

The Energy Glut: Transport and the Politics of Fatness and Thinness

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Contents

1. Cars are dangerous to pedestrians and cyclists	1
2. Road death rates fall as roads get more dangerous because people get out of the way.....	2
3. The resulting decline in human movement moves the population BMI distribution upwards	5
4. The car industry says the main problem is a lack of road safety education	8
5. Structural reasons for the current situation.....	9
6. The good news and why we should act	12
7. References	14

The Energy Glut: Transport and the Politics of Fatness and Thinness¹

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Summary:

Global environmental change, in particular climate change, presents a serious threat to the stability of the ecosystems on which all human life depends. On the other hand, mitigating climate change through the decarbonisation of transport, and society more generally, presents unrivalled opportunities for improving public health. The policies that need to be implemented to reduce greenhouse gas emissions will also bring about substantial reductions in heart disease, cancer, obesity, diabetes, road deaths and injuries, and air pollution. These health benefits arise because climate change policies necessarily impact on two of the most important determinants of health: human movement and human nutrition. Although the health co-benefits of climate change policies are increasingly recognised by health professionals they are not widely appreciated by those responsible for environmental policy. Because the existence of important health co-benefits will dramatically reduce the cost to society of taking strong action to mitigate climate change, failure to appreciate their importance could have serious environmental consequences. In the transport sector, the creation of safe urban environments for mass active travel will require prioritization of the needs of pedestrians and cyclists over those of motorists. Walking or cycling should become the most direct, convenient, and pleasant option for most urban trips. We have an urgent responsibility to ensure that the health benefits of wider environmental policies are understood by both the public and by policy makers.

¹ Note: This paper is based on the book *The Energy Glut: the politics of fatness in an overheating world*. The book was published by Zed Books in 2010. All monies from the sale of the book go to Road Peace a UK based charity for the victims of road traffic crashes. The charity is a strong advocate for road danger reduction.

The Energy Glut: Transport and the Politics of Fatness and Thinness

1. Cars are dangerous to pedestrians and cyclists

Twenty years ago as a junior hospital doctor working in paediatric intensive care in Auckland, New Zealand, I discovered a public health problem that horrified me, and having just become a parent, frankly terrified me. I discovered what road traffic ‘accidents’ really meant for children and for the people who care for them. Of course I knew, in an abstract knowledge sort of way, that being hit by a car was the leading cause of death in children in Britain, as indeed it was in most of the highly motorised countries of the world. I knew that children were continually being urged to take care whilst crossing the road. Indeed, I myself had grown up with the Green Cross Code.

What I had not appreciated, what I had not felt before, was the reality of the devastation, the horror and the real, raw human suffering, that being hit by a car entailed. I had known about it before but now I felt it. The experience of caring for seriously injured children dug deep grooves in my soul that later channelled strong emotion onto problems that many people, most people actually, could not give a damn about. Most of my medical colleagues were interested in cardiology or endocrinology, areas where young doctors could really make a name for themselves, where they could get on. But having seen what energy can do a child’s body what I wanted to know was how we could let that happen to children and why. I gave up being an intensive care doctor and studied

epidemiology which is the science of disease causation. I started by working with transport engineers to look for risk factors for child pedestrian death.

The Oxford Dictionary defines an “accident” as an event that is without apparent cause or that is unexpected. The use of the word accident to describe child road deaths could not be more inappropriate. More is known about when, where and why child pedestrian-motor vehicle collisions occur than for almost any other disease in childhood. It would make much more sense to talk about a case of accidental leukaemia. Calling road deaths accidents implies that no one is responsible and no one is to blame. The child either made a bad judgment or was just unlucky. But parents are responsible for their children and are not meant to put them in a position where poor judgment or bad luck can be fatal. Blaming a child victim really means that the parents are held responsible. Many bereaved parents live out their lives in silent desperation.

When the experiences of the hundreds of children killed and injured on Auckland’s roads were aggregated however, a very different picture emerged. Most of the children were injured close to home, often in the street where they lived. When we compared the traffic characteristics of the streets where injured children lived with a group of non-injured children selected from the general child population, we found that the main determinants of injury risk were the volume and speed of the traffic. The injury risk increased

Table 1. Risk factors for child pedestrian death and injury – data from the Auckland Child Pedestrian Injury Study

<250	1.00
250-499	4.52 (2.04 to 9.98)
500-749	7.29 (3.09 to 17.20)
>=750	14.30 (6.98 to 29.20)
Mean speed (km/hr)	
<40	1.00
40-49	2.68 (1.26 to 5.69)

particularly steeply with rising traffic volume (Roberts et al. 1995). Children living in the busiest streets were fifteen times more likely to be injured than children living in the quietest streets.

Traffic and not erratic jaywalking children is the cause of child pedestrian injury. Children get hit by cars because the cars are there. There is one street and it is either a place for children or a place for cars. Mixing the two, at least at average urban speeds, does not work without bloodshed. A vehicle driving down a residential street at forty miles per hour packs more destructive energy than a bullet. If a child is unlucky enough to be hit, a single shot can kill and crossing a busy main road is like making a dash through machine gun fire.

Epidemiological studies reveal associations. In this case, the association between the volume of traffic and pedestrian injury risk. Whether this is a cause-effect relationship is a matter for judgement. It seems very likely but perhaps we would like to confirm it with a natural experiment. What would happen to road deaths if the volume of traffic actually fell? Because the history of western motorisation is one of almost relentlessly increasing traffic, there has been little opportunity to answer this question. However, the Middle East oil crises of 1974 and 1979 provided a rare insight into what happens when traffic volume falls. Despite its clean green image, New Zealand is one of the most heavily motorised countries in the world and the 1974 energy crisis, which was accompanied by a fourfold increase in the price of petrol, hit hard. The government responded by introducing "car-free days" when every car had to be off the road for one day each week. There was also a weekend ban on petrol sales which lasted until August 1980. During the period of high petrol prices, child pedestrian death rates plummeted. Between 1975 and 1980 child pedestrian death rates fell by 46% (Roberts et al., 1992). But when the oil started flowing and traffic volume resumed its upward trajectory, the number of children killed and injured on the roads increased along with it.

