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ABSTRACT

The environmental challenges for the transportation sector

Mr Gijs Kuneman, Director European Federation for Transport and Environment (T&E)

Transport is one of the single largest sources of environmental damage and nuisance: it has a large if not the major share in climate change, acidification, eutrophication and ozone formation, it is the main source of noise, it takes up large expanses of space in cities as well as in rural areas and leads to millions of people getting injured and tens of thousands of deaths on the roads every year. As such, the challenges for the transport sector, both environmental and regarding human health, are enormous.

Governments and the EU have set many environmental targets (e.g. Rio Climate Convention, EU 5th Environmental Action Programme, Convention on Long-Range Transboundary Air Pollution). In relation to these targets, many of the current trends show only moderate improvements, or are even heading in the wrong direction. The main areas of concern are emissions of nitrogen-oxides and particulates, CO2 emissions, noise and land-use. And the main cause behind all these is the increase in motorised transport.

Making transport sustainable

What can be done to solve the transport-related environmental and health problems? The broad measures at our disposal can be ordered in the following hierarchy:

1. Technical improvements (vehicles, fuels)
2. Increase in efficiency (e.g. higher load factors, advanced logistics)
3. Modal shift (generally from road and air to water and rail)
4. Reduce the need for transport (e.g. changes in production and distribution systems)
5. Reduce the level of consumption and production (e.g. travelling less)

The policy instruments available to stimulate this happening are fiscal, regulatory and information/awareness raising, which ideally are all applied in a single package.

Studies on freight transport show that full and ambitious packages of the first three levels of measures will help improve the environmental performance a lot, but are generally not sufficient to make freight transport sustainable in the long term. The problem is made worse by the large growth which can be expected in the next two decades. It may well be possible to bring noxious emissions down to sustainable levels, but noise, land use and CO2 emissions will continue to pose a problem. Therefore, measures in category 4 or even 5 may be necessary. The same is true for aviation.

For land-based passenger traffic the picture is more positive. Increased and improved public and non-motorised transport is essential, but we could still maintain the current level of car-based mobility within the bounds of sustainability, provided we consistently apply best-available technology (BAT). A super-efficient and super clean car is technically feasible, though costly.

The balance

A series of recent studies done in OECD framework concludes that in order to reach sustainable transport, the most effective and efficient solution is a combination of advanced technology and strong control on transport growth. The problem with current policies is that we have neither. Governments are generally not prepared to apply BAT, nor are they willing to control transport growth.

What is lacking is a clear political choice. Despite many stated commitments to the environment, governments seem to be reluctant to turn their principles into action. Just one example is the disparity between the principles expressed in the EC's green paper on fair and efficient pricing and the total lack of political commitment to those principles in Council and EP on the one concrete instrument on the table: the Eurovignet Directive. *The real challenge for the transport sector is not an environmental but a political one.*

In order to get the priorities clear, we should ask ourselves is: Do we think the transport sector should make its contribution to reaching sustainability? If our answer is no, if we think transport should be granted a special status, we will have to take up the challenge of telling other sectors that they have to do (even) more. If our answer is yes, we will have to take up the question of managing long-term growth.

The environmental challenges for the transportation sector

Mr Gijs Kuneman

Director European Federation for Transport and Environment (T&E)

This speech gives a general overview of the environmental challenges for the whole transport sector, covering all modes (though focusing on road specifically), passenger transport as well as freight. The speech is in three parts:

1. Sustainable development and current transport trends
2. Measures
3. Policy developments

1. Sustainable development and current transport trends

Sustainable development

The term sustainable development was first coined in 1980 by WWF, UNEP and IUCN in the "World Conservation Strategy", made famous by the Brundtland Commission in 1987, and given official recognition in Rio in 1992. It involves a development which, taking into account ecological, health and social aspects, can be sustained essentially "for ever". Sustainability means living off the Earth's interest, not off its capital. Current developments are not sustainable.

As an illustration: this means we need a 75-90 % reduction of emissions of VOC and NOx, and a reduction of 60% in CO2 emissions.

Sustainable transport

Transport is one of the single largest sources of environmental damage and nuisance. The following illustrates transport's share in pollution and nuisance:

25% of CO2 emissions
50-60% of NOx emissions
45% of VOC emissions
the majority of small particulates
by far the largest share of noise nuisance
45 000 people killed and 1.6 million injured on the roads each year
transport takes up large expanses of space in cities as well as in rural areas

In my view it will be difficult, if not completely impossible, to reach sustainable development without a contribution from the transport sector. In other words: we need sustainable transport.

This speech will focus on air pollution and climate change as the most prominent problem for transport, the most politically accepted issue and the most easily quantified indicator. Naturally other concerns like noise, water pollution, accidents, land use etc. should also be taken into account in sustainable development.

