto the workforce. To cope, the convenience society of today will continue, preferring 'make, break, throw away' to alternatives that resemble sustainability.

5. Governance

5.1 Free market oriented society

In this scenario the free market will increasingly determine the way in which decisions are made. It will be accepted that it provides the best basis for prosperity. There will be an international consensus that government intervention and spending on a large scale is inflationary and undesirable. Political tendencies to resist the free market model will be 'trampled over in the rush' as countries from the developing world mature economically and follow the free market model.

The move to a free market oriented society will in part be a reaction to the perceived failures of government intervention. People will become increasingly disillusioned with predictable and adversarial political debate and national government that will be seen as secretive, weak willed, and inefficient. Efforts to revive local democracy through devolved local government and elected mayors will be met by declining public interest and acceptance. Cynicism about the motives and behaviour of politicians and the electoral system will lead people to look to the market to address society's needs.

A free market oriented society will contribute to increased levels of migration as people will move as freely as goods and services. Migration within Britain will increase substantially. The South East of England will continue to be an economic hot-spot of a high growth service economy. Social segregation between cities and regions of economic prosperity and less

successful areas will become increasingly marked and a large proportion of the population will lack the financial resources to migrate to the more attractive areas. This will have implications for the economic landscape of Britain with failing industries including some types of manufacturing and agriculture being pushed to the geographical margins. Leisure migration will become popular. People will retire in increasing numbers to areas like Mediterranean Europe in search of a better climate and escape from the pace of life associated with highly competitive economies of the Northern European region. This will result in a similar form of economic clustering as people of similar social class will congregate to share in this leisured lifestyle.

Pricing mechanisms and the profit driven self-interest of market forces could naturally control environmental exploitation. Markets might level off as depleted resources become so expensive that new solutions, innovations and products are developed and targeted as alternatives (although by this stage a great degree of the damage will have been done). In addition, increases in production efficiency will slow resource depletion as the principle of 'cutting costs means cutting waste' is applied. On the other hand, it could be that scarcity would add to the profitability of controlling certain resources, such that there was intense competition to sell. Companies controlling non-renewable resources might seek to stifle competition from more sustainable rival products, for example, oil companies might buy up and patent solar technologies, so that exploitation of its full commercial potential is held back whilst there is still money to be made from the more profitable activity of oil production. The free market will have the capacity to accommodate environmental consumerism. This is evidenced in the realm of food with the rise in popularity of organic produce and opposition to developments like GM foods.

Social exclusion will have stark consequences in this scenario. Market forces will increase the divide between the 'haves' and the 'have nots'. As a result the 'have nots', in the

face of diminishing state support, will have an increasing propensity to turn to crime. Rather than recognise and take actions to avert such a trend in the interest of its impact on national economies, industry will seek to prosper through the exploitation of the fear of crime among the 'haves'.

5.2 Government interventionist society

In this scenario there will be a transformation in the political process of national government to accommodate increasing levels of intervention. This will require strong leadership at a national level ignoring adverse public and media opinion and taking serious decisions in the long-term national interest. This will reverse the culture in which potentially beneficial measures are hampered by short-termism as expressed through public and media opinion. This transformation will be driven by the success of international examples of more authoritarian yet benevolent governments such as that currently championed in Singapore. This transformation could be achieved through a change to the five year political cycle or the electorate could be educated to think more long term recognising that policies often only take full effect after ten or more years.

A strong central government will recognise that some decisions have to take account of specific local circumstances and are therefore best taken at a local level. Elected mayors backed by assemblies in both the major cities and smaller towns will use their powers to create sustainable local environments. This approach to decision-making will allow new initiatives to be tested in a particular location, benchmarked by others and then implemented more widely if deemed successful.

These political developments will reinforce cultural changes relating to identity. People will define their identity in terms of ethnic groups or local community or region rather than nation leading to a highly diverse, cosmopolitan and internationalist society. Population mobility and migration will reinforce these developments as intermarriage and transience undermines traditional and segregated social organisation.

A more consensual form of politics based on intervention for the public good and the experience of effective local and international government in improving everyday life will revitalise political participation. Compulsory voting will ensure that the electorate will also be more accountable and socially responsible. The introduction of Proportional Representation for all elections will serve to encourage the belief that every vote will count. Voting will become more convenient, taking place electronically. As a result government will be able to regularly poll its electorate where appropriate.

