Environmentally sustainable transport: policy options at the national level

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1. Introduction

One of the goals of transport policies in Denmark and the Netherlands since the beginning of the 1990´s, and in Sweden somewhat later, has been the creation of sustainable transport systems.

In a recently completed empirical study (Tengstrøm 1998), I found that, in all three countries, the number of transport policy failures in the perspective of environmental sustainability is, in contrast to the number of successes, impressive. These failures relate to four intermediate objectives:

1. Despite the political will to influence the transport volumes (in size and distribution on different transport modes)
- transport volumes are still increasing (somewhat less rapidly in Holland)
- car density has been increasing (with the temporary exception of Sweden as an effect of a weak economic development)
- passenger kilometres by car are still increasing
- the transport share of the public sector is not growing
- the role of the bicycle is not strengthened

2. Despite the political will to influence the energy consumption of the transport sector
- the use of energy in the transport sector shows a stable upward trend (with a temporary (?) exception in Sweden 1996 and 1997)
- the dominance of fossil fuels is still unbroken
- the per capita emissions of CO_2 are far from being of an globally acceptable amount

3. Despite the political will to influence the technical standard of the fleet of motorcars
- the trends towards improved energy efficiency has been broken
- the percentage of cars heavier than 1100 kg is increasing slowly
- the emissions of CO_2 from the transport sector have increased significantly

4. Despite the political will to influence the environmental adaptation of new infrastructure
- losses of productive soil are still substantial as an effect of the building of new motorways (to a somewhat less degree in the Netherlands, where the total losses, however, are impressive)
- the attempts to apply environmental impact assessment in road building have been a failure.

There are, thus, quite a few failures in the political efforts to reduce the present unsustainable character of the national transport systems in the three countries. This fact raises, at least, two questions:
- why have the policies for environmental sustainability failed and
- what policy options would be able to enhance environmental sustainability in passenger transport at the national level?
In this paper, I will address the second question.

2. The importance of an underestimated policy instrument

The creation of long-term sustainable passenger transport systems necessitates, in my view, the involvement of the ordinary citizens. To achieve their involvement, traditional policy instruments are inappropriate. More importance needs to be attached to an underestimated policy instrument, namely communication.

In the case of environmental policy, a similar position is taken by the German political scientist Martin Jænicke, who claims that "(i)n contrast to the attention accorded to technology and legal regulation, the significance of information and communication as policy instruments for environmental change has been neglected" (Jænicke 1996, p 80). As to transport policy and practices, the same opinion has been voiced in the USA. A study entitled *Toward a Sustainable Future* (1997), published by the Transportation Research Board, emphasizes that "(c)hanges in transportation policies, technologies , and prac- tices...often require broad and deep public support. Because the risk of climate change and the other ecological effects of transportation are at present largely imperceptible to the public, special efforts are needed to enhance public awareness and understanding of these risks in order to spur dialogue and debate about opportunities for addressing them" (p 12).

To be sure, information/communication is often mentioned in political documents. In the Danish Transport Action Plan of 1990, information campaigns are mentioned briefly (p 182). In a recent publication, entitled *Lokal agenda 21* (August 1997), the Danish Ministry of Energy and Environment recommends local authorities to initiate a dialogue with the general public on environmental problems such as emissions of carbon dioxide. The Swedish Commission on a National Plan for Transport and Communications analyses, at some length, the possibilities of information strategies in order to influence the attitudes of the citizens (SOU 1997:35, pp 455sq) but it also says, very briefly, that it is important that "information develops into a dialogue with the public and business sectors" (p 456, my translation).

The Dutch Transport Structure Plan of 1990 discusses "Communication and education as strategic factors" at some length, on the basis of theoretical reasoning about the value of communication and education as strategic factors in transport policy (SVV2, pp 81sq). Communication should therefore be a key factor in creating political acceptance of more radical policy instruments. "On the basis of a communication plan, action will be under- taken over the next few years with a view to increasing public knowledge, promoting awareness and ultimately altering behaviour" (SVV2, p 82).

