

Parliamentary Advisory Council on Sustainable Development

Position Paper

Prospects for sustainable mobility – ensuring mobility for the future

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1. Starting situation – sustainable mobility

1.1. Challenges in the area of mobility

The development of sustainable mobility faces great challenges from several aspects:

Demographic change will lead to a shifting of mobility needs. Increasing numbers of older people will want to and should be able to remain mobile. Solutions must be found to adapt mobility to the changing requirements of an ageing society. At the same time social life will increasingly be concentrated in urban areas, while rural areas will increasingly be faced with a declining population. This, too, changes requirements in terms of mobility, creating the need to satisfy the growing demand in urban areas while at the same time maintaining mobility in less densely populated rural areas.

Further challenges to sustainable mobility arise from the current energy and climate protection targets and the finite nature of fossil sources of energy – the latter combined with a rise in energy prices. Both aspects mean that the transport models of the 20th century will have to be replaced in the 21st century by sustainable solutions with lower greenhouse gas emissions and less reliance on fossil fuels.

1.2. General objectives with respect to sustainable mobility

The example of mobility shows that the three priority areas of sustainable development are mutually dependent. Ecological, economic and social aspects must be reconciled with each other in a way that ensures the resulting solution is sustainable in the long term in the context of sustainable development. This means that sustainable mobility must ensure that society's changing need for mobility can be satisfied with reduced use of resources and reduced greenhouse gas emissions – 85 to 95 per cent less in 2050 compared with 1990 – and at affordable prices.

2. Sustainable mobility in the National Sustainability Strategy:

The National Sustainability Strategy based on the 2008 Progress Report formulates targets for the area of mobility and provides information – based on the 2010 Indicator Report published by the Federal Statistical Office which monitors the situation with regard to sustainability in Germany – on progress towards implementation. The Parliamentary Advisory Council on Sustainable Development (PBNE) regularly assesses progress towards implementation of these targets, most recently in November 2010 (Bundestag printed paper 17/3788). The targets and progress towards reaching the targets are briefly outlined below and the last assessment carried out by the PBNE presented in abbreviated form.

a) Targets of sustainable mobility

Indicator 11 – Guaranteeing mobility, protecting the environment

Indicator 11 a – Intensity of goods transport (Goods transport performance / GDP)

Target: Reduction to 98 % (2010) and 95 % (2020) in comparison to 1999 (= 100 %)

Status in 2008: Rise to 118.4 %

Instead of being reduced in line with the target, the intensity of goods transport rose by 18.4 per cent between 1999 and 2008. The reasons for this rise include the increasing import of prefabricated parts from abroad and the greater distances between places of production and places of use. There has been a favourable development in energy consumption per tonne-kilometre, although the gain in efficiency has not been as significant as in previous years. In 2007 the Federal Ministry of Transport, Building and Urban Affairs forecast a 71 per cent increase in the intensity of goods transport from 2004 to 2025. There is a need for political action here to use intelligent logistics to cut this figure or distribute it better in the face of growing volumes of traffic.

Indicator 11 b – Intensity of passenger transport (passenger transport performance / GDP)

Target: Reduction to 90 % (2010) and 80 % (2020) respectively in comparison to 1999 (= 100 %)

Status in 2008: 90.9 %

The intensity of passenger transport has fallen and is approaching the target of a 10 per cent cut by 2020 in comparison to 1999. The reduction is due predominantly, however, to a rise in GDP and only to a smaller extent to a reduction in traffic. The Federal Statistical Office surmises that the latter is due in part to the rise in fuel prices, which suggests that price has a controlling effect. It is to be welcomed that energy consumption per passenger-kilometre is already decreasing further. The Federal Ministry of Transport, Building and Urban Affairs forecasts a 17.9 per cent rise in passenger transport performance between 2004 and 2025. Efforts therefore need to focus in particular on using the most environmentally-friendly means of transport for a particular journey and/or making all means of transport more environmentally friendly.

For both goods and passenger transport the conditions need to be made as comparable as possible for all means of transport in order to create real choice between the different means of transport. The PBNE supports the idea of establishing cost transparency and gradually internalising the external costs of transport, while recognising that there are different ideas regarding implementation and, in some instances, definition.

