NEGATIVE AND POSITIVE EFFECTS OF TRANSPORT ON ENVIRONMENT

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The paper deals with negative and positive effects of transport on environment. The society, as a bearer of costs on environment protection does not represents homogenous unit. In term of transport costs allocation the society can be split on society sphere (environment protection costs especially bear public service organisations and civil service authorities) and on individual sphere (majority of costs on environment protection bear in essence individuals). Finally the paper deals with the trends of transport in relation to environment including the problem of financing the external costs of transport.

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Key words: environment, transport, costs, pollution, subsidies, internalization

1 Introduction

Transport activity and its development bear both positive and negative effects on society and individuals. Positive effects finally take effect in quantified economic and uneconomic benefits such as possible economic prosperity of region for society and for example time saving, reaching new markets, destinations and the like for individuals. Negative transport effects especially in connection with environment can be describe partly like economic losses and partly like after-effects economic nonquantified, but which in any case induce unavoidable costs needful for cut off or at least reduction of these effects.

Generally speaking positive transport effects are restricted to a great extend just on direct transport users and only within the specific scope on the whole society. On the contrary negative transport effects are on the instant all-society phenomenon. These effects influence also those people, which are not embraced in the transport process, at the concrete they are exposed of these negative transport effects during some time as well as the buildings, flora and fauna.

2 Society as a bearer of costs on environment protection

It is necessary to realize that society, as a bearer of costs on environment protection does not represents homogenous unit. In terms of transport costs allocation the society can be split on two basic sphere:

- society sphere,
- individual sphere.

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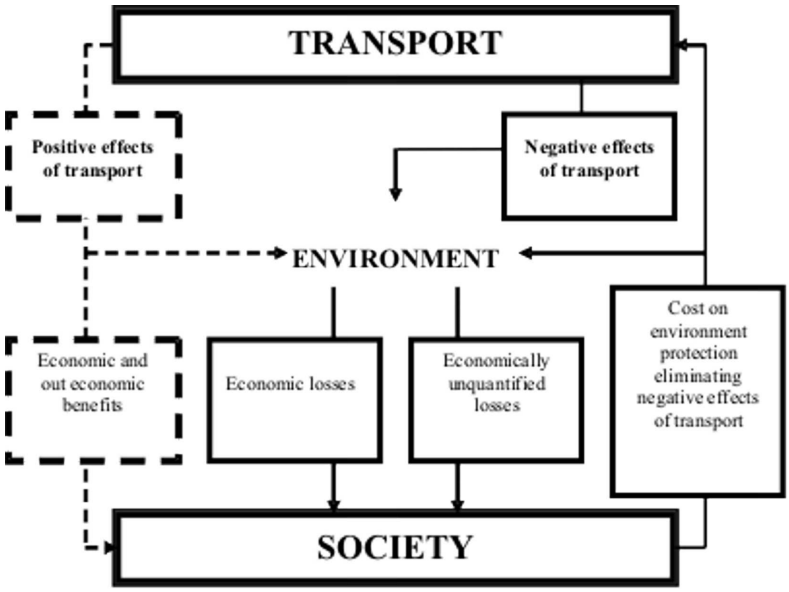

Fig.6: Structure diagram of society, transport and environment

From figure 1 there is evident, that costs on environment protection represent a sort of feedback of society in face of the transport and environment.

Methodically and relevantly right setting cost level (already expended or needed) for remove, prevention or elimination methodically and materially right set environment damages involved by transport is the basic condition for ecological aspects integration to the calculation of economic efficiency of capital and non capital steps in transport.

2.1 Society sphere

Costs needed for transport operation and development, defrayable by society sphere, could be defined from different points of view:

- from pragmatic point of view on: costs of traffic way (roads, tracks, airports, etc.), costs of traffic facilities (crossroads, railway – stations, parking, lay-byes, etc.), costs of means of transport,
- in term of financing subjects on costs defrayable by: public service organizations, other organizations, control economic centre (civil service authorities),
- in term of consequence of defrayable resources in transport on: costs on common operation of state transport system, costs on improvement employee's working environment, costs on improvement the quality of transport services, costs on protection and creation of environment, costs connected with establishment new progressive trend of technical development in transport etc.

