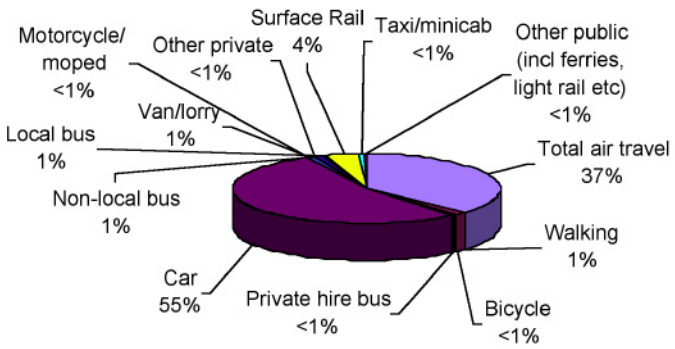
Taking Stock
Fact sheet 1: Transport

TAKING STOCK
managing our impact

Mobility is the basis for modern lifestyles, and transport is the 'maker or breaker' of cities and regions. But the transport system is increasingly dysfunctional - it is breaking local and global environmental limits, and future trends are set to bring the system itself to a halt. The long-standing link between economic growth and transport growth has somehow to be 'de-coupled'.

Most people now agree on this, but would prefer to see other people's travel restricted before their own. The 'predict and provide' philosophy is over in the UK, at least in principle, and there is a new generation of local transport plans and partnerships for an 'integrated' transport system. But will this be enough to contain the inexorable demand and desire for mobility ? It is relevant that the main high street of the SE region, the M25, is the most seriously over-loaded piece of the national infrastructure. We cannot provide all the answers here for this hugely controversial question, but we do aim to build bridges between the no-win trends of 'business as usual', and the win-win opportunities of a more sustainable future.

Figure 1 (below): Proportions of distance travelled by different transport modes



Key facts

The average distance travelled on all forms of surface transport by South East residents was 13,100 km per person per year, or 36 km per day per person. 85% of the distance was by car, 6% by rail, and 3% by bus. This figure divides into those people with very localized lives – the old and the young – and others who travel much more.

Half of all journeys are for leisure / personal business, and two thirds if shopping is included. Commuting and business are 23% for males and 15% for females. 83% of households have at least one car or other vehicle, and 37% have two.

The average person in the South East region travelled 7,600 km by air per year, of which 97% was international travel, and 26% of this was within the EU. Residents in the South East spend more on holidays per person than in any other UK region, averaging almost £500 per person in 2000, although this varies greatly between different socio-economic groups.

See Figure 1 for overall transport breakdown.

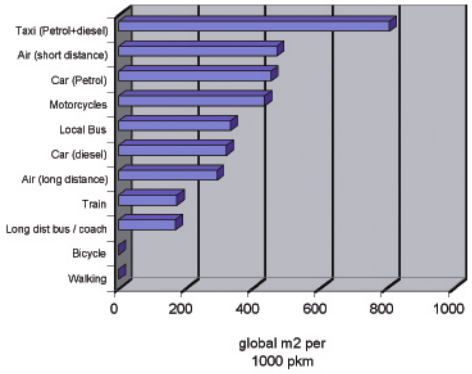
For walking the reported figure is 304 km per person – less than half a mile per day (although there are questions on how this is measured). Cycling, the most energy efficient mode of all transport, is an average 74 km per person per year, or one mile per week per person. Given these trends it is not surprising that obesity is a growing problem.

Passenger transport in the South East used a total of over 6 million tonnes of fossil fuels. The majority of this is used by cars (53%) and planes (39%). If hidden flows associated with fuel production are included the total material flow is 6.9 million tonnes or 850 kg per person per year. The result of the combustion of this amount of fuels was CO_2 emissions of nearly 24 million tonnes per year, or 2.9 tonnes per person. Air travel for SE residents used a total of 2.5 million tonnes of oil, with CO_2 emissions of 7.9 million tonnes per year.

From an ecological footprint (EF) perspective transport as a sector is centred on the consumption of fossil fuels, the resulting carbon emissions, and their direct relationship with the footprint. Real land area requirements are very small compared to energy land for transport. The highest impact comes from the use of cars followed by air travel.

- The total EF of surface travel is 0.53 gha per person, of which 92% is from cars. The total EF of air travel is 0.25 gha per person per year.
- The total EF from all passenger transport is 0.78 gha per person, or 11% of the total aggregated EF for the region.
- The total EF of freight transport is 0.6 gha per person, or over three quarters of the total for passenger transport. This includes distribution within the SE region and UK transports as well as imports destined for consumption in the South East.

Figure 2 (below): Relative EF factors of main transport modes, per thousand passenger kilometres.



The relative efficiency of different transport modes is a key factor (See Figure 2): taxis are by far the least efficient on a per person per kilometer basis (assuming one-way trips), followed by short-haul air and petrol cars. Long distance coach, rail and long distance flights are relatively efficient. The net effect of course depends on the distance travelled, which in the case of air travel, can be very large giving rise to a correspondingly large impact. The reliance on fossil fuel oil is likely to change with new technologies including gas, vegetable oil, hydrogen, electrical power, and various hybrids of these, but the pace of change and the resulting impacts are hard to predict.

Policy background

Trends and projections in transport are the subject to many engineering models and policy studies. The current forecasts in traffic growth are consistent with recent evidence, despite the government's goals in the 10 Year Strategy for transport.