The oil price shocks of 1974 and 1979 also coincided with reductions in road death rates in the USA and Britain. The oil crises had revealed link in the chain of causation, the link

between the price of fossil fuels and the amount of danger on the roads. When petrol prices rise, fewer children die, when they fall more children die. To a physicist this connection would seem obvious. Petroleum is chemical energy and the petrol in the fuel tank is the source of the energy that kills and injures. The tens of thousands of controlled explosions that drive the pistons that spin the wheels are fuelled by a steady stream of petroleum, and whatever obstructs this flow of chemical energy, whether it is war in the Middle East or hurricane damage to oil refineries in the Gulf of Mexico, there will be less road danger and fewer road deaths as a result. However, the oil crises were just a temporary blip and for the next thirty years traffic volumes would soar on the back of reliable supplies of cheap petroleum. Had nothing else changed, the bloodbath on the streets would have made current road death statistics seem trivial. But something else did change. The pedestrians and the cyclists got out of the way.

2. Road death rates fall as roads get more dangerous because people get out of the way

A vehicle travelling at forty miles per hour down a residential street is an obvious threat. Due to its mass and velocity, it contains enough kinetic energy to break bones and tear flesh. There is an equation in the physical sciences that tells us that the kinetic energy in a moving object is equal to one half of its mass times its velocity squared. This means that a car weighing 1500 Kg driving at forty miles per hour (eighteen metres per second) has $\frac{1}{2} \times 1500 \times 18 \times 18 = 243,000$ Joules of energy. A car moving twice as fast has four times as much kinetic energy. We do not need to have been hit by a car, or to have seen someone else being hit, to understand this. Evolution has hard-wired this knowledge into our brains. In the street, might is right. The person with the power is the person behind the wheel of the car. They hold the power to kill or disable and if they do kill or disable then they face little or no legal sanction. When faced by an assailant with a dangerous weapon you have two choices: to run or to fight. Picking a fight with raw kinetic energy is stupid and futile. The normal human response is to get out of harm's way and make sure that your children are out of harm's way too.

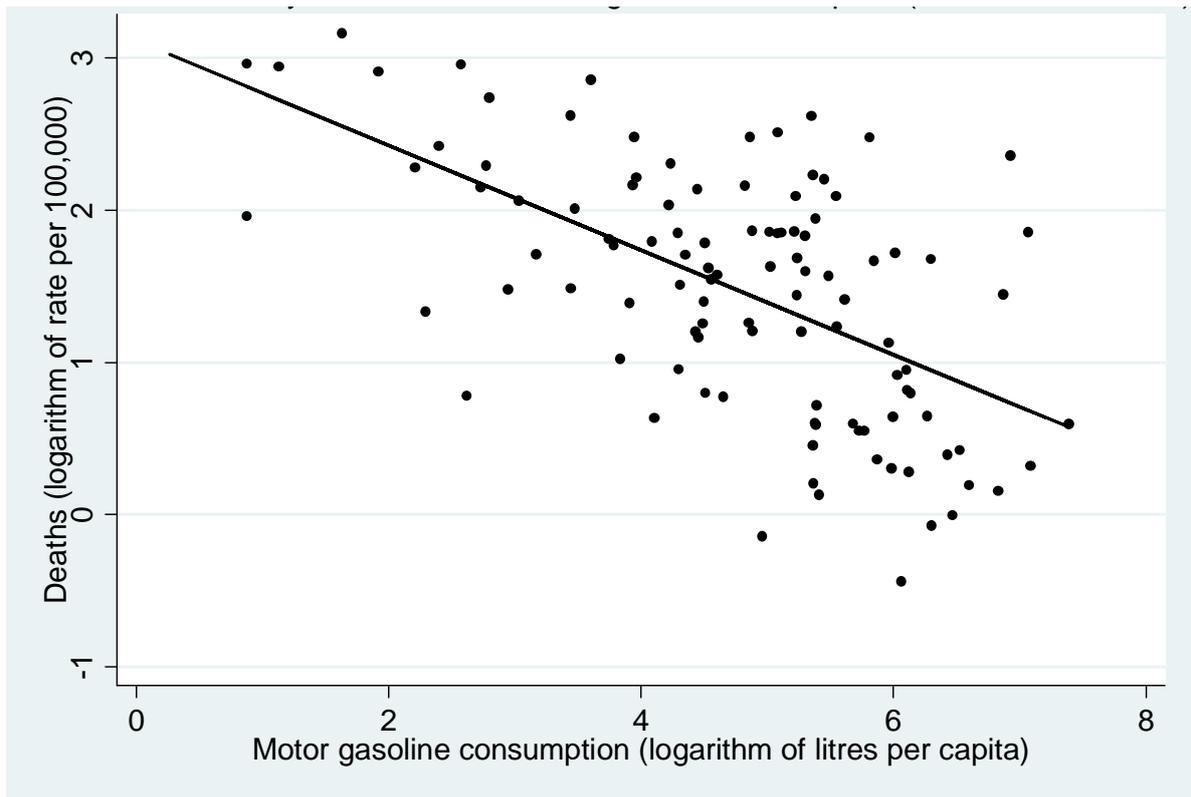


Figure 1. Pedestrian and cyclist deaths and motor gasoline consumption (107 countries, 2008)

Figure 1 shows, in general, as per capita motor vehicle gasoline consumption increases, pedestrian and cyclist death rates fall. Child road deaths in Britain and the USA have been falling for decades. Death rates fell more steeply when oil prices were high but the fact that the overall trend was down, despite rising road danger from increased motor vehicle traffic, meant that something else was going on. As the volume of road traffic increased and the streets became rivers of lethal kinetic energy, the pedestrians got out of the way. Parents kept their children indoors and those who could afford a car started driving rather than walking, even for short distances. The body counters at the Ministries of Transport of course claimed that death rates were falling because the traffic planners and police were doing a great job. Transport ministers proudly claimed responsibility for the fall in the number of deaths. No one bothered to count how many live people there were out on the streets.

