TRANSPORT
2009
24(2): 93–99

THE IMPACT OF TRANSPORT ON THE COMPETITIVENESS OF NATIONAL ECONOMY

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Received 20 September 2008; accepted 10 April 2009

Abstract. Transport has always been and remained one of the main driving forces in the economical development of any country including Lithuania. The paper assesses a positive impact of transport on Lithuanian economy in the light of the analysis of the main indicators measuring the success of the transport sector: the share of transport and warehousing sectors to national GDP (%) and the share of the export of transport services in GDP (%). It is also widely acknowledged that transport is going to play a crucial role in economic development in the future, especially in transit-related transport like the Baltic States. On the other hand, the growth of transport, particularly in road transport, has had a significant impact on congestion, safety and pollution. Therefore, the task of transport decision makers is to find the key for sustainable transport development and reduction of a negative transport impact to sustain the transport sector as the engine of economy. The paper analyses both the positive and negative impacts of transport on economy and evaluates the possible ways developing the sustainable transport system.

Keywords: export of transport services, sustainable transport, cost internalization.

1. Introduction

Transport plays a crucial role in economy bringing goods and services to customers as well as transporting passengers to work or acting for pleasure purposes. A modern society can effectively function only having an effective transport and logistics system. Customers are willing to pay for the quality of goods and services, i.e. the transportation system must work effectively to distribute those goods on customer's demand (Baublys 2009; Vasilis Vasiliauskas, Barysienė 2008a, 2008b; Morkvėnas *et al*. 2008; Kiisler 2008; Kabashkin 2007; Meirane 2007; Vasilis Vasiliauskas, Jakubauskas 2007; Meidutė 2007). Therefore, larger and larger investments are spent annually to maintain and improve the transport system in the EU to benefit passenger and freight transportation. Along with the internal market, the volume of freight has significantly grown over past few decades and still keeps increasing all over Europe. The main task for transport decision makers is to ensure further effective transport services to maximally foster economic development. Surface transport plays a fundamental role in nearly all social and economic activities providing and maintaining the infrastructure consuming enormous resources. Thus, it is essential this must be carried out using the most efficient ways, for example, through the implementation of certain transport policy instruments the basic one of which is the mobility of goods and people ensured by minimal costs and minimal transport process related to consuming goods and services. In other words, higher than possible minimal costs reduce the competitiveness of economy because the prices of imported products increase and export revenues decrease. In addition, the real revenues of the country also decrease (Estimation and Evaluation … 2007).

At national level, high transport costs distorts the distribution of labour resources in regions, thus negatively effecting the development of competitive services and production. Besides, an increase in transport costs dwarfs even regional growth. In general, the reduction of production costs has a direct impact on the increase of the real incomes of society, therefore fostering the development of economy.

2. Trends of Transport System Development

A specific purpose of transportation is to fulfill demand for mobility, since transportation can only exists if it moves people and freight around. Otherwise, it has no purpose. This is because transportation is the outcome of a derived demand. Distance and a core attribute of transportation can be represented in a variety of ways ranging from a straight line between two locations – to what

ISSN 1648-4142 print / ISSN 1648-3480 online
www.transport.vgtu.lt
DOI: 10.3846/1648-4142.2009.24.93-99

can be called logistical distance; a complete set of tasks required to be done so that distance can be overcome. Consequently, any movement must consider its geographical setting which in turn is linked to spatial flows and their patterns (Tolley and Turton 1995). Urbanisation, multinational corporations, the globalization of trade and the international division of labour are all forces shaping and taking an advantage of transportation at different but often related scales.