Government intervention will dramatically reduce crime in society at the expense of a measure of individual freedom which will be considered acceptable. Personal identification will be extended to the implanting into people's bodies of an ID chip. Public resistance to ID chips will decline with recognition of the inability of police forces to control crime with available resources without such technology. People will feel safer to utilise spaces previously considered dangerous providing greater freedom of access and movement.

6. Proximity

6.1 Workplace to the workers

In this scenario teleworking will become a very widespread practice significantly impacting on the ways and culture of working. Large sectors of employment (such as primary

and manufacturing industry, health services and retail and leisure services) will be unable to shrug off the significance of workplace location. However, some sectors of the expanding service sector will be ideally suited to teleworking practices. Early pioneers of teleworking practice who involve high proportions of their staff will achieve substantial savings in the historically fixed infrastructure costs of expensive and large office buildings and associated parking spaces. Such savings will be invested in the provision of high quality teleworking facilities in other locations and in increased salaries and other employee benefits. The uptake of teleworking practice will then accelerate as early adopters thrive commercially because of the high quality staff they attract.

The long-term solution to the problem of social interaction will be the community office or telecottage. People from different organisations will work in their local office. A community office will contain a number of 'worker cells'. These will be self-contained, insular, miniature working environments with high quality telecommunications media to enable remote virtual interaction with other company staff in other such offices. Such 'cells' will ensure that information security within a multi-company office is maintained. The office will provide the context for the rediscovery of local communities. Sharing with different disciplines will be stimulating, aiding community integration as people will be grouped by locality and not corporate colours. Worker cells will also exist in homes and at transport interchanges. They will be compatible across different countries thereby rendering the physical location of the workplace even more insignificant.

The qualitative standards of electronic communications will improve so greatly that travel and the printed media will become non-essential, largely leisure based pursuits. Communication between employer and employee via video conferencing will be highly realistic

and effective, eliminating the need for a large proportion of physical meetings. Realism is likely to extend to video quality immersive virtual reality, particularly for the 'executive worker cells' in community offices. Multimedia communications facilities will be used by the vast majority of the population, irrespective of age and of whether or not they work in the service sector. Staff productivity monitoring technology will also ensure that teleworking is not confined to 'high flyers' as management will assess remotely the performance of staff.

The consequences for housing and land use of increased teleworking will be mixed. Companies will need less office space freeing up space in urban areas for housing, leisure, open space and other uses. The more intensive use of smaller buildings made possible by accommodating work and home in the same building will lead to some higher density living. However, homes that accommodate workspace will have to be bigger than those which do not.

The erosion of the importance of physical location will enable a more effective and sustained match between employment supply and demand in contrast to today where the geographic patterns of supply and demand are not fully compatible leading to unemployment and staff shortages. As a result, the total working population will increase in size. This will also be fuelled by an increase in the retirement age and an increase of women in the workforce. These increases will result from the greater opportunity to work on a part-time basis and to job share.

Couples are less likely than today to face the problems of conflicting workplace locations and commute requirements. Childcare will be rendered more flexible through the presence of one or both parents working in the home although as women increasingly take advantage of the opportunity to develop 'tele-careers' on a full or part-time basis the need for independent childcare facilities will remain or even increase. Workers will be more selective with employers.

The ability to change employer without disruption to their domestic circumstances will mean they can demand acceptable working conditions.

6.2 Workers to the workplace

In this scenario the workplace will remain important and indeed grow in importance for a large proportion of the population. Management culture and job insecurity will encourage longer hours and place a premium on time. Time pressure will drive people to live and work in close proximity, or demand convenient and fast modes of travel. There will be recognition that (regular) homeworking does not provide a viable alternative to the office for the majority of workers. Developments in workplace technology will demand that people travel to work as the costs of support staff and training for newly acquired technology will be cheaper if located at a single site. Home working will be seen to be detrimental to both work and home life. Concern for social and familial duties will compromise working efficiency. The use and benefits of childminders will become more widely accepted as the benefits of full-time care and interaction with other children at an early age is recognised. Employers will recognise that employees who work two rather than five (or more) days a week are just as valuable to the company and job sharing will not prove a barrier to career progression.

