TRANSPORT
2009
24(2): 154–169

TRANSPORT MANAGEMENT: THE POPULARITY OF STUDY PROGRAMMES AMONG THE APPLICANTS TO LITHUANIAN UNIVERSITIES EVALUATING THE QUALIFICATIONS OF GRADUATES IN THE LABOUR-MARKET

Olegas Prentkovskis[1], Romualdas Kliukas[2], Aidas Vasilis Vasiliauskas[3], Alfonsas Daniūnas[4], Valerija Marina[5], Kristina Ledauskaitė[6], Vaida Zemlickienė[7]

Vilnius Gediminas Technical University
[1]*Dept of Transport Technological Equipment, Plytinės g. 27, 10105 Vilnius, Lithuania*
[2]*Dept of Strength of Materials, Saulėtekio al. 11, 10223 Vilnius, Lithuania*
[3, 6]*Dept of Transport Management, Plytinės g. 27, 10105 Vilnius, Lithuania*
[4]*Dept of Steel and Timber Structures, Saulėtekio al. 11, 10223 Vilnius, Lithuania*
[5]*Dept of Foreign Languages, Saulėtekio al. 11, 10223 Vilnius, Lithuania*
[1, 2, 4, 7]*Adimission Office of Applicants, Saulėtekio al. 11, 10223 Vilnius, Lithuania*

E-mails: [1]*olegas@ti.vgtu.lt;* [2, 7]*pirmininkas@adm.vgtu.lt;* [3]*aidasv@ti.vgtu.lt;*
[4]*alfonsas.daniunas@adm.vgtu.lt;* [5]*lynx_114@yahoo.com;* [6]*Kristina.Ledauskaite@vv.vgtu.lt*

Received 5 October 2008; accepted 10 April 2009

Abstract. The accession of Lithuania to the European Union made transport one of the most important branches of national economy. Presently, economic development is hardly possible without an efficient transport system (providing both local and international transportation). The operation of industrial, construction and agricultural enterprises as well as work efficiency and a public opinion largely depend on the reliability and effective performance of transport systems which is not possible without qualified transport managers. The paper presents requirements raised for controlling the abilities and level of educating specialists in Transport Management and introduces employee assesment at student skills. Specialists in Transport Management are trained at vocational and higher schools of Lithuania. Experts in the field of Transport Management are trained at two university-level higher schools in Lithuania (Bachelors, Masters and Doctors) including Vilnius Gediminas Technical University and The General Jonas Žemaitis Military Academy of Lithuania (the introduced higher schools are located in Vilnius, the capital of Lithuania). Although both study programmes taught at the above mentioned higher schools cover the area of Transport Management, they have some differences discussed in the paper. A brief survey of admission to Lithuanian higher schools is analyzed in the article. Some statistical data on the popularity of study programmes chosen by the applicants participating in the joint admission programme to Lithuanian higher schools is presented in the article. Also the popularity of the study programmes of Transport Management (competition, competitiveness indices and average competitive marks and motivation indices) available at two higher schools of Lithuania is described.

Keywords: transport management, higher schools of Lithuania, applicants, joint admission, study programmes, statistical data, competition, competitiveness index, motivation index, average competitive mark, popularity, labour-market

1. Introduction

The growth of Lithuanian economy in 2004–2007 created favourable conditions for increasing employment and decreasing unemployment.

In 2006, the total number of working persons aged 15 and older reached 1499 thousand. Over the year, the number of the employed persons reached 25 thousand.

Unlike the situation in agriculture, the number of the employed persons in the service sector has been increasing. In 2006, 57.9% of the employed persons worked in the service sector (compared to 52.6% in 2001), see Table 1.

With the rapid development of national economy and continuing emigration as well as with fast growth in the number of vacancies, both the number of the unemployed and unemployment rate have been rapidly decreasing. As compared to 2001, the number of the unemployed decreased by 3 times in 2006.

One of the sectors of economic activities providing services is transport, storage and telecommunication.

According to the data provided by the Ministry of Finance of the Republic of Lithuania, the total value added (VA) created in Lithuania in 2007 achieved 84 million litas. VA created in the sector of transport and postal services in 2007 was higher by 15.8% than that achieved in 2006 and by 31.6% – than in 2005, see Table 2.

The VA share created in Lithuanian transport sector is twice as large as the average EU value.

79 thousand (6.0%) of all working persons were employed at transport and storage enterprises while only 16 thousand (1.2%) of those were employed in the sector of postal services and telecommunications.

The variation of the number of persons employed in the transport, storage and telecommunication sector is demonstrated in Table 3.

It can be seen that the number of the employed in the transport, storage and telecommunication sector was growing from year to year.

However, statistical data also show that the need for specialists in some economic sectors had not been fully satisfied. For example, there were 0.6 thousand vacancies in the transport, storage and telecommunication sector in 2005 and 2 thousand vacancies in 2006. Professionals, technicians and associated professionals as well as craft and the workers of related trades were greatly needed.

