# International Transport Forum

Leipzig 2008:

Transport and Energy: The Challenge of Climate Change

**RESEARCH, INDUSTRY AND STAKEHOLDERS' DAY**
***28 May 2008***

## Workshop 2
## Changing Behaviour in Passenger Transport

# WAYS OF INFLUENCING BEHAVIOUR IN PASSENGER TRANSPORT

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# Ways of influencing behaviour in passenger transport

## 1. INTRODUCTION

Much has been achieved to improve traffic and vehicle performance in terms of pollution, energy consumption, noise and accidents. However, the increased number of cars and their increased use more than compensate the technological gains of engineering. In order to meet reduction targets also for the transport sector, our behaviour in our use of cars needs to be reflected upon and reduced in the long run, both in developed and developing countries.

Also political behaviour and decisions are not in accordance with intentions and climatic goals. WHITELEGG (2002) calls it “perverse policies” when taxation, land-use decisions, and construction of infrastructure encourage urban sprawl and car use. Instead incentives and measures to reduce the dependencies on cars by promoting the alternative modes and, in particular, land-uses in “integrated locations” should be developed. Examples of such incentives are residential developments, spaces for work and shopping in our towns or at least having suburban areas reachable by public transport (PT).

This paper will describe the unsustainable development of travel behaviour and car use in the past and some of the causal behavioural relations. The questions to be answered are what are the necessary changes and measures to stop the loss of technical improvements through risen demand in order to reach reduction targets and quality improvements on many levels: climatic change, accidents, less congestion and accessibility for all, noise, pollution, etc.

There are, of course, different situations in developed and developing countries. In developed countries motorization and car use have already reached a degree of saturation, whereas in the developing countries there are huge growth rates.

## 2. UNSUSTAINABLE DEVELOPMENT OF PASSENGER TRANSPORT

Since 1972, the Technische Universtät Dresden has been conducting a five-year household survey SrV (*System repräsentativer Verkehrsbefragungen* – Mobility in Towns) to explore travel behaviour of the population in German cities. Again this year after the last survey in 2003 more than 100 000 interviews will be collected in 60 cities (www.tu-dresden.de/srv/).

Of particular interest, are the changes in East Germany after the political integration with the West in 1990. In only 10 years, East German mobility indicators turned from a “developing” state to the level of “developed” West Germany. With a free-market system, increasing incomes and higher standards of living, car ownership had already jumped from 200 to 400 cars per 1 000 city-dwellers by the year 1998. However, motorization in cities has remained clearly lower than the German average.

With increased car availability, new developments were erected outside of towns and also outside of areas with high density; the average trip lengths grew from year to year for the motorized modes. The modal split for PT shrank from 26 to 15 % with a slight recovery after 1995. The automobile use for trips of the city population grew from 25 to 44 %. As a result, the average kilometres travelled per day and person by car increased from 5 to 20 km. Twice as many cars in less than ten years lead to four times as many kilometres travelled in them!

These examples illustrate that passenger transport is based and will be based in the future, especially when you look at countries with fast growing economies, on our unsustainably growing motorization. This led and will lead to growing emissions and a growing number of accidents in most of these countries. We can see directly, how fast vehicle-related reduction targets of 20% or even 50 % get eaten up by traffic growth.

The average motorization in European countries varies around 400 - 600 cars per 1000 people, while in North America or Australia, it is more than 800. World wide the average motorization index is probably around 130. Just look at China where today there may be 15 to18 cars per 1000 people. The growth rates are breathtaking. There is no doubt that countries such as China, India or Brazil, which soon will have populations of about 3 billion, might reach at least the magic number of 130 cars per 1 000. With this perspective or scenario, the chance is rather dim that the technically achievable emission reductions in the sector of passenger transport can be also maintained as a whole.

What can be done to better promote and make more acceptable behavioural alternatives to car use in developed as well as in developing societies?

## 3. WHAT INFLUENCES TRAVEL BEHAVIOUR?

There are different research approaches in the fields of traffic and social sciences to explore travel behaviour. Classic traffic science tends just to describe and to model behaviour. Social science tends to ask questions like: “Why do people travel and what does it mean for them and the society?”