The workplace will adapt to increasing time pressure and longer working hours. Companies will provide on site services and leisure facilities not associated with the traditional working environment such as bedrooms, gyms and shops. As more leisure facilities become available the distinctions between work and leisure will become increasingly blurred leading to an almost subconscious acceptance of longer working hours. It will be recognised that communication and creativity thrives best in the communal social areas such as coffee bars and

restaurants both within and outside of the business environment. Cities and towns will provide environments where people can easily access their place of work and their peers, moving simply and rapidly between work and leisure environments.

Government and private companies will appreciate the logistical and economic benefits of the clustering of resources and workers buoyed by global patterns of development. There will be intense investment in business parks, science and technology parks and other campus type centres of industry.

7. Implications for transport

Many transport implications arise from the scenarios developed. None of the scenarios are mutually exclusive. Some implications will be polarised within a given pair of scenarios while others could prevail in several scenarios. Below we consider some of the implications. The discussion is illustrative rather than exhaustive in exploring the types of developments in transport that will be required.

7.1 Trips

Total population will not in itself place an additional burden on the transport system in terms of the number of potential tripmakers. However, the lifestyles adopted by the population will greatly influence travel demand and the use of different modes of transport. In both the community and individual oriented society people will delay having children resulting in a longer period in early adult life of high levels of mobility and home relocation. The individual oriented society is characterised by personal flexibility coupled with increasing affluence. This will result in a greater dependence on personal forms of transport. Ownership or long-term rental

of a car or other personal vehicle is likely to increase. Highly individualised pay per ride systems, equivalent to taxis, may also become appealing and affordable as alternatives. If urban renaissance is realised in a community oriented society then high density public transport corridors will become much more viable than today and indeed the need for private transport will be further diminished because the size of housing developments will be sufficient to support local amenities and activity centres.

7.2 Vehicles and infrastructure

Optimism at the beginning of the 21st Century that new sources of oil will continue to be found will prove to be misguided. The free market will drive technological innovation leading to the creation of environmentally friendly cars as a niche service which will subsequently develop into a mass service. Environmental dangers will be addressed by the introduction of fuel cell and organic waste powered cars. Vehicle emissions will also be dramatically reduced, regardless of any increase in total vehicle traffic, by the introduction of zero emission vehicles (ZEVs). The concern that ZEVs involve a transfer of air pollution from the vehicle (point of use) to the source of energy production (e.g. electricity power station) will be addressed to some extent through parallel technology and science innovations to deliver clean(er) energy production.

In the free market oriented society, businesses will protest at the cost and inefficiency of road congestion and convince government and the public that free flowing roads at a cost are better than congested roads. In response the government will auction off roads to private companies. This will provide a context for road user charging. Any lingering cultural opposition to such moves will be overcome by practical experience of the benefits. When congestion does occur the experience will be dramatically improved by in-vehicle infotainment including Internet

access and roadside environments that have been improved to be more scenic and interesting. The transport of information will be seen as being as important as that of goods and people in the free market oriented society. The telecommunications industry will experience problems of traffic and congestion comparable to those faced by the transport industry. Information will be seen as the currency of a free market economy with knowledge increasingly being seen as a weapon as well as a resource. Those with access to valued sources of information will be successful. Other people will be excluded and marginalised.

Crime and the fear of crime in the free market oriented society will be detrimental to advances in transport solutions as communal means of travel are seen as a threat to personal security and the insularity afforded by private vehicles becomes even more prized for the protective environments they provide. Acceptable compromises between invasion of privacy and civil liberties in the government interventionist society might release a generation of more effective transport solutions as information about individuals and their movements becomes available to transport system providers and authorities and enables them to better influence and control travel demand.

A government interventionist society will promote a wider recognition of the environmental and societal impacts of road transport. Recent examples of co-operation between the European Governments and vehicle manufacturers have secured reductions in CO_2 emissions and this process will provide a fast track to the development of more sustainable modes of transport. Whilst a free market oriented society will achieve the same goals to some extent through efficiency and consumer demands it has the potential to be a longer term and more environmentally damaging process.

