



TRANSATLANTIC PLATFORM FOR ACTION ON THE GLOBAL ENVIRONMENT (T-PAGE)¹

Transport and Climate Change: the Policy Challenges

April 2008

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¹ IEEP and NRDC would like to thank the European Commission for part funding T-PAGE under their 2006 budget line [19.050200 'Transatlantic Dialogue at Non-Governmental Level'](#)

1 THE CHALLENGE OF TRANSPORT

Transport as a sector poses major challenges for future policy – not only as a major and growing source of greenhouse gases, but also as the principal consumer of oil-based fuels, on which it is almost wholly dependent. Also, transport is a key derived demand. That is, it is rarely an end in itself, but gives almost every individual vital access to the goods and services that they need; and to work, leisure, friends and family. This involves a complex series of behaviours and interaction that are not easy to change or unpick.

2 TRANSPORT BY AIR AND SEA

The main focus of this paper will be on road transport, as this is by far the largest transport subsector in terms of its greenhouse gas emissions. However, air and sea transport are also significant contributors, and their shares are growing rapidly in both relative and absolute terms, owing respectively to the rapid growth in international travel by individuals, and the massive movements of raw materials and manufactured goods around the world – in particular the tidal flows from major developing countries such as China into the prosperous OECD countries.

Owing to their largely international nature, these sectors have proved difficult to deal with in policy terms. The majority of their emissions fall outside national inventories under the Framework Convention on Climate Change and the Kyoto Protocol, and little progress has been made to date in the UN bodies tasked with tackling these sectors – ICAO and the IMO respectively.

A further difficulty is that there are no ‘easy fixes’ available to radically reduce the greenhouse gas emissions from aviation in particular. In fact the fuel economy of new aircraft is improving quite rapidly such that the average fleet efficiency improves by at least 1% per year; but unfortunately this rate of improvement is greatly outstripped by the growth in demand. In contrast there are considerable possibilities for reducing maritime emissions, including improved ship and propeller design, and even requiring ships to travel at an optimum rather than maximum speed. However, as fuel remains a relatively small component of the cost of shipping – because ships are already a very efficient method of moving goods relative to other modes – there is little incentive to make improvements.

3 SURFACE TRANSPORT IN THE US AND EUROPE IN THE GLOBAL CONTEXT

Surface transport is a large and growing sector of greenhouse gas emissions in both the US, Europe and elsewhere, and is heavily dominated by road transport. Furthermore, the sector is almost entirely oil dependent, requiring very substantial imports from oil-producing countries. There is also growing competition for such supplies from the expanding economies of China, India, etc, so high oil prices appear to be here to stay.

Particularly in the US, personal mobility is largely car (or automobile)-based, and there are now more cars in the US than there are drivers. Also, owing to low fuel taxes, ready availability of road space (at least outside urban centres), and in part to

the vagaries of the Corporate Average Fuel Economy system, a substantial proportion of US passenger vehicles are extremely large, and most are unnecessarily inefficient. Europe is in many respects following a similar pattern with car ownership levels approaching US levels; but there are two important differences:

- For historical and geographical reasons, European cities tend to be more compact than American ones, and although urban sprawl is an issue in many places, they tend nonetheless to be quite well served by public (ie mass) transit in the form of buses, trams, metros and railways. This offers viable and relatively low-carbon alternatives to the car, especially for urban and inter-urban travel; and
- Owing to far higher levels of fuel duty and relative lack of available space, European cars are on average significantly smaller and more fuel efficient than US ones, and there are moves to require further improvements.

Transport conditions vary across the rest of world, from those where car ownership is still a rare luxury to countries which seem destined to follow the path of car-based ‘hyper-mobility’ as is exercised in the US and Europe. This however presents us with an ethical dilemma posed by one British geographer as ‘pull up the ladder, or climb back down?’ - that is, it seems impossible and morally indefensible for us to try to deny the people of China or India the things that we enjoy, but to allow the rest of the world to follow the US transport model would be totally unsustainable in terms of resource use, land use and the environment. For example

- This would imply a world with perhaps 7 billion cars (there are fewer than a billion now);
- Unsustainable levels of demand for oil and other resources; and
- In much of Europe and in many of the world’s ‘megacities’, excessive demand for space for transport infrastructure.

On the other hand, people in the US and Europe have thus far proved not very ready to ‘climb back down’ the ladder of high mobility and car ownership either. However to have any hope of averting an ever-increasing contribution to greenhouse gas emissions, we will need to take action in a range of areas in order to promote a more sustainable model. In this there will be no single ‘silver bullet’ to cure all our ills; rather we need to think of a series of ‘wedges’ that will help us unpack the problem – and not just technology wedges, but also land use, intermodal and behavioural ones.

4 OPTIONS AND POLICIES TO REDUCE TRANSPORT CO₂

There are four main ways to cut transport CO₂ emissions:

- Improve vehicle fuel efficiency;
- Reduce fuel carbon intensity;
- Travel by less carbon-intensive modes of travel; and
- Travel less

The sections which follow offer some observations on each of these routes, and the policy options associated with them.