Indicator 11 c – Share of rail transport in goods transport performance

Target: 25 % in 2015 – Status in 2008: 18.1 %

Indicator 11 d – Share of inland water transport in goods transport performance

Target: 14 % in 2015 – Status in 2008: 10 %

While the percentage of goods transported by rail has risen from 16.5% in 1999 to 18.5%, there is a long way to go to reach the target of 25% by 2015. The percentage of goods transported on inland waterways actually fell from 13.5% in 1999 to 10 % in 2007, where it is currently stagnating. In terms of sustainable development further efforts are needed to come anywhere near to reaching targets. This cannot be achieved without investment in infrastructure and is leading in various areas to conflicts with targets in other areas of the National Sustainability Strategy. Ultimately it will be necessary to carry out sustainability tests in order to weight targets and set priorities.

b) Further indicators in the National Sustainability Strategy with an indirect impact on sustainable mobility

Indicator 1 – Resource protection – using resources economically and efficiently

Indicator 1a – Energy productivity (GDP per unit of primary energy consumption)

Target: Doubling between 1990 and 2020 – Status in 2008: +40.5 %

The 2010 Indicator Report reveals that as things stand at present, it will be impossible or only possible to a limited extent to reach the targets set in the area of resource use. Energy productivity increased by 40.5 per cent in the period 1990 to 2009; energy consumption, however, fell by only 10.5 per cent because efficiency gains were largely eaten up by economic growth. In addition there was a slowdown in the increase of energy productivity and a rise in import dependency. It will therefore be impossible on current progress to achieve the target of doubling energy productivity by 2020. In its response to the 2010 Indicator Report, the Parliamentary Advisory Council on Sustainable Development highlights the need to increase energy productivity and resource efficiency.

Indicator 1b – Raw material productivity (GDP per unit of raw materials withdrawn + imports)

Target: doubling between 1994 and 2020 – Status in 2008: +39.6 %

There has been only a formal increase in raw material productivity. While more was generated per tonne of raw materials used, this – at first glance - positive development is due primarily to the growth of the service sector vis-à-vis material-intensive branches of the economy. More finished goods are being imported but their raw material productivity is not relevant to the indicators. According to a study conducted by the Federal Statistical Office, efficiency gains would be considerably less if raw material productivity abroad were to be factored in. The indicator therefore provides only limited information. The goal must be to achieve resource and material efficiency on a global scale.

Indicator 2 – Climate protection – Reducing greenhouse gas emissions

Target: Cutting to 79 % (2010) and 60 % (2020) in comparison to 1990

Status in 2008: 77.6 %

In terms of cutting greenhouse gas emissions Germany is well on its way to reaching the ambitious target set for 2020, although the one-off effects from 2009 must not be allowed to lead to a relaxing of efforts. The 2010 Indicator Report makes it clear, however, that Germany is one of the world's biggest emitters of greenhouse gases among the industrialised nations. Efforts to cut greenhouse gases therefore need to be stepped up.

Indicator 3 – Renewable energies – expanding sustainable energy supply

3a – Share of renewable energy sources in total electricity consumption

Target: Increase to 12.5 % (2010) and 30 % (2020) – Status in 2009: 16.1 %

3b – Share of renewable energy sources in primary energy consumption

Target: Increase to 4.2 % (2010) and 10 % (2020) – Status in 2009: 8.9 %

These figures for renewable energy sources as a share of energy consumption are positive examples of how the targets set in the National Sustainability Strategy can be met and even exceeded if policymakers put in place the right conditions. This should serve as an example for other sectors. The share of CO₂ emissions in the transport sector rose from 15.1 per cent in 1990 to 18.1 per cent in 2007 and oil dependency was 95 per cent.

Along with energy efficiency, the Parliamentary Advisory Council on Sustainable Development believes the creation of intelligent networks and storage possibilities to be important challenges in terms of driving forward the expansion of renewable energies.

Indicator 4 – Land use – sustainable land use

Target: Reduction to 30 ha per day by 2020

Situation as per 2008: 95 ha per day

The reduction in land use for housing and transport should be viewed positively although increased efforts need to be made to achieve the target of cutting land use to 30 ha per day by 2020. The Parliamentary Advisory Council for Sustainable Development points out that impact on land use should be taken into consideration in infrastructure planning for sustainable mobility.

Indicator 5 – Conserving species – protecting habitats – species diversity and landscape quality

Target: Restoration to 100% of situation in 1975 by 2015 – Status in 2008: 69 %

Extinction of species continues unabated in Germany and the rest of the world. The indicator

falls 70% below the target value and it is unlikely that the national target will be achieved by 2015. There is a particularly noticeable fall in the sub-indicators of housing, farmland, sea and coast. Depending on how infrastructure planning factors in sustainable mobility, this may impact positively or negatively on the species diversity indicator.