In Europe we know that people move statistically 3 to 3.5 times per day on foot, by bicycle, by PT, or individual motor vehicles. They have done this already for decades. Also the time budget for these trips has remained with 70 to 80 minutes per day rather stable. So we must conclude that mobility in terms of the trip rates and time spent for trips per day has not increased during the last 30 years, maybe not even over the last centuries. However, growing motorization and better transport infrastructure does lead to higher travel speeds and larger ranges within the same amount of time. We have the choice to carry out our activities like working, studying, shopping and leisure in a larger area. This has often lead to smaller facilities in neighbourhoods not being able to compete with bigger ones further away, so that they lose their traditional customers and go out of business.

As a result, suburbanisation with more space-consuming behaviour (longer trips mainly by cars) developed. But did wider ranges through higher speeds bring more mobility in terms of more activities? Clearly not, it has only increased the transport effort for the same purposes.

When we look at the modal split of age groups with or without an available car in East German cities since 1990 (Fig. 1), we do not see too dramatic behavioural changes within these groups. However, the number of cars doubled and the groups without available cars became smaller, as well as their influence on average modal split, trip lengths etc.

Figure 1 shows that even juveniles below 18 years of age without a driver's licence, who by definition do not have an available car, got more often rides in autos (taxi-mama). At the same time, larger school districts lead to an increased use of PT. We can see clearly that otherwise independent of the age group, people with cars use them primarily, while they use PT only for less than 10% of their daily trips.

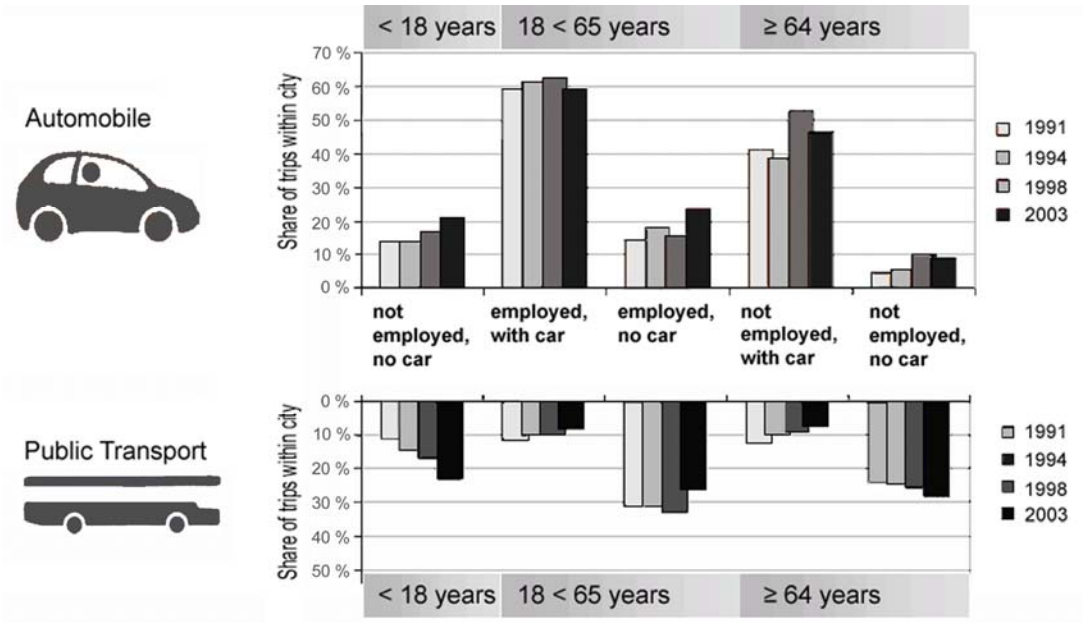


Fig.1: **Modal split in East German cities according to age and availability of cars**

Transport planners and behavioural researchers conclude: when a car is available and the route to the destination tends to be free of congestion, as well as when there are no extra charges and extra time losses for parking, the alternative modes will hardly have any chance of acceptance, unless a short distance allows walking. The technically best, most comfortable and reliable PT-system cannot beat the comfort, unlimited availability and privacy of a car.