International commitments

The European Union, and indeed most European countries, are bound to a number of political commitments to reduce environmental damage. Examples for climate change and air pollution are: the Rio Convention on Climate Change, the UN-ECE Convention and Protocols on Long-Range Transboundary air Pollution, the European Union's air quality framework directive and upcoming daughter directives, and the upcoming EU acidification and ozone strategies.
These commitments in fact are concrete steps towards sustainability, and as such extremely important.

The balance: commitments vs the trends

Comparing the desired situation and the commitments to actual real life developments provides not a rosy picture. The (modest) targets set by the EU's 5th environmental Action Programme for VOC and NOx and certain, and for noise and CO2 are likely to be overshot (see graphs on VOC, NOx, CO2 and noise, source: European Environment Agency). Further reductions in the future towards stricter targets will prove difficult.
And the main cause of the targets not being met is the growth of motorised transport.

2. Measures

Having seen the environmental challenges for transport, what can be done?

Hierarchy of measures

The measures at our disposal can be ordered in the following hierarchy:

1. Technical improvements (vehicles, fuels) and driving style
2. Increase in efficiency (e.g. higher load factors, advanced logistics)
3. Shift to cleaners modes of transport (generally from road and air to water and rail)
4. Reduce the need for transport (e.g. changes in production and distribution systems)
5. Reduce the level of consumption and production (e.g. travelling less)

ad 1: This is the lowest level of measures, which has no effect on milage, but only aims to reduce emissions per km driven.

ad 2: Increasing efficiency is a very desirable measure, as it directly benefits both the environment and the operator: transporting the same number of goods with lower milage.

ad 3: All modes of transport cause environmental pollution - but in a differing degree. Compared to aviation and road transport, rail and waterborne transport are much more energy-efficient. However, where noxious emissions are concerned it is important to note that new cars and trucks may become so clean in the future that they will approach (inland-) shipping and (diesel-traction) rail in performance in some cases. If all policies as proposed in the EU's acidification strategy are implemented, and if emissions from shipping remain unchanged, the latter will amount to more than a third of the total EU emissions (nitrogen and sulphur, North-Eastern Atlantic only). Clearly, for shipping and rail to maintain their large environmental advantage, measures to curb emissions will be necessary in the future. Thus, rail and shipping can remain the environmental alternative.

ad 4. Reducing the need for transport and travel can be applied both in passenger and in freight transport. Examples of the former are bringing work and living closer together, and enabling people to work from home. Especially in the freight sector, reducing the need for transport can be greatly beneficial to the economy. A less transport-intensive economy, i.e. maintaining the same output with less transport required, will help save money as well as the environment. One micro-scale example to illustrate: the German Wuppertal Institute made a comparison of the transport intensity of 11 mushroom growers in Germany. The investigation revealed that, in order to produce the same pound of mushrooms, the "best" grower made a truck move 8 metres. However, the "worst" needed 96 metres of truck transport to produce and market an identical pound of mushrooms. Simply by choosing suppliers from closer by, and by streamlining the process of production, companies can save enormous amounts of transport.

ad 5. If we are serious about sustainability, there may be no way out but, at some point, to put a ceiling to transport growth....

Policy instruments

The classic triad of policy instruments can be used to put in place the above measures:

1. Legislation
   For instance emission limits, access to city centres
2. Financial/fiscal instruments
   For instance fuel taxes, parking fees, road tolls, reduced charges for cleaner vehicles/fuels, but also investments and subsidies
3. Information
   Training, awareness raising, education.

How effective are the measures?

The general picture as we saw in the trends, is that the growth of transport, of both passengers and freight, more than offsets any progress in abatement of noise and emissions. Our main question therefore is: what should we do in order to reach our environmental targets - which measures can and should we use?

Can technology solve the problem?

For *passenger* transport, in theory it is possible to maintain a high degree of private motorised (= car-based) mobility and still reach sustainable transport. For noxious emissions like VOCs, NOx and particulates rigorously applied best-available technology can largely solve the problem - in theory. A super-efficient and super clean car is technically feasible, though costly.

The table by the Dutch Centre for Energy Conservation and Environmental Technology illustrates how technical progress in fuel efficiency (leading to the so-called 3-litre car, consuming 3 litres/100 km) in theory can more than offset increased CO2 emissions due to growth in mobility. This is theory indeed; the 3-litre car is nowhere in sight in real life. It is simply not marketed.

