

~ Discussion paper ~

---

## **The Real Cost of Transport**

**John Newson**

**The modern transport system is extremely extravagant and costly for what it actually delivers and there has been a collective denial about its real cost**

**It is literally costing the earth**

**As European countries struggle to control mass mobility, the new economies in Asia and Latin America are attempting to drive down the road of the 20th century. Too many are intending to travel a route too costly for the Earth to sustain; hence the journey is likely to be short.**

**The report shows that we cannot all have our foot on the accelerator.**

**We have lived well with much less transport, and we urgently have to rebuild these low energy systems, so societies can progress in a just and sustainable manner.**



## **Background information**

The writing of *The Real Cost of Transport*, by John Newson (2009) was inspired by a request from Sir Mark Tully, author and broadcaster based in New Delhi.

John [PhD technology policy, University of Aston] is a transport consultant and campaigner in Birmingham, England's second city'.

### Key points in the paper:

Britain had a far more efficient transport system during the first part of the 20th century which was over-whelmed by the onslaught of cheap oil and the mobility that it promoted.

There is an urgent need to rebuild these systems in Britain and other countries, so that societies can progress in a just and sustainable manner.

Examples of attempts to reverse this chronic over-dependence, their costs and benefits, are examined.

The new economies in Asia and Latin America are also attempting to travel a route far too costly for the Earth to sustain, hence the journey is likely to be short. Developing countries have the chance to leap-frog our lifestyles to something much more satisfying and sustainable

The hope is that the Two Thirds World can avoid the mistakes of the 'West' instead of imitating them, with disastrous consequences.

-

This paper - about the transport of people - will be complemented by Rianne ten Veen's valuable updating of the Caroline Lucas, Colin Hines 2002 report, *The Great Trade Swap* which calls for an end to the unnecessary long distance transport of food and animals, the creation of shorter food chains, more local processing, measures to promote direct buying schemes, developing regional sourcing co-operatives by farmers and retailers and providing economic disincentives for long distance food haulage.

**Greening the North Fund: October 2009**

<http://neweranetwork.info>



# The Real Cost of Transport

By John Newson (2009)

## Contents

Introduction	3
Rear View	3
Cars by Design	4
Cycle Crash	6
King of the Road	7
Going Dutch	8
What does it Cost ?	9
Speed	10
Space	10
Danger	11
Health	12
Fuel and Fumes	13
End of the Road?	14
Taking to the Skies	15
A High Energy World?	17
A Transport System for Everyone	17
Looking Forward	18
References and sources	19

## Summary

Transport is not a good, it is a cost - and should be assessed as such. The modern transport system is extremely extravagant and costly for what it actually delivers, but there has been a collective denial about the real cost of transport.

This report will analyse the cost of transport: personal, social and environmental, focusing on Great Britain as a prime example.

It is literally costing the earth - yet, each journey seems cheap, and so, by millions of individual decisions, the whole mass of mobility continues to grow and grow, until it has come to seem inevitable.

Looking back at the history of Britain, we will see how the rather efficient transport system of the first part of the 20th century was re-built for cheap oil and the mobility that it promoted.

We examine some examples of attempts to reverse this over-dependence on high energy transport, with their costs and benefits.

As European countries struggle to control mass mobility, the new economies in Asia and Latin America are attempting to drive down the road of the 20th century. Too many are intending to travel a route too costly for the Earth to sustain; hence the journey is likely to be short. The report shows why we cannot all have our foot on the accelerator.

Fortunately, we have always known how to live well with much less transport, and we urgently have to rebuild these low energy systems, so societies can progress in a just and sustainable manner.

The hope is that the Two Thirds World can avoid the mistakes of the 'West' instead of imitating them, with disastrous consequences.

## Introduction

Transport is sold to us as a benefit, a form of pleasure: speed, convenience and freedom. Just selling the idea of mobility is an industry in itself. Paid advertising, in every form of media, is dominated by travel and motoring ‘offers’.

A lot of people are paid to tell us about the benefits of going further and faster, but it is probably no-one’s job to explain the cost that we really pay for all this mobility. This is odd, because transport is what economists call an ‘intermediate good’, something useful only because it allows you to access something actually desired. In other words, transport is all cost. Ideally, everything would be within walking distance. The more transport we use to access what we want, the more costly and inefficient our way of life has become. Rationally, if we could consume less transport, we would all be better off.

Modern, high-energy transport is extremely inefficient. For example, to meet their needs, the average person in the United Kingdom now travels 7,000 miles in a car (11,000 km) per year,<sup>1</sup> equivalent to driving to India and back. We should ask what this level of mobility is really costing us? How did we come to be so transport dependent? Can we make the transition to a more efficient and less polluting transport system? For most of the world, is there still time to avoid the road we have taken and to divert fewer resources to unnecessary transport?

## Rear View

Britain was ‘The First Industrial Nation’<sup>2</sup> and the first to be urbanised. By 1850 most Britons lived in towns. Industrial Britain went on to create seven cities by 1900, each having over one million inhabitants - with London as a monster of eight millions administering an empire on every continent. The other great capital cities; Paris, Berlin, New York, Tokyo, all functioned without cars.

The author’s grandfather told a good story about the excitement of seeing his first motor car (in outer London in the late 1890s). Short distances you walked or cycled, then there were trams (electric street cars), buses, the underground railway, and the suburban train network. If you had the money, you could get a train to anywhere in Europe from the main London stations. 19<sup>th</sup> century civilisation appeared to have solved the transport problem, by collective provision.

100 years later, in essentially the same towns and cities, and in the same crowded island, Britain struggles to accommodate 30 million private vehicles<sup>3</sup>, enough to transport the whole population by car, simultaneously. London changed, from a city where the car was a curiosity, to one blocked solid with cars by the 1960s, crawling at walking pace.

It was the United States of America that invented mass motorisation. The very Constitution of 1776 had promised “liberty and the pursuit of happiness”. In the early 20<sup>th</sup> century, most of it was still in the age of the horse, and was thinly inhabited. The USA had, and still has 100 times more space per person than Great Britain. Americans had a space problem, for which Henry Ford offered a solution; a ‘horseless carriage’ to get farmers into town, at a price they could afford.<sup>4</sup> In many states, the fuel just gushed out of the ground.

Britain and Europe resisted the car much longer. Motor cars were seen as an intrusion and a public danger. Someone could be hurt! In Britain, the Red Flag Act required a man with a red flag to walk in front of the vehicle to give warning and keep its speed to a safe 4 mph.

This law was repealed in 1896 and the responsibility then put on everyone to get out of the 'motorist's way'. By 1929, a Pedestrians' Association was formed; to protest that 6,000 people a year were being killed on the now 'dangerous' roads, half of them pedestrians<sup>5</sup>.