Indicator 10 – Economic prosperity – raising economic output by environmentally and socially compatible means – GDP per capita

Status in 1991: 22,000 euro per capita – Status in 2009: 26,400 euro per capita

The Parliamentary Advisory Council on Sustainable Development has been critical for a long time of using gross domestic product as the sole indicator for prosperity. Nevertheless, the Council believes it is important that in working towards sustainable mobility the goal of increasing economic output by environmentally and socially compatible means is not neglected.

It is to be welcomed that the Federal Ministry for Environment, Nature Conservation and Nuclear Safety has already addressed the question as to how positive and negative ecological and social services which are free of charge can be factored in or out. A study commission of the German Bundestag is also currently examining the questions of growth, the definition of welfare and its numerical representation. Regardless of the findings of the Commission, the PBNE appeals for efforts to be made not only to achieve a better numerical representation of these factors, but also to find ways to achieve sustainable economic development in an ecological and social market economy.

Indicator 13 – Air quality – keeping the environment healthy – air pollution

Target: reduction to 30 % compared to 1990 by 2010 – Status in 2008: 44.7 %

While air pollution has improved since the reference year of 1990, the improvement in recent years has been insignificant. As the Federal Statistical Office states, this pace of development is not enough to achieve the target of a 70 per cent reduction over the reference year of 1990. Only 80 per cent of the target has so far been achieved. Most of the reduction in nitrogen oxide emissions, which is still off target, should come from the road traffic sector and heavy goods vehicles since transport has the highest emissions per unit of energy consumed.

3. Perspectives / aspects and measures of sustainable mobility:

3.1. Mobility tomorrow – new mobility concepts and transport structures

The drivers of a new mobility

Politics and industry face historic challenges in the form of climate change, demographic changes, the finite nature of fossil resources and the worldwide increase in energy demand, as well as air and noise pollution in urban areas. It will take nothing short of an industrial revolution to meet these challenges. Few areas will change so much as the way we deal with mobility.

The task for policymakers is wide-ranging: they must resolutely drive forward the transition from a sector-driven transport policy to a sustainable mobility policy. Mobility must continue in the future to be accessible and affordable for all since mobility is the basis for personal freedom and social participation and the motor driving the economy and employment. Sustainable mobility concepts must meet the mobility needs of the modern person. This will only be possible if users and consumers are involved in devising new concepts, so that these concepts meet with the necessary acceptance.

From traffic management to mobility management

The trend is already moving towards a new mobility in which environmental awareness and

quality of life determine the choice of means of transport. For future mobility users who live in urban centres, the private car will not be the exclusive means of transport; rather they will travel intermodally. In addition, demographic changes and competition from newly industrialising countries are altering demand for car-based mobility and are increasing the pressure on the German business sector and automotive industry to develop new vehicle concepts and use concepts. To maintain Germany's position as the international lead market in the area of mobility, the automotive industry must rethink its role and change from being a vehicle provider to an all-round mobility provider. At stake are nearly one million jobs in the automotive industry. Policymakers must establish the right conditions to support changes to mobility and technological and structural change on a basis which is sustainable, climate friendly, socially equitable and economically viable.

Air pollution, congestion and lack of parking spaces in urban areas and, above all, in the megacities throughout the world demand new and efficient concepts. Simply replacing drive technology is not enough. The car must become part of an intelligent mobility system. The electrification of drive systems offers an opportunity to establish mobility which is fit for the future. In order to cut greenhouse gases by 80 to 95 per cent by 2050 over the 1990 level mobility must be more efficient and generate less CO₂. Electric mobility is only climate-friendly, however, if it involves the use of renewable energies. The efficient use of resources must not be a separate issue; rather it must be part of an overall strategy for the long-term use and procurement of raw materials.

In order for consumers to make electric mobility successful, there is a need for incentives to encourage the use of car sharing and electric cycle hire schemes, as well as well-developed public networks of buses and trains as a key element of innovative transport concepts.

There is a need for “mobility management” which uses new media and communication and information technologies to organise and facilitate the intermodal use and linking of different modes of transport and the needs-oriented use of mobility services. Innovative mobility concepts encourage the development of new business models which, instead of a vehicle, offer the customer a “mobility package”. This will create new occupational profiles and new manufacturing processes and value chains.

The use of electric mobility and other environmentally friendly means of transport – organised by users themselves – can also make an important contribution to climate-friendly mobility in sparsely populated rural areas. Efficiency and needs-oriented flexibility can be achieved if users organise their own mobility. One means of achieving this is to change over from object-based to subject-based financing in the area of regional transport.