- In recent decades the overall demand for surface transport has been closely linked to economic growth at 2-2.5% growth per year (i.e. a 30-40 year doubling time). Most 'business as usual' projections continue these trends.
- Light commercial transport is growing at a faster rate than passenger, at 3-3.5% per year.
- Air travel is growing at the unprecedented rate of 5-6% per year, with a doubling time of less than 15 years.
- Increasing the rate of growth are affluence / lifestyle factors; technology improvements; the falling price of fuel; and induced demand, for instance from internet-enabled business activities and social networks.
- Restricting the rate of growth are physical limits and infrastructure congestion; time constraints on the part of consumers and businesses; government pricing and fiscal policies; and not least, environmental objectives which may encourage regulation and market measures.

In terms of projecting these trends, a very simplified set of transport scenario trends and drivers can be structured as follows:

- Vehicle occupancy: Basically, the higher the occupancy, the less the vehicle movements and the greater the efficiency. This occupancy factor will be influenced by technology, information systems, demand management, green travel plans and so on.
- Passenger travel demand intensity (economic): This is an overall measure of the linkage or 'decoupling' of economic growth from travel demand.
- Public transport proportion of all transport: This is the holy grail of the 'modal shift'. It works at different geographical scales, e.g. rapid shift is possible in Central London, but much more difficult in the diffused economy and social networks of the SE, where orbital and cross-country movements are dominant.
- Vehicle energy efficiency: Subject to fuel and engine regulations and fiscal measures at UK and EU levels.
- Vehicle new / existing stock: i.e. the turnover effect, size of the stock, and any effects on vehicle efficiency which may be higher in new vehicles.
- Alternative fuels percentage: This includes a complex set of combinations and transformations from one medium to another: e.g. gas, renewable oil, hydrogen and other forms of electric power.

In the full Taking Stock Project Report we consider four scenarios for each sector, ranging from high growth (Factor 0) through business as usual (Factor 1) to low growth (Factor 2) and finally a 'Factor Four' scenario which represents a more sustainable alternative involving more efficient use of resources and a reduced ecological footprint. The Factor Four scenarios are designed to achieve a 40% reduction in EF by 2020, and a 75% reduction by 2050, in line with the 'halving resource use – doubling efficiency' targets first set out in the book Factor Four published in 1997.

Possible future scenarios

High growth scenario (F-0)

Transport is increasingly privatised and there is a new generation of large scale road building on private finance lines. Growth in transport demand is unrestricted, although a market driven approach involving direct charging increasingly means differential access to roadspace and public transport according to ability to pay. The ability of big business to make big investments is seen in the increasing scale, integration and privatisation of transport and development, regionally, nationally and globally.

Business as usual scenario (F-1)

For transport infrastructure, a planned management on both supply and demand sides results in a more sophisticated system, where users and providers are in continuous networked contact. While the public policy objective was to support public transport, private cars still show a greater facility for efficient 'self-organizing' systems, and now that congestion management and differential pricing can be organized in real time, the benefits of car travel are even greater. Sharing and leasing of cars are more widely available. The effect is to enable a doubling of traffic in all modes over the 50 years, while air traffic multiplies by 5 times.

Low growth scenario (F-2)

The defensive stance of many territories and communities continues to mean the state of the transport system is a huge problem for everyone concerned – users, providers, financiers and neighbours. Congestion soon reaches the point at which it is self-regulating, so car manufacturers in response continue the trend towards self-containment, with mobile in-car leisure, lifestyle and work facilities improving all the time. Public transport deteriorates in terms of quantity and quality. The rate of transport growth declines due to economic slowdown and social division, although air travel continues to double every 15 years accelerated by environmental degradation, restlessness and displacement.

Factor Four scenario (F-4)

This 'win-win' scenario sees the quality and general efficiency of transport increase rapidly. Quality of life is key, as people derive greater happiness from less travel in a more localized lifestyle. Integrated accessibility (walking, cycling, train, bus, multiple occupancy, single occupancy) is the basis for new housing developments. The demand for travel is stabilized and in some areas reduced, as more people live and work locally, and local communities offer more in the way of cultural identity. A worsening of some aspects of the transport system may result, as communities reject the dominance of roads, and increased congestion may worsen emissions. Property values will reflect car free zones and access to urban transport hubs. Air travel will continue to grow, albeit at a slower rate, as one of the features of the community-oriented society is the desire to share global cultures and kinship networks.

Policy implications

Transport can be seen as an endemic contradiction in late-industrial society, which national governments appear to be powerless to solve. It is not surprising that the South East region does not possess the power or the resources to provide real solutions. However there are various kinds of enabling measures which might combine to have some tangible influence on what are otherwise problematic trends, for example:

- A multi-sectoral regional and sub-regional integrated transport strategy would use the combined weight of public purchasing for bargaining power, expertise and added value.
- Incentives for clean technology to reduce emissions.
- Diversification of vehicle ownership and access.
- Integration of diverse transport networks.
- Coordination of supply and infrastructure with journey demand and cultural mobility.
- Use of ICT as the catalyst for integration, diversification and coordination.
- Demand management: Social economy networks for car and lift sharing; green travel plans; coordination of public transport, etc.

As in other sectors, it is clear that the main agenda for transport strategy will be constructed on a range of social and economic objectives, and it is to be hoped that environmental and resource objectives can be combined as a win-win case. Regional transport policy aims to do this by bridging national level policy and taxation and sub-regional/local investment, but it is currently mainly aspirational.

Overall, the current evidence appears to show huge difficulties in even slowing the rate of growth in transport demand. The majority of external pressures are against any such constraints, and rather encourage the spread of travel to social groups which at present are relatively localized – the old, the young, the sick, differently abled and the less affluent.

The implication is that some level of trade-off may be necessary between the transport sector, where factor four type reductions are very difficult, and other sectors, where F-4 reductions are much easier. Direct energy to buildings in particular is one where rapid reductions are possible and desirable for all parties involved.

For further details of our findings on transport see the full Project Report at www.takingstock.org.uk

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