In modern Britain we have now become used to 30,000 people being seriously injured or killed every year by vehicles.<sup>6</sup> These casualties are all termed accidents'. Road safety advice now largely blames the victims, and urges them to be more careful, rather than tackling the source of the danger, i.e. motor vehicles at speed.<sup>7</sup>

44% of British households have one car, with another 29% having two or more cars, according to the Population Census 2001<sup>8</sup>. There are 30 million cars for 60 million people. From the family car, we have moved towards the idea of a car for every adult. This makes the UK one of the most car-dependent societies ever to have existed according to the Integrated Transport Commission<sup>9</sup>. The objective of transport policy has now become 'how to get people out of their cars'.

## Cars by Design

100 years ago, the private car was experienced as dangerous, inconvenient and unnecessary. Motorists were mocked for having such an impractical way of getting around. There were no motor roads, petrol stations, car parks, traffic lights, or supermarkets. For cars to become convenient, even essential, required a massive programme of investment and engineering that lasted for generations. Cities for people had to become cities for cars.

The Road Lobby was organised by 1932, as the British Road Federation, bringing together the companies who made the cars and those who sold the oil<sup>10</sup>; but the Lobby needed the devastation of the 2<sup>nd</sup> World War to take its chance to convert the car from a luxury to a necessity. Post-war Europe's cities were in ruins. Everything American was admired. People were tired of sacrifice and wanted individual satisfaction. The British civil engineers visited German autobahns and American freeways and believed they knew the future – radial roads, orbital roads and a car for every family.

In 1963 the Minister of Transport approved the drastic plan proposed by Dr. Beeching, to close 40% of the rail stations of Great Britain. This has been called "The Great Railway Conspiracy"<sup>11</sup> and was met with vigorous, but unsuccessful protests. Instead of replacing steam trains with diesel or electric ones, lines were closed. The train was no longer a way of getting to every town, from every town. 100s of miles of line closed every year. Outside the crowded South East of England, rail dwindled to an 'intercity' network.

The transport minister was Ernest Marples, who had private interests in the road building industry<sup>12</sup>. The previous year (1962) he had announced a 1,000-mile national motorway-building programme, which was complete by 1971 - when another 2,000 miles were announced<sup>13</sup>. Motorways were to be built with public money, using the power of the state to remove all obstacles to the private motorist, who in Britain was to enjoy motorways free of any toll or charge. Roads were to be designed only for fast traffic that stopped for nothing and dominated the landscape. They turned the car from a local option to a fast and cheap way of making longer journeys as well. It was known from America that the more road space you provided the more traffic you got. At first, British motorways were empty, but demand for free road spaces duly rose to meet the supply.

The methodology of the Department of Transport was called “predict and provide”.

1. Assume higher levels of car use in the future,
2. Provide for them, by road building,
3. Induce the level of car use provided for.

Every local authority was expected to draw up such plans. The report by Colin Buchanan ‘Traffic in Towns’<sup>14</sup> presented to Minister Marples in 1963, had reported that the demands of traffic in towns would be insatiable, no matter how much space was found - but the new policy was aimed at accommodating it, anyway.

***“We have to rebuild our cities.***

***We have to come to terms with the car”***

*Transport minister Ernest Marples 1960,  
to the Conservative Party Conference.*

The result of this long and very expensive experiment is the finding that it is impossible to ‘satisfy’ the demand for driving or ‘cure congestion’ by road building. The Westway into London in the 1970s showed this, and the M25 orbital motorway around London was famously full as soon as it opened in 1986. Only in 1994 did the Department of Transport finally admit that building roads generates more traffic - about 20% more for the average road scheme over the long term<sup>15</sup>.

City streets had to be conquered for the car, which is greedy for space. Its most effective alternative was the electric tram system. 40 of these systems were destroyed in British towns between 1945 and 1965<sup>16</sup>. Vehicles carrying up to 100 passengers were said to be ‘in the way’ of vehicles carrying 1 or 2 people. The tram, that had been an everyday and efficient means of making journeys, became a nostalgic memory.

This closely followed the pattern in America, where General Motors car company was found to have been involved in the closure of 100 tram (street car) systems in 45 cities plus the Los Angeles rail system uncovered by a US Senate Committee in 1975<sup>17</sup>. In Britain, local government did the job of killing this technology.

The buses that were supposed to replace Britain’s trams lacked their own track-way and were soon blocked in by rising numbers of cars, becoming unreliable and slow. Bus use began its long decline. Since a bus at average loading holds as many passengers as a line of 22 cars, the shift from bus to car was one from an efficient to very inefficient use of road space.

The change from public transport to space-eating private transport has generally been described as the result of people’s spontaneous decisions to buy cars, but in reality it was the planned reallocation of road space that was the precondition for the mass motorisation of British towns.

Every urban street was to be a motor road and re-engineered to facilitate traffic flow. Pedestrians were pushed onto footways and taught to give way to cars for their own safety.

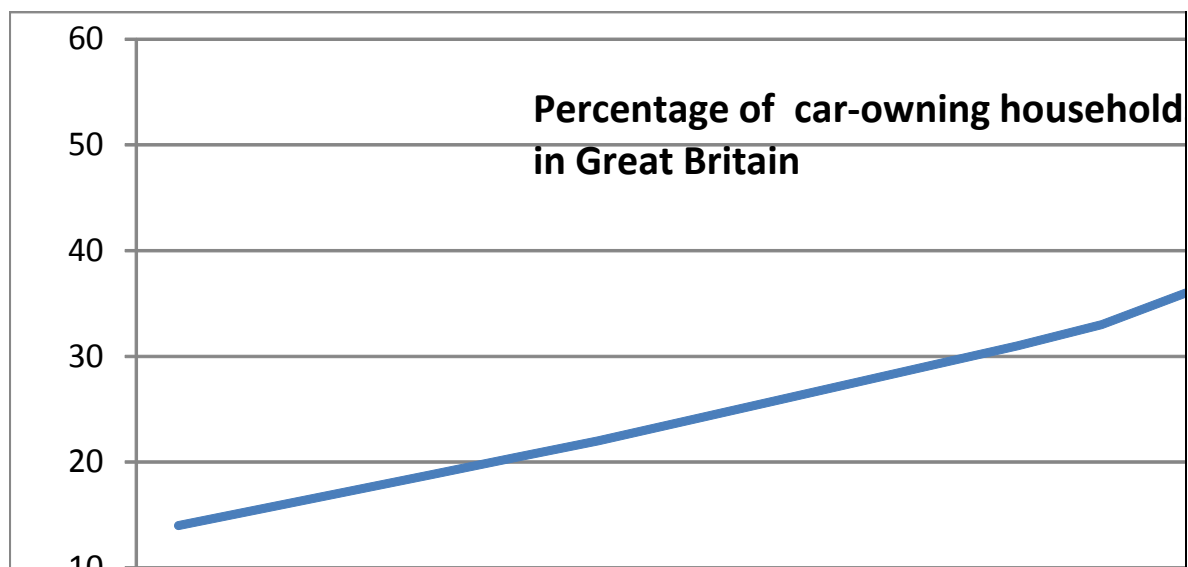
Streets ceased to be children's playgrounds, or places where adults socialised. Mobility, at speed and in a metal box, had the priority. The streets also became car parks. British life changed in one generation, from an outdoor experience of 'everyone's town', to an indoor experience in 'the family home'. Streets came to divide people instead of connecting them. The poorest communities got the worst effects of traffic as the middle classes drove in from the new car-dependent suburbs.