However, in political documents, the distinction between information and communica- tion is not always strictly observed. Information is certainly a kind of communication but is has one-way direction: from the sender to the receiver. This policy instrument is generally regarded as being inefficient (Palm 1994; Windahl 1997). Ideas for developing more efficient environmental information strategies are sometimes suggested (for instance, Nitsch 1996).

Communication is a more complex interaction between, at least, two participants. The official view of communication as a political instrument, if distinguished from information, is, however, often technocratic. The ordinary citizens are seen as objects of educational efforts rather than subjects with minds of their own. I believe that policy-makers and their experts have to change this view, if they want the ordinary citizens to become more involved in the necessary transformation of the transport system. Genuine communication is, in my view, an underestimated instrument in transport policy.

There are a number of well-known difficulties associated with the use of communication as a political instrument. The pessimistic view is that, if communication can go wrong, its goes wrong. Secondly, communication is a time-consuming process, even when it is successful. It is easier to initiate communication at the local level than at the national level. The channels between the politicians and the general public are sometimes non-existent, sometimes difficult to use. In the Netherlands, there is therefore a growing interest in the role of "intermediate groups" (such as NGO:s). After all, communication is the key method of problem-solving in modern democracies such as Denmark, the Netherlands and Sweden.

The entire idea of the involvement of the ordinary citizens in transport policy can be linked to Giddens´ theory of "life-politics". According to him, the global problems of environmental sustainability necessitate not only coordinated global responses but also "reaction and adaptation on the part of every individual". Individual responses to transport problems as part of the crisis of modernity could lead to a gradual change in lifestyles and would also stimulate the emergence of new political forms.

Referring to these ideas, I repeat that the creation of a sustainable society necessitates the involvement of the ordinary citizens, maybe also their deep commitment. "The sustainability transition" has to be a democratic process (cf O´Riordan 1996). I believe that the transformation of the passenger transport system could be used as a process of collective learning. The reason for this last view is that most decisions concerning if, when and how to move from one place to another are taken individually.

The role of communication can also be related to the theory of J. Habermas about "das kommunikative Handeln" (Habermas 1981). This concept refers to a linguistic interaction without coercion between citizens and an exchange of rational arguments. According to Jænicke, the ecological question has already "led to the development of new integrative mechanisms such as quasi-institutional dialogue structures" (Jænicke 1996, p 77).

Habermas´ theory has been applied to an analysis of modern society from the point of view of decision-making by a Norwegian sociologist (Eriksen 1993). Modern society is assumed to have a potentiality for reasoning (p 35). In such a society, decisions are taken on the basis of a free debate by means of arguments (p 27). The communicative process results, when it is successful, in mutual understanding (p 31). Under such circumstances, people are supposed to be able to act both in the general interest and in their self-interest (p 47). However, some actors may be able to manipulate information in a strategic way (p 38). In reality, therefore, the power relations in a society often determine the actual outcome of the decision-making process.

Objections have therefore been raised against Habermas´ view mainly on the grounds that there is an obvious tension between the normative and the real (Flyvbjerg 1998b). To increase the understanding of social change in democratic societies in an effort to develop procedures for dealing with conflicts that cannot be solved by argumentation, the discourse ethics of Habermas have to be contrasted, according to Flyvbjerg, with the power analysis and ethics of Foucault. In the case of environmentally sustainable transport, there is possibly general agreement about the necessity to develop transport systems that are sustainable in the long-term, but ideas do diverge about how and when to reach this goal. Conflicts between collective actors may, however, become constructive, particularly if these collective actors consist of reflecting citizens. I draw the conclusion from these arguments that the use of genuine communication as a political instrument will initiate both dialogues and conflicts, some of which will be constructive.