We have to see these facts realistically. It is not enough just to build attractive PT and think people will use it. Most citizens are very much in favour with measures to improve PT, because they want their neighbour to use it. When people have a car, they want to drive it themselves without disturbances. In addition, there are strong emotional ties between many car owners and their vehicles, especially here in Germany.

Also the economics of a private car helps to explain its intense, often un-reflected use out of habit: high fixed costs for the particular trip, on one side, and relative low variable costs, on the other side, mean that the price per kilometre becomes lower with higher vehicle use.

Important for our behavioural statistics and to explain travel behaviour is the more “general behaviour” before the trip. This includes decisions of where to move, what kind and how many cars to buy, or whether to participate e.g. in a car-sharing program. In Germany we observe tendencies to move back to the cities (re-urbanisation) and a decreasing trend of young people and families to move out into the countryside or suburbs which involves higher transport costs and sometimes the necessity of a second car. These often neglected facts will probably be given more consideration with higher energy costs.

We know that the number of households without cars is much higher in cities than in the countryside. As a result, motorization in cities is significantly lower than the average for a whole country. Recent research of FERLIC a. ALBRECHT (2007) showed that also within German cities around good subway or street car connections, people own fewer cars and make better use of the mobility alternatives of walking, bicycling and PT. The number of cars per 1000 inhabitants in these areas is less than 75% than in the other areas of the city

As part of their mobility management, cities like München began advising people to move to more integrated locations. In addition, new residents who have recently moved to a place get information on how they can travel best from where they live to major destinations in and around their new residence. This is an attempt to avoid the development of “habitualized” behaviour. We can observe that many people organize their daily trips without considering and evaluating the alternative options, especially when a car is available. Almost 20% of all trips in German cities are not taken with PT because of a lack of knowledge (VDV/SOCIALDATA 1993).

Through intensive mobility management in a work group of employees, Dresden’s big company INFINION achieved within 9 years (from 1996 to 2005) by means of continuous information and improved conditions for PT and bicyclists that the car modal split was lowered from 68 to 55 %. This is a reduction rate of 19 %. PT use climbed from 13 to 19 % , and bicycling use increased from 13 to 16 % (LANDESHAUPTSTADT DRESDEN/PGN 2006). Thus, we have examples where through better supply, better information and education also “habitualized” behaviour could be changed to produce a more desired modal shift.

In contrast to the U.S.A., e.g. a decision for a PT season ticket (monthly or annual pass, BahnCard) does play a relevant role in Germany, where a continuous growth of PT users could be observed during the last years. This correlates negatively with the decision on a car (SIMMA a. AXHAUSEN 2001). There is also a considerable potential of multi-modal users who use PT or bicycles despite owning a car (BECKMANN et al 2006, KUHNIMHOF et al 2008). However, the effects of these tendencies did not lead to very significant changes yet.

New contributions of transport behaviour research involve studies of lifestyles and mobility biographies in the context of pluralisation and individualisation of our societies. It is assumed that the determining power of structural conditions for travel behaviour - like I described them before - declines significantly over time (SCHEINER 2006). These authors expect that the determination of travel behaviour through life situation and car availability becomes less

reliable, whereas attitudes, values and spatial conditions might become more important, particularly with regard to modal split.

FLIEGNER (2002) investigated potentials of de-motorization in households with cars. For his analysis he used the inclusion of lifestyles according to GÖTZ et al. (1997) in order to differentiate travel behaviour better by also including more subjective factors. He derived on the basis of 498 face-to-face interviews with households owning automobiles, using factor and cluster analysis, the following five mobility lifestyles:

(1) Auto-fixed rider (17 %)

    Strongest auto-attached group and prototype of the unsustainable problem group. These are mainly male and very young. Emotions are important. They follow ideals from the movie “Easy Rider” like fun, driving for fun, risk, design and technique.

(2) Vigorous, self-confident driver (18 %)

    Also young and mainly male and partly emotionally motivated (speeding), but they seem to be tolerant towards non car-users. They are not sensitive towards danger and risks.

(3) Inconsistent, anxious auto-friend (22 %)

    Mainly elderly people, who are torn in their orientation. They are sensitive towards dangers in traffic, but they consider the car as their best friend.