## Cycle Crash

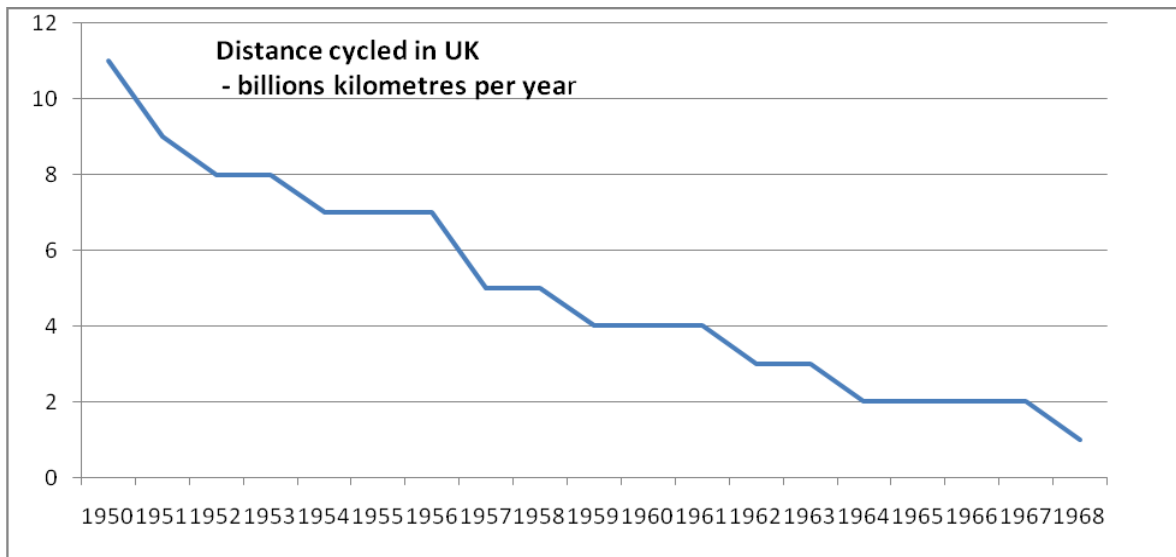
Cycling is possible for the short journeys that are a large proportion of trips within towns. The bicycle is cheap, convenient and accessible to almost everyone. Pre-car towns were full of cyclists. But traffic danger and rising likelihood of an accident deterred people from cycling in Britain, and this was long before most people became car owners. It was not the attraction of the car (or the weather) that defeated the bicycle on British streets, but fear of being knocked down.

The graphs below illustrate how between 1950 and 1968, the proportion of car owning households tripled<sup>18</sup>, while in the same period, the length of journeys by bicycle fell by 90% on the 1950 level<sup>19</sup>.

It is important to recognise that in 1968 a majority of households still had no car, but they had effectively lost the right to cycle safely, along with the members of car owning households who were not drivers (mostly women and children).



Source:<sup>18</sup>



Source:<sup>19</sup>

Cycling has declined steadily in Britain for 70 years, so that in some areas it is almost unknown today. A study in 1973,<sup>20</sup> which was repeated and confirmed with later data,<sup>21</sup> found a close relationship between how dangerous a British town was for cyclists and how many people ‘chose’ not to cycle. The ‘dangerous’ town of 1973 Britain is now typical of all towns. People’s not cycling is a rational response to a perception (correct) that it is dangerous. For example, about half the working residents in Birmingham need to travel less than 5km (3 miles) to get to their work, but only 1.5% of residents cycle to work, or 1 in 75 commuters.<sup>22</sup>

The number of cycle (and pedestrian accidents) has fallen steadily in the UK – not because streets have been getting safer, but because cycling and walking have become more and more unattractive and dangerous. Journeys walked and cycled fell 26% between 1980-2004.<sup>23</sup> In the 2007 National Travel Survey, 42 % of respondents said they had not made a walk of 20 minutes or more at least once a week.<sup>24</sup> The absolute numbers injured on our roads have tended to fall, but the rate of injury remains frighteningly high. In 2007, 16,000 cyclists were recorded as killed or injured on roads in Britain, an increase over the 2004 total.<sup>25</sup>

## King of the Road

There has been a political face to motorisation in Britain. A new kind of citizen appeared in the 20<sup>th</sup> century - the ‘motorist’, assumed to have only a single desire, even a right, to demand ever more space, money and resources. They formed a new and very powerful alliance with the car and oil companies. Millions of people joined the two big motoring organisations for the insurance cover and breakdown service, but were represented as ‘demanding’ more and more roads.<sup>26</sup> Every car counted electronically on the road by traffic engineers has been taken as a vote for more roads. Popular newspapers have systematically attacked any attempt to “restrict motorists’ rights”. In 2005 the Conservative party presented itself in the general election as “the motorists party”.

Politically, we have simplified transport issues, and the supposed needs of “the motorist” have become dominant; although what people really want, revealed by public opinion surveys, is a much more complex picture when other options are offered to them. People without cars have been largely excluded from decisions and this now seems normal, a state of affairs called by one author “car supremacism”.<sup>27</sup>

***Car Supremacism** = the belief that the needs of car drivers should predominate over other people and other needs.*

Yet the effort has been in vain. Most motorists are still dissatisfied, according to a recent survey that found two thirds hate driving in their own town, due to ‘congestion’ and ‘lack of parking spaces’.<sup>28</sup>

## Going Dutch

Britain is a country which largely accepted a vision of ever-rising ‘inevitable’ car use and has tried to accommodate it. Our neighbours in the Netherlands had a real political debate and reached a different conclusion, with different outcomes. This suggests that there was, and still is, a choice to be made.

From 1956, the Netherlands reviewed its transport policy every 10 years and considered the future that it wanted to create. The Netherlands, as an even more densely populated country than the UK, realised that the space required by traffic could eat up the Dutch countryside and historic towns, and they determined to prevent this by sustaining the more efficient alternatives.

- Tram systems in Amsterdam and The Hague were not taken out, but modernised.
- Rotterdam, rebuilt from the bombed ruins post-war had a new public transport system.
- The railways were steadily improved, not closed or privatised as in Britain.
- Cyclists were given protected cycle ways on every street.
- Municipal and national authorities have worked together over 50 years to make car-free travel possible and attractive for their citizens.
- Dutch towns have remained compact, due to the lower use of the car, allowing more trips to remain of walking or cycling length.

The effect of all this investment on people’s behaviour is shown in the table below.

<b>Comparison of transport in Netherlands and Great Britain</b>		
	<b>UK</b>	<b>Netherlands</b>
Travel by <b>Car</b> - kms per person per year (2003)	11,370	9,010
Travel by <b>Rail</b> - kms per person per year (2003)	690	850
Travel by <b>Bicycle</b> – km per person per year (2000)	70	830
<b>Fatalities in road accidents</b> per year per million inhabitants	<b>54.5</b>	<b>44.6</b>

Source:<sup>29</sup>

The two countries have similar levels of car ownership, but British people use their cars substantially more. The comparison shows that on average they drive 2,360 kilometres further by car every year. While car use grew in Britain between 1990 to 2003 by an average of 0.7% every year, in the Netherlands it actually fell by 0.3% a year<sup>29</sup>. The British use trains less. The difference is most striking, however, over short journeys within towns. The Dutch use bicycles about 12 times as much as the British. Despite the high level of cycling (regarded as a 'dangerous' activity in the UK), Dutch people are considerably less likely to be killed in accidents on the road.