A possible effect of a period of intense communication and conflict is a reconstruction of the *social representations* concerning the problems and possibilities of passenger transport. After such a reconstruction, the ordinary citizens may be willing to accept a more innovative transport policy than that of the 90s. At the same time, the behaviour of industrial and commercial actors may be modified as a consequence of the new involvement of the ordinary citizens/consumers. Finally, the same citizens are the only ones that are able to develop long-lasting solutions to the conflict between sustainability and the other goals of transport policy by adopting new ways of defining welfare and the quality of life. Under favourable circumstances, such development may lead to new patterns of mobility and new, less mobile and less car-dependent, lifestyles.

Communication and conflict can also inspire such public actions that are characterized as "*history-making*" in a recent study of "entrepreneurship, democratic action and the cultivation of solidarity" (Spinosa, Flores & Dreyfus 1997). Taking a political action group called "Mothers Against Drunk Driving" as a paradigmatic example, the authors found that the shared personal experience of the participants helped them to identify disharmonies in accepted practices (i.e. drinking before driving) and to involve other groups of citizens (physicians, lawyers, educators, executives etc) in their efforts to alter the law (*op. cit.* pp 88sqq).

My main thesis in this chapter is, thus, that a period of intense communication and conflict initiated by the policy-makers will change the preconditions for more radical policy options aiming at reduced environmental unsustainability in the medium term (2005-2020) and aiming at the creation of sustainable transport systems in the long-term (2020-2050). It should be added that applying genuine communication as a policy instrument will naturally not render other policy instruments obsolete.

3. Four possible topics for dialogue or conflict

In the preceding section, I suggested that policy-makers in Denmark, the Netherlands and Sweden should consider the possibility of initiating a period of genuine communication with the ordinary citizens in order to inspire dialogue and conflict concerning the road towards sustainable transportation.

A great variety of questions could be addressed by the participants in such a dialogue or conflict but I would like to draw attention to four possible topics or policy options. These options all cover transport-related activities that are completely within the control of the citizens of a single nation:
- reducing speed on the entire road-net
- increasing the use of carbon-neutral or carbon-free fuels
- stabilizing present motor vehicle transport volumes for individual mobility
- reducing the use of private cars

3.1. Lowering speed limits on the entire road-net

An appropriate first topic for dialogue or conflict is the question of a general reduction of speed limits on the entire road-net as well as a reduction of the actual speeds. Such reductions, if attained, would not only increase road safety to a significant extent but also cut down the energy consumption and the emissions of noxious fumes substantially.

A discussion of this issue could be initiated by the authorities through an intense informa-

tion campaign similar to the one which preceded the change-over from driving on the left side of the road to the right side, which occurred amazingly smoothly in Sweden in 1967. The reasons for a speed reduction should be spelled out in the perspective of increased safety and reduced unsustainability. Good arguments are easily available.

In a recent Dutch report entitled *Time to tame our speed?* (1996), it is argued that it is possible to define the optimum speed limit in a socio-economic sense. This is defined as "the limit in which the balance of social costs (travelling time) and social benefits (less external costs in terms of injuries, fatalities and the environment) reaches a maximum" (p 2). As there is no consensus in the scientific literature on the estimates of these costs and benefits, the authors of the report calculate with two alternatives: one where they assume average external costs and one where they assume high external costs.

Under these assumptions, they identify a number of direct effects of applying optimum speed limits (reduced energy consumption, reduced emissions and reduced injuries and fatalities) as well as indirect effects (a reduction of vehicle kilometres due to longer travelling times).

To present their results, they compare four scenarios (p 4):
1/ a basic scenario representing the actual speeds on the Dutch road-net
2/ a scenario where the present speed limits are scrupulously observed
3/ a scenario where the optimum speed limit is defined on the assumption of average external costs and
4/ a scenario where the optimum speed limit is defined on the assumption of high external costs:

	basic	present speed limits observed	optimum average costs	optimum high costs
vehicle km	100	94	91	86
energy	100	89	79	68
CO_2	100	89	79	68
NOx	100	85	64	48
injuries	100	85	83	73
fatalities	100	79	75	60

Table 1. Estimates of direct and indirect effects of three different scenarios of speed reduction in Holland compared to the actual figures (=basic scenario).