Freight volumes are expected to increase by another 70% by 2020 according to the Freight Analysis Framework, a comprehensive database and policy analysis tool (European Energy and Transport … 2008). Over the five years from 2001 to 2006, land, air and water transports had the fastest growing turnover among nonfinancial servicing activities with the average growth rates of 5.4% or more per annum over this period of time (Europe in Figures … 2008). However, the key problems of congestion, the quality of services (punctuality and connectivity), affordability and pollution put at risk economic development. Moreover, international trade is forecast to grow faster than domestic trade. The way in which goods are moved has also evolved. Presently, businesses and individuals demand more flexible and timely service increasing the importance of an efficient and reliable freight transportation system. Another trend is the increasing use of intermodal transportation to move freight. The rise in intermodal transportation emphasizes the importance of infrastructure that connects different modes, especially at international gateways or where modes converge at transfer points. Consequently, not only is the condition and performance of each modal network important but also how different modes fit together to provide a continuous transportation system. The growth in freight movement is placing enormous pressure on the already congested highway system all over Western Europe. No slowdown in freight transportation growth in coming few years is in sight. Freight flows tend to turn into the transcontinental pattern as Far East, Middle East Asian countries as well as Caucasus region have been intensively developing economic relations with European countries. Lithuania, crisscrossed by trans-European axis, also expects stable growth in freight volumes.

The implementation of intelligent transport systems (ITS) will shape transport systems in the future: ITS are seen as a precondition towards the sustainable transport system approach and an effective instrument needed to deal with growing freight transport flows and increased demand for seamless mobility.

3. Benefits of Transportation to Economy

Investments into transport infrastructure are aimed at additional transport capacity, increased reliability and a better quality of transport services. This in turn leads to lower transport costs as well as to shorter transit times. Besides, better transport infrastructure is the core element for business expansion. Summarizing the above presented ideas, we have better productivity and competitiveness which is the backbone of economic growth (Fig. 1).

Both types of direct and indirect benefits of transport are significant to economy (Table 1). If direct transport benefits are easily evaluated and considered as the direct outcomes of successful transport policy, indirect benefits are not that easily assessed, nevertheless these are very important for the development of economy and different sectors.

It is widely acknowledged that transport plays a crucial role in economic development. More specifically, it has been recognized that the provision of a high quality transport system is a necessary precondition for the full participation of remote communities in the benefits of