On 1 January 2007, 76 516 enterprises having 1318 thousand staff members were registered in Lithuania. In the transport and storage sector, 5454 enterprises making 1% of all enterprises were registered. In the sector of postal services and telecommunication, 403 enterprises (i.e. 0.5% of all enterprises) were found. There were 4188 land transport enterprises, 20 water transport and 13 air transport enterprises while 1230 enterprises provided other transport and related services (see Tables 4 and 5).

All statistical data presented in this section are based on information provided on the websites of the Department of Statistics attached to the Government of the Republic of Lithuania (Statistics Lithuania), The Ministry of Economy of the Republic of Lithuania, The Ministry of Finance of the Republic of Lithuania and The Ministry of Transport and Communications of the Republic of Lithuania.

2. The Role of the Transport Sector in the Development of National Economy

Modern society places a particular emphasis on technological and social sciences because no state can prosper without having a sufficient amount of highly qualified specialists in technologies, economics and

Table 1. The employment of population, per cent

Area of employment	2001	2002	2003	2004	2005	2006	2007
Agriculture	17.3	17.8	17.9	15.8	14.0	12.4	10.4
Industry and construction	27.1	27.5	28.1	28.2	29.1	29.7	30.7
Services	55.6	54.7	54.0	56.0	56.9	57.9	58.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 2. VA created in transport, postal services and telecommunication

	2002	2003	2004	2005	2006	2007
Postal services and telecommunication	4.2	3.9	3.3	3.1	2.9	2.7
Transport	9.2	9.5	9.3	9.8	9.9	10.3
Total	13.4	13.4	12.6	12.9	12.8	13.0

Table 3. The average annual number of the employed persons, thousands of people

Type of economic activity	2001	2002	2003	2004	2005	2006	2007
Total	1351.8	1405.9	1438.0	1436.3	1473.9	1499.0	1534.2
Transport, storage and telecommunication	86.0	87.4	92.2	93.9	93.9	98.9	111.4

Table 4. The variation of the number of enterprises in the transport and storage sector

Types of enterprises	2004	2005	2006	2007
Land transport enterprises	4626	4607	4280	4188
Water transport enterprises	18	22	22	20
Air transport enterprises	9	12	11	13
Enterprises providing other transport services	1037	1156	1095	1230

Table 5. The size of enterprises according to the number of employees in 2007

Types of enterprises	0–4	5–9	10–19	20–49	50–99	100–149	150–249	250–499	500–999	More than 1000
Land transport enterprises	2266	793	545	387	140	30	13	8	4	2
Water transport enterprises	13	2	1	–	–	1	–	1	2	–
Air transport enterprises	5	2	–	4	1	–	–	–	1	–
Enterprises providing other transport services	678	282	137	89	24	6	6	6	2	–

management. The demand for specialists in technological and social sciences, their competitiveness in the labour market, prestige and payment as well as the popularity of these specialities among school-leavers have been changing considerably during the nineteen years of Lithuanian independence.

The accession of Lithuania to the European Union made transport one of the most important branches of national economy (Prentkovskis *et al.* 2008; Vasilis Vasiliauskas and Barysienė 2008). Presently, economic development is hardly possible without an efficient transport system (providing both local and international transportation). The operation of industrial, construction and agricultural enterprises as well as work efficiency and a public opinion largely depend on the reliability and effective performance of transport systems (Prentkovskis *et al.* 2007, 2008; Burinskienė 2009).

Transport is a branch of producing material values associated with the transportation of people and goods. In the system of production, transport refers to service provision. Transport is an integral part of a larger system, i.e. a logistic chain, and therefore the whole process of transportation – from freight sender to freight receiver – should be analysed. When the interests of customers are taken into account, other processes including not only transportation by the main means of transport but also processing, storage, packing and unpacking as well as feeding materials to machine-tools in the shop and information processes related to the flow of materials should be considered. This approach helps us with making an optimal choice of transport services because the quality of transportation is usually closer connected with overall expenses than its cost (Prentkovskis *et al.* 2008; Baublys *et al.* 1999 and 2003).

From the perspective of specialization and cooperation in the sphere of production, the study of transport should not be restricted to the area of some particular material and technical links. Therefore, transport should be considered in the system of logistics, including transportation from the primary supplier to the final user and all intermediate stages.

Logistics is a branch of science dealing with planning, managing, controlling and regulating material and information flows in space and time in their movement from the primary source to the final user.

Logistics, though having deep roots in the past, is still a relatively new science. It flourished in the years of World War II helping to solve strategic problems providing effective interaction between the defence industry and supply bases and transport for a timely supply of the army with arms, ammunition, combustible materials, lubricants and rations. Later, the concepts and methods of logistics were gradually transferred from military to civil life. First, it was perceived as a new scientific approach to achieving the effective control of the flows of materials in the area of circulation, and consequently in the sphere of production.