For *freight* transport, the problem is much greater, even in theory. The potential for reducing CO2 emissions per truck via technical means is estimated by the Dutch Centre for Energy Conservation and Environmental Technology to be 10-20% between 1995 and 2010. Extreme technology-push scenarios estimate a 25% reduction. The technical potential for reducing NOx emissions is 45-60% between 1995 and 2010. However, with road freight projected to grow by 70-80% in the same period, it is clear that road freight cannot become sustainable by only applying technical measures.

Combining measures

Combining technical advances with more levels of measures, for instance increasing efficiency and stimulating modal shift, will of course improve the picture. However, an overview of four recent studies shows that even that will not do (see table "Four studies on reducing CO2 emissions by road freight").

We can conclude from the table that in order to reach our targets we need to go further than measure level 3. Level 4 must be utilised, and maybe even 5, if we are serious about sustainability. Managing growth is inevitable, moreover because the extreme technology and modal shift scenarios, as included in the studies, are unlikely to take place.

This conclusion is confirmed by the OECD Task Force on Sustainable Transport. This Task Force is currently working on a large project involving six case studies covering a total of 8 countries, modelling transport scenarios which lead to sustainable transport by 2030. The preliminary conclusions from that study indicate that the most feasible, "optimum combination" scenario

requires an average of 50% reduction in car use, and also a severe reduction in lorry-kms...

Other modes

So far I have only talked about road transport. What does this mean for the other modes? Obviously, shipping and rail should see their market share increase because of the essential modal shift. In the meantime, however, both these modes should also improve their emission performance.

For aviation the picture is more or less the same as for road freight. Potential technological improvements in emission abatement and fuel efficiency in aircraft are likely to be roughly of the same way order or magnitude as in lorries, though probably slower. Meanwhile air transport is projected to grow twice as fast as road freight..... Clearly, aviation is a sector which causes great environmental concern.

Other problems

So far, I have also limited myself to emissions and climate change. Let's not forget that increased transport, especially road and air, will also offset technical advances in noise abatement. Traffic noise is likely to increase rather than decrease. And finally, it is hard to quantify sustainable land-use, but there is no doubt, however, that growing transport demand will have further negative impacts on land-use.

Conclusion

Our biggest environmental and social concern in transport is growth. Technological progress, increased effiency and modal shift can in theory offset a large share of the nuisances caused by the increased traffic. However, if we take sustainability seriously, this is likely not to be enough - we will have to tackle transport growth. Only a full package, a combining all levels of measures, can help us reach sustainable transport.

3. Policy developments

All the above is theory. It is about what is technically feasible, what is theoretically possible if a coherent long-term policy on transport and the environment existed. But it does not. Governments are generally not prepared to force expensive best-available technology on industry and consumers, but nor are they prepared to seriously consider managing traffic demand. They largely avoid making a choice.

EU policy

Interestingly, the policies for sustainable transport are rather advanced on the European level. Since a few years the EU has a comprehensive transport policy which seems to lead the way in Europe (see overview).

However, so far these grand ideas have proved to be little more than just that (see overview).

The real challenge: making a clear choice

We have some important choices to make:

- do we really want sustainability?
- if so, do we think the transport sector should make its contribution to reaching sustainability?
- if not, if we think transport should be granted a special status, someone has to convince other sectors that they have to do (even) more.
- If our answer to the 2nd question is yes, we do want transport itself to become sustainable, we will have to take up the question of managing long-term growth.

This is everybody's job

Non-one in society has nothing to do with transport. Therefore all actors in society will have to take up their responsibility. Companies can start their own process of "greening" their operations, and on the longer term think about restructuring, consumers have to reconsider their travel behaviour. But in the end it's the governments who will have to make the situation clear, who will have to help society to make the right decisions.

The real challenges for transport therefore are political.

The European Federation for Transport and Environment

The European Federation for Transport and Environment (T&E)

- represents non-governmental organisations working in the field of transport and environment
- has 29 member organisations in 19 European countries
- among these are environmental organisations, public transport users' associations and Environmental Transport Associations
- indirectly represents more than a hundred regional organisations and several millions of individuals.

T&E

- monitors European transport policy and submits responses to all major papers from the European Commission
- lobbies the European institutions for a more environmentally responsible transport policy (EU, ECMT, OECD, UN-ECE)
- also frequently commissions studies, and publishes its own reports on important issues

Over the last few years T&E has done extensive work on:

- the external costs of transport. Many or T&E's conclusions can be found in the EC green paper "Towards Fair and Efficient Pricing in Transport".
- the link between road building and economic growth
- best-practice in urban transport
- best-practice in freight, showing how hauliers and forwarders can "green" their operations. T&E participates in Neil Kinnock's best-practice advisory group on freight.
- air quality, emissions and fuel specifications. Experts of T&E also participate in the working groups of the EC Auto-Oil Programme. And last year T&E published a report on reducing the emissions from shipping.