The future belongs to combined transport

Goods transport is responsible for nearly a half of harmful particle emissions from road traffic. The focus in terms of the transport of goods must be on improvements to efficiency and the intelligent linking of modes of transport. Combined transport as a cross-modal system of goods transport in which the significantly longer stretches of the route are completed by rail or ship, offers huge advantages in terms of energy balance and climate compatibility over conventional transport using only one mode of transport. As mass means of transport, rail and shipping are the most energy-saving modes of transport overall, particular over longer distances, and need to be boosted in the context of combined transport.

Mobility as part of the energy system

A key role in terms of the successful implementation of sustainable mobility concepts is played by new and decentralised energy supply systems and the development of intelligent networks which can adapt consumption and storage to the supply situation and which guarantee a secure and efficient power supply for the transport network using renewable energies. Producers and consumers must prioritise saving energy and increasing efficiency.

Rethinking mobility

Making the transition from our current transport system to sustainable mobility requires a massive effort on the part of all stakeholders. This is about more than changing over to renewable energies and developing competitive drive technologies. Mobility begins in the

head and needs to be rethought. Changing to sustainable mobility goes further and deeper: it is a matter of technology and infrastructure and also of societal changes which are reflected in new forms and styles, a new management, a new culture and diversity.

3.2. Infrastructure

A system can only perform effectively if the infrastructure is appropriate. Investments in transport infrastructure have lasting implications not only for the transport system itself but for the totality of ecological, economic and social systems with which the transport system interacts.

Because of the scope and size of the transport budget, optimising the transport system can have a positive impact on the goals of the National Sustainability Strategy. Transport infrastructure policy can comply with the objectives of budget consolidation and intergenerational equity providing it ensures that while the strain on the general budget is relieved, infrastructure investments remain safeguarded.

The policymakers can ensure that transport is shaped in such a way that it means more mobility and less burden. Technological improvements and innovative transport concepts alone will not bring about a system change in the medium term with respect to sustainability. However, infrastructure planning and financing that are fit for the future can make a fundamental contribution to bringing together individual and collective mobility needs while avoiding negative ecological and social impacts.

Prioritisation

The next Federal Transport Infrastructure Plan (BVWP), which has to meet sustainability criteria, will play a key role in shaping future infrastructure planning. Before it is compiled, there is a need to examine which federal traffic routes could and should be regionalised. Instead of giving preference to particular modes of transport, there is a need to develop a cross-modal network strategy, including everything in principle which could increase the efficiency of the system. This applies in particular to the prioritisation of transport projects. It is imperative for projects to be prioritised on the basis of a sustainably formulated benefit-cost ratio rather than on the basis of the stage of planning they have reached. In this context there is a need to examine the extent to which existing *Länder* quotas comply with the requirements of sustainable infrastructure planning. Only in this way can scarce investment funds be used efficiently and effectively rather than on a proportional basis.

Particular attention needs to be paid in this context to examining the indicators of the benefit-cost analysis. Considerably more weight must be given to the criteria of eliminating congestion, closing gaps and providing links to airports and sea ports. Instead of a patchwork of new and expansion projects, there is a need for nationwide spatial planning with respect to federal highways, waterways and railways which ensures that traffic arteries are upgraded without delay along their entire length.

Furthermore, priority should be given to maintaining existing infrastructure over building new infrastructure. It is essential to end the serious structural deterioration which has been going on for years. It is particularly important to close intermodal and intramodal gaps in order to guarantee efficient use and networking of transport infrastructure. This can generate significant synergy effects.

In the light of the inadequate funds made available for the maintenance and expansion of federal waterways over many years, there is a need to examine whether and to what extent a waterways expansion act, similar to the road and rail expansion acts, is necessary and realistically implementable.

Financing

Investment in infrastructure is central to the development of sustainable mobility and needs to be accepted by the general public. Obtaining the support of the population for the maintenance and expansion of traffic routes and for the necessary public spending depends in

large measure on transparent and comprehensible processes in the preparation of the traffic forecasts on which planning is based and in the subsequent planning of transport projects. Over and above this, ecological concerns and the avoidance of traffic noise and exhaust fumes are particularly important issues for the public at large.

Funding mechanisms play a central role in the design of sustainable transport systems. In the light of current underfunding, reliable funding is the key parameter for the maintenance, optimisation and expansion of the transport infrastructure. Furthermore, the funding structure for transport systems can be designed in such a way that it acts as an instrument of economic control, exerting a decisive influence on environmental sustainability and thereby leading to greater acceptance of mobility needs in society as a whole. The starting point for sustainable mobility concepts must therefore be not only federal traffic infrastructure planning but also and in particular funding.