The suggested lowering of speed limits will not be dramatic on the Dutch road-net. In the optimum scenario based on the assumption of high external costs, they would be 90 km/h on motorways, 70 km/h on present 80 km/h roads and 40 km/h on present 50 km/h roads (given that the speed limits are scrupulously observed).

Lowering speed limits on the road-net seems to be politically feasible. There are already organizations pleading for such a reform (for instance, the "Swedish Association for Traffic Safety" in its periodical publication *Sæker trafik*, 1997:3). Many citizens are probably able to identify disharmonies in established practices in terms of a high level of fatalities and limited saving of time. I believe quite a few citizens could be mobilized in a drive for speed limits. The time they lost through reduced speed would have a negligible impact on their life patterns. A new traffic culture would instead offer some advantages in terms of reduced stress.

The majority of the voters could probably also accept more rigid ways of controlling actual speeds, if this turns out to be necessary. The Dutch study recommends two methods: a prompt

punishment policy or the gradual compulsory introduction of various technical devices such as cruise control and speed limiters.

3.2. Increasing the use of carbon-neutral or carbon-free fuels

The present dependence of the transport sector on fossil fuels is not sustainable in the long-term, possibly not even in the medium term. In order to carry out the step-by-step replacement of fossil fuels, it is necessary to use a number of measures. Some of these are available and politically feasible now. An intensified dialogue between politicians and experts, on the one hand, and the ordinary citizens, on the other, would probably make this process more viable than it is today.

A *first step* in the replacement process is to reduce the present consumption of fossil energy. The technical possibilities of reducing the specific energy use of the individual car per km are considerable. In the period until 2010 a major part of the present car fleet will have been replaced by new cars. It has been estimated by the Swedish Environment Protection Agency that, if new energy-saving cars (of the same size) replace older cars in 50% of the Swedish households, this would mean a 5% saving on fuel (*Biff och bil*, pp 48sq). It has also been estimated by the same Agency that if 50% of all car-owning households in Sweden carried out 20% of their local journeys by other means than the car, this would already reduce the transport fuel consumption of Swedish households by another 5% (*ibid.*).The possibilities of saving fuel by reducing the speed were discussed above on the basis of Dutch figures. A real speed reduction on the Swedish motorways from 110 to 90 km/h has been estimated to correspond to a reduction of fuel consumption of 25% per km, provided that the cars are optimized for these two levels of speed respectively (Steen et al. 1997, p 186).

A *second step* in the replacement process is to increase the use of carbon-neutral or carbon-free fuels. A voluntary introduction of such fuels seems to be viable in the near future (before 2015) even if the taxes are of decisive importance (*SOU* 1997:35, pp 366sqq). The significance of such an introduction is not so much its impact on the actual energy consumption but rather that it increases the public awareness of the necessity of replacing fossil fuels. It will help to improve the mental readiness of the population to face possible non-linear developments in the future, for instance, in terms of international agreements on substantial national reductions of emissions of carbon dioxide from the transport sector, or in terms of various forms of turbulence on the oil market (price shocks etc).

In the case of cars, the easiest way to replace some fossil fuels today is probably to use rape oil methyl ester (RME) in diesel-fuelled vehicles and, in petrol-fuelled vehicles, to use a mixture of petrol and alcohols (ethanol or methanol) made from renewable energy sources. Blending can be done at a refinery or at the depot *(Implementing Alternative Fuels in Sweden* 1996). The potential production of biofuels in Sweden has recently been estimated to have capacity to cover the future demand of the transport sector (Johansson 1996).

The possibility of a broad introduction of ethanol was demonstrated in Brazil in the 70s. It was essential to entrust the oil companies with the task of distributing the new fuel. It was (and still is) used both mixed (22%) with petrol and as neat ethanol (100%). The latter is most convenient in specially constructed cars. The crucial problem of the Brazilian case (which is based on sugar cane) is the variability of world sugar prices. When the price is high, it is more profitable for the producers to produce sugar instead of ethanol.