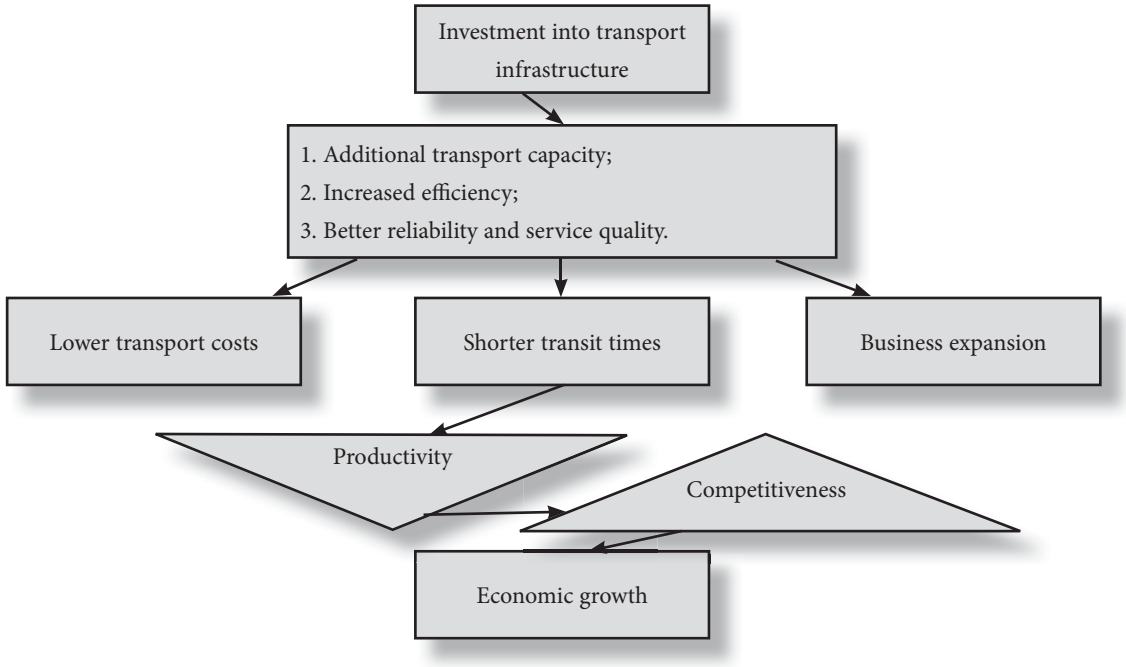


Fig. 1. The impact of transport on economic growth

Table 1. The benefits of transportation to economy

Direct Transport Supply	Direct Transport Demand	Indirect Microeconomic Benefits	Indirect Macroeconomic Benefits
Income from transport operations (fares and salaries)	Improved accessibility	Rent income	Formation of distribution networks
	Time and cost savings		Attraction and accumulation of economic activities
	Productivity gains	Lower price of commodities	
Access to wider distribution markets and niches	Division of labour		Increased competitiveness
	Access to a wider range of suppliers and consumers	Higher supply of commodities	Growth of consumption
	Economies of scale		Fulfilling mobility needs

national development: adequate, reliable and economic transport is essential, although not in itself sufficient, for the social and economic development of rural areas in developing countries (ST/ESCAP/2017 1999).

The transport sector is an important component of economy impacting on the development and welfare of populations. When transport systems are efficient, they provide economic and social opportunities and benefit that impact throughout economy. When transport systems are deficient, they can have an economic cost in terms of reduced or missed opportunities.

4. Impact of Transport Activities on Lithuanian Economy

A positive impact of transport on Lithuanian economy will be assessed in the light of the analysis of the main indicators to measure the success of the transport sector. There are two transport related indicators amongst other national success indicators of national economy (approved by the resolution of Lithuanian Parliament of June 26, 2007, No. X-1225). These are:

– the share of transport to national GDP (%) and;
– the share of the export of transport services in GDP (%).

The transport sector in the EU contributes to 7% of the EU GDP and 5% of total employed persons are employed in the transport sector. To compare the situation in Lithuania, Lithuanian transport sector contributes in average over 10 % to national GDP with constantly growing contribution in monetary terms (Fig. 2) and 5% of total employed persons are working in the transport sector.

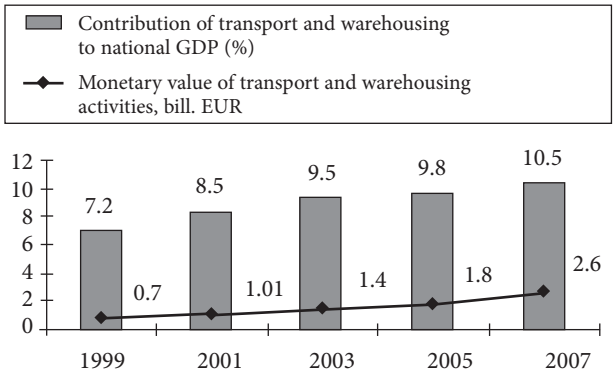


Fig. 2. The share of the transport sector to GDP

Transport remains a rapidly developing industry that ensures the effective functioning of the domestic market, the provision of foreign trade and transit services, passenger service and tourism development. Analysing the situation in the entire Baltic Sea region, constantly increasing volumes of transport service export demonstrate the role of the transport sector in the economic growth of those countries.

Improved transport brings obvious benefits to economy embracing improved logistics (reduced level of inventories, more reliable supply of goods, higher delivery quality etc.) and improved mobility that leads to the improved profitability of business (Fig. 3). This in turn leads to greater demand for transport and requires a larger extent of investment. This in turn, again, leads to improved transport and better productivity and profitability. Having this cycle well-working, country's economy becomes stable and conditions for long term business planning and making are created.

Transport is one of the most productive sectors of Lithuanian economy. Transport services is one of a few domains where Lithuanian companies export more than import. This shows how Lithuanian transport sector is competitive in the international market. Besides, the growth of the export volumes of transport services (particularly those of road transport) proves the ability of Lithuanian companies to successfully compete in changing conditions after the accession to the EU in 2004. This means, that the vast majority of Lithuanian companies were able to timely react on new competitive conditions, to create well working marketing and logistics strategy and having more attractive cost policy to compete with other freight carriers.