In 2000 the Pällmann Commission calculated that an annual investment of around 7 billion euro was needed to build, expand and maintain the German highway network in line with requirements. This figure has been nowhere near reached in previous years despite the fact that revenue from taxes and duties from road traffic alone has increased to over 53 billion euro. This disparity is evidence of the seeming impossibility of providing adequate long-term funding for transport infrastructure out of traditional public funds. Moreover the debt brake provided for in the Basic Law obliges the Federation to reduce new debt on a continual basis and to restrict it to 0.35 per cent of nominal gross domestic product up to 2016. In order to avoid further deterioration of the transport infrastructure and at the same time to ensure necessary expansion, there is an urgent need for greater user funding, particularly with respect to road traffic. One possible next step is the introduction of closed-loop funding flows. In the context of social justice, this changeover would have to be revenue-neutral and must not place more of a burden on individual traffic participants. The problem with the current financing structure is not insufficient revenue from taxes and duties but the fact that these funds are not ring-fenced. Combined with greater user funding, closed-loop funding flows could create greater certainty and continuity of funding. The aim of any new system must be to decouple investment decisions and funding from the fluctuations and uncertainties of annual budget planning and make opportunistic behaviour on the part of the public authorities more difficult.

The difficult budget situation faced by the Federation will continue in future to make funding through taxation alone impossible. The users of infrastructure already make a large contribution to the Federation's income as taxpayers, inter alia through mineral oil tax and motor vehicle tax. The introduction of the HGV toll has constituted an important step towards supplementing budget funding with revenues raised from users of traffic routes. This must be further developed. The acceptance of the toll by users depends to a significant extent on the fact that the revenue from user funding flows directly into the maintenance and expansion of the transport infrastructure.

The use of income from the HGV toll for roads is a first step in a closed-loop funding cycle. In order to implement a preventive maintenance strategy and ensure carryover funding of important investment projects, further steps should be examined. The possibility of expanding the existing HGV toll system to lighter weight classes and all roads as an instrument of funding and control should also be examined in the current legislative period, as should the advantages and disadvantages of a car toll. If such provisions are incorporated in local government traffic concepts, a city toll is preferable from both ecological and social viewpoints to a general ban on driving in inner cities. Towns and municipalities should have the option of introducing a toll.

With regard to the rail sector, the Service Level and Funding Agreement has brought planning certainty with respect to the maintenance of the existing network to 2013, but new construction and expansion projects are drastically underfunded. Despite the basic approach of user funding, current structures are an obstacle to efficient and transparent use of funds. Rail companies pay track access charges to use the rail network. Added to this are several billion euros per year of federal funding. Any profit made by DB Netz AG after deduction of all operating expenses should be ploughed back into expanding and maintaining the rail network in order to increase the amount invested in the rail system. The structure of Deutsche Bahn

AG has led on multiple occasions in the past to the exclusionary abuse of private train operators and a lack of competition on the railways. This is evidenced by the current infringement proceedings being brought by the European Commission.

In order to ensure transparent and economically sustainable funding of the rail network as well as its expansion to meet demand, one particular instrument - profit absorption and domination agreements – needs to be abolished without delay. In its current White Paper, the European Commission calls for the structural separation of infrastructure management and operation.

3.3. Electric mobility

Electric mobility is about more than changing the drive systems of private cars. It is also a central manifestation of a changed environmental awareness. It is both a product and driver of the change in transport behaviour. Implemented correctly, electric mobility can be a central lever encouraging more sustainability in transport and is therefore in clear contrast to conventional oil-based forms of mobility.

Sustainability vis-à-vis the environment

The Parliamentary Advisory Council on Sustainable Development believes that electric mobility promotes the environmental aspects of sustainability. The main focus here is on motorised road traffic since this is currently responsible for around one fifth of all German CO₂ emissions. Based on Germany's current energy mix, an electric car at the time of the report generates 15 per cent less CO₂ emissions than a comparable vehicle with a petrol engine and 10 per cent less than a comparable vehicle with a diesel engine. Electric mobility is only climate-friendly, however, if renewable energies are used for the purpose.

It is particularly noteworthy that with the steady improvement in the share of renewable energies, the electric drive form has the potential to achieve mobility with effectively zero emissions. Combined with other measures to reduce CO₂ emissions in transport, the PBNE believes that changing over to electric drive vehicles in motorised road transport will make a very big contribution in the medium term to achieving the emission reduction targets accepted by the Federal Republic and the European Union.