Given a similar climate, society, economy and geography, the Netherlands has chosen a very different transport system from the UK; one that is cheaper, safer and takes much less space. These experiences have proved that driving in one's own car is not a fundamental desire but just one possible behaviour, which depends on what is presented as a convenient and inexpensive journey. Public policy and investment has determined how people behave in the two similar European countries.

### **What does it Cost?**

The costs of transport are born by a range of sources:

- The traveller
- The owner of the vehicle
- Other travellers
- Local residents
- The public budgets
- The wider environment
- The future

Seldom do we consider these costs together.

The car-dependent society assumes everyone must own their 'own transport'. In Britain, 75% of households own one or more cars<sup>30</sup> and this is very expensive. The proportion of the average family budget spent on transport has doubled since 1957 (8% to 16%), according to the Family Spending Survey.<sup>31</sup> By contrast, the proportion spent on food has halved.

Car owners have to pay the cost of purchase and depreciation, repairs, road fund tax licence and insurance. The car is expensive to own and keep on the road, before any journeys takes place. Journeys in it are then rather cheap. The incentive is to get as much mileage out of it as possible. The Automobile Association calculates the cost of owning a mid-price car as £5,000 a year, thereafter the running costs are just 20p a mile.<sup>32</sup>

Not surprisingly, car owning households travel much more than non-car-owning. As car ownership has risen, so has the length of journeys undertaken. Lives are stretched, as longer journeys rather than more journeys are made. For example, people commute further between home and work. Motorways have become daily commuter routes for many people, as the assumption that people live and work in the same town has been abandoned. Some people shop by motorway.

Train fares in Britain do not encourage rail travel, being 50% above the European average and the most expensive in the world.<sup>33</sup> This is unlikely to change, since the services were handed to private monopolies in the 1990s. Decades of under-investment and the false belief that passenger numbers would decline has led to frequently overcrowded and delayed trains.

## Speed

Most journeys are off-motorway and although the car is engineered to travel at up to 100 mph, it is legally confined to 30 mph in British towns, where most journeys take place. Cars compete for road space and slow each other so that actual speeds in town are typically 20mph or less.<sup>34</sup> ‘Commuter races’ have been staged between car, bus, train and bicycle in various towns, such as Birmingham and London. The car does not deliver the shorter journey time in any such experiments.

Where drivers have a public transport alternative, any improvement to driving time will cause people to shift off the public transport and into cars, so removing any temporary gain. Car drivers cannot ‘win’, unless the public transport alternative is removed altogether!

The AA figure for the average cost of motoring in a mid price vehicle in 2009 is £5,000 a year fixed cost and for 10,000 miles driving is £2,000 running costs.<sup>32</sup> To earn this money at an average (median) wage of £24,000 in the UK you would need to work 15 weeks or 600 hours.<sup>35</sup> To cover the 10,000 miles at 30mph driving, = 333 hours but adding time working to pay for the car = 933 hours, so average speed drops to 11 mph or 17.6 kph and much less in town. Counting both time and money slows you to a third of the speed indicated on the speedometer; so the car is no more effective than a bicycle at delivering motion for time and energy invested.

This does not include all the costs which the driver is passing to the environment, other road users and the wider community. The car is a ‘get away vehicle’ for taking the safety, convenience and space of others - without paying.

## Space

A car requires about 170 sq m of tarmac for roads and parking, i.e. about 25 times its stationary footprint according to one calculation.<sup>37</sup> One third of the space in towns is for cars. This space is dead in economic terms, since it cannot be built upon.

Faster traffic requires more space, so urban motorways effectively remove all other land uses. At 60 mph all other uses of the street become too dangerous. It must be an urban clearway, or expressway: no stopping, no pedestrians or cyclists. Such a road severs communities and prevents customers from reaching shops and business. Fast driving contributes nothing economically, but uses prime land. Traffic converges on city centres, where most vehicles spend the day immobile. In downtown Los Angeles, two thirds of land is said to be for moving and parking cars.

Birmingham, England is an example of a city centre that began to die when surrounded by its Inner Ring Road (1970s) ‘. This ‘concrete collar’ has now been partially demolished; recovering streets and pedestrian space, with a dramatic upward effect on property values and level of economic activity - enough to pay for the next section of the Ring Road to be demolished.<sup>38</sup> Apartments and office blocks have been built on former car parks and

roundabouts. As cars are forced out, the economy has returned. By contrast, Glasgow is still building urban motorways in the hope of producing ‘regeneration’.

Cities are blighted by traffic. In Britain the cheapest housing areas are the ‘inner cities’, where the better off have fled to escape the blighted environment, leaving the poor (who mostly don’t own cars). By moving to the suburbs or villages, people became car-dependent

commuters, who make the problem worse. In Birmingham most people who work in the city travel into it every day.<sup>39</sup>

The average car journey carries only 1.56 people. Overall 64 % of people making a car trip are the drivers, but for commuting, this increases to 83 % of those travelling by car,<sup>40</sup> so our transport system largely moves empty seats around.

The efficiency of cars could be increased by lift sharing, encouraged by ‘multiple occupancy’ lanes on main roads. The British double-decker bus carries up to 70 passengers, which is equivalent to a line of 58 cars, so bus only lanes are easy to justify. The equivalent numbers by walking or cycling require only a path. On space grounds alone, we could conclude that British towns would work much better if cars were only a small part of the traffic mix.

## Danger

<b>Road deaths by means of transport used - Great Britain (Deaths per 100 million hours of travel)</b>				
Bus passenger	Car passenger	Pedestrian	Cyclist	Motor cyclist
<b>19</b>	<b>87</b>	<b>160</b>	<b>640</b>	<b>4,700</b>

Source – Road Casualties Great Britain 2006<sup>41</sup>

This table shows the externalisation of danger to other road users. There are winners and losers from motorisation. Being in a car is substantially more dangerous than using public transport, but walking is twice as dangerous as riding in a car, and cycling is over seven times as likely to result in your death as being in a car. The 50% of car trips in British towns that are under 3km (1.8 miles) in length<sup>42</sup> are explained in part by people using cars to protect themselves from other people’s cars. The healthy modes of transport are effectively suppressed by the dangerous traffic environment. Efforts to ‘promote’ walking and cycling as ‘healthy options’ have to be put in this context.

The main cause of injury to children is being struck by a vehicle - both in the UK, and in the world. Britain is the 11th worst for pedestrian deaths, out of 24 most developed economies, but for child pedestrian deaths the UK is 17th out of 24.<sup>43</sup> 2,000 children were killed or seriously injured on Britain’s streets in 2006.<sup>44</sup> In poor ‘inner city neighbourhoods’ of Britain the risk is greater than in other areas.