Hybridecars (fuelled by petrol and electricity) are seen, particularly by the car industry, as an alternative, at least for the near future. When driven on "clean" electricity, they contribute both to a substantial reduction of local pollution and a minor reduction of emissions of

greenhouse gases. The future of the pure electric car is, however, still (spring 1998) obscure. Another option for the consumer is to buy a flexible fuel vehicle (FFV). The technical and political possibilities of introducing various kinds of environ-mentally friendly cars have recently been assessed in Denmark (*Mere miljøvenlige biler - tekniske muligheder og politiske tiltag*, 1997).

A *third and final step* in the replacement process would be to increase the use of non-fossil fuels substantially in the period 2015-2040. The feasibility of a long-term replacement programme has recently been studied by a group of scientists at Stockholm University (Steen et al. 1997). The group has analysed the possibility of creating a sustainable transport system in Sweden around 2040 and has arrived at the conclusion that, by 2040, Sweden could have a transport system based only on renewable energy amounting to 35 TWh. Despite this, they estimate that leisure time mobility will have increased by 20% compared with today´s levels.

However, the main conclusion drawn from this future study was that a sustainable transport system in Sweden cannot be based only on technical change. A successful transition will also necessitate
- stabilized transport volumes
- planning for reduced mobility by means of conscious urban planning och increased use of information technology
- the public acceptance of strong economic measures and new principles of urban planning and the whole idea of sustainable development (*op.cit.* p xi).

3.3. Stabilizing the motor vehicle transport volumes for individual mobility

In the three countries under investigation, the growth in transport volumes is generally expected to continue in the short (1998-2005) and medium (2005-2020) term. Increased mobility by car threatens, however, to undo any of the benefits gained by enforcing other measures to deal with the problems of the trans-port system. The increased energy efficiency of the individual vehicle risks being outweighed by a growth in traffic. With increasing transport volumes, congestion problems become more serious in many areas. When traffic intensifies, so does the problem of trying to reduce the total environmental impact.

The necessity of breaking the tendency of increasing mobility has been emphasized by many scientists, for instance, the British Royal Commission on Environmental Pollution, which recommended in its Report (1994) that "the aim of future planning policies must be to reduce the need for movement (instead of stimulating ever more mobility, as has been for too long the case). This will involve a gradual shift away from lifestyles which depend on high mobility and intensive use of cars" (*Report on Transport and the Environment*, p 233).

No "natural" saturation levels are in sight today. Suppose that the average growth in GDP will be something between 1-2.5 % in the next two decades in the OECD countries, the task will be to decouple transport growth from economic growth in the same way as energy growth was decoupled from economic growth in the 70s (Peak & Hope 1994). Historical experience shows, however, that it is difficult for politicians to influence traffic growth by means of traditional policy instruments.

Stabilization can, I am convinced, be achieved by a conscious rationalization of individual trips - if the general public is committed to this objective. It is reasonable to assume that the potential for rationalization of individual trips is substantial. At present, the incentives for such a rationalization are weak. Rationalization may be realised 1/ by means of better planning of one´s own mobility, 2/ by increased use of public transport, car sharing, and soft modes (cycling and walking), and 3/ by increased use of information technology.

After a period of intensive dialogue between politicians and transport experts, on one hand, and the ordinary citizens, on the other, it would be possible for the governments in the three countries (supported by majorities in the Parliaments) to *enter into a social contract* with the population stipulating 1/ that the total passenger transport volumes should be stabilized by voluntary means in a period of economic growth and 2/ that, if the volumes are not stabilized by voluntary means, strong economic instruments to reach the target should be accepted by the voters.