Further potential in environmental terms arises from the avoidance of the danger of environmental disasters associated with the production and transport of oil. From the point of view of traffic in densely populated areas, the use of electric cars also helps to cut down on noise emissions, particulates and other air pollutants.

A final factor to mention is the potential of electric mobility with respect to the stability of power grids. As the share of renewable energies feeding into the grid on a decentralised basis continues to rise, decentralised electricity storage devices are becoming a particularly important factor to compensate for power fluctuations.

Social sustainability and intergenerational equity

The Parliamentary Advisory Council on Sustainable Development also rates electric mobility in very positive terms with respect to social aspects. This assessment is based on a number of basic assumptions:

Huge importance is attached to mobility in our society. It is the basis of personal freedom and social participation as well as the motor driving the economy and employment. Mobility must remain affordable and barrier-free. From the point of view of traffic participants, electric mobility will ensure that with rising oil prices, the costs of individual mobility will remain at an acceptable level, particularly for less privileged income groups, providing it proves possible to achieve the predicted reductions in vehicle costs.

From the economic perspective electric mobility will in particular lessen Germany's dependency on oil imports, which in 2010 amounted to 41.4 billion euro. In terms of

intergenerational equity, electric mobility can make an important contribution to conserving the valuable commodity of oil for future generations for uses beyond that of combustion.

The PBNE also highlights the positive consequences of electric mobility for industry and employment. If the right conditions are created for production in Germany, changing over to electric drive forms will potentially create a large number of new jobs in Germany in the areas of the automotive industry (including suppliers), electrical engineering, information and communication technologies, the energy sector and environmental technologies. The PBNE agrees with forecasts which suggest that projected long-term job losses in the area of classic motor manufacture will be made up several times over. This is happening against the background of additional worldwide sales of up to 470 billion euro from the production of electric and hybrid vehicles in 2020.

Recommendation

In order to fully exploit its considerable potential for sustainability, electric mobility must be conceived on a technologically open and cross-modal basis. It must be part of sustainable transport concepts which have low switching barriers between means of transport. From an environmental viewpoint, suitable instruments must be developed to link into additional capacities for generating renewable energies.

From these viewpoints the PBNE calls on the Federal Government to press ahead rigorously with the support policy for electric mobility begun with Economic Stimulus Package II and the National Electric Mobility Platform and urges it to put in place the necessary political framework to achieve the expansion targets of the National Development Plan for Electric Mobility and make Germany a market leader.

The Federation can set an example and send out a signal for sustainable mobility through the public procurement of particularly climate-friendly vehicles. The PBNE therefore proposes that with effect from 2013 at the latest, annually increasing binding quotas of cars with emissions below 50g/cm CO₂ be set for vehicles procured by the Federation. The Council furthermore proposes to the Council of Elders of the Bundestag that the next invitation to tender for cars for the Bundestag's internal car pool and those companies providing cars for members of parliament on parliamentary duties specifies cars with emissions lower than 50 g CO₂/km.

3.4. Intermodality and multimodality

Intermodality signifies the connecting of different means of transport to carry passengers or goods and hence describes the quality of the transport system. Multimodality refers to the mobility behaviour of people who choose between different means of transport for their journeys. Intermodal provision is the prerequisite of multi-modal mobility behaviour.

Intermodality in passenger transport

Germany is an important centre of the transport industry. Some 1.3 million people are employed in the automotive and rail industries, including suppliers, while the logistics branch employs as many as 2.7 million people. It is the task of an intelligent economic policy to fulfil the requirements of future mobility at the present time in order to secure these jobs over the coming decades. The worldwide trend towards urbanisation demands much more than just better cars. What is needed are intelligent concepts for civilised and comfortable mobility in which cars are one component of a comprehensive integrated mobility system and can link up easily to public transport. Intelligent cars called up by mobile phone on every street corner in the centres of big cities will largely replace private cars. People will then buy not cars but the availability of (car-based) mobility.

Despite splendid sales figures, particularly in the emerging economies, it is clear to all those involved in the market that the full motorisation of developed societies with motorisation rates of 500 and more vehicles per 1000 inhabitants is not transferable on a sustainable basis globally. This applies even if current tentative approaches to electrifying power transmission and using renewable energies replace the combustion engine in the coming decades.

There is a growing understanding that sustainable mobility also means providing new mobility

services which allow shared use of cars on the principle of using rather than owning. Car sharing is a component of an intermodal transport system compatible with urban life which is also now being offered by car manufacturers.