Each year, more than a half of Lithuanian exports of services comprised transport services. The volume of such services rendered to foreigners in 2007 grew by 10% compared with 2006 (Fig. 4), while despite the fact that their imports compared with 2006 jumped by 16%, the balance reached 678 mill. EUR (annual growth of 3%) remaining at the similar level as in 2006 (661 mill. EUR). Comparing the situation in all three Baltic States, it is notable that Lithuania, having the lowest share of the export of transport services in 2002, in several years' period has taken a strong leadership. This was influenced by timely investment into the trans-European transport network – the extension of capacities at Klaipeda State Seaport, the renewal of Lithua-

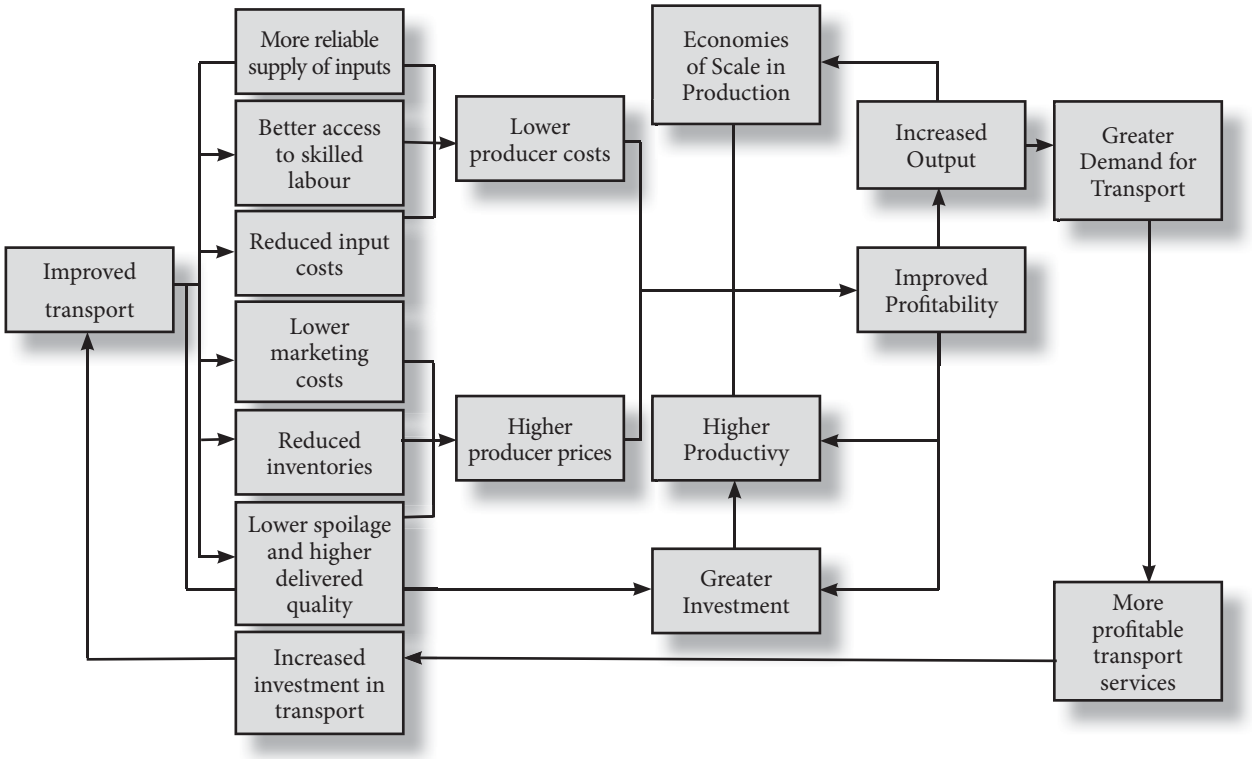
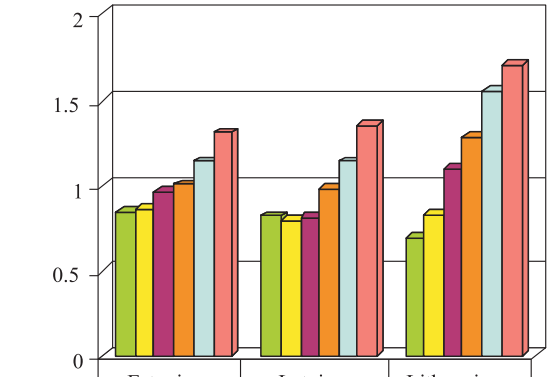


Fig. 3. Economic importance of transportation (ST/ESCAP/2017 1999)

nian railway system and the efficient integration of Lithuanian carries into the EU market.