Most children are not allowed to walk or cycle to school as it is seen as being ‘too dangerous’. The number of children travelling to school by car over the past 20 years has doubled, although 80% of children driven to school by their parents would rather walk according to a recent study.<sup>45</sup> 20% of peak hour traffic consists of parents driving their children to the school gate.<sup>46</sup> However, those schools in London that have adopted travel

plans for parents have seen the number of car journeys fall by 6.4 % - equivalent to 3.3 million annual car journeys.<sup>47</sup>

Some people conclude that the 30mph speed limit in built up areas should be reduced to 20mph, similar to that in most North European countries (Roadpeace and '20's plenty' campaign). Such a slow down would reduce child pedestrian casualties by two thirds according to a Health Development Agency report in 2003.<sup>48</sup>

## Health

Air in cities is effectively diluted exhaust fumes. Birmingham was the first city in which it was proved that lead in petrol was damaging children's brains. Having phased out lead, we have become aware of the effects of fumes on children's lungs. Childhood asthma rates have been found to relate closely to the number of vehicles using the area, and rates of asthma in the UK are the highest in Europe. The rate among young people is six times higher than it was 25 years ago.<sup>48</sup>

The 30 minutes a day of exercise that is recommended by the British government's Chief Medical Officer is not taken by 60% of men and 75% of women.<sup>49</sup> The report noted that this is connected to the fact that walking and cycling levels have declined (by 26% between 1980 and 2004).

70% of adult men and 55% women are now overweight in England. Weight problems already cost the wider economy in the region of £16 billion, and that this will rise to £50 billion per year by 2050 according to recent projections.<sup>50</sup>

17% of British children are now obese, but on current trends, 65% of children will obese or overweight by 2050<sup>51</sup> and there is a concern they will not live as long as their parents. The 60 minutes of exercise a day that are recommended is not being provided for today's inactive childhood.

Health promotion professionals now advise that Britain has become an 'obesogenic' environment.

**Obesogenic;** *adjective - likely to cause someone to become excessively fat. Macmillan English Dictionary*

We are not eating more food than previous generations, but we are getting much less exercise. Some people now drive to the gym to 'work out' on treadmills and cycling or rowing machines, but British people will have to get out of their cars and use their legs if they want to get fit and combat heart disease. "Cars make you fat" as Lyn Sloman has put it bluntly.<sup>52</sup>

As we become more 'car dependent', local facilities have become not 'economically viable' and closed - post offices, cinemas, hospitals, food shops. Such facilities have moved to edge of town locations for easy car access. Towns have increasingly separate into housing areas, retail parks, office and industrial parks. Then, people must use a car, as the only way to reach everyday destinations. The unhealthy has become compulsory.

**Car Dependency** = *the inability to reach destinations except by car (may be real or perceived).*

## Fuel and Fumes

The petrol or diesel engine is a 19<sup>th</sup> century machine. It is a heat engine, which needs constant cooling, because it is inherently inefficient in converting fuel to motion. Motor vehicles generally travel in traffic much slower than the engine's design efficient speed.

The most fuel efficient cars on sale are 30% more efficient than the least efficient, according to the King Review on Low Carbon Cars.<sup>53</sup> However, the electric motor is 4-5 times as efficient compared to the petrol engine. This implies that new fuels, such as biodiesel or liquefied natural gas, would be better burned in an electric power station (where any waste heat can be captured and used), rather than in car engines. Bio-fuels may just transfer carbon emissions from transport to agriculture and make the world's hungry compete with its motorists. Electricity in Britain is largely coal-derived, so high carbon and there are substantial losses in transmission. Pushing individual metal boxes around will always be a high energy activity.

The average mileage of a car in Britain produces about 2 tonnes of carbon dioxide a year<sup>54</sup> along with other greenhouse gases, such as ozone and nitrogen oxide. The UK parliament has passed a Climate Change Act, based on the best science, which commits the country to reducing carbon emissions by 80% by 2050.<sup>55</sup> The transport sector 22% emits of total CO<sub>2</sub>,<sup>56</sup> and to achieve its share of the carbon reduction target will be extremely challenging, using the current system of 30 million steel boxes.

Past growth in traffic levels cannot be sustained as we reach the limits of space, energy and money for such a demanding technology. A doubling of UK traffic levels by 2050 was projected by the Eddington Transport Study.<sup>57</sup> By 2028, a 28% increase was predicted. This was based on past trends that have already stalled. Following an oil price spike of \$150 dollars a barrel, and the resulting global economic recession, UK traffic levels are falling in 2008/2009.<sup>58</sup> There is a collapse of sales of new and used cars, with the least fuel efficient being most affected. Only a government subsidy of £2,000 to buy a new vehicle has kept sales alive.

The re-introduction of electric trams has been promised in Britain since the 1970s - but to find space for them, the car would have to give up road space. The alternatives of wholesale demolition of buildings have proved too expensive and politically unpopular. Progress has been very slow, for example Birmingham has managed to accommodate one tram line in 30 years (on a former railway line).

People do not want to live in a heavily trafficked environment, and this is a major factor in the big declines in population that most British cities have suffered over the last 40 years. Residents, who pay city taxes, have been forced out by out-of-town commuters and the traffic they generate.

## End of the Road?

The cost of motoring to the driver has been falling for many years in real terms. The car is actually a device for externalising inconvenience, danger and cost to others. Its over-use is the result of unrealistic pricing, roads being 'free at the point of delivery'. Not surprisingly our towns and cities are now full up. The illusory 'free ride' is coming to an end.

Road pricing, or congestion charging, is the obvious way to pay for the space used by cars on public roads. The mayor of London introduced a 'congestion charge' in 2003 of £5 a day on all vehicles entering Central London. The effects have been reported.<sup>59</sup> They are that traffic entering the charging zone remains 21% lower than pre-charge levels (70,000 fewer cars a day). There has been a 6% increase in bus passengers during charging hours. There has been a 12% increase in cycle journeys into the Western Extension of the zone. £137m was raised from the charges, in the financial year 2007/08, to invest back into improving transport in London. Other results were less pollution and less road casualties. Use of two wheelers and electric vehicles has noticeably increased (being free of congestion charge). London won the opportunity to hold the 2012 Olympic Games partly on the success of this scheme, while Beijing was struggling with congestion and air quality at its 2008 games.

The approach of deterring drivers by making them pay for the space they use has proved politically very difficult.

- The mayor of London, Ken Livingstone, lost his next election after introducing the congestion charge and promising to add an extension area (which the new mayor will abolish).
- Edinburgh, the capital of Scotland, had a popular vote in 2005 and rejected road pricing to pay for public transport improvements.<sup>60</sup>
- Greater Manchester was offered an ambitious package of public transport investment the UK government (2008), if people also voted for a congestion charge of £5 a day for peak periods. A referendum was defeated in all 10 districts of greater Manchester with 80% overall voting against.<sup>61</sup>

People do not seem to vote for a new tax or charge, and do not trust that the benefits that are promised will really occur. In London, truly comprehensive public transport systems were already in place and people saw the immediate benefit (and there was no referendum).