Logistics departments have been established at industrial and agricultural enterprises, in the transport system, NATO organizations etc. They are even included in organizing the committees of some large international competitions.

At the end of the 20th century, logistics was seen as a complex discipline including purchasing or supplying logistics, the logistics of manufacturing processes, sale (market) or distributing logistics, transport logistics, information or computer logistics etc.

A great deal of logistics operations performed with the flows of materials in moving them from primary sources to the final users are based on using various means of transport. The costs of these operations make up to 50% of the overall costs of logistics.

The subject – matter of transport logistics is a number of problems associated with organizing freight transportation by the commonly used means of transport.

The main problems of transport logistics include:

- choosing a particular means of transport;
- choosing the required type (category) of transport;
- simultaneous planning of transportation, storage and production;
- simultaneous planning of transportation (by various means of transport) for multimodal transportation;
- ensuring the technological unity of the processes of transportation and storage;
- determining rational delivery routes.

To solve the above mentioned problems, any country (not only Lithuania) needs highly qualified specialists in the area of *Transport Management* (Prentkovskis

et al. 2008; Ledauskaitė and Bazaras 2008; Palšaitis and Bazaras 2007, etc.).

The issues of training specialists in transport management (for example, transport and logistics) as well as in other sectors are not new because they are closely connected with the general problems of education. All these questions have been investigated by scientists from various countries. Thus, Ledauskaitė and Bazaras (2008) studied the demands for specialists in the transport sector. Fila and Misnevs (2008) investigated the development of methodology and its implementation in the analytical system for transport and logistics educational programs. Palšaitis and Bazaras (2007) examined the theoretical aspects of managing logistics training. Ginevičienė *et al*. (2007a) made a feasibility study for introducing Master degree courses into the university curriculum based on multi-criteria evaluation methods. Ginevičius and Ginevičienė (2009) studied the problems of the compliance of Master degree studies with the economic needs of the country. Kaklauskas *et al.* (2009) analysed a web-based model of multiple criteria ethical decision-making for the ethical behaviour of students. Kliukas *et al*. (2006) performed a qualitative analysis of knowledge of applicants to transport engineering study programmes. Prentkovskis *et al*. (2007) analysed the popularity of study programmes in transport and telecommunication engineering among the applicants to Lithuanian higher schools. Daniūnas *et al.* (2007) examined the attractiveness of engineering study programmes offered by Lithuanian universities. Boyer (1987) analysed undergraduates' experience in America. The introduced studies make only a small part of investigations into the field of education.

Researchers from different countries have been studying various problems of transport and related fields. Thus, Burinskienė (2009) analysed new methodology for sustainable development towards the development of the sustainable transportation system. Jakimavičius and Burinskienė (2009) investigated GIS carrying out multi-criteria analysis and ranking transportation zones in Vilnius. Dubra and Gulbe (2009) analysed the problems of forecasting labour force demand and supply in Latvia. Khaki *et al*. (2009) studied the development of the composed probability model to predict household trip production in the Isfahan city (Iran). Labanauskas and Palšaitis (2007) made a feasibility study of establishing a regional transport terminal in Kaunas. Gromule and Yatskiv (2007) analysed a coach terminal as the key element of transport infrastructure. The problems of logistics centers and companies were studied by Kiisler (2008), Kabashkin (2007), Tolli and Laving (2007), Meidutė (2007) and Jaržemskis (2007). Ziari *et al*. (2007) examined the problems of locating the stations of public transportation vehicles for improving transit accessibility. Pocklad (2007) analysed the development of interurban service by using alternative commercial road trains. Lin and Juan (2007) studied personnel supply and demand for civil aviators in Taiwan. Vasilis Vasiliauskas and Barysienė (2008) analysed the possibilities of Lithuanian transport sector in the context of European-Asian trade relations. Meirane (2007) carried out research on the structure of cargo flow in Latvia. Žvirblis and Zinkevičiūtė (2008) made an integrated evaluation of the macro environment of companies providing transport services. Petravičius and Tamošiūnienė (2008) presented a study of corporate performance and the measures of the value added. Susnienė and Jurkauskas (2008) used a stakeholder approach to analysing the management of public transport companies. Morkvėnas *et al*. (2008) studied the methods of assessing the potential of employees' knowledge in the transport sector.