The share of the export of transport services has been constantly growing while that of travelling and other types of the exporting services are more or less in a stable position. The share of the export of transport services augmented from 44% in 2002 to 57% in 2007 and tends to keep growing.



	Estonia	Latvia	Lithuania
2002	0.85	0.82	0.69
2003	0.86	0.8	0.83
2004	0.97	0.81	1.09
2005	1	0.99	1.28
2006	1.14	1.14	1.55
2007	1.31	1.36	1.71

Fig. 4. The dynamics of the export of transport services in the Baltic States, bill. EUR

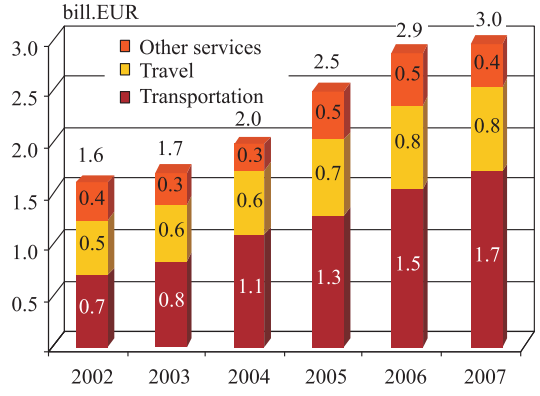


Fig. 5. The breakdown of the export of services in Lithuania, bill. EUR

The export of transport services covers services provided by all modes of transportation comprising sea, air etc. which includes space, rail, road, inland waterway and pipeline and are performed by the residents of one economy for those of another. The different types of services offered include the transport of passengers, the transport of freight and other supporting and auxiliary services (e.g. storage and warehousing). Along with the export of travel services, transportation comprised over 83% of total transport services in 2007. The export of all remained services comprise those transactions of international services not covered under transportation and travel (communication services, construction services, insurance services, financial services, computer and information services, royalties and license fees, other business services, personal, cultural and recreational services and

government services) accounted for only 0.4 bill. Euro (17% of the total export of transport services).This clearly shows not only the importance of the transport sector to Lithuanian economy but also the competitive advantages of Lithuanian transport sector in the international market (Fig. 5). The positive balance between the export and import of transport services clearly proves that investments into the transport sector are sound and reasoned (Social and Economic Development … 2007). To keep these trends, investments need to be continued in a large extent, particularly taking into account the fact that the potential of the export of transport services for Lithuania is quite huge: Denmark which is of more or less comparable size to Lithuania, earns 29 mill. Euro from transport export services (17 times more than Lithuanian indicator). Comparing the situation in the entire Baltic Sea region (BSR), in 2003–2007, all countries increased their efficiency of transport services (Table 2). The lowest increase was 36% (Sweden) and the highest – 107% (Lithuania). BSR is becoming as a hub for trans-continental trade and this is explained by a fast growth of the role of logistics it plays. Looking beyond the EU's neighbours, external transport policy is differentiated and focused on the EU's major trading partners. Having good port facilities well-connected by the motoway of the Baltic Sea and good eastbound connections by uncongested roads and railways, BSR is well linked with TRACECA and the trade routes of central and Far East Asian regions.

To promote trade between BSR and adherent regions, the elimination of physical and legal bottlenecks has been in progress. The EU is the main trade partner of the Russian Federation and the most significant cargo flows between the Russian Federation and the EU are directed through the central ports of the Baltic Sea (Russian ports, ports in the Gulf of Finland and the Baltic States). Besides, for the entire BSR, good perspectives are set for trade exchange with China, Russia and Kazakhstan (Mačiulis, Jakubauskas 2007).