The backbone of mobility in the city is modern, environmentally-friendly, comfortable, affordable and safe public transport, enabling mobility and hence participation in public life for all, while at the same time protecting the environment. Public transport makes sense for economic reasons too, not only as an important means of transport for commuters but also for the development of particular locations, particularly for the retail trade. Public funding for public transport therefore makes sense from all aspects of sustainability, although the PBNE believes more consideration should be given to switching from object-based to subject-based funding. To ensure efficient use of funds transportation contracts should specify social and ecological standards. This is also a way of developing a competitive public transport branch which can market its services outside Germany too.

Modern public transport should not be limited to rigid line operations but should supplement these services with mobility components such as car sharing or cycle hire systems along the lines of the systems offered by Deutsche Bahn AG. Many local public transport companies have entered into cooperation agreements with small and medium car sharing enterprises. The growth of car sharing in cities is hampered by a lack of suitable parking spaces. The *Länder* Bremen and Berlin have created spaces by partial requisition of road space. In view of the fact that municipalities want to and already do use this instrument to promote multimodality, the PBNE recommends making more use of such road-related solutions where possible.

Smart phones which facilitate locally based mobility services offer a good opportunity to spread multimodal mobility behaviour. They can enable users to access all available mobility services in real time during their journey and act as mobile navigators for sustainable mobility, particularly in strange surroundings.

Unlike the “Generation Golf” who acquired their driving licences and bought their own cars at the first opportunity, the “Facebook Generation” are defined by their wish to be online all the time and everywhere and to be able to use the internet interactively. This is possible only to a very limited extent while driving a car but is much more possible on public transport.

Smart phones make it easier to access an as yet underutilised resource for sustainable mobility, namely lift sharing. As well as traditional lift arrangement agencies in Germany where lifts have to be booked in advanced, there are now a number of agencies arranging dynamic lift sharing possibilities which enable passengers to book lifts by smart phone even after they have started their journey. There are plans to integrate this function at a later date in navigation systems so that the position and destination of a person searching for a lift are automatically displayed to a driver if they match his or her route. The more people who join this system, the more likelihood there will be of linking drivers with would-be passengers.

If such lift sharing systems were to increase the average occupancy rate of a car from 1.1 to just 1.2, many traffic jams would be prevented and much CO₂ saved.

One barrier to the use of public transport is the lack of uniform fare systems in the various integrated transport authorities in Germany. In the medium term cashless payment systems by mobile phone or mobility card should be developed and offered for all public transport services, enabling passengers to board their transport without first having to wrestle with complex fare structures at the ticket machine. Mobility advice and management services should be expanded for this purpose. One good example is the New Citizens Package provided by the city of Munich which offers every new resident a package of individually customised offers for use on environmentally-friendly means of transport in the city.

Multimodal services, however, should not be limited to smart-phone-using technophiles but must be made available to everybody without barriers. This starts with easily legible information signs at railway stations and bus stops, same-level entry to buses and trains and accessibility of all platforms in Germany to mobility-impaired people. The carrying of bicycles on the ICE intercity express could also be an element of multimodal transport behaviour. The forthcoming refit of ICE2 and later ICE 3 should therefore include provision for bicycles pre-

registered for carriage.

Intermodality in goods transport

Where goods have to be transported long distances in an inelastic time frame, it is often the best option to use rail, inland waterways or feeder transport in short sea shipping to complete the main part of the journey and to use HGVs only for dispersion. “Broken supply chains” as they are called in the trade, that is to say the transshipment of goods from one means of transport to another, however, involve a high logistical outlay. Cargo handling facilities, as interfaces in the transport chain, and the capacity of the rail network are therefore very important factors. The handling terminals owned by Deutsche Bahn AG, as well as the private terminals supported by the Federation in line with the relevant directive, should be opened up without discrimination to all rail transport companies in order to promote the growth of environmentally-friendly goods transport by rail, which is responsible for only one fifth of the CO₂ emissions of HGVs per tonne-kilometre. The profits of DB Netz AG, which is responsible for building and maintaining state-owned rail track, should in addition be reinvested with priority in the maintenance and expansion of smaller renovation and expansion projects below the level of the rail requirement plan.

Combined transport presents an opportunity to relieve some of the pressure on Germany as one of Europe’s main transit countries. Support should therefore be given in the form of initial funding for new transport connections to exploit the potential to shift goods from road to rail, the inland waterways and short shipping. The Parliamentary Advisory Council on Sustainable Development welcomes the fact that the European Union is already doing this successfully through the Marco Polo Programme.