3. Requirements Raised for Educating Specialists in Transport Management and Employees Assessment of Student Skills

A modern knowledge-based society requires that professionals should be able to learn and analyse the immediate situation to accept novelties etc. Therefore, if a specialist is creative, s/he will be able to contribute to social and economic development with his/her knowledge. Experts state that interdisciplinary relationships are relevant for supporting such knowledge-based development. Globalisation should focus on educational needs for information as well as on the development of science and engineering. A flexible approach to education allows the learners of various abilities to develop the required skills (Stukalina 2007 and 2008). It should be taken into consideration that the qualification of an economist or a manager, his/her contacts with people and the ability to motivate and guide them etc. largely determine the competitiveness and success of particular enterprises in business. They also have an indirect impact on the economic state of the country, its international image and welfare. Therefore, business needs effective and all-round education rather than formal studies, diplomas, degrees, scientific titles etc. In recent years, the ability of the graduates to adapt to constantly changing market conditions as well as the practical use of the acquired theoretical knowledge have considerably grown in importance. The labour market as the key factor influencing the development of competence is rapidly changing. It can be observed that the need for specialists in some fields is significantly decreasing while the demand for managers remains unchanged.

In general, the supply of managers in the labour market considerably exceeds the demand because the number of students in *Management and Business Administration* is the largest and several times exceeds the amount of those studying in other areas. This is due to the fact that in the majority of cases, higher schools train specialists in *Management and Business Administration*. The state register of study programmes contains154 programmes in the areas of *Management and Business Administration*. They represent about 70 university-level programmes and about 80 non-university-level study programmes. In general, 65 management study programmes are registered. However, it is difficult to determine the number of specialists in *Transport Management* because it is included into a general number of

specialists having diplomas in *Management and Business Administration*. Therefore, the need for a more thorough examination of the existing situation arises. Long-term research carried out in this field in Lithuania has shown that the most relevant problem of training specialists in *Transport Management* is lack of practical and personal skills negatively affecting the intellectual capital and performance of enterprises.

The conducted research shows that business demands for training undergraduates and graduates may be described by a number of qualitative criteria. When undertaking a survey, the authors faced some problems. Thus, the respondents failed to answer appropriate questions, and therefore, in some cases, the total data obtained did not make 100%. It should also be noted that the respondents were provided the possibility of choosing more than one option when answering questions. Analysis has shown that the educational level of the staff members of transport/logistics enterprises varies considerably, being represented by higher education (58.37%), secondary education (20.16%) and professional training (21.47%). As indicated, staff members having higher education make the majority. However, according to the survey, the positions of drivers, serving staff etc. are mainly occupied by people with secondary and professional education while staff members with obtained higher education are managers, freight forwarders and logistics specialists. It may be concluded that the larger is the enterprise/organization, the smaller is the percentage of specialists having higher education and working for it. This allows us to make an assumption that in small enterprises with a large number of specialists having higher education, apart from professional competence, staff members should have knowledge and skills in economics, financial account, management etc. to ensure an effective performance of the enterprise. At large enterprises, a small percentage of staff members having higher education probably indicates they occupy leading positions and should have knowledge of management, psychology and skills in working with groups of workers.

Considering the specialities of the staff, it has been determined that 2.03% of staff members have engineering education, 5.13% – management education and 2.46% education in economics while the staff members of other professions make 90.38%. In addition, in recent years, the number of staff members at the enterprises surveyed has increased considerably (up to 54.84%) due to an increase in work volume.

The survey has also revealed that the majority of the owners of enterprises are satisfied with the qualifications of their staff. However, the respondents had serious difficulties in answering the question about the level of the qualification of transport specialists. When asked about the qualification of graduates from colleges/universities in the area of *Transport Management*, most of them agreed that university graduates were better qualified. However, when asked about the need for additional investments to be made in *Transport Management*, the most of graduates from a university or college (93.55%) answered that the graduates from both educational institutions required additional investments.

Therefore, the respondents unanimously (93.55%) agreed that within the process of training specialists, universities should cooperate with enterprise leaders to determine their needs and to find out requirements for the qualification of specialists, in order to be able to better satisfy these needs.

The key criteria describing the competence of transport managers and economists under the conditions of market competition are as follows (see Fig. 1): professional skills (experience) in a particular area (74.19%), foreign languages (61.29%), information technologies (58.06%) and personal characteristics (see Fig. 2) (e. g.