There is another common response to an assailant with a dangerous weapon apart from getting out of the way. Obtain such a weapon for yourself. You would prefer that you and your children were safe inside a vehicle, rather than vulnerable on the outside. A survey of parents of primary school aged children in north London

found that most were very worried about road danger on the daily journey to school and that most would drive their children if they had access to a car (DiGiuseppi et al., 1998). And so begins the motorised arms race which drives the downward spiral of walking and cycling. If what I am saying is true, we would expect more pedestrian deaths among poor people who can't afford to use a car, and fewer pedestrian deaths among the wealthy people who can. Every death in England is recorded along with the occupation of the person who died. For dead children, the occupations of their mothers and fathers are recorded. When we looked between 2001 and 2003 there were 205 children killed as pedestrians in road crashes in England and Wales. Of these, seventy-one children had parents who were 'long-term unemployed', sixty-two had parents who were in 'routine occupations', and twenty-five children had parents in 'managerial and professional occupations'. When taking into account the number of children in each group, the risk of road death for a child in the lowest social group was five times that of a child in the highest social class (Edwards et al., 2006). Walking surveys show that children from families without a car walk much more often than children in car owning families (Roberts et

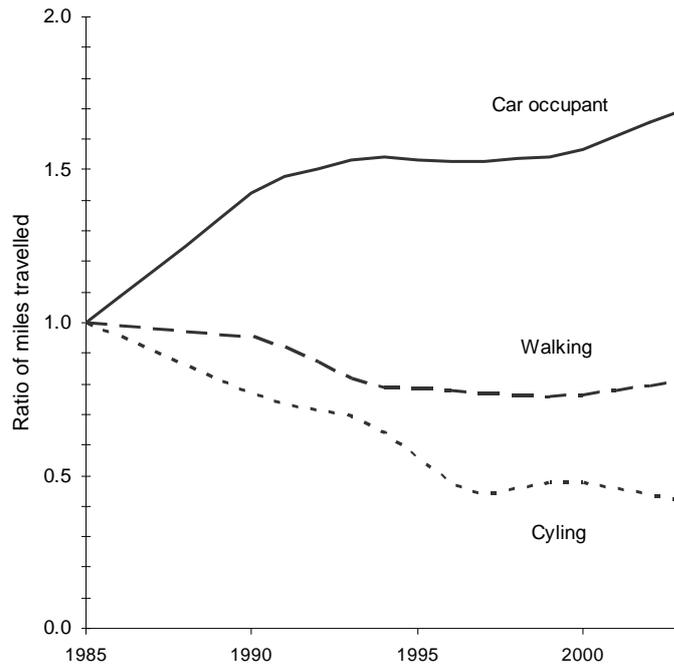


Figure 2. Walking cycling and car use trends 1985-2005

al., 1997). Poor children are outside the car because they cannot afford to get inside.

Increasing road traffic has decimated walking and cycling in Britain, the USA, and most other highly motorized countries. Data from the UK National Travel Survey shows that the average distance walked per person per year fell from 255 miles per person per year in 1975 to 192 miles in 2003. Over the same period, the average annual distance cycled fell from fifty-one miles per person to thirty-four miles. The distance walked by children has fallen by almost a quarter. Children today walk less than ever before in the history of humanity (Hillman et al, 2000). It is likely that by 1975, when the UK Department of Transport first started measuring walking and cycling, most of the decline had already taken place. We can get an indication of the extent of the changes from old photographs and paintings. Lowry, the Manchester artist famous for his matchstick figures, painted Salford streetscapes in the 1920s and 1930s before the hay day of the motor car. His sombre skies show the pollution of industrial England but his streets scenes show a vitality that is completely absent today. The streets Lowry painted belonged to the people living in them. Now they belong to the car. The same process is currently underway in India.

Traffic is not the only danger people consider when deciding whether to put on their walking shoes. For the past ten years, conducting clinical trials with trauma doctors on four continents, I have visited some of the most violent cities in the world. Many of these are in Latin America where the juxtaposition of conspicuous wealth and obscene poverty elevate routine urban violence to war-like proportions. There are forty homicides per 100,000 people each year in Medellin, a murder rate over ten times higher than in London.

When it comes to violence, even though it is people we fear, we feel most afraid when there are few people about. We feel safest in the peripheral vision of other people's awareness. We don't want to be stared at but we do want to be seen. In Medellin, as soon as I turn into an empty street my heart starts racing. In her book 'The Death and Life of the Great American Cities' Jane Jacobs wrote how "eyes on the street" help to keep the street safe (Jacobs, 1992). The more eyes the better, especially if those eyes can summon for backup if there is cause for concern. She describes a brief urban drama in her neighbourhood. A man is seen dragging a young girl up a side street. The child is resisting, crying and shouting. A crowd quickly gathers. The eyes on the street did not like the look of what was going on. It turns out that the man is her father, the child is having a

tantrum and that there is nothing amiss. The crowd disperses. On this occasion there was no cause for alarm but people were concerned and came to help. According to Jacobs, this collective concern is what keeps communities safe.

Traffic takes eyes off the street. It divides the street. Interactions between people on the other side of a busy street are less likely to be noticed, voices might not be heard and the mood of interpersonal situations might not be understood. Yes there are eyes inside the cars, but when travelling at speed, sight lines are polarised ahead, along the road, and not on the pavement. Would someone stop if someone was being attacked? Just as for road danger, the response to stranger danger is to get off the street and into a car, another vicious circle. Traffic makes a street seem hostile. This leads to more traffic and more hostility. The only people left on the street are the very poor people.

Research shows that when considering whether to let their children walk to school, London parents fear stranger danger more than road danger. But are these parents worried that someone would drag their child screaming and yelling up a busy street or that they would be pulled into a passing car and whisked away? The latter seems far more likely. Enrique Peñalosa the former mayor of Bogotá mused that children are like an indicator species for urban safety in the way that the presence of fish indicates whether or not a river is polluted. By taking children off the street, traffic increases our fear of violence. A colleague told me a story about a street party in England, where the street was closed to traffic for the day, as a demonstration project for a safe street initiative he was involved in. The children from the street were outside playing. One of the residents said that it was an excellent event but asked my colleague “where did you get all the children from?”

3. The resulting decline in human movement moves the population BMI distribution upwards

The human body is a vehicle perfectly designed for personal transportation. It will keep running until the day we die. Whether moving or not it requires energy but provided that we fill it up

regularly with enough food, it will meet most reasonable transportation demands. It has an important special feature. If the amount of food energy taken in is surplus to requirements, it will store the excess energy as fat. This energy can be called on later if needed, allowing the body to keep running for weeks, even on an empty tank. Body fat accumulates when the amount of energy we eat as food exceeds the amount of energy we use moving around and keeping warm. Fat is stored energy.