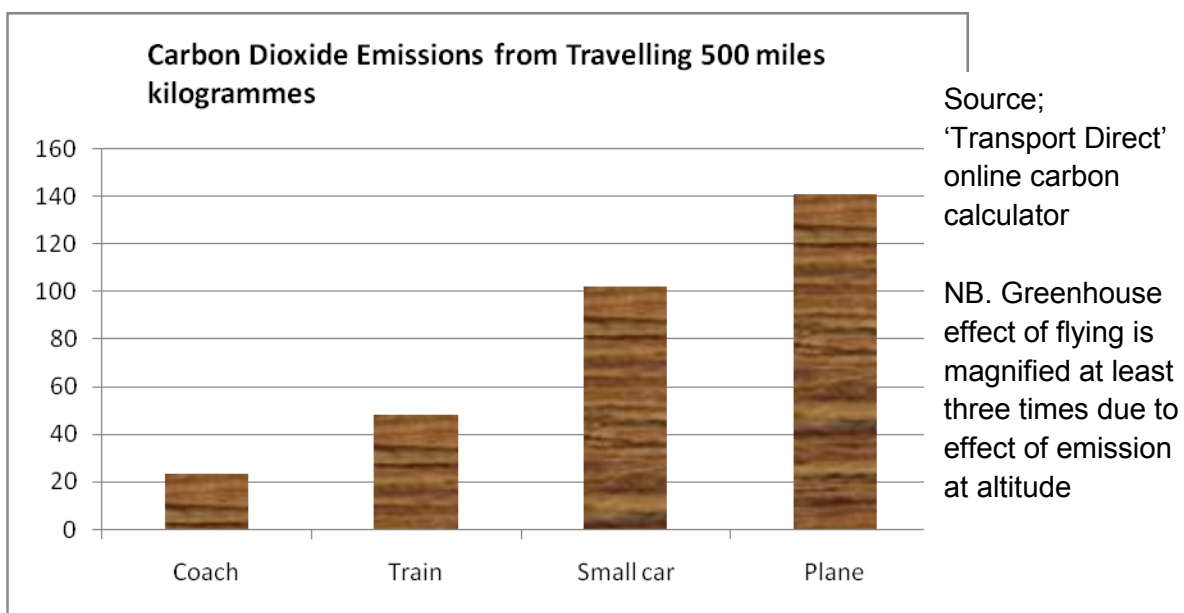
We found out during 2008 how very price-sensitive high-energy travel is. The oil price rose from \$50 a barrel to \$150 – a kind of national road charging through the petrol pump. In Britain there was an immediate effect. When oil production falters, demand pushes up prices and demand falls. Much driving is a luxury and not the necessity we have pretended it to be. A new car is even more of a luxury and British car plants are struggling to stay in business with car sales down 30% in 2008-2009.

There are millions of reluctant motorists. Much driving is unnecessary and not much change may be needed to cause people to switch to other modes of transport. The Sustainable Travel Demonstration Towns experiment in 3 towns has cut car use overall by 9% since 2004.<sup>62</sup> Walking, cycling and bus use were all increased using simple measures that cost only £10 million - very little compared to road building options. We can plan for less traffic, instead of more traffic.

## Taking to the Skies

One way of escaping our congested transport system is by flying. Air services have been introduced between major cities in Britain. This is a wildly extravagant solution, as energy demand relates to weight and to speed, and an aeroplane is by far the heaviest and fastest vehicle we use. Flying externalises its costs to the environment even more dramatically than does driving

Much of the pollution from aircraft is at takeoff and landing, so short haul flights are the most polluting. Greenhouse gas emissions at altitude are understood to have 2.8 times the effect of those at ground level.<sup>63</sup> One flight can produce the same greenhouse gas effect as a year's driving a car, or a year of heating a house.<sup>64</sup> The aeroplane begins to look like a machine designed to destroy the atmosphere - yet in a small island the British have expanded their use of aviation dramatically. Currently aviation accounts for 13% of the UK's CO2 emissions<sup>65</sup> but if the past growth in flying continues unchecked it would use the entire national CO2 target for 2050.<sup>66</sup>



Thousands of people suffer the 'noise footprint' of living under the flight paths of airports. Every British airport has plans to expand, and the people most affected have become increasingly rebellious. There has been a massive political campaign against a 3<sup>rd</sup> runway at London Heathrow, designed to increase capacity by 220,000 flights a year and add millions of car & taxi movements. The Labour government has approved it, but the Conservative opposition has promised to cancel if elected to power. This new runway at Heathrow is effectively a new airport and would emit as much CO2 as the whole population of Kenya, according to the World Development movement.<sup>67</sup> If this is built, then to keep within the government's commitment to cut greenhouse gases, all other airport expansion around Britain would have to halt. We have literally run out of air.

It has been estimated that one third of the destinations served by London's Heathrow airport are reachable by train, in a day, now that the Channel Tunnel connects to high speed rail

lines.<sup>68</sup> This includes all of Britain and France, and the ‘near Continent’. People fly because the prices are unrealistic and do not reflect the real costs. Air travel does not carry fuel excise duty or Value Added Tax. The subsidised and privileged position of flying is in stark contradiction to the environmental requirement to reduce emissions.

Yet, flying is still very much a minority means of travel, even in ‘rich’ countries. The National Travel Survey in 2007 found that 90% of British people surveyed had not made an internal flight within Great Britain in the last 12 months, and 54% had not made an international flight from Great Britain.<sup>69</sup>

Most people in Britain, as in the world, suffer the consequences of flying, while not enjoying the benefits.

Air travel is even more of a luxury than driving, and even more a phenomenon of cheap oil. The 2008 oil price surge and the following credit crunch are leading to a major contraction in flying. 25 airlines went bankrupt in 2008 because of falling sales of tickets. The flights through UK airports in the 1<sup>st</sup> quarter of 2009 declined by 13% or 6.4 million passengers compared to the same quarter of 2008.<sup>70</sup>

The airline industry helped to create the excess demand for oil that created a surge in prices and stalling of the economy in 2008/09. 70% of flights are leisure flights and very vulnerable to price and consumer demand. The official projection was for an annual growth of 4.5% in air travel through British airports In 2007/2008 from the 1997 Department of Transport Air Traffic Forecast,<sup>71</sup> but actual demand fell through 2008 and 2009.

Worldwide aviation is seeing losses of £5 billion (\$9 billion) from rising energy costs and falling passenger numbers.<sup>72</sup> British Airways has lost £400m in 2008/09 as oil price added £3,000 million to costs and is contracting its operations. A new tax on all takeoffs and landings from November 2009 will have a further impact. The immediate reaction of operators has been to cut fares, but a major collapse of capacity is happening across the aviation ‘industry’.