The citizens can be assumed to accept a voluntary rationalization of trips associated with production and reproduction (which makes access to various services necessary) more easily than trips associated with their leisure. Trips of the first category have seldom any value in themselves and a reduction of them would not mean any loss of traditional welfare. People can therefore be assumed to be willing to consider ways of reducing the number of such vehicle-km. Everyday commuting may, for instance, be rationalized through initiatives taken by the employers or by the organizations of the employees.

The willingness to stabilize the number of vehicle-km covered in periods of leisure can be assumed to be much less. The proportion of domestic trips made in "free" time (not for production nor reproduction purposes) is considerable. It corresponds to around 40-50% of all trips (measured in length and time but not in frequency). It should be emphasized that traditional statistics do not include international trips, estimated to correspond to 15 % of the overall mobility in the case of the Swedish population (Frændberg 1998, p 51). International trips by Swedes are dominated by tourist trips both with regard to frequency and trip length. This kind of tourist mobility corresponds on average to 5 km/a day per capita (*op.cit.* pp 49sq). Among the tourist trips, the 10% longest trips accounted for around 60% of the energy used for tourist travel (*op.cit.* p 84). In the perspective of sustainability, the volume of such trips and its present increase are particularly problematic, as the annual average improvement in fuel efficiency cannot be expected to compensate for the increase in energy consumption and corresponding increase in emissions of carbon dioxide and NOx. The latter substance emitted in the upper troposphere contributes relatively more to global warming than NOx emitted at the ground level (*op.cit.* pp 82sqq).

Any stabilization of transport volumes in free time challenges basic values of modern welfare (in terms of quality of life) and modern lifestyles. At present, a high degree of mobility in free time is regarded by many as an important element of their welfare. Basic values can hardly be changed by political means in a democracy. It is therefore only the citizens them-selves who are able to reorientate their priorities and preferences. To reflect on the environ-mental consequences of one´s actions seems, however, to become a new element in the existential situation of modern man. The individual´s mobility in free time is, indeed, an urgent matter for such reflection. A less mobile lifestyle may make more room for values which are underestimated today (see Berg 1996). In my view, any stabilization of the use of motor vehicles would also necessitate a reorientation of the lifestyles in leisure time. Globalization of the current international tourist mobility of people in countries like Denmark, the Netherlands and Sweden would be unsustainable.

3.4. Reducing the use of private cars

A fourth topic for dialogue and conflict would be the possibility of changing the role of the *private* car in national transport systems. A reduction in the number of cars and in the number of trips made by car would help to solve many traffic problems (congestion, increasing energy consumption, emissions of carbon dioxide and other substances).

Successful implementation of this reduction would not conflict with the goal of efficiency, at least not at the societal level, as congestion would decrease. At the individual level, efficiency (measured in terms of time, not in terms of money) would sometimes decline. On the other hand, such a change in the role of the car would not necessarily conflict with the goal of striving for social equity in transport, not even with regard to equal access to car use (see below).

What makes it very difficult to break the historical trend of increasing car use is not only the obvious advantages associated with the practical and convenient use of the private car but also the cultural embeddedness of this remarkable vehicle. Therefore, certain political risks are involved when challenging the role of the automobile, not only as a part of the national transport system, but also as a part of the entire social and cultural context of modern men and women. The ownership of a private car is sometimes regarded as a human right by politicians, for instance, by a former Swedish Prime Minister Ingvar Carlsson in an interview in the newspaper "Dagens Nyheter" (1989-08-21). His successor, the Conservative Prime Minister Carl Bildt , when asked about the problems connected with a globalization of car ownership at the Rio Summit in 1992, replied that the Chinese people should consider the possibility of developing public transport instead of introducing mass automobility ("Dagens Nyheter" 1992-06-13). The ethical arguments for and against automobile use have been recently evaluated with reference to John Stuart Mill´s theory of freedom (Meaton & Morris 1996). The authors arrive at the conclusion that a total ban on private automobile use is justifiable but not advisable at present.