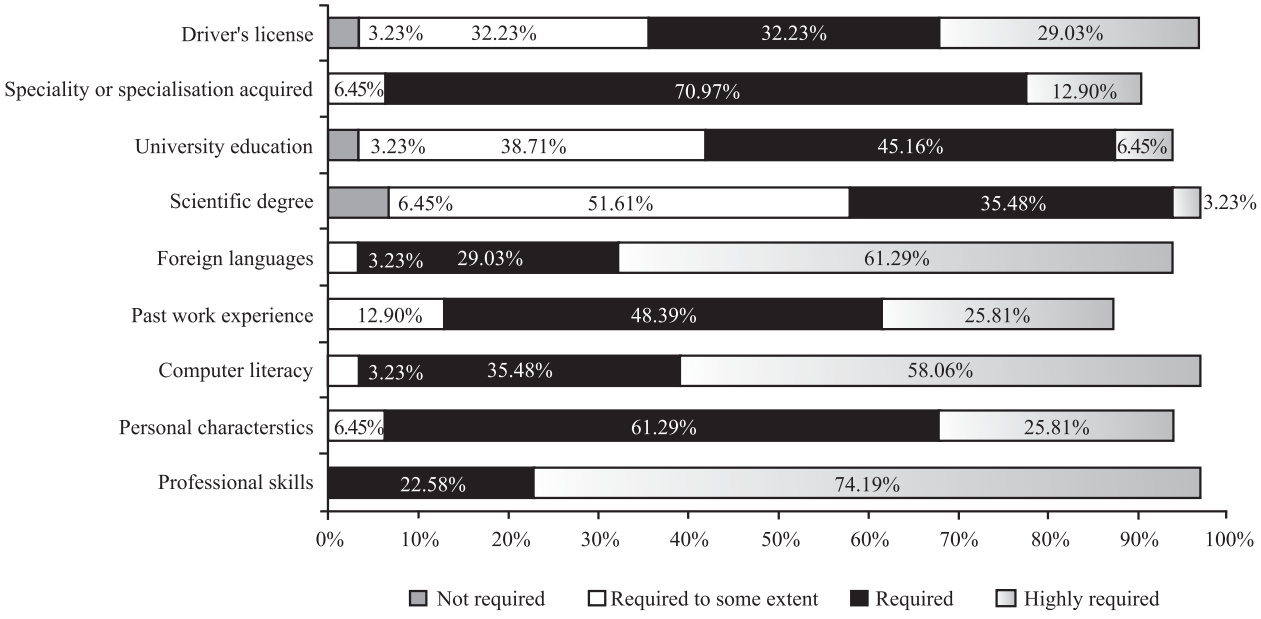

Fig. 1. The assessment of data on the criteria describing specialist training obtained in surveying the managers of transport/logistics enterprises

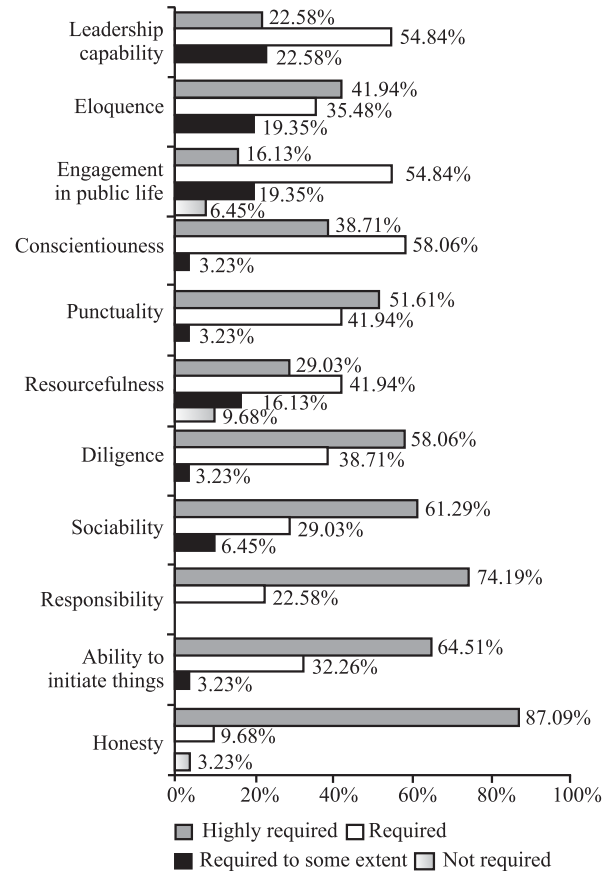

Fig. 2. Personal characteristics required for transport/logistics enterprise managers

honesty (87.10%), responsibility (74.19%), the ability to initiate things independently (64.52%), etc.).

The leaders of transport/logistics enterprises not only assessed the competence of their future employees but also indicated some shortcomings preventing them from solving the arising business problems effectively (see Fig. 3). The main following drawbacks were distinguished:

- inability to identify, analyse and solve the current problems (80.65%);
- inability to plan activities (64.52%);

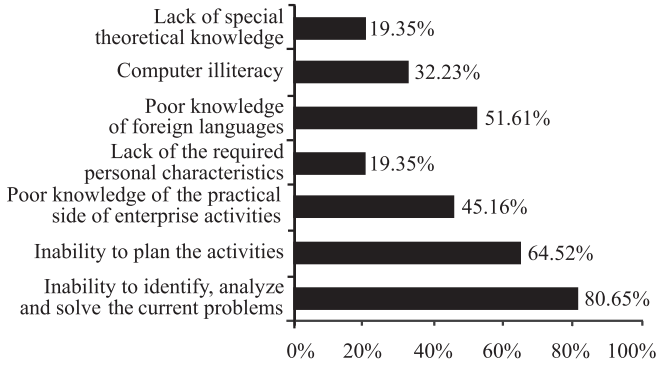

Fig. 3. Shortcomings of transport/logistics specialists reducing the efficiency of their work

- poor knowledge of the practical side of enterprise activities (45.16%);
- poor knowledge of foreign languages (51.61%).