Most of our body fat is stockpiled under our skin and around our internal organs as adipose tissue, which is mostly made up of fat cells, also known as adipocytes. Fat cells contain a large droplet of lipid. This lipid, which has the consistency of margarine on a hot day, pushes the nucleus and everything else to the edges of the cell. The lipid droplet plumps up the cell, rather like a silicone implant plumps up a breast and the bigger the droplet the fuller the cell becomes. As we get fatter, the number of fat cells in our body increases, and the fat cells that we already have expand as the lipid droplets they contain get bigger. Energy intake need only be slightly higher than energy output for fat to accumulate. Doctors gauge how fat we are by working out our body mass index (BMI), which is our weight in kilograms divided by our height squared (height in metres multiplied by height in metres). Doctors diagnose “overweight” if a person’s BMI is between twenty-five and thirty, and “obesity” if it is thirty or more.

If we measured the BMI of all the people in a particular country and plotted on a graph how many people there were at each BMI value we would find a wide spread of values. This spread of values is called a distribution. There would be some really skinny people with a very low BMI and some really fat people with a very high BMI, but most people would have a BMI close to the centre of the distribution.

As average levels of human movement have decreased, the average BMI has increased with it. Figure 3 shows the BMI distribution in Canada in 1978 and 2004. It can be seen that the entire distribution has shifted upwards. Everyone has become fatter – the whole of the Canadian population.

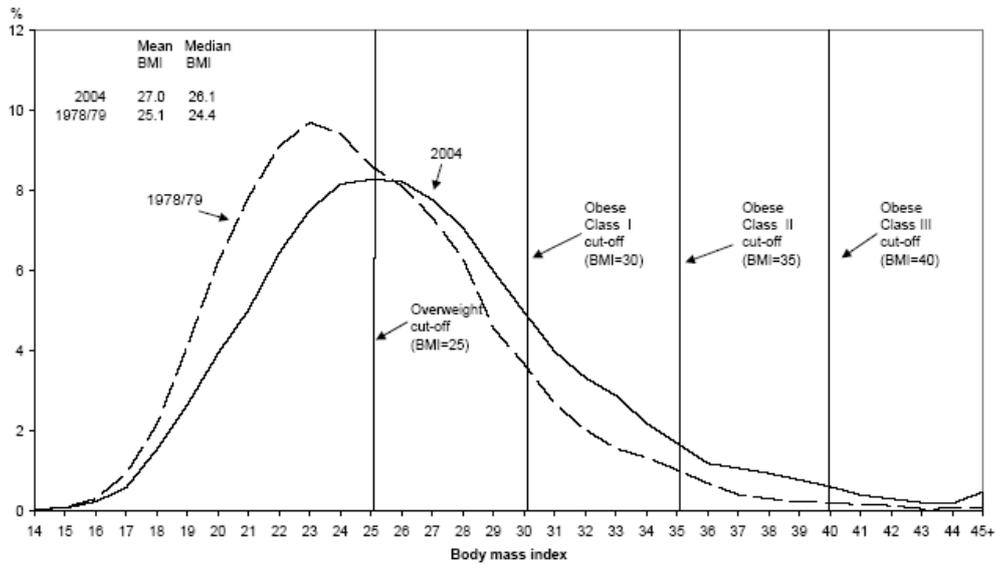
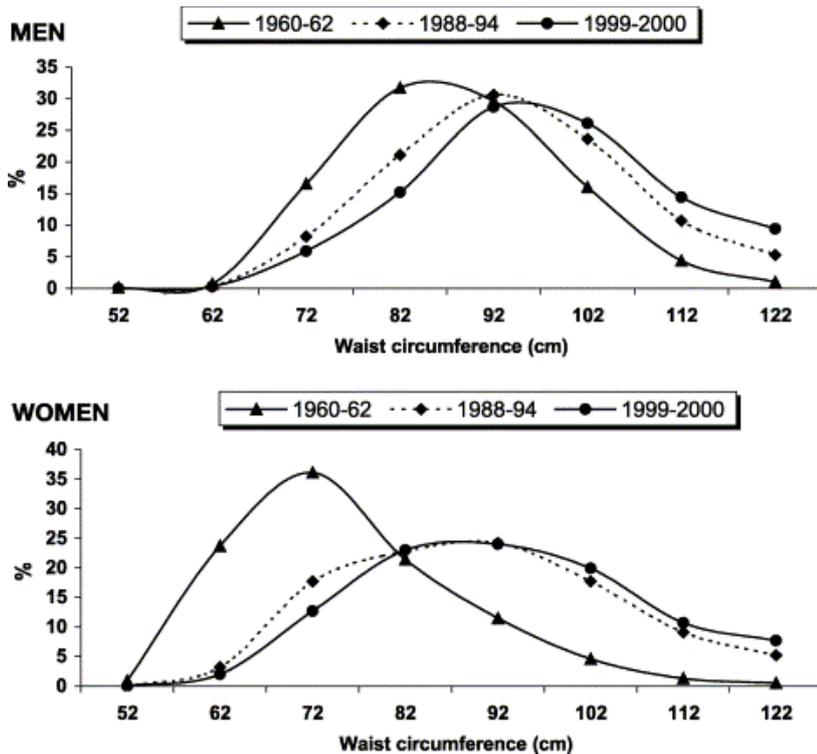


Figure 3. BMI distribution in Canada in 1978 and 2004.

The same trend is evident all around the world. Increasing body fat is not a problem limited to a particular country. Wherever you happen to be living you can be reasonably sure that the population is getting fatter. Canada is not as fat as the USA but the Canadian BMI distribution is slowly sliding upwards. In 1978, the average BMI in Canada was twenty-five. In 2004 it was twenty-seven. China has a relatively low average BMI but it has already started drifting upwards. Between 1989 and 2000, the average BMI of Chinese men increased from 21.3 to

22.4 and that of Chinese women increased from 21.8 to 22.4. It is the same story in Europe, Asia, and South America. In 2006, the World Health Organization reported that there are 300 million obese adults living on planet earth and there will be many more in the future. Epidemics that affect the whole world are called pandemics. The USA may be the epicentre, with very large increases in the weight and size of the population (see Figure 4) but no country is immune.