Table 2. The dynamics of the export of transport services in BSR, mill. EUR (source: EUROSTAT)

BSR countries	2003	2004	2005	2006	2007	Change (%) 2007/2003
Denmark	15.8	17.2	21.7	26.4	29.0	83.91
Germany	23.9	27.0	30.9	33.5	37.5	56.88
Estonia	0.8	0.9	1.0	1.1	1.3	52.56
Latvia	0.8	0.8	9.8	1.1	1.3	69.42
Lithuania	0.8	1.0	1.2	1.5	1.7	107.02
Poland	3.5	3.3	4.3	5.5	6.7	91.43
Finland	1.7	1.9	1.9	2.1	2.3	34.45
Sweden	5.9	6.5	7.0	7.3	8.1	35.95

The indicator itself does not show its importance for the whole economy of the country. If we take the same BSR countries as a comparative element, we can see that the share of the export of transport services in national GDP (at current prices) remains very salutatory: the lowest is noticed in Germany (less than 2%) and the highest – in Denmark (over 12% in 2007) (Fig. 6).

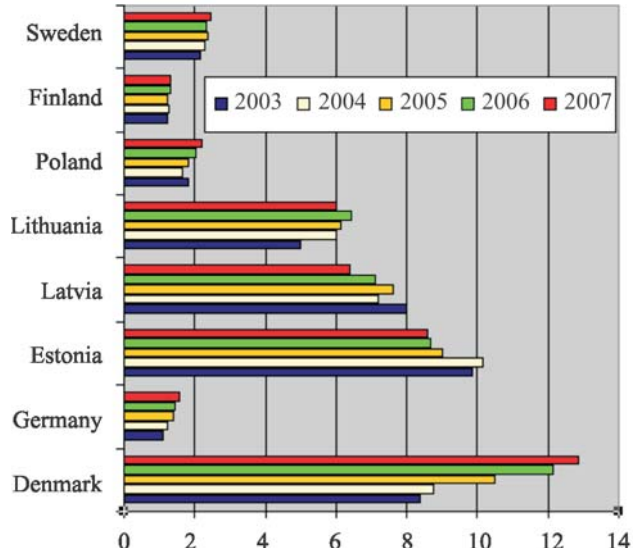


Fig. 6. The dynamics of transport services in BSR, mill. EUR (source: EUROSTAT)

The transport sector is very important for the Baltic States – Estonia, Latvia and Lithuania. In the transition period, into knowledge economies, this share might slow down, nevertheless, the experience of West European countries shows that the export of transport services could be much higher even with a lesser share of that in national GDP.

5. Negative Effects of Growing Transport Activities

The growth, in particular an imbalanced growth of transport services may cause negative effects. In the EU, over 60% of population lives in urban areas. In Green Paper (2007), the European Commission draws attention that throughout Europe, increased traffic in town and city centers has resulted in chronic congestion with a number of adverse consequences and that this entails in terms of delays and pollution. Every year, nearly 100 billion euros, or 1% of the EU's GDP, are lost to the European economy as a result of this phenomenon.

Air and noise pollution is getting worse year by year. Urban traffic is responsible for 40% of CO_2 emissions and 70% of emissions of other pollutants arising from road transport.

The number of road traffic accidents in towns and cities also grows each year: now, one in three fatal accidents now happen in urban areas and it is the most vulnerable people, namely pedestrians and cyclists who are the main victims. While it is true to say that these problems occur at the local level, their impact is felt on a continental scale: climate change/global warming, increased health problems, bottlenecks in the logistics chain etc. An unbalanced growth of transport activities gives direct rise to environmental impacts, accidents and congestion. In contrast to the benefits, the costs of these effects of transport are generally not borne by transport users. Without policy intervention, the so called external costs are

not taken into account by transport users when they make a transport decision. Transport users are thus faced with incorrect incentives leading to welfare losses (Maibach *et al.* 2008).