There is no substitute for aviation fuel in view. There is no way to store electricity with low enough weight for an aircraft. Hydrogen must be produced using some source of energy. Bio-fuels would compete with other uses, such as food. Flying will always be a high energy, high polluting and expensive activity.<sup>73</sup>

High speed rail services are connecting more and more of Europe to London within a day’s travel, using a fraction of the energy and emissions of flying. The communications revolution, in the forms of the internet and video, means we can meet people and even experience faraway places at very low cost, without having to physically visit them.

Companies are cutting business trips in the recession. A warmer climate is making Britain itself a more attractive holiday destination, which combined with the recession means 5 million Britons holidaying here in 2009 compared with 2008.<sup>74</sup>

Yet plans for airport expansion across Britain have powerful economic and political backing. Some interests are locked into a growth of aviation and still hope for a new ‘take off’.

## A High Energy World?

Urbanisation was pioneered in Britain but has since spread worldwide. The Earth's human population has doubled in the last 50 years. In 2007 we passed 50% of people living in towns and cities. Most of the 3,000 million additional people expected by 2050 will try to join the move to the cities, with 70% expected urban population increase.<sup>75</sup> If they become car drivers at predicted rates, this would double the emissions and demand for transport fuels. Fortunately for the planet's life support systems (and therefore our own), such a world of car drivers and frequent flyers is unachievable.

World oil reserves that took millions of years to accumulate are 'half gone' in one century.<sup>76</sup> Britain has gone from being an oil importer to a major producer from the North Sea field, back to an oil importer, all in 30 years. World oil demand will over-take production permanently by 2011, according to the International Energy Agency. This will put the price of petrol out of reach of most people. The OPEC cartel of oil producing countries makes it clear they will restrict production to keep prices up and protect their incomes. 'Peak Oil' has gone from a fringe theory to an accepted fact of life,<sup>77</sup> pushing oil prices back above \$70 a barrel even in the depth of an economic recession (mid-2009).

Our combustion of fossil fuels has increased the level of carbon dioxide in the air by 25% in just 50 years, the current level of 387 parts per million being the highest recorded for hundreds of thousands of years.<sup>78</sup> The world is warming according to climate scientists, faster than any time in the last 600,000 years.<sup>79</sup> Polar ice caps are melting more each summer and sea level rise is faster than expected. Most cities and populations are close to the sea. The Intergovernmental Panel on Climate Change says fossil fuel burning must be cut by 80% to prevent dangerous climate change.<sup>80</sup> Transport emits 22% of global carbon emissions, so the world desperately needs a low energy, low carbon transport system able to be put in place quickly and cheaply for cities around the world. History shows that mass motorisation cannot deliver this and a clear alternative has to be found.

## A Transport System for Everyone

There are cities in Europe with reduced levels of car use. However, this has been obtained by huge investment in public transport, to make it competitive and attract people from their cars which they could well afford to buy and use. Zurich, Copenhagen, Amsterdam, Stockholm are examples. These cities have saved themselves from drowning in vehicles, and without unpopular 'anti-car' measures, at the cost of huge public investment programmes. They are some of the richest cities in the world. Dependency on the car, once entrenched, is difficult and frightfully expensive to reverse.

Prevention of the disease may be easier than a cure. Where most people still do not have cars, there is the possibility of convincing them that they do not want/ need one. Having most people **not** in cars can be seen as a precious opportunity for any city. When the majority have, or expect to soon have cars, then there is a formidable political barrier to creating a 'city for all'. It requires strong political determination not to allow the 'city of cars' to create itself.

In Brazil, Curitiba is the capital of the state of Parana, and it has a population of over 2 millions. The city authority anticipated at a future of a huge growth in traffic, and planned to accommodate it with wide boulevards radiating from the city centre. These plans would

have been very expensive and destructive to realise, and were never built. The future looked like one of intolerable congestion. However, the Curitiba's major and government then produced a bold Master Plan that focuses on meeting the transportation needs of all people—rather than those using private vehicles. This has been implemented over 30 years, with spectacular results.<sup>81, 82, 83</sup>

Curitiba's Bus Rapid Transit system has priority on the streets, giving it many of the features of a subway system, but above ground using dedicated lanes, and was built at a fraction of the cost. Stations are sited every 500 metres. They are attractive and provide shelter, designed so as to allow rapid loading and unloading: pre-boarding flat-fare payment system being in operation. The buses are articulated and hold up to 270 people, running reliably and frequently. New development has been planned along these bus lines, rather than dispersed, or concentrated just in the centre of the city. Parking spaces are strictly limited. The cheap bus fares make driving the more expensive option. Yet the huge popularity of the system means the companies operating it make an annual profit.

The result is that buses have replaced the car as the primary means of transport within Curitiba. 70 % of commuters use the system to travel to work. The reduced demand for road space has allowed the city centre to be partly closed to traffic, and pedestrianised. The city uses 30% less fuel than comparable Brazilian cities and has the cleanest air. Curitiba shows that a modern city does not have to be poisoned and polluted by its transport system.

Bogota (7 million population) the capital of Columbia has studied and followed the model of Curitiba since 1998.<sup>84</sup> It was clear that cars were in danger of strangling Bogota, although 85% of residents didn't own one. The mayor rationed car use in the rush hour, with the result congestion dropped. The road space was reallocated to a Bus Rapid transit system that showed itself faster and more convenient than private cars or the previous buses. The transit system now carries 70% of vehicle trips, only 19% being by car. Road deaths have dropped dramatically, as has crime. Cars are banned on Sundays from central streets and citizens have voted for a plan to exclude them completely by 2015. 300 kilometres of cycle routes in Bogota make this provision probably the most extensive in the world. As a result, journeys cycled have increased by 900%, to 300-400,000 cycle trips a day.

## Looking Forward

The lesson of these cities is that 'predict and provide' can be applied to any means of transport, not only cars. Provide for pedestrians, bus users or cyclists, and people will use those modes. Only where 'the car is king' are these other modes suppressed. We can reverse the motorisation of the environment - better still prevent it. Europe's attempts to follow the USA with a car-dominated transport system do not need to be exported to the rest of the world. Latin America and Asia may lead with urban transport systems for the 21st century, and London and Birmingham may one day follow back to a sane transport system. The current recession and crisis of the car industry could be the opportunity for the 'tide to turn' in many countries, and sustainable transport systems to be put in place.

The transformation of transport systems could be part of a wider agenda. A country like Britain has had an 'environmental footprint' as though we had 3 planets.<sup>85</sup> Yet a zero carbon Britain is possible, even attractive.<sup>86, 87</sup> As fossil fuels get more expensive and we are forced to use them more wisely, our technology and our lifestyles should actually improve.

Having more of everything, as cheaply as possible, will not be seen to be the way to be 'well-off'. We appreciate the basic physical 'law of entropy'. As we pump more energy through a system it produces more disorder, waste and pollution, so only low energy systems can be elegant, efficient and effective.<sup>88</sup> This means pursuing quality of life instead of speed, as the Slow Towns movement is showing.<sup>89</sup> The change will require political will and determination to achieve a transport system that is equitable for all and sustainable for future generations.