7.3 Public transport

The experience of public transport under a free market will be mixed. Where a market exists such as in large cities and main inter-urban routes, services will improve as companies compete to operate profitable services. This will be evidenced in the re-branding of public transport by private operators using commercial marketing techniques. Buses and trains will be recognised as being lucrative (and captive) advertising markets stimulating investment partnerships between operators and other commercial organisations. This will result in email, television, radio and other forms of interactive entertainment being standard on-board facilities. These facilities will improve the perception of public transport making its use more socially acceptable within major urban areas. Less profitable services, particularly those in rural areas will struggle to survive in a culture where government subsidy of unprofitable services meets with strong disapproval.

The workplace to the workers scenario would increase demand for public transport in urban areas where greater concentrations of people will live and work in the absence of the need for as much conventional office space in cities. People will want services close to their homes so that they do not have to travel far to access them. This will result in a greater proportion of non-motorised trips. In contrast, as people do not need to travel (regularly) to the workplace they will have more flexibility in terms of living place. Whilst this will support greater family life it could also encourage the dispersal of homes for those who can afford to live in more remote areas where they may become more car dependent.

The travel implications of a society where workplace location becomes increasingly important are mixed. People working in city centres and business villages will seek to minimise the time they spend travelling in the context of lengthening working hours and will increasingly

choose to live in urban locations relying on efficient public transport. By contrast, campus based workers in business and science and technology parks as well as call centre staff and industrial shift workers will continue to be located outside of the cities and adjacent to major roads. They will continue to rely on private transport. Private transport will continue to be seen as the only viable mode for a large proportion of consultancies and burgeoning small and micro companies who rely upon irregular and varied trip making to visit clients. The growth in domestic passenger flights will continue apace. Businesses will increasingly view the mode as viable in terms of cost, speed and convenience as the competitive deregulated market sees niche business services develop with costs driven down and services increased.

The workers to the workplace scenario has greater potential to stimulate regeneration of urban areas as the importance of the workplace increases alongside a growing need to reduce commute times to accommodate a longer working week. The importance of national centres of business activity to operate in an international business market linked by air travel will further concentrate people and commuting into urban areas and produce densities of commuting along corridors that can support high quality public transport.

7.4 A culture of mobility

Both the free market oriented and government interventionist society will increase the amount of migration. It is unclear on what scale migration will occur and in turn what impacts it will have for travel. If, for example, a significant proportion of the retired population of the UK were to migrate to continental Europe in pursuit of more favourable climates then the predicted boom in leisure travel associated with this age group may not arise within the UK. Of greater significance is the potential for widespread migration to stimulate change and the acceptance of

it. This could enable new transport policies and practices to be introduced with reduced public resistance. As people migrate so too will examples of successful practice in travel demand management from around the world.

Evidence that demonstrates a reduction in travel as a result of telecommunications is scant. The telephone has stimulated, not dampened the need for business travel. Videoconferencing and virtual meetings have been unable to deliver technologically an experience that matches the real thing. As a result the need for face–to-face contact in business has remained. The advances in technology we envisage have considerable potential to overcome this situation. However, particularly in the workplace to the workers scenario, a more fundamental issue might prevail, namely man's in-built desire for mobility and contact with others. If this is the case then the suppression of business and commute trips could lead to an increase in leisure trips leading to less predictable temporal and spatial patterns of travel and traffic. Nevertheless, the potential exists for peak-period congestion to diminish as conventional 'rush-hours' are replaced by a more even spread of traffic throughout the day, particularly as planning permission for new centres of employment may require working hours to be staggered through the day to reduce local traffic congestion at peak times.

7.5 Air travel

The consequences for international air travel within the workers to the workplace scenario will be profound. Companies operating in the global economy will increasingly desire physical contact causing dramatic expansion in travel pressures on routes to airports and in the air. Business class flights will grow substantially and regional airports will expand in size and

services to meet demand. Companies will increasingly see benefits in sending employees to work abroad and international business consultancy will be a major growth industry worldwide.

8. Conclusions – an interpretation of the scenario planning exercise

As explained earlier, scenario planning is founded on the recognition that, when contemplating the future, to start with certainties is to end with doubts. Changes in the course of society's development both in the UK and worldwide can, in some cases, be incremental or even predictable. Yet development can also fall prey to significant events that can change the course of the future. The September 2000 fuel tax protest in the UK may have been one such event. It has probably limited present and future governments' options on this policy lever. At a global level a year later, the events of September 11 2001 in New York and Washington may have suddenly halted the seemingly inexorable growth of air travel in our future global society as envisaged in section 7.5.