The classification criteria's interrelationships are very difficult, because they show the cost's complexity defrayable by society sphere on transport as a whole. At the same time they show, that almost all costs defrayable on traffic ways, facilities and means of transport have correlation to environment protection. On the other side only costs inserted to transport's surroundings can be uniquely defined as ecological type costs.

It is evident that costs on traffic ways and facilities (within these costs also the costs on environment protection) bear partly public service organizations and also civil service authorities.

2.2 Individual sphere

Individual sphere, i.e. single citizens, bear cardinal part of costs on vehicles like acquisition costs of new vehicles, fuel and oil costs, costs spent on tires, replacement parts and accessories, insurance costs, service and repair costs.

In term of total society effectiveness is future usage of individual engine vehicles profitable. Individuals bear majority of costs on environment protection, while society as a whole gains relevant effects.

3 Environmental performance of the transport sector

The Commission's review of the 2001 Transport White Paper in respect to the environment, changes the focus from managing transport demand to addressing negative side effects. This change in focus means that transport demand growth is no longer explicitly identified as one of the main environmental issues within the transport sector. However, as the extent of important environmental impacts such as noise, landscape fragmentation are closely linked to transport volumes, addressing them still requires the management of transport demand. The overall success of the new policy therefore still hinges on limiting (growth in) transport volumes. [2]

Generally more goods are transported over longer distances and more frequently in conjunction with GPD growth (of course with the exemption of current period of economy crisis). The transport growth is dominated by road transport, because this mode of transport is generally faster and more flexible when compared to other modes. But just this mode of transport much more affects negatively environment. Simple support ecologically more pleasant mode of transport like rail transport or inland shipping is in any case good but however not completely solving the problem. This measure may in some cases boost the transport volume of for example rail without necessarily decreasing road transport volumes significantly. In those cases, the net effect is higher transport volume and higher total emissions [3]. Therefore, in addition to modal shifting in specific cases, all modes of transport have to improve their environmental performance.

Passenger transport volumes have grown strongly in and between EU member countries during last years, especially due to increased incomes and more and better infrastructure. For the next decade further growth of passenger transport volumes is also expected (of course after expiry of current economy crisis). [5] The environmental impact of the passenger transport system depends on the transport volumes and vehicle technology. Pollutant emission reduction has been achieved by effective emission standards, but the technical solutions to compensate the growth in CO2 emissions have been easily offset by increased volumes. Pricing is being discussed as a tool to address transport volumes. Research has shown that people tend to change their behaviour as the prices for transport increase. [7] Also, the London and Stockholm congestion charges for road transport demonstrate that people are sensitive to prices.

Transport, especially road transport, is becoming less polluting due to increasingly strict emission standards for the different transport modes. Nevertheless, air quality in cities does not yet meet the limit values set by European regulation, and still has a major negative impact on human health.

SO_X emissions have shifted from land to sea rather than actually decreased (maritime transport is the major emitter of SOX in transport).

Efficiency improvements in passenger cars were slower than expected, partly due to market trends. The European Commission has announced a new policy for CO_2 emissions from light duty vehicles.

After a century of fossil fuel dominance in the transport sector, biofuels are beginning to be more and more common on the market. This is happening as a result of government policies that were implemented in response to the EU Biofuels Directive 2003/30/EC. From an environmental point of view, the main

reason for using biofuels is the possible reduction of GHG emissions as plants absorb CO2 while growing. This CO2 is then later released when the biomass is burned to release the energy. However, the production of biomass must be carried out in a sustainable way to avoid loss of biodiversity.

Fossil alternative fuels currently commercially available are LPG and CNG, but their market shares are limited to specific niches. Their environmental benefits have decreased in conjunction with Euro 5 standards.