Recommendation

Supplementary to and in association with the National Platform for Electric Mobility, the Federal Government should develop a strategy for intermodality which encourages the optimum linking of all modes of transport. The Federation’s infrastructure policy should also be oriented to this goal, which should be taken into account in the preparation of the next Federal Transport Infrastructure Plan. There is a need to move from a sector-based infrastructure policy geared to individual modes of transport to create new transitions and interfaces between all modes of transport in order to make efficient use of the capacity reserves and strengths of the different modes of transport, instead of investing in expensive duplicated structures.

3.5. Climate-friendly short distance transport

The Parliamentary Advisory Council on Sustainable Development points out that the transport sector can make a big contribution to achieving the climate-policy targets set out in Germany’s National Sustainability Strategy. While overall economic emission intensity, that is to say CO₂ emissions as a factor of domestic economic output, has fallen over the past 20 years, the share of the transport sector in total CO₂ emissions has risen steadily because there has been less success in controlling emissions.

Nevertheless, the PBNE welcomes the efforts of the transport sector to date. Increasing driving performance and the trend towards higher-performance and heavier vehicles led initially to a rise in emissions despite further refinements to vehicle technology and a decrease in the specific CO₂ emissions of vehicles between 1990 and 1999. Since 2000 more fuel-efficient engines and improved vehicle construction, a steep increase in the share of cars with diesel engines (lower fuel consumption with comparable vehicle parameters), but also a reduction in vehicle performance since 2004, have helped to slightly lessen the impact of transport on climate. Nevertheless TREMOD (transport emission model) calculations show that CO₂ emissions from traffic could be higher overall in 2020 than in the reference year of 2005. It will therefore be very difficult to achieve Germany’s target of cutting CO₂ emissions by 40 per cent by 2020 compared to 1990.

The reason why transport has so far made only a slight contribution to climate protection lies in the increase in traffic levels which has so far outweighed efficiency gains.

The increase in passenger traffic levels in Germany is directly linked to settlement development. Since the 1960s firstly housing and businesses, then large-scale retail units and services have been increasingly settling in the urban hinterland. The extensive and sometimes monofunctional settlement structure that has been created leads to longer journeys which are more difficult to coordinate and which for this reason predominantly involve the use of private cars since public transport and non-motorised traffic cannot access a settlement structure of this nature on an equivalent basis. Between 1982 and 2002, the length of all shopping trips grew by around 50 per cent and that of journeys to work by more than 55 per cent.

Recommendation

The Parliamentary Advisory Council on Sustainable Development notes that traffic that does not occur does not cause CO₂ emissions. In order to avoid traffic, measures must be put in place to tackle the causes of traffic. The settlement and production structures and infrastructure that have developed over decades have led to ever greater distances between the starting point and destination of journeys. Traffic levels could be reduced by paying closer attention to the many varied interactions between spatial structure and traffic development, inter alia to reduce induced traffic needs and to modify building codes. This is a prerequisite for sustainable economic development in which individual mobility and production based on a division of labour are possible with reduced traffic levels. Creating settlement structures and residential environments which entail short distances and therefore generate less traffic and promoting regional economic cycles help to reduce transport demand wherever this is possible.

In a “city of short distances” investment in the expansion of non-motorised transport can have a far greater effect in line with the National Sustainability Strategy in terms of achieving climate change targets than investment in promoting individual motorised transport. This is because a large proportion of urban road traffic involves short distances of under five kilometres. 15 to 30 per cent of these car journeys could potentially be shifted to cycle journeys, while more than 40 per cent could potentially be shifted to journeys by foot. The same mobility requirements could therefore be met with less investment and lower operating costs than for car travel.

4. Concluding remarks:

The subject of sustainable mobility clearly indicates the extent to which individual thematic areas can impact more or less directly on other areas of the National Sustainability Strategy. The Parliamentary Advisory Council on Sustainable Development believes it is essential in the formulation of a sustainable transport policy to examine not only the direct specifications with respect to mobility but, within the context of a more comprehensive sustainability review, to consider the indirect effects on the indicators in the National Sustainability Strategy referred to in chapter 2. These include: resource use (Indicator 1), reduction of greenhouse gas emissions (Indicator 2), shares of renewable energies (Indicator 3), land use (Indicator 4), species extinction (Indicator 5), gross domestic product / gross fixed capital formation (Indicator 7) and air quality (Indicator 13).