(4) Inconspicuous, careful car-user (20 %)

    Mainly female and middle-aged. They reject risky driving, but they could not live without a car. Auto-emotions play a minor role.

(5) Auto-critical multi-optional (22 %)

    The only group that shows critical distance towards the car. They are open to other modes, or use them already. The middle-age group dominates.

Also these mobility styles underline my thesis of car availability as the dominant factor for travel behaviour. Almost eighty percent of the questioned people in the city of Halle, Germany belong to mobility styles with strong attachment to their cars. However, group (5), the “auto-critical, multi-optional” traveller is increasing, as the studies of BECKMANN et al. (2006) show. This potential might rise through slowly changing subjective values and lifestyles. However, I believe that mainly a growing sensitivity towards costs will be the dominant factor for positive new developments and growing chances for the more sustainable options of travel.

But also better education and understanding and, of course, an inviting standard and convincing qualities on the side of the alternatives walking, bicycling and PT are as important. With the given car dominance, however, just incentives and options for volunteer behavioural changes, the desired and necessary changes cannot be achieved. So we need PUSH- **and** PULL- measures for a significant modal shift with more effective emission control and better congestion management. PULL-measures improve the supply of the alternative modes. PUSH-measures like parking-management, limited car-access and other pricing schemes restrict cars or make their use more expensive to “push” people into using the alternative modes.

## 4. APPROPRIATE MEASURES – LEARNING FROM THE PAST

Our future projections tend to look to the year 2030, and some even dare to go as far as 2050. This is comparable to looking back to 1986 or 1966. The questions are: How did the transport sector and trip behaviour change during this period? What were our measures and strategies then and what did they achieve?

As we discussed already, the number of cars and kilometres travelled in them have grown consistently in industrialized countries, and the rest of the world is "successfully" catching up. We spoke already back then about uncontrolled traffic growth and that control of this was required. But since then there have been no dramatic changes in the systems, even though technological developments made travelling much easier with all modes, maybe except for bicycling and walking which have become virtually forgotten modes in many parts of the world.

Impressive are all kinds of technological and organizational improvements, especially when we look at the information available before and on the trips. Mechatronical achievements in the vehicles make driving much easier and safer. In the developed countries, the number of killed and injured people through accidents in cars went significantly down. Truly alarming are the accident rates in countries with growing traffic, poorer infrastructure and often undisciplined driver behaviour.

So, do we have good reason to assume that developments during the next 20 to 40 years will also happen in small steps on a line of continuity? Will also in the future more control and less automobile traffic just be wishful thinking of planners and some politicians? We have the models and solutions - just the individual behaviour does not go along with them!? However, major threats and yet unknown future influences from an increasing power of environmental considerations, from an upcoming shortage of energy with still growing demand in developing countries and from much higher prices, might very likely accelerate changes of travel behaviour.

What can we learn from similar environmental challenges in the past? Key events in Europe - comparable to the present climate discussion – were the effects of the first oil shock in the seventies and the challenge of acid rain and dying forests in the eighties. Next to pollution from industrial sources, the transport sector was considered to be the major causing factor. So transport planning and policy in Germany reacted, however, as a partly not yet understood pace-maker in Europe in those days. Reactions and suggested measures were in many ways like those in many countries today which seek to reduce $CO^2$-emissions in transport.

At that time the German automobile industry finally realized that technological innovation was necessary and unavoidable to reduce emissions. They gave up their resistance to install catalytic converters. However, without legal enforcement through tighter emission standards this goal would have not been reached on a purely volunteer basis.

Together with 11 West European states Germany signed on 31 October 1988 the "Declaration of Sofia". The NOx-emissions from 1985 to 1998 had to be reduced by 30 % and were not allowed to further increase afterwards. The German Environmental Protection Agency UBA (Umweltbundesamt) calculated that this reduction was not achievable by just technical improvements (UMWELTBUNDESAMT 1989). Further measures to reduce transport demand and to change behaviour were necessary. Since some opposing opinions thought that planning or behavioural changes was ideological or even socialistic the term "Non Technical Measures" was chosen for this area of action.