Six divergent scenarios have been presented in this paper and for the reasons above it would be inappropriate for this paper to conclude with any pretence of definitive outcome for the future of society and lifestyles. Nevertheless, the Transport Visions Network recognised that the scenarios can be grouped as two opposing visions as outlined in Fig. 5. We should recognise the possibility of both outcomes and plan transport accordingly. Vision A is a future where policy makers are better able to influence travel demand and transport provision. However, vision B is probably the direction in which the world has been moving for some time and one for which we should make most effort to prepare. The following comments apply to vision B.

Figure 5

At the start of the new millennium the Internet has massively increased the opportunity to undertake certain activities without recourse to physical movement. Whilst the dot.com bubble may have burst, on-line grocery shopping, banking and the mobile office are growing in significance. Yet, rather than substituting for physical travel demand, telecommunications of this sort are facilitating further flexibility of lifestyle, enabling new tripmaking and patterns of travel to emerge. There is a clear prospect that trips which are repetitive in terms of their regularity and fixed temporal and spatial orientation will decline as a proportion of all trips. Collective transport will be far less readily able to support the growth in alternative, more discretionary trips which are variable in terms of temporal and spatial orientation.

It is suggested that transport policy should therefore acknowledge that total travel is unlikely to decline but that its nature will change. Collective transport should be heavily promoted where it serves major urban areas and major corridors. Elsewhere, collective transport will only exercise a limited contribution to supporting the diversity of individualised travel demands and patterns. Individualised transport will predominate for a large proportion of trips as well as for the main means of access to collective transport corridors. The role for policymakers is therefore to improve the efficiency of individualised transport in ways that can support economic prosperity (e.g. higher vehicle occupancies, car sharing clubs) whilst also promoting technological advances that can mitigate the impacts of high levels of mobility on the environment and society. Transport policy should aspire to users meeting the full costs of their mobility. Economic instruments will be crucial both in regulating levels of mobility and in securing revenue streams that can indirectly address other aspects of our society upon which developments in transport will impact.

Acknowledgements

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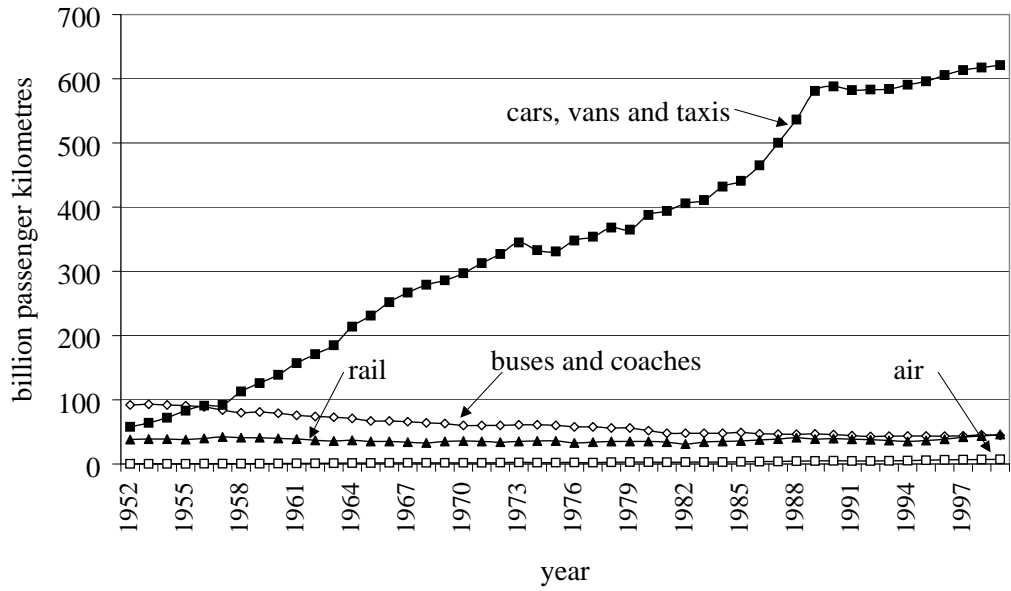
Fig 1. UK passenger transport by mode 1952-1999 (DETR, 2000d).