Any attempt to reduce the role of the car in a more permanent way necessitates an intense public debate about the key problems of the transport system. Messages from national and local political authorities and their experts must be relevant to their audience (deal with the health and safety of the citizens and with the future life conditions of their children, with land-use and energy consumption) and relate to the experience of the citizens (the economic costs of car use). Messages should also emphasize practical and positive alternatives. These are at least the recommendations made by an the OECD panel of social scientists in 1996.

There is fortunately one easy way of reducing the role of the car substantially and of doing it in a socially acceptable way. It is by creating incentives for the spreading of a new form of car sharing that has begun to emerge through grass roots initiatives in several European countries. I refer to privately owned car-pools or "clubs", where individuals may become members. This kind of car club has been set up particularly in Germany (in 50 cities) and Switzerland (40 cities). There are also some examples to be found in Austria, Holland and Sweden, and there is some interest in Denmark. A European umbrella organization called "European Car Sharing "(ECS) has already been established (in 1994) to stimulate the spreading of the idea, now also supported by the "Car Free Cities Network". In Sweden a tenant-owners association (HSB) has recently (October 1997) initiated a programme in which its more than half a million members will be given the opportunity to join car-pools.

There are a number of individual advantages associated with the arrangement according to a brochure, published by the "Car Free Cities Network" in cooperation with the organization "European Car Sharing" (*City Car Club: Carfree but carefree*). A member of the car pool does not need to be responsible for the maintenance of the car, he/she can choose between cars of different types and sizes for different purposes. As a rule, the member has to pay a member-ship fee (with a deposit), a monthly contribution and, of course, cover the costs of the use of a vehicle (varying according to the size of the car).

There are some disadvantages, too. A member does not have the same immediate access to a car as the private car owner. The demand for cars might also sometimes exceed the supply of

cars (for instance, at beautiful weekends in springtime). If predicted, this increased demand can, however, be met by a temporary extra-supply of cars hired from car-renting firms. The members also have access to cars belonging to other clubs in more than 250 European cities.

The cost/driven km is reduced substantially (one example is described in *City Car Club: Carfree but carefree*). The greater economic saving for the household is, however, represented by the elimination of unnecessary car use. The reduced cost for having access to a car would probably be a strong argument among quite a few present car users. On the other hand, previously careless people may join the clubs (Hovgesen 1998). This would, however, favour increased equity in the transport system.

The policy instrument that political decision-makers at the national level could use here is to facilitate the creation of car pools by adapting the present systems of regulations and taxes in order to provide incentives for people to organize or join them. At the municipal level, local authorities may support the initial promotion of the service by offering parking facilities to the club. They may also hire unused cars in the daytime for their own employees in order to reduce the costs of car club members (this is the case in Ørebro, Sweden).

The creation of a major number of car pools would reduce the role of the car in the transport system quite substantially. According to the estimates of the "European Car Sharing", every car used by the members of the clubs can eliminate 4-6 private cars on the roads. Such a happening would, in its turn, mean less pressure on the existing infrastructure, less pollution and less energy consumption in the transport sector. Larger areas could be used for other purposes than parking. The total energy consumption per capita of a member of a car club who is a previous ordinary car user is estimated by the Swiss office for energy affairs to be reduced by 50% (including energy consumption covering the use of car and the use of public transport).

The introduction of numerous car clubs would also mean that the socio-cultural role of the car would be modified. To break the personal relationship between the car and its user would reduce the symbolic importance of the automobile and transform it into a purely practical vehicle. Certainly, many individuals would stick to the old values associated with private car use. At the same time, however, a new trend in terms of changed attitudes and behaviour in relation to car use would prepare the ground for new lifestyles. A less car-dependent Western lifestyle would have a further effect: it will offer new models for the growing economies in the Third World and contribute to the creation of a new global pattern of mobility, compatible with the climate system and ecological systems.

References

I refer to the reference-list in my forthcoming report *On the Road Towards Environmental Sustainability? A Comparative Study of Danish, Dutch and Swedish Transport Policies in a European Context*