The UBA suggested (1) to substitute some long distance car travel by trains, (2) to increase modal split for the mobility coalition in urban travel and (3) to substitute inner German flights by fast train connections. Could this not also be a modern program of nowadays?

(1) The following four measures were recommended to increase individual train use by more than 50 % to reach the French level of that time. This way 5 % of the Nox-emissions of 1998 could be reduced.

1. Increase of variable car costs (internalization of external effects)
2. Better rail service and supply for smaller fares (half price pass)
3. No further significant improvements in the highway network
4. Improvements in the railway network

Looking at the data now, long distance train travel in reunified Germany rose from 1991 from 23.300 Mio. Pkm to 38.100 Mio. Pkm in 1998 or to 41.300 Pkm in 2005 (BUNDESMINISTER FÜR VERKEHR, BAU UND STADTENTWICKLUNG 2006). So we can certify a relative success in this area with an increase of 77 % from 1991 to 2005.

(2) For regional and urban transport the UBA argued that Germans who live in cities could use PT almost as often as Swiss people do. If they would increase their annual rate PT-rate by 200 trips, a reduction rate of 40 billion car km could be achieved which would have been 32 % of the for 1998 expected Nox-emissions of car traffic in towns. The following measures were recommended:

1. Increase of variable car costs (internalization of external effects)
2. Change of tax-refunds on the basis of distances to or on the job travelled in the car
3. Parking management, guiding systems
4. Access limitations, city maut like in Honkong or Singapur)
5. Priorities for PT, bicycles and pedestrians in cities
6. Mobility master planning in cities, investment and environmental planning
7. National funds for additional municipal measures to reduce emissions of transport

The passenger-km travelled by PT in Germany grew from 77 Mio Pkm in 1991 to 89 in 1998 and to 94.5 in 2005. A 22 % increase is not as much as desired, but it is considered as a success since private car use did also "only" increase by 22 %.

Further measures to substitute air travel and in the area of freight traffic I will not describe here. For all these "non technical" measures with significant influences on modal shift and travel behaviour the UBA concluded that 11 of the promised 30 % could be reduced. Technical measures only would have achieved 25 %. On the basis of this calculation Minister Töpfer decided to sign the Declaration of Sofia and to implement a reduction program on all levels.

As a result, already then integrated approaches of planning, managing and organizing measures of engineering, economy, enforcement and education/information were more or

less developed on all planning levels in Germany in order to secure mobility, on the one hand, and to reduce negative transport related effects at the same time, on the other hand. This was considered to be necessary by professionals and many political decision-makers, in order to achieve and to preserve the reduction goals.

Industry, automobile clubs and other EU-member states were sceptical of many of the car restrictive policies. Even though the public was highly concerned with such issues as acid rain and environmental effects, it was not easy to introduce emission-low behaviour as an attractive political choice at that time. Auto-dependent lifestyles were widely spread through the existing spatial distribution of opportunities with forced mobility requirements.

Behavioural mobility changes are not easy to implement, since they are based on long-term decisions of where to live, what cars to buy and on a very “habitualized” lifestyle. However, cognition of “dying forests” or “climate change” stimulates at least a critical reflection of these negative effects of our own behaviour. This “window of opportunities” opened at that time – as it still does nowadays – political and public acceptance for sustainable congestion and mobility concepts in some cities. These concepts restricted private car use, promoted PT and the non- motorized modes walking and cycling (e.g. area wide traffic-quietening, reduction of spaces for traffic and parking, auto-free zones and city centres, bus and streetcar-lanes, parking management, speed limits, …).

These measures were discussed very controversially. They were decided and implemented with environmentally concerned political majorities. However, maybe the success and positive effects of these measures were not communicated enough. Maybe some measures did not make sense and lead to rejection of the whole concept. Only after a few years did the political and public acceptance for these concepts shrink in many cities so that many governments did not get re-elected at the beginning and mid-nineties. This process started in Kassel and lead to significant political changes in the cities of the Ruhrgebiet, the industrial Rhine-Ruhr-zone. This “back-lash” stopped many promising conceptual approaches to achieving less congestion, less pollution and noise, less accidents, as well as to giving more room to non-motorized users and urban activities like shopping, strolling, resting and communicating in public spaces. The new governments improved again auto accessibility with the undesired costs of increased congestion and pollution. The complex interrelations in our socio-technical transport system are, indeed, hard to communicate and to understand.