Soft					**Hard**
(intuitive/learning)					(analytical/control)
Embracing Ambiguity					*Aiming for Certainty*

◄───►

| Informed fiction writing | Behavioural simulation | Scenarios | Modelling | Forecasting | Extrapolation |
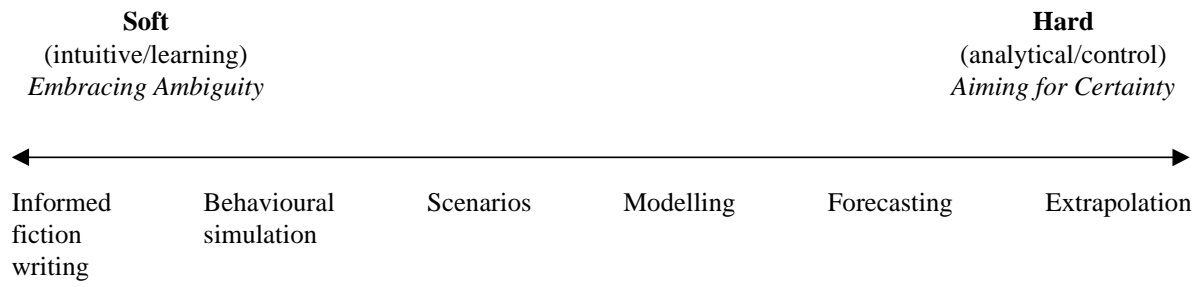
Fig. 2. Practices used in the study or prediction of the future.

Globalisation

| World Markets | | Global Sustainability |

Consumerism ← → Community

| Provincial Enterprise | | Local Stewardship |

Regionalisation
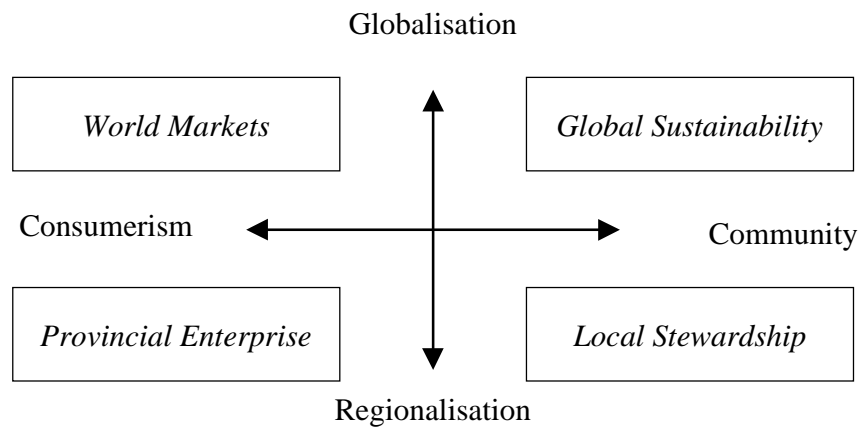
Fig. 3. Scenarios developed using two axes of influence (DTI, 1999).

31

| Individual oriented society | ← Societal values → | Community oriented society |

| Free market oriented society | ← Governance → | Government interventionist society |

| Workers to the workplace | ← Proximity → | Workplace to the workers |
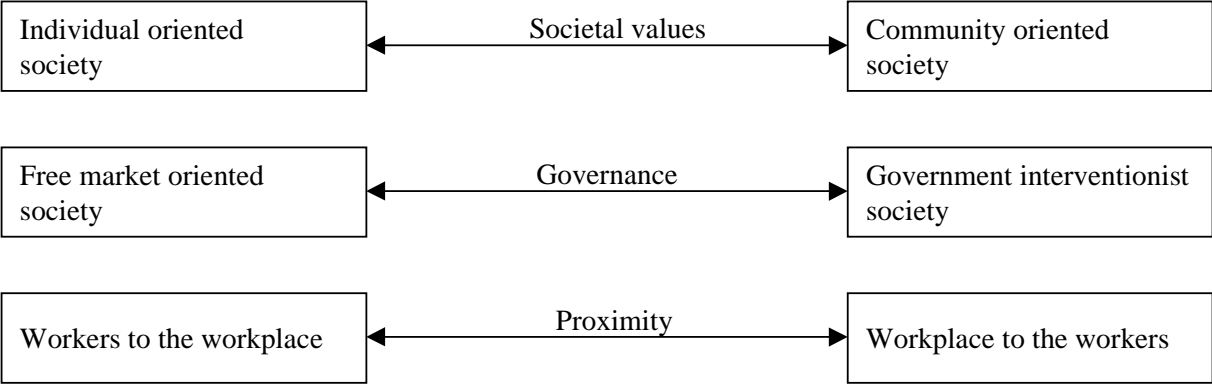
Fig. 4. A framework for exploring society and lifestyles.