## References and sources

1. 'National Travel Survey': (2007)
2. 'The First Industrial Nation - The Economic History of Britain 1700–1914' by Peter Mathias, Routledge & Kegan Paul, London 1969
3. 'Census of Population Great Britain' 2001 Table KS15
4. 'My Life and Work' – Henry Ford
5. 'Wheels within Wheels – a study of the Road Lobby' – Mick Hamer, Routledge & Kegan Paul, London 1987, ISBN 0710210078 p 31
6. Road Casualties Great Britain: 2007' - Annual Report, Department of Transport
7. 'Death on the Streets – cars and the mythology of road safety' – Robert Davis ISBN 0-948135 Leading edge pubs, Yorkshire 1993
8. 'Census of Population Great Britain' 2001 Table KS17
9. 'Are We There Yet?' Integrated Transport Commission
10. 'Wheels within Wheels – Mick Hamer, London 1987 Chap 2
11. The Great Railway Conspiracy - David Henshaw 1991, ISBN: 0948135301
12. 'Wheels within Wheels – Mick Hamer, London 1987 p50
13. Ibid Chap 4
14. 'Traffic in Towns' – Colin Buchanan, Ministry of Transport 1963
15. SACTRA – Trunk Roads and the Generation of Traffic, Department of Transport 1994
16. 'The Heyday of the European Tram' - Peter Waller, 1994, ISBN: 0711021201, Pub; Ian Allen
17. 'Great American streetcar scandal' – Wikipedia- summarises the evidence
18. 'Travel Survey of Great Britain' DpT 2008 Chap 9. Private Motoring
19. 'Cycling in Great Britain' report (chart1) Department for Transport, ISBN=0115518649
20. 'Cycling in towns: a quantitative investigation' J.Waldman LRT1 Working paper no.3, Department of Transport 1977
21. 'More Bikes – Policy into Best Practice', D. Matthews, Cyclists Touring Club 1995
22. 'Census of Population Great Britain' 2001 Table KS17
23. 'National Travel Survey': (2007)
24. Quoted in 'Healthy Weight, Healthy Lives: a cross-government strategy for England'. Department of Health January 2008
25. 'Improving road safety for Pedestrians and Cyclists in Great Britain' (2007 figures) – National Audit Office, 2009
26. 'Wheels within Wheels – Mick Hamer, London 1987 p14-16
27. 'Death on the Streets' – Robert Davis p244-245 see ref 7
28. Survey by More Than insurers May 2009
29. EU Energy & Transport in Figures 2000 figures quoted in 'Are We There Yet?' Integrated Transport Commission
30. 'Census of Population Great Britain' 2001 Table KS15
31. Family Spending (2006), National Statistics Office 2007

32. 'Running Cost tables' AA 2009
33. Passenger Focus survey Feb. 2009
34. 'Road Traffic and Congestion in Great Britain': Quarter 1 2009, Dept of Transport
35. 'Running Cost tables', AA, 2009
36. 'Annual Survey of Hours and Earnings' (ASHE) 2008, National Statistics Office
37. 'Transport and Land Take' – Prof. John Whitelegg, report for CPRE 1994
38. Urban Design Compendium <http://www.urbandesigncompendium.co.uk/birminghaminnerringroad>
39. 'Census of Population Great Britain' 2001 Table KS17
40. 'Car occupancy: by trip purpose, 1998-2000: Social Trends 32
41. 'Road Casualties, Great Britain 2006' - Department for Transport
42. National Travel Survey: (2007)
43. 'Improving road safety for Pedestrians and Cyclists in Great Britain' (2007 figures) – National Audit Office, 2009
44. Road Casualties, Great Britain 2006' - Department for Transport
45. Research by John Barker, of Brunel University, reported The Guardian, 4 Jan 2002
46. National Travel Survey: (2007)
47. New Transport for London (Tf) October 2008
48. 'Management of Obesity and Overweight' – Health Development Agency 2003
49. 'At Least Five Times a Week' report of the Chief Medical Officer for England 2004
50. 'Healthy Weight, Healthy Lives: a cross-government strategy for England'. Department of Health January 2008
51. Ibid
52. 'Car Sick: Solutions for our car-addicted culture' - Lynn Sloman ISBN190399876X Pub: Green Books
53. 'The King Review on Low Carbon Cars' - HM Treasury, 2008
54. Transport Direct; journey carbon calculator  
<http://www.transportdirect.info/web2/JourneyPlanning/JourneyEmissionsCompare.aspx>
55. Climate Change Act described on DEFRA website
56. The King Review on Low Carbon Cars' - HM Treasury, 2008
57. 'The Eddington Transport Study' (2006) Department of Transport.
58. Road traffic in Great Britain - May 2009 Department of Transport
59. 'Central London Congestion Charging - Impacts monitoring' 6th Annual Report, 2008 Mayor of London & Transport for London
60. 'The Scotsman' 23 February 2005
61. 'Manchester says no to congestion charging' Guardian, 12 December 2008
62. 'Sustainable Travel Demonstration Towns' evaluation by Sustrans 2009
63. 'Climate Change 2007' 4th Assessment report of the Intergovernmental Panel on Climate Change
64. 'Act on CO2' calculator Direct Gov.
65. 'Aviation: Carbon Emissions' Parliamentary Question House of Commons 2 May 2007
66. Campaign for Better Transport refers to 2005 levels of emissions from flying at British airports
67. Submission of WDM to Transport Committee Inquiry into the Future of Aviation
68. See Rail Europe
69. National Travel Survey: (2007)
70. Civil Aviation Authority figures reported in The Guardian 16 June 2009
71. Department of Transport Air Traffic Forecast 1997
72. International Air Transport Association Sept. 2008
73. Can Flying Ever be Green? – Mark Anslow The Ecologist v 38, no 6
74. Visit Britain 2009
75. UN Commission on Population

76. 'Half Gone: Oil, Gas, Hot Air and the Global Energy Crisis' – Jeremy Leggett, London 2005 ISBN 1846270049
77. 'The Oil Crunch' UK Industry Taskforce on peak oil and energy security 2008, expected peak oil production 'within 5 years'.
78. 'Climate Change 2007' 4th Assessment report of the Intergovernmental Panel on Climate Change
79. Ibid
80. Ibid
81. 'The Curitiba Story – Positive News Autumn 2008
82. 'A Convenient Truth – urban solutions from Curitiba' film by Maria Vaz  
[www.mariavazphoto.com/curitiba](http://www.mariavazphoto.com/curitiba)
83. 'Curitiba's Bus System is Model for Rapid Transit', by Joseph Goodman, Melissa Laube, and Judith Schwenk (excerpt from a US Federal Transportation Administration publication on Issues in Bus Rapid Transit).
84. 'Pedal Power' – Chris Webb, New Internationalist, Nov. 2008
85. 'Living Planet Report 2008' Global Footprint Network
86. 'Zero Carbon Britain – an alternative energy strategy' – Centre for Alternative Technology,
87. "Zero Carbon Britain - Taking a Global Lead" – Liberal Democrat Party 2007
88. 'Entropy – a new world view' – Jeremy Rifkin (Granada Pubs. London 1985)
89. 'Cittaslow' – slow towns movement in Italian started 1999 'Città Slow UK