The lesson to be learnt for new climate-aware concepts is that reduction strategies and measures have to be communicated, to be understood and accepted by stable majorities in our democratic societies! Of course, we as professionals and scientists know what would be right and appropriate to reach the goals. But what people do not understand, they do not accept. Most of the time, a compromise achieves more than insisting on ultimate solutions and risking political rejection or a back-lash as when the measures are forced through without public acceptance.

We also have to realize and to accept, and this is true in developed as well as in developing countries, there is no easy single solution to reach a changed behaviour and a more sustainable transport system with a durable reduction of emissions. As in the past, also nowadays we have to develop concepts and packages with technical, infrastructural, economical, behavioural and legally enforcing measures. These packages of measures, sometimes referred to as the “PUSH and PULL strategies”, or as “hard and soft policies”, need to be prepared and communicated through sustainable integrated transport or mobility

master plans on all levels. They have to be developed as part of or in close connection with land use planning. They serve as an informal framework for operational decisions on measures, as a basis for financing and as framework for transport and mobility management. The interrelationships between these areas have to be clear in order to reach the goal without contradictions and to create a reasonable basis for political bargaining.

In the end, the sustainable mobility concept will be implemented through consistently derived and interrelated land use plans, mode-specific infrastructure programs, traffic management (if possible multi- and inter-modal), and mobility management.

Table 1 provides an overview of what kinds of measures belong to the wide range of integrated transport and mobility planning. They all effect and influence behaviour. The frequently mentioned central four “E” areas

Engineering
Economy
Education
Enforcement

are framed by the integration of land-use-planning (regional or spatial planning on higher levels) and how to locate investment decisions. They could be easily influenced by taxation or pricing schemes, so that a more sustainable choice of locations for transport-generating uses would be automatically the most economical alternative (e.g. land capture value). Management and operation of the transport system with more possibilities for inter- and multi-modal organisation and logistics at the other end would tie the four “E”-areas of action together.

A key measure for more effective financing and behaviour of and in the transport system, would be a more consequent user-financed scheme. Paying for the trip when you do it through road pricing makes the alternative choices clearer and allows additional management options e.g. through peak-hour pricing. PT creates indirect benefits through better accessibility of facilities or less congestion. So far for these effects no contributions are collected from those who benefit. This would have a significant effect on the multi-modal price scheme and trip behaviour.

There is a wide range of literature on these measures and, in particular, on the many ways to influence perception, understanding and behaviour of people through hard and soft measures, campaigns and incentives (DE TOMMASI et al. 2000, BANISTER et al. 2006, CERWENKA 2000, KUTTER 2005, OECD 2004). Table 2 contains a list of a few selected more specific examples to initiate behavioural changes and to create a better psychological and sociological framework in order to make the desired changes more attractive and “trendy” in our personal environments. Of special importance is the wide range of possibilities of “mobility management” on all levels.

However, we have to realize that behavioural patterns can very likely only be changed in the long run and unfortunately, as CERWENKA et al (2000) stated:

Popular measures are not effective.
Effective measures are not popular!

**0. Land use planning**

- Determination and control of land uses to reduce traffic demand
- New developments in "integrated" zones or areas with public transport access

**1. Engineering**

- Construction of routes and transport facilities for all modes, multi and inter-modal use
- Vehicle improvements
- Information technology, e. g. multi modal navigation systems

**2. Economy**

- Taxation (vehicles, energy, …)
- User-financed systems
- Road pricing
- Fares
- Land value capture
- Parking management

**3. Enforcement**

- Legislation, emission and other standards
- Access restrictions**,** car free zones, emission-control zones
- Speed limits
- Safety control
- Traffic guidance and control
- Police enforcement, fixed quotas

**4. Education, Information**

- Transport behaviour issues in school
- Driver education
- Public awareness, public relations
- Mobility Management on all levels
- Involvement of media
- Public participation

**5. Organisational and logistic measures**

- Improved efficiency (car-sharing, car-pooling, …)
- Differentiated supply also for inter and multi-modal use
- Incentives, privileges for best practice approaches