Some of these drawbacks result from the insufficiently developed practical skills of transport specialists in the following areas:

- carrying on negotiations (71.42%);
- rhetoric (19.35%);
- business ethics (29.03%);
- way of behaviour (19.35%).

In addition to the above pointed out shortcomings, enterprise executives emphasized some more essential drawbacks of training students for professional activities the most important of which were professional skills (competence) (29.03%) and practical training (87.10%). The data provided (see Fig. 4) show that lack of the practical training of graduates is the most relevant problem of Lithuanian transport/logistics enterprises.

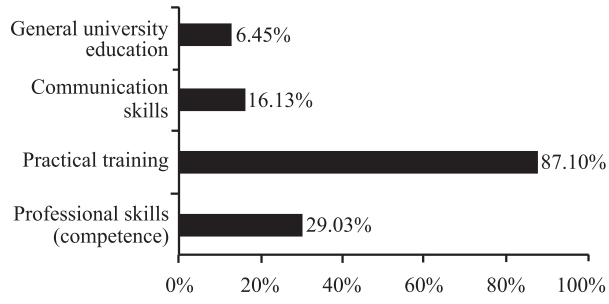

Fig. 4. Shortcomings of professional student training

Taking into account the prospects of enterprise development, the problem of staff mobility associated with aging, the turnover of staff members and lack of young specialists should be considered. In this area, it is expected that the qualification of some employees will not be in compliance with the needs of employers. Also, some enterprises may suffer from lack of the specialists of the required specialities. Therefore, the employers emphasized the need for keeping qualified employees preventing them from going over to other national enterprises and organizations as well as to other countries.

It seems that obstacles on the way of keeping employees and preventing the brain drain may be limited by the possibilities of enterprises to raise payment, lack of staff motivation, the problems of a local enterprise etc. Therefore, keeping qualified specialists at an enterprise and strong motivation are required. The respondents believe that the best reasons for employees to stay at a particular enterprise are as follows:

- awareness of work importance (25.81%);
- knowledge of the final results, aims etc. (22.58%);
- responsibility in seeking results (19.25%).

However, it should be noted that the insufficient integration of business and the educational sector force enterprises to search for the appropriate ways of training the required specialists in place. Therefore, the respondents believe that under conditions of market

competition, a specialist should learn new technologies and work independently (see Fig. 5).

Thus, the question of what should be done differently to harmonize specialist training and the need for business enterprises arises. First, practical training at business enterprises should be included in the basic modules of the study programmes of particular specialities. For example, future transport managers could have at least three periods of practical training according to their speciality in the course of studies:

- business organization and economics;
- marketing and business legislation;
- staff management and business ethics as well as the final practical training that would help a student with a preparation of a thesis.

The employers also recommend taking the following steps to ensure so that transport specialists could easier get a job after graduation in the future (see Fig. 6):

- to pay more attention to the organization of practical training (22.58%);
- to closer coordinate study programmes with the needs of the labour market (45.16%);
- to inform students at the final stages of studies about vacant workplaces (38.71%);

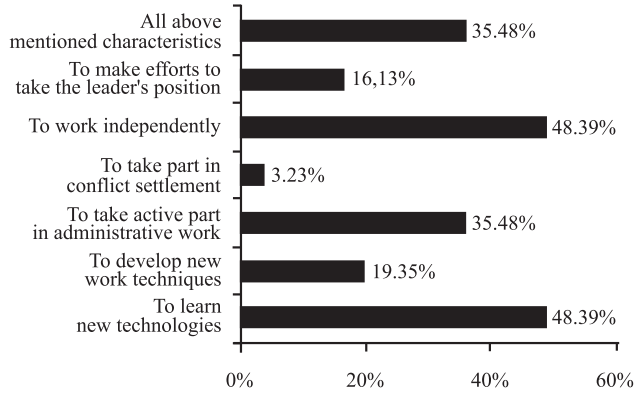

Fig. 5. The characteristics required for specialists working under conditions of market competition according to the executives of Lithuanian transport/logistics enterprises

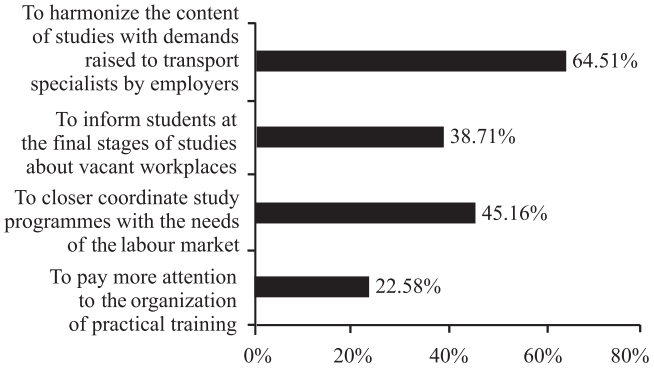

Fig. 6. Recommendations of managers for transport/logistics enterprises facilitating graduates from *Transport Management* to get a job according to the acquired speciality

- to harmonize the content of studies with demands raised to transport specialists by employers (64.52%).