Figure 4. Abdominal adiposity in U.S. adults: prevalence and trends, 1960–2000



In brief, the entire population distribution of BMI is shifting upwards, in almost every country in the world. Governments internationally tend to portray the increasing in population fatness as a personal problem, highlighting the number of people in the upper “obese” tail of the distribution. The British government for example recently launched a campaign to tackle obesity, arguing that the British people were developing bad habits. This is of course nonsense. If this was a habit problem it would imply that almost everyone on earth had fallen into exactly the same unhelpful habits, a bad habit pandemic on an unprecedented scale! Decades of health research have shown that population fatness is an environmental problem and not a personal weakness. Our tendency to fall into unhelpful habits is the

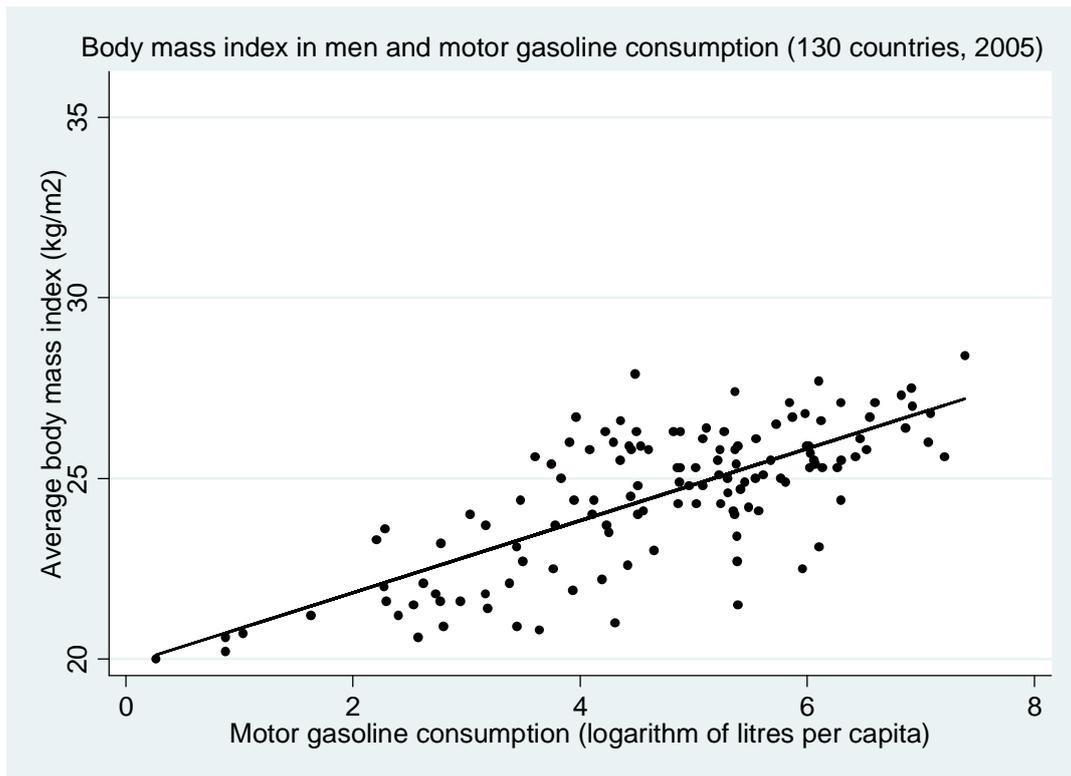


Figure 5

same as it ever was. What has changed is that thanks to motorization and mechanisation, there fewer opportunities to move our bodies than ever before, whilst at the same time we are besieged by a food industry that uses the best marketing brains in the world to sell us mountains of cheap energy dense food.

Figure 5 shows the relationship between the average BMI and motor vehicle gasoline consumption per capita for the 130 countries for which the necessary data were available. Each dot represents a country and the solid 'regression' line is chosen so that it comes as close to the points as possible. This line provides an indication of how average BMI varies as motor gasoline consumption increases. There is a clear strong relationship between average BMI and motor vehicle gasoline use. Where motor vehicle gasoline consumption is low, average BMI is also low, and where gasoline consumption is high, average BMI is also high. The association is present in both men and women, although strongest among men.

The current panic in the West about rapidly rising obesity levels is a consequence of forgetting that the whole BMI distribution was moving upwards. The slow but steady movement of the BMI distribution could be

likened to the New York marathon, with the obesity threshold as the finishing line. Once the race starts, the whole population of runners starts moving towards the finish. For the first few hours no one crosses the finishing line but then the front runners start crossing in dribs and drabs. An hour or so later, the main lump of competitors reaches the line, and the number of finishers increases rapidly. In most wealthy countries the main lump of the population is now crossing the obesity threshold and so obesity is rising very rapidly. But there is little point searching frantically to find out what is happening now to explain the increase. The race towards obesity started decades ago. Here however, the analogy ends, because unlike runners in a marathon, on our increasingly fat planet, the runners just keep going.

Doctors and health scientists have been astonished by the sudden increase in obesity and have only recently started conducting studies looking for the causes. Most of these studies compare the food intake and daily activity levels of obese and non-obese people within a particular population at one point in time. The problem is that because we are now all exposed to the same transportation system, physical activity levels are at a record low across the entire population and the factor that

most differentiates the fat from the thin is food intake. By analogy, if everybody smoked and to exactly the same extent, and we compared people with and without lung cancer, smoking would not differentiate those with and without cancer. But this would not mean that smoking was not a cause of lung cancer. When it comes to fatness, scientists have been asking the wrong question (a focus on obesity rather than on average BMI) and having been using the wrong data (a focus on what is happening now rather than what has happened over the past half century).

I will not go into detail here about the political reasons for the neglect of motorization as a cause of population fattening, other than to say that scientists tend to have a blind spot when it comes to gradual societal transitions and that they tend to limit their consideration of causes to those things that they believe are amenable to change. As we will see later, the notion that the de-motorization of society is either possible or desirable has effectively been barred from consciousness by a sustained bombardment of industry and government propaganda. Road danger is a key environmental determinant of declining physical activity levels even though it scarcely given the time of day in contemporary public health literature. Entire populations do not passively give up walking and cycling because they are tempted to do so by the speed, comfort and glamour of motorized travel. On the contrary, they are driven off the street by deadly force, with a barrage of propaganda being required for its justification. The forceful eviction of people from urban public space is currently underway in many low and middle income countries, in particular in India and China. Many politicians call it progress.

4. The car industry says the main problem is a lack of road safety education

The huge increase in road death and injury that results from the forceful eviction of the walking public from the streets space is politically problematic for the car industry. The problem is too big to ignore but at the same time tackling it at source would be bad for business. They understand the political threat posed by the great mass of the walking public. Currently, they are busy manoeuvring themselves into pole position in road safety politics. They have to ensure that efforts to improve global road safety don't adversely impact on car sales. In

2006, the Federation Internationale de l'Automobile set up a Commission for Global Road Safety with a remit to 'examine the framework for and level of international cooperation on global road safety and to make policy recommendations.' At its inception, the Commission was chaired by former UK Defence Secretary, Lord Robertson, and had eight commissioners, one from each of the G8 group of wealthy nations.