Table 1: **Range of measures in integrated transport planning and management**

- Attractive opportunities for homes, for work, for shopping and leisure “near by”
- Incentives for less auto-oriented life styles (privileged parking for car-sharing or car-pooling, refunding non-parking to public transport user, pedestrians or bicyclists)
- Improved conditions for public transport, bicycling and walking; create a friendly atmosphere for walking, bicycling and for using public transport on all levels
- Management and pricing of road use and parking
- Inter- and multi-modal information and booking schemes
- Information centres for car-pooling, car-sharing, co-driving
- Mobility management on all levels (DE TOMMASI et al 2000)
    - Information and advice
    - Consulting
    - Public awareness and Education
    - Transport organisation and co-ordination
    - Sales and reservation
    - New transport related products and services
- Public initiatives for safe and slow driving, for more sustainable travel behaviour and mode choice
- Marketing on all levels for pro-climate policies and energy saving
- Employer service for “close-by living”
- Campaigns to promote sustainable modes, to reduce private car use and to create awareness on all levels (in schools, companies, sport clubs, theatres, cinemas, in events, on national, regional and local level)
- Easy to use $CO^2$-calculators
- Pay as you drive (taxes, fee, insurance)

Table 2: **Selected measures to influence $CO^2$-aware travel behaviour**

The knowledge about effective measures is only half the rent. Political and public acceptance is necessary for their implementation. This part of the battle will be more difficult and need more scientific and public attention. The present climate discussion, the growing understanding and insight that we have to act, this “window of opportunity” is helpful and it should be kept alive and used.

## 5. CONCLUSIONS

Although the use of cars may have reached a degree of saturation in some developed countries, the number of cars and their use is still increasing in most countries of the world. This means that only technological improvements of the vehicles to reduce the consumption of energy and of resources will not be enough in the long run, because traffic growth with unchanged behaviour would more than compensate these improvements. Thus, any policy that concentrates solely on technological measures would convey that behavioural changes are not necessary. This would suggest that our auto-oriented lifestyle could be adopted by the rest of the world although car ownership is growing world wide without negative effects on climate change!?

It is obvious, therefore, that only with a consequent policy and a wide range of measures with behavioural effects can we change the logic of the past. The energy sector in Europe has successfully decoupled energy consumption from economic growth. There are similar potentials in the transport sector. We could achieve the same mobility with less traffic. To achieve this new quality, we need to implement integrated sustainable land-use and transport plans. This requires organisational and logistic efforts: next to engineering measures, also the use of economical, enforcement, education and information strategies are needed.

The present “window of opportunities”, the insight of policy and public opinion to reduce $CO^2$-emissions can be felt everywhere. This spirit provides a good basis for achieving, with enough patience and step by step, a desired behavioural change,.

Successful examples seen in many parts of the world and best practises of mobility management in cities and companies document a new and more intelligent understanding of travel and movement in our cities. The potential of multi-modal behaviour is growing.

However, only perception and understanding is not enough to actually reach the necessary behavioural changes in terms of modal shift and fewer kilometres for the same purposes and activities. Of course, attempts to change behaviour require explanation and changing the knowledge of trip-makers. Furthermore, they have to lead to actual decisions and changes. Here incentives and PULL-measures can be very helpful, but these by themselves are, unfortunately, often not enough or insufficient.

The package of measures, the transport policy also requires the undesired PUSH-measures. But we should not go too far and risk lack of acceptance, as has happened in the past. We have to communicate the necessity of also these elements of the strategy in the broad context and search for political and public acceptance and consensus.

A more consequent multi-modal implementation of true prices (with consideration of external effects) on the basis of primarily user-financed transport systems could easily help generate many of the desired behavioural effects. When the user feels the costs for each driven kilometre, and he is able to compare the modes directly with rising prices, he is likely to

develop a new sensitivity towards distance and to modal shifts in favour for walking, bicycling and PT.

However, in this era of auto-dependent lifestyles and the strong trend of a growing motorization in the world, past experience indicates that more than just political intentions are needed. The goal must be to make genuine but real steps with measurable effects in a more sustainable direction of personal travel behaviour.

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