4. Study Programmes of Transport Management at Lithuanian University-Level Higher Schools

Specialists in Transport Management are professionally trained by the higher schools of Lithuania. There are two types of higher schools in Lithuania providing *university-level education* (universities and academies) and *non-university-level education* (colleges) (Prentkovskis *et al.* 2007; Kliukas *et al.* 2007; Daniūnas *et al.* 2007; Kliukas and Vadlūga 2008).

Graduates from professional training schools obtain professional staff qualification. Those from university-level higher schools are awarded diplomas certifying of higher university-level education and the Bachelor's degree while graduates from non-university-level higher schools get diplomas certifying of non-university-level education and a particular qualification. Since 2007, the graduates from colleges have been awarded the Professional Bachelor's degree (Prentkovskis *et al.* 2007 and 2008; Ginevičienė *et al.* 2007b).

There are 6 groups of study areas in Lithuania: Technological Sciences, Social Sciences, Physical Sciences, Biomedicine Sciences, Humanities and Fine Arts.

The study programmes of *Transport Management* belong to the group of Social Sciences (Kliukas *et al.* 2006; Open Information …; Website of Vilnius Gediminas …; Website of the General …).

Specialists in the field of *Transport Management* are trained at two university-level higher schools of Lithuania (Open Information …; Website of Vilnius Gediminas …; Website of The General …; Prentkovskis *et al.* 2008) – Vilnius Gediminas Technical University and The General Jonas Žemaitis Military Academy of Lithuania (see Table 6). Both institutions are located in Vilnius, the capital of Lithuania.

Specialists in *Transport Management* with Bachelor's, Master's and Doctor's degrees are trained at Vilnius Gediminas Technical University (Website of Vilnius Gediminas …; Prentkovskis *et al.* 2008).

The General Jonas Žemaitis Military Academy of Lithuania trains only Bachelors of Transport Management (Website of The General …; Prentkovskis *et al.* 2008). The graduates are awarded not only the Bachelor's degree but also a military rank of Platoon Commander. For getting the Master's and Doctor's degree, the graduates should choose another study programme or higher school (university) of Lithuania.

The popularity of programmes leading to the first (Bachelor's) degree in *Transport Management* (qualification – the Bachelor of Management and Business Administration) in two Lithuanian universities is considered below (see Table 7 and the next Chapter).

Although both study programmes at the above introduced two higher schools are in the area of *Transport Management* (Open Information …; Prentkovskis *et al.* 2008), they have some differences.

Table 6. Study programmes available at university-level higher schools of Lithuania in the area of *Transport Management*

Bachelor's study programmes	Master's study programmes	Doctor's (PhD) study programmes
Vilnius Gediminas Technical University		
Transport Engineering Economics and Management (*Transport Economics*) Qualification – *Bachelor of Management and Business Administration* **Transport Engineering Economics and Management** (*Transport Logistics*) Qualification – *Bachelor of Management and Business Administration*	**Transport Engineering Economics and Management** (*International Carriage Organisation and Management*) Qualification – *Master of Management and Business Administration* **Transport Engineering Economics and Management** (*Transport Logistics*) Qualification – *Master of Management and Business Administration* **Transport Engineering** (*Transport Engineering Management*) Qualification – *Master of Transport Engineering*	**Management and Business Administration** (*Social Sciences*) Qualification – *Doctor of Social Sciences* **Transport Engineering** (*Technological Sciences*) Qualification – *Doctor of Technological Sciences*
The General Jonas Žemaitis Military Academy of Lithuania		
Platoon Commander training **Transport Engineering Management** Qualification – *Bachelor of Management and Business Administration*	–	–

Table 7. Bachelor's study programmes in *Transport Management* in Lithuanian higher schools (qualification – *Bachelor of Management and Business Administration*)