If you wanted to represent the interest of motoring classes you could not put together a more able group of Commissioners. Canada was represented by an Executive Director at General Motors, Japan by a Board Member of the Bridgestone Corporation, the major trans-national tyre maker. Russia was represented by the President of the Russian Automobile Federation and Italy by a former president of the Automobile Club of Italy. Michael Schumacher represented Germany and France was represented by Gerard Saillant, a doctor who works on the medical aspects of Formula One. The UK Commissioner was the Chief Economist at Lehman Brothers, the US investment bank whose later collapse precipitated the perfect storm of global economic chaos. The Commission's Patron is Prince Michael of Kent, a former racing driver, now a member of the British Racing Drivers Club and the Bentley Drivers Club. Lord Robertson himself was then Deputy Chairman of the Board of TNK-BP, a Russian oil company. According to the House of Lords' Register of Interests, which shows that the FIA paid Robertson to attend the 2006 Monaco Grand Prix, the Commission holds its meetings at the race track (Roberts, 2007).

Working through the Commission, the FIA and the car lobby are taking a lead role in global road safety. They would like to set the policy agenda for road safety and thus gain considerable influence in global transport policy. They do not want to fund road safety efforts but to dictate how other organizations spend their money, and in particular how development money is spent. Former World Bank President Paul Wolfowitz was eager to confirm the Bank's willingness to implement the Commission's recommendations, and the former UK Secretary for State for International Development Hilary Benn welcomed the Commission's proposals.

Although most people in poor countries will never own a car and most of the victims of road traffic crashes are pedestrians, the Commission has worked hard to ensure that the views of the motoring elites dominate transport policy decisions. Unelected, with only token representation from developing nations, the car lobby wants to dictate how poor countries' governments spend the development loans that their impoverished people will repay for decades.

The car lobby's favourite road safety policy is pedestrian education. Despite decades of evaluation research, safety education has never been shown to reduce road injury rates, a point emphasized by the WHO in the World Report on Road Traffic Injury Prevention (Peden et al., 2004). Road user education is favoured by the car lobby because it places the responsibility for road traffic injury squarely on the victim and has no impact on industry profits. Its primary purpose is ideological. It sends the message that the road space belongs to drivers and that pedestrians and cyclists must look out or die. This also applies to children by the way, who account for 300,000 of the 1.2 million road deaths each year. Awareness campaigns are another favourite (Duperrex et al., 2002). The Commission promoted the 'Think Before You Drive' campaign, supported by the Bridgestone Corporation, which reminded drivers to use child seats and seatbelts and to check their tyres. Sensible suggestions they may be, but such exhortations have no discernable effect on road safety. On the other hand, the campaign may improve Bridgestone's corporate image.

At first sight there appear to be many different stakeholders in the global road safety policy arena, but careful examination reveals otherwise. In 1999, the World Bank—arguing that a partnership between businesses, NGOs and governments can deliver road safety improvements in poor countries—established the Global Road Safety Partnership (GRSP), a business partnership that includes the automotive giants General Motors, Ford, Daimler Chrysler, Volvo and drinks multinationals such as United Distillers and Bacardi-Martini. General Motors was represented on the GRSP and on the Commission for Global Road Safety.

A 2006 study compared the frequency of use of different road safety related words in GRSP road safety reports and in the World Report on Road Traffic Injury Prevention, a report that was prepared relatively independently of business concerns by the World Health Organization. In the GRSP reports there was a clear lack of reference to pedestrians and cyclists. In the WHO report, 'speed limit' occurred seventeen times in every 10,000 words; in the GRSP reports, just once. 'Pedestrian' was used sixty-nine times by the WHO, and fifteen times by the Partnership; 'buses' and 'cyclists' were mentioned thirteen and thirty-two times respectively by the WHO but not once by the Partnership (Roberts et al., 2006).

5. Structural reasons for the current situation

The main reason why car travel is annihilating human movement and putting our planet in peril is that motor vehicle travel is highly subsidized. Motorised transportation depends on three essentials: roads, oil and vehicles. Although most of the world's population will never own a car, road building is invariably funded by public funds in "developed" and "developing" countries alike. Road transportation is 95% oil dependent and ensuring a steady supply of cheap oil also involves massive public expenditures. Then there is the automobile industry, which received billions of dollars of taxpayers' money at a time when thousands of small businesses were going to the wall. In December 2008, US carmakers went cap in hand to Congress seeking a \$34 billion bailout package and received the best part of it.

And it does not stop there. Motorised transport causes a mountain of suffering. Who pays for the road traffic crashes that kill 1,000 children per day and permanently disable ten times as many? Who pays for transport related air pollution and the cardiac and respiratory diseases it leads to? Who pays for physical inactivity and the obesity, diabetes, heart disease, stroke and cancer it causes? And who will pay for climate change? These are the real social and environmental costs of motorised transport but it is the public and the global environment, and not the people who benefit from motor vehicle use who pay.

Table 2. Top ten corporations in the world according to Fortune 500 annual ranking for 2008.

Rank	Company	Product	Revenue (\$ millions)	Profit (\$ millions)
1.	Wal-Mart Stores	Supermarket	378,799	12,731
2.	Exxon Mobil	Oil	372,824	40,610
3.	Royal Dutch Shell	Oil	355,782	31,331
4.	BP	Oil	291,438	20,845
5.	Toyota Motor	Cars	230,201	15,042
6.	Chevron	Oil	210,783	18,688
7.	ING Group	Finance	201,516	12,649
8.	Total	Oil	187,280	18,042
9.	General Motors	Cars	182,347	-38,732
10.	ConocoPhillips	Oil	178,558	11,891

Table 2 shows the top ten corporations in the world according to the Fortune 500 annual ranking for 2008. Eight of the top ten are oil companies or car makers. The corporations that sell oil and cars pack enormous economic and political clout with revenues higher than the gross domestic product of many developed countries.