4.1 Improve vehicle fuel efficiency

Cars and trucks are still almost invariably powered by internal combustion engines, and these are very fuel inefficient, especially in stop-start driving conditions. There are therefore many technical options to improve fuel economy even within conventional vehicles, such as improved engine technology, better aerodynamics, advanced tyres and lubricants, etc. Beyond this there are possibilities for more advanced technology (hybrids, fuel cells, battery vehicles) which offer even bigger gains. Cars are already improving, but they are still getting larger and faster which counteracts much of the gains.

Europe is now formulating legislation requiring some of the toughest corporate fuel economy standards in the world. The key features of the proposed legislation are as follows:

- Overall target of 130g/km (broadly equivalent ambition to Japanese plans);
- A Regulation – administered at EU level;
- Obligations will be placed on each car manufacturer holding company (ie not individual brands or cars);
- Company average target determined by a utility function based on average weight;
- To be met by annual sales-weighted CO₂ of new cars sold; and
- Increasing fines for non-attainment – rising to €95 per car g/km.

The US is also looking to tighten its existing regime, but has a very long way to go owing to its very high current average fuel consumption. There is a great deal of scope for fuel economy gains, and even more if people could learn to accept smaller cars and reverse the long-running car size inflation trend.

4.2 Reduce fuel carbon intensity

Currently the best option available to reduce the carbon intensity of road fuels is liquid biofuels, often blended into conventional fuels. Measures are already in place to significantly increase the use of biofuels in both the US and Europe, but there are some serious concerns over current policy:

- ‘First generation’ fuels offer limited CO₂ savings in most cases, and would require too much land to make a major contribution (especially in Europe);
- Wide scale use of biofuels is already causing contention for agricultural land with food and industrial crops, and helping to drive up prices of food staples;
- Increased demand for fuels and land is in danger of bringing more rainforest, wetland or grassland under cultivation – in which case the carbon released hugely outweighs any carbon saved by the resulting biofuel.

Hence much more emphasis needs to be paid to certifying biofuels for genuine carbon reductions and for environmental and social sustainability, and to hastening the switch to ‘second generation’ fuels. In association with this effort, in 2007 California’s Low Carbon Fuel Standard sought to reduce transport fuel carbon content by 10% by 2020. Shortly afterwards the European Commission proposed a similar commitment as part of the revision of the EU’s Fuel Quality Directive, although it is by no means guaranteed that this proposal will survive un-amended.

In the longer term, a switch to all-electric vehicles may well prove the better option, but this will require a huge investment in further tranches of low-carbon electricity infrastructure.

4.3 Travel by less carbon-intensive modes of travel

As noted above, there has been a sustained trend in North America and much of Europe away from the less carbon-intensive modes of travel, and towards car-based mobility. This covers not only public (mass) transit modes, but also person-powered transport such as walking and cycling. A complex range of policies is needed, probably operating in conjunction, if we are to reverse the current unsustainable travel patterns, for example:

- Changes in land use planning, urban design and allocation of road space to encourage use of public and active travel modes;
- Policies to directly promote modal shifts, walking and cycling within local communities;
- Policies (eg road pricing) to dissuade motorists from driving;
- Better interurban rail networks;
- Promotion of unconventional vehicle ownership and use models, eg car clubs, car sharing, etc.

4.4 Travel less

As transport is primarily a derived demand – ie it is mainly about gaining access to some other facility or service, it is not automatically the case that a fulfilling life requires ever more travel. Indeed, life could be improved by travelling less if certain goods or services could be obtained without the need to travel at all.

Currently information and communications technology is undergoing a huge expansion in terms of capacity and capabilities, and offers some of the best options for displacement of physical travel with a low-carbon alternative. These options include for example:

- Internet shopping;
- Home working;
- Videoconferencing; and
- Home entertainment

Thus promoting ICT might offer one of the best hopes for reducing ‘hyper-mobility’ in developed societies.

5 CARROTS AND STICKS – CHANGING TRAVEL BEHAVIOUR

While it will always be important to offer consumers lower-carbon alternatives as part of the effort to change travel behaviour, arguably the level of travel demand in Europe and North America is such that ‘sticks’ will also be needed to dissuade individuals away from carbon-intensive travel behaviour.

In Europe, as noted, fuel duties have historically been very high and these have had an impact on the carbon-intensity of cars and their levels of use. Increasingly, too, elements of road charging are also emerging as a new means of charging motorists

directly for their use of roads. The policies are not popular, but appear to be increasingly accepted as an inevitable tool to ration the use of limited resources – ie fuel and space.

Europe also leads the world in implementing a greenhouse gas emissions trading scheme. It has now been agreed to include aviation into the scheme, but there is a lot more reluctance to include surface transport. There are a number of important reasons for this, including:

- Surface transport is a complex sector so it is not clear who should be included in a trading scheme; vehicle manufacturers, fuel suppliers, service operators or users;
- It is a huge and complex sector, so tracking individual journeys and emissions poses major practical difficulties;
- Individuals and small operators seem unlikely to be able to operate effectively in a trading scheme dominated by large emitters; and
- Fuel and road charges seem far simpler, and more likely to have known and desired effects.