The future of hydrogen within the transport sector is as yet uncertain. There are still some technical and especially economic problems to solve before it can be seen as a commercially available solution. If these issues are resolved in the longer term, hydrogen could contribute to improving security of supply, and if produced by renewable energy reduce emissions of greenhouse gasses. From a GHG reduction and energy efficiency point of view, however, renewable energy might be better used directly in the power sector. [8]

3.1 Transport subsidies and external costs

Fair competition on the transport market is a key goal of European transport policy. However, compared to other markets the transport market is characterised by some privileges which may impede fair competition [2]:

- different transport modes cause different external costs, and many transport activities do not pay full costs,
- transport depends on infrastructure networks, which are to a varying degree financed from public budgets,
- different transport modes gain large benefits from privileged regulations and land-use policy,
- different transport modes are fiscally supported by various forms of subsidies.

Transport subsidies influence current volumes and structures of transport, and consequently the environmental impact of transport. We can define them (according to narrow fiscal-policy approach) as fiscal relevant transport subsidies with direct impacts to public budgets. They comprise government expenditure including annual public funding of infrastructure and preferential tax treatment in fuel tax and VAT. These transport subsidies can affect the environmental performance of vehicles, i.e. they may bridge the gap between the costs of environmentally friendly vehicles and conventional ones. Also the level playing field between different modes may be affected by subsidies resulting in a shift from environmental harmful modes of transport to less harmful ones and vice versa. Finally subsidies affect transport volume, i.e. cheaper transport encourages additional transport demand, which results in changes in total transport emissions.

It is difficult to assess the environmental impact of transport subsidies. For example, subsidies to railways can increase the competitiveness of rail compared to road transport, resulting in a shift from road to less environmentally harmful rail transport. On the other hand, this subsidy can also increase the total transport volume, which will have a negative environmental impact. Another example of environmentally harmful subsidies is the significant amount of public financing spent on road infrastructure. These subsidies will increase road transport volumes and consequently the negative environmental effects. In contrast to these environmentally harmful subsidies, some subsidies are aimed at supporting sustainable transport. Examples are the subsidy for environmentally friendly vehicles and the financial support for biofuels. [2]

Subsidies are not the only impediment to fair competition in the transport market. The lack of internalisation of transport's external costs (e.g. contribution to climate change, air pollution, accidents

and congestion) as well as preferential regulations interfere with market processes. Large welfare effects can be achieved by internalising external costs.

4 Conclusion

Finally it is necessary to realize necessity of assessment of real costs spent on environment protection. These costs will differ partly with respect to sphere (society, individual), partly with respect to transport section (means of transport, traffic ways, operation…) to which they are invested. Simultaneously we will have to put mind to the question how can we, in practise, restrict negative effects of transport on environment.

The costs of restriction of negative transport effects on environment, as well as transport costs as a whole bear partly transport and other firms, individuals and civil service authorities.

The environmental performance of the transport sector is still unsatisfactory. There is a need to intensify efforts to improve it, not least concerning the sector's contribution to climate change.

Transport subsidies can have environmental impacts at different levels which can counteract each other. It is possible to put an environmental label on some but not all subsidies. Another impediment to fair competition in the transport market is the lack of internalisation of transport's external costs and preferential regulations interfere with market processes.

The need for fair and efficient pricing, which considered external costs, was underlined by the EC White book on the Common Transport Policy and reaffirmed in its recent review. Pricing policies can contribute to this internalisation strategy. For example for the road sector, the Commission announced the possibility for EU states to introduce road tolls for heavy vehicles on all roads. These tolls are allowed to be differentiated according to the capacity load and the environmental performance of vehicles, indicated by the Euro category of the lorry. In addition to these European initiatives in the field of pricing policies, national and local pricing schemes have been developed. Finally, also fiscal policy, e.g. in the field of transport subsidies can contribute to internalising the external costs of transport.

Note: The article is published within solution of research proposal VZ-MSM 0021627505 „The transport systems theory“.

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