As regards roads, the wealthy world needs poor countries to build more roads so that the car makers can remain profitable. The market for cars in high income countries is nearly saturated. In the year 2000, there were 769 cars per 1,000 people in the USA and 441 per 1,000 people in UK. Although there is some turnover, as old and damaged vehicles are taken out of stock, a process that was recently given a boost with a generous injection of public funding, the main prospect for a growth in sales is in Africa and Asia. Nigeria has eleven cars per 1,000 people and India has seven per 1,000. To survive, the car industry must sell more cars and to make sure that it can, poor countries must build the roads to accommodate them.

Getting impoverished countries to spend public money on road building requires some serious propaganda. Poor countries have lots of pressing problems to deal with. The most pervasive misinformation is that road building is good for development. In 2005, the British Prime Minister Tony Blair launched the Report of the Commission for Africa. The Commission's objective was to diagnose African woes and make a prescription for a better future. Its conclusion was that Africa

needed more roads. More important than healthcare, AIDS prevention, security or better governance, road building it was argued would jump-start the stalled economy of a continent mired in misery for decades.

The commission's analysis was simple. Africa is poor because its economy is not growing. Improving its transport infrastructure would make its goods cheaper, allowing Africans to break into world markets and trade their way out of poverty. Of the estimated \$75bn needed to implement the commission's recommendations, 27% would be spent on infrastructure, mainly road building, with 13% spent on AIDS, and 10% on education.

If reducing the costs of getting African goods to western markets is really the cause of African poverty, as Tony Blair and the Commission for Africa claim, Britain could help Africa's poor by reducing the transportation costs for African goods once they reach Britain. Like many wealthy countries, Britain has high levels of fuel taxation. In most of Africa, fuel is not taxed but subsidised. In 2004, a litre of super gasoline in Nigeria retailed for US\$ 0.40. The corresponding cost in the UK was US\$ 1.56. British politicians would not contemplate reducing fuel taxes since these are such an important source of government revenue. Indeed, the money raised from fuel sales in Britain helps to pay for the huge state apparatus required to service a car based transportation system. This includes the police needed to enforce road safety laws, a judiciary, a system of pre-hospital and hospital care, and a social safety net for injured victims. African

fuel prices do not even cover the costs of road maintenance. According to the World Health Organization, the economic loss associated with road traffic injuries in poor countries is around 2% of GDP, nearly US\$ 100 billion, twice the amount they receive in development aid (Peden et al., 2004). Reducing the cost of road transportation in Africa might be good for trade but not so good for most Africans.

In 2006, the UK Department for International Development commissioned transport expert Professor David Banister at University College London to collate the scientific evidence on the link between road building and development (Banister et al., 2005). Although he did find a statistical link between the road infrastructure and the size of the economy, he could find no evidence that the former caused the latter. It is no surprise that rich countries have more roads than poor countries. Wealthy countries have more cars and so there is a higher demand for roads. There are more swimming pools in wealthy countries but no one would claim that swimming pools are "central to development" which is what the World Bank claims for road building. However, the report did point out that the congestion resulting from rapid motorisation hampers economic productivity and that the poor bear the lion's share of the negative impacts of road transport. At the Department for International Development the report was given a hasty burial.

If roads are the cure for African poverty, we have learned nothing from history (Rodney, 1981). For centuries, Africa's roads have led to its impoverishment. In his economic history of Africa, Walter Rodney describes the role of Africa's transport infrastructure in this way: "means of communication were not constructed in the colonial period so that Africans could visit their friends. Nor were they laid down to facilitate internal trade in African commodities. There were no roads connecting different colonies or different parts of the same colony to meet Africa's needs and development. All roads and railways led down to the sea. They were built to extract gold or cotton and to make business possible for the trading companies and for white settlers."

So who does benefit from reducing the transportation cost of transnational trade? Global business revolves around resources, factories and markets. Raw materials are transported to factories where workers produce

manufactured goods. These goods are then transported to markets so that consumers can buy them. If consumers are willing to pay more for the finished goods than it cost to produce them, the business will make a profit. And making a profit is what business is about. Cheap transport is good for profits because it reduces the costs of production and the costs of getting goods to markets. It also enables companies to take advantage of the lower wages of workers in poor countries. Indeed, cheap labour is one of the main reasons why the captains of industry are so excited about transnational trade. It is more profitable to set up factories in poor countries where wages are low than in rich countries where workers enjoy decent wages and standards of living. But poor people cannot afford to buy expensive manufactured goods and so the goods have to be transported back to markets in high-income countries. All this depends on cheap transport which is bad news for road safety, physical activity and climate change, but good for profits (Roberts, 2004).

The globalization of trade leads to more freight, longer journeys, more road danger and more greenhouse gas emissions. In the poor countries that bear the brunt of the road death epidemic, trucks are responsible for the majority of crashes. In India, trucks are involved in half of crashes in cities and two thirds of crashes on highways. The victims are mostly pedestrians and cyclists. Their experiences are part of the real social cost of international trade. And will small farmers in Africa compete with the subsidised grain from US agribusiness? Transnational trade is a new name for an age old activity.

For centuries, countries with greater economic and military power sought access to the resources and markets of weaker countries and millions died in the process. Rich countries claim that 'trade' benefits both rich and poor but the historical record suggests otherwise. Walter Rodney believed that Africa's roads were built so that white settlers could make themselves rich at the black continent's expense (Rodney, 1981). The Uruguayan journalist Eduardo Galeano came to the same conclusion (Galeano, 1973). In his book "The Open Veins of Latin America," Galeano wrote how the continent's transportation infrastructure was developed to drain its wealth into the ports and then out to the colonial economy. Nevertheless, publicly funded road building is only one of the

three essential elements of a profit centred transportation system. Cheap transport runs on cheap oil and keeping oil prices within profitable limits entails huge public subsidies and masses of misery for a great many people.

6. The good news and why we should act

So far, this paper has argued that the increase in global motorization has profoundly important consequences for the health of the population. First, there is an epidemic of death and injury on the roads. This is followed by a decline in pedestrian and cycling activity and an increase in average population fatness, followed in turn by an epidemic of chronic disease. However, because transport runs on fossil fuel, it also has important consequences for the health of the planet. Climate scientists predict an average global temperature increase of between 1.5°C and 6°C by 2100, depending on the extent of future emissions, possibly reaching a temperature not experienced in the past 100,000 years. This will have dire consequences for plant and animal life and for our health. Even cautious scientists are talking in apocalyptic terms about famine, disease and environmental refugees. That climate change is real and man made is not in doubt. All that is uncertain is how bad it will turn out to be.