The development of the transport sector, equally as every other sector, should strive for sustainability. In this respect, it should be noted that transport activities has certain influence on environmental impacts, accidents and congestion. In contrast to the benefits, the costs of these effects of transport are generally not borne by transport users. The internalisation of external costs means making such effects part of the decision-making process of transport users. At the European level, this problem is being solved for several previous years. In 2007, the European Commission drafted a handbook that outlined a model for the internalisation of external costs which will serve as a basis for the future calculations of infrastructure charges. The handbook, jointly prepared by several transport research institutes, summarises the state of the art as regards the valuation of external costs. It evaluates the best practice approaches for different cost categories by pointing out sensitive issues providing guidelines for valuation approaches for the most important cost components: the cost of scarce infrastructure, accident costs, air pollution costs and human health, building and material damages, impact on nature, impact of noise, climate change and nature and landscape (Table 3).

Table 3. Valuation approaches

Cost component	Best practice approach
Costs of scarce Infrastructure	WTP* for estimating the value of time (based on stated preference approaches). Alternatively: WTA**. WTP for scarce slots (based on SP*** with real or artificial approaches). Alternatively: WTA.
Accident costs	Resource costs for health improvement. WTP for estimating the Value of Statistical Life based on SP for reducing traffic risks. Alternatively: WTA.
Air pollution costs and human health	Impact pathway approach using resource cost and WTP for human life (Life years lost) base. Alternatively: WTA.
Air pollution and building/ material damages	Impact pathway approach using repair costs.
Air pollution and nature	Impact pathway approach using losses (e.g. crop losses at factor costs).
Noise	WTP approach based on hedonic pricing (loss of rents – this reflects WTA) or SP for noise reduction. Impact pathway approach for human health using WTP for human life.
Climate change	Avoidance cost approach based on reducing scenarios of GHG-emissions; damage cost approach; shadow prices of an emission trading system.
Nature and Landscape	Compensation cost approach (based on virtual repair costs).

WTP* = Willingness to pay.
WTA** = willingness to accept.
SP***= Stated preference approach

The internalisation of external costs means making such effects a part of the decision making process of transport users. According to the welfare theory approach, the internalization of external costs by market-based instruments may lead to a more efficient use of infrastructure, reduce the negative side effects of transport activity and improve the fairness between transport users. The internalization of the external cost of transport has been an important issue for transport research and policy development for many years in Europe and worldwide (Vasilis Vasiliauskas, Barysienė 2008a; Jakimavičius, Burinskienė 2007). Nevertheless, there is no one common agreement on a technique of valuating external costs. Some countries have developed their own guidelines. The aforementioned handbook was the first attempt to evaluate all the main cost factors.

7. Conclusions

1. The influence of the transport sector on market development is quite often underestimated when planning society and business costs. Therefore, a certain transport policy instrument should be more actively discussed and evaluated at all levels of decision making processes.
2. Statistical information is not sufficient to evaluate the efficiency and necessary planning of transport infrastructure development or the supply of transport services. Undoubtedly, in terms of statistical analysis, there is a need for a more detailed analysis of transport sector activities and for revealing the results of transport activities as well as its influence on the competitiveness of economy and importance for the development of other sectors and live quality.
3. The internalization of external transport costs, research on efficient energy transportation technologies and the reducing emission are the main domains where scientific engineering and technological collaboration is needed to ensure mobility in conditions for market globalization.
4. Having in mind a positive balance of the export-import of transport services, it means that the transport sector is very competitive in the international arena and thus should be further strongly developed.
5. Lithuania, just as other countries with developing economies, has an objective to ensure a rapid growth of national economy and an increase in competitiveness. Through the allocation of public investments, the national economy development policy strives for maximum economic growth in the short term. Improving transport infrastructure is one of the key priorities of such investment. Timely allocation to the modernization of the transport system could ensure sustainable mobility for the members of the society and transportation of goods to maintain a dynamic development of economy and to increase Lithuania's competitive capacity in global markets.
6. Lithuania's access to the EU has resulted in changes in the macroeconomic environment whish improved conditions for competition, the development of business contacts and a faster development of both pas-

senger and freight transport. Sustainable and efficient transport operations are both a service creating high value added and a precondition for a successful development of other branches of economy and the quality of life.

7. 'Sustainable mobility', that is disconnecting mobility from its harmful effects, has been strongly promoted by the EU Transport Policy documents in recent years. It encourages using a broad range of policy tools ranging from economic instruments and regulatory measures to infrastructure investment and new technologies in order to achieve sustainable mobility and reduce the negative impacts of transport.

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