Vision A

```
        ┌─────────────────┐
        │   Government    │
        │ Interventionist │
┌───────┤     Society     │
│Community├─────────────────┤
│Oriented │                 │
│Society  │   Workplace    │
└───────┤    to the      │
        │    Workers     │
        └─────────────────┘
```

Vision B

```
        ┌─────────────────┐
        │  Free Market    │
        │    Oriented     │
┌───────┤     Society     │
│Individual├─────────────────┤
│Oriented  │                 │
│Society   │    Workers     │
└───────┤    to the      │
        │   Workplace    │
        └─────────────────┘
```
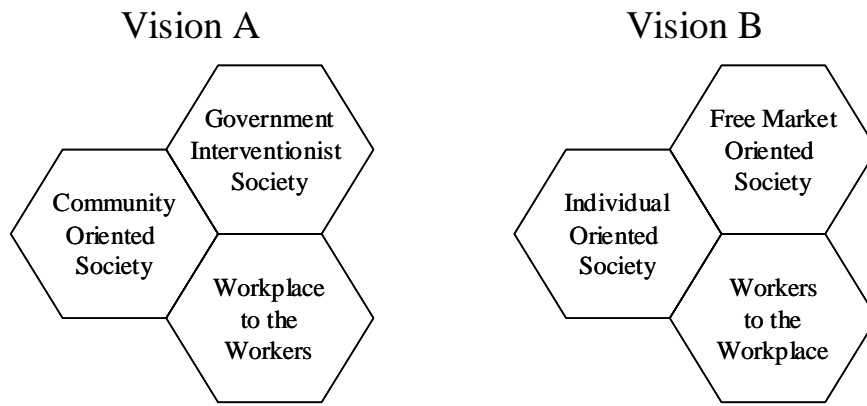
Fig. 5. Alternative visions based on scenario grouping.

Table 1

Comparison of forecasting and scenario planning (Government of Queensland, 2000)

Forecasting	*Scenario planning*
Focuses on certainties and disguises uncertainties	Focuses on and legitimises recognition of uncertainties
Conceals risk	Clarifies risk
Results in single point projections	Results in adaptive understanding
More quantitative than qualitative	More qualitative than quantitative

Table 2

UK society and lifestyles statistics (National Statistics, 2000 (except where noted))

	Population		
Population (millions)[1]		1998: 58.7	2020: 60.0
Birth rate (children per woman)[2]		1974: 2.43	1994: 1.74
Male life expectancy (years)		1984: 71.5	1994: 73.9
Female life expectancy (years)		1984: 77.4	1994: 79.2
Over 65s (millions)[3]		1997: 12	2020: 16
Annual migrant inflow (thousands)		1971: 200	1999: 450
Annual migrant outflow (thousands)		1971: 240	1999: 268
	Households		
Average household size (persons)		1961: 3.1	1995: 2.4
Single person households (% of all households)[4]		1984: 10	2010: 40
Housing stock (millions)		1972: 19.7	1996: 24.6
Marriages (thousands per year)		1984: 395.8	1995: 322.3
Divorces (thousands per year)		1984: 144.5	1995: 155.5
Cohabiting couples (millions)[4]		1996: 1.56	2021: 3
	Childcare		
All day nursery places (thousands)		1987: 60	1997: 202
Registered childminders (thousands)		1987: 153	1997: 379
Playgroup places (thousands)		1987: 433	1997: 413
Children in single parent families (% of all children)		1972: 7	1998: 21
	Employment		
Men in employment (millions)		1984: 14.1	1998: 14.9
Women in employment (millions)		1984: 9.9	1998: 12.0
Full/part-time teleworkers (thousands)		1997: 987	1999: 1325

Other sources: [1]United Nations, 1999; [2]Eurostat, 1996; [3]Engineering Council, 1997; and [4]Scase, 1999.