Whereas continuing our dependence on fossil fuel powered transportation presents a serious ecological threat to the future of our civilization, reducing it presents unrivalled opportunities for improving population health and well being. Policies to reduce greenhouse-gas emissions have the potential to bring about large reductions in heart disease, respiratory illness, cancer, obesity, diabetes, depression, and road deaths and injuries. They could improve food security, reduced inequalities, strengthen communities, build a resilient and sustainable economy and reduce the threat of large scale violence.

The health benefits arise because climate change policy necessarily affects two of the most important determinants of health: human nutrition and movement. Although health professionals increasingly recognize the benefits of policies to address climate change, they are not widely appreciated by public policymakers. As regards climate policy, the existence of these health benefits implies a dramatic reduction in the net cost of taking

strong action to mitigate climate change – which means that failure to understand their importance could have serious environmental consequences.

In 2009, as part of a research project to estimate the health effects of reducing fossil fuel energy use, researchers from the London School of Hygiene & Tropical Medicine and the Indian Institute of Technology in Delhi estimated the health effects of transport policies that would meet greenhouse gas emissions reduction targets (Woodcock, 2009). They compared business-as-usual 2030 transportation scenarios (without policies for reduction of greenhouse gases) for both London and Delhi (as examples of British and Indian cities), with more sustainable transportation scenarios. In both settings, meeting greenhouse gas emissions targets in the transport sector would require modest increases in walking and cycling and reduced car use as compared with the business as usual scenarios.

Based on the epidemiological evidence linking transportation patterns and health, the resulting increase in physical activity would dramatically reduce rates of chronic disease. In India, which currently faces a major epidemic of chronic disease, there would be large reductions in ischaemic heart disease (11–25% of total ischaemic heart disease burden), stroke (11–25% of total stroke disease burden) and diabetes (6–17% of total diabetes disease burden). There would also be reductions (27%) in road traffic injuries. The increase in physical activity from more sustainable transport policies would also improve mental health, with an estimated 6% less depression. There would be additional mental-health benefits from more green spaces, less noise pollution, and improved physical fitness.

The experience of Cuba in the 1990s confirms the health benefits of societal reductions in fossil fuel energy use. During the Cuban energy crisis the proportion of adults who were physically active more than doubled (Franco, 2007 and 2008). The population average BMI fell by 1.5 units with a halving in the prevalence of obesity from 14% to 7%. Deaths from diabetes fell by 51%, from heart disease by 35% and from stroke by 20%. No one starved, because Cubans recognise food as a human right and not an economic commodity to be rationed according to the ability to pay. Cuba

ranks seventh on the New Economics Foundation Happy Planet Index for 2009. Its neighbour the USA ranks 114th, next to Nigeria. Cuba shows that weaning off oil can be achieved whilst maintaining high levels of sustainable well-being.

Sustainable transportation policies would reduce the population fatness. World-wide, a total of 1.5 billion adults are either overweight or obese. In the USA, more than one-third of the population is obese and UK scientists predict that the United Kingdom will be “a predominantly obese society” by 2050. The prevalence of obesity in India is very low but set to increase with increasing motorisation. The fact that motor vehicle use contributes to population fatness is well recognised but the fact that it can also contribute to under-nutrition has received much less attention. In April 2008, Evo Morales, the president of a poor and increasingly hungry Bolivia, pleaded for “*la vida primero, los autos segundos*” (life first, cars second), exhorting the wealthy world to stop burning food every time they drive – a reference to Western governments’ policies on bio-fuels. However, as was discussed earlier, motor vehicle use and food prices were linked long before bio-fuel policies.

Car use drives up food prices through its influence on the price of oil. Indeed, whereas agricultural economists reject the theory that the rising demand for food from in India and China was partly responsible for 2008 food price crisis, they do accept that the rising demand for oil in India and China is likely to have played an important role. Reducing oil use in the transport sector will help to prevent starvation. Until agriculture unshackles itself from dependence on oil, petrol tanks and stomachs will be competing to be filled. The decarbonisation of transport will contribute importantly to improving food security and reducing global hunger.

Reducing oil demand through sustainable transport policies would also help to reduce hunger by promoting the sustainable economic growth that is needed to lift people out of poverty. Rising oil prices threaten economic growth by increasing inflation. In February 2011, India's prime minister warned that the country's rapid economic growth is under "serious threat" from inflation. It is worth noting that almost every major economic recession in the USA has been preceded by an oil price rise

and every oil price rise has been followed by a recession. Indeed, the sudden rise in oil prices in 2008 is believed to have been a key causal factor in the current global recession. Prior to this period, low petrol prices had helped to keep inflation down which in turn kept interest rates low. However, between January 2004 and January 2006, US oil prices surged from thirty-five to sixty-eight dollars per barrel. This set off a burst of inflation which pushed interest rates up from one to five percent. Suddenly paying the mortgage and the interest on the loans for the two family four by fours became a lot more difficult, quite apart from the costs of filling them up at the pumps. Food prices also went up. Then the bubble burst, the banks went bust and the economy went into recession.

When the financial meltdown began the immediate response from western governments was to get un-sustainable consumption back on the roads. In both Europe and the USA, car makers were given cheap loans that cost the taxpayer billions. European car makers claimed that the loans would be used to manufacture greener vehicles. In 1998, the car makers had promised to cut the greenhouse gas emissions of their vehicles voluntarily. By 2006, it was clear they had lied and the European Commission announced that it would set compulsory standards. By 2009, they were claiming that they could only go green with massive public subsidies.

Propping up the car industry through public loans and by subsidising the purchase of new cars is not a long term solution. What is needed is an ambitious decarbonisation programme that will cut across all the major areas of fossil fuel energy use. This would include the decarbonisation of our energy supplies, increasing the energy efficiency of homes, the creation of an urban infrastructure for safe walking and cycling and the greening of our cities.

Renovating towns and cities for walking and cycling will require architects, artists, arboriculturists, builders, carpenters, engineers, ecologists, educators, planners, planters, street performers and urban farmers. Their job description would be to ensure that walking and cycling provides the most enjoyable, the most satisfying, the safest and the most direct means of getting around. These will be socially useful jobs that build the foundations for better health, safer and stronger communities and a

sustainable economy. Resuscitating a carbon based economy is a short term fix that can only fail. As soon as the economy starts growing and the demand for oil increases, petrol price rises will choke it back into a recession. The de-carbonisation of transport and society more generally is not the path towards austerity - it is the only way to avoid it.

7. References

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