Bachelor's study programme	The objectives of the study programme and competencies acquired	Professional status, access to further studies
Vilnius Gediminas Technical University		
Transport Engineering Economics and Management Qualification – *Bachelor of Management and Business Administration*	Specialists in transport engineering economics and management can perform various managerial functions in creating and developing business, organizing work of the staff at transport enterprises and their departments, designing and implementing projects and making plans for developing and providing transport services as well as compiling and arranging documents for developing business, maintaining business relations and initiating and implementing innovations in transport, giving the priority to management and administration of international transport.	Graduates can work at different departments of transport enterprises solving various economic and management problems. Graduates can continue studies in the fields of economics, management and administration.
The General Jonas Žemaitis Military Academy of Lithuania		
Platoon Commander training **Transport Engineering Management** Qualification – *Bachelor of Management and Business Administration*	To train medium link transport engineering management specialists having sufficient knowledge, capabilities and skills to solve management problems. Upon graduation from the Academy, they must have mastered the fundamentals of transport economics, marketing, management, transportation technologies, finance and enterprise management and should be able to plan, organize and effectively use the transport of enterprises and institutions in accordance with the laws in force.	Graduates can work in the subunits of the National Defence System as managers or in similar positions at various enterprises, institutions and organizations. Graduates can take Master's degree studies in management or choose the directions of studies close to it.

Thus, at Vilnius Gediminas Technical University, the course of studies lasts 4 years (8 semesters) and finishes with a thesis on the Bachelor's degree. The studies are given 3008 hours (160 credits). According to the blocks of subjects, the hours and credits are distributed as follows (Fig. 7):

- *Block A* includes the general subjects of university education (8 modules) – 464 hours (23 credits);
- *Block B* embraces the fundamentals of study programme (25 modules) – 1642 hours (84 credits);
- *Block C* includes special subjects (15 modules and the thesis) – 902 hours (53 credits).

According to the programmes of this study, seven optional subjects (four in the 1st, two in the 2nd and one in 3rd year of study) are included in the four-year course of studies. A choice at Vilnius Gediminas Technical University is wider than that in The General Jonas

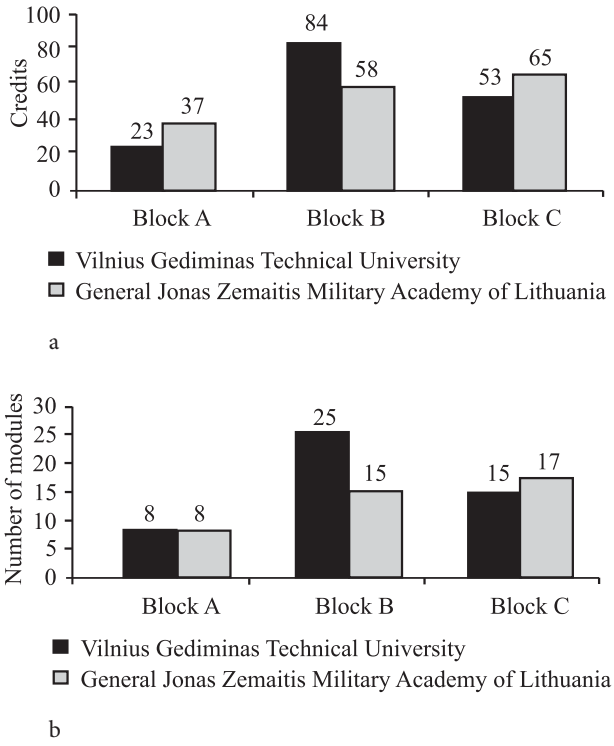

Fig. 7. University-level study programmes in the area of *Transport Management* according to blocks: a – credits; b – the number of modules

Žemaitis Military Academy of Lithuania (with respect to the modules to be chosen). The study programme at Vilnius Gediminas Technical University also includes one-week educational practice (after the 1st year of study) along with five-week work practice (after the 2nd and 3rd year of studies, respectively).

At The General Jonas Žemaitis Military Academy of Lithuania, the course of studies lasts 4 years (8 semesters) and finishes with a thesis on the Bachelor's degree. The studies are given 2640 hours (160 credits). According to the blocks of subjects, the hours and credits are distributed as follows (Fig. 7):

- *Block A* includes the general subjects of university education (8 modules) – 736 hours (37 credits);
- *Block B* embraces the fundamentals of study programme (15 modules) – 972 hours (58 credits);
- *Block C* includes special subjects (17 modules and the thesis) – 932 hours (65 credits).

According to the programmes of this study, five optional subjects (two in the 2nd, one in the 3rd and two in 4th year of study) are included in the four-year course of studies. Physical education and educational and work practice are not provided. However, some more specific modules of subjects, such as the history of Lithuanian state and its army, the fundamentals of advanced technologies, applied chemistry, the fundamentals of mechanics and design, the fundamentals of electrical engineering and electronics, economic management in case of emergency and the organization of military transportation are found in The General Jonas Žemaitis Military Academy of Lithuania.

5. A Brief Survey of the Admission System for Lithuanian Higher Schools

Lithuanian higher schools formed the Association of Lithuanian Higher Education Institutions to implement the programme of joint admission (Kliukas *et al.* 2006 and 2007; Prentkovskis *et al.* 2007 and 2008; Kliukas and Vadlūga 2008) helping the applicants to enter a higher school and to reduce the risk of a single possible choice making the selection of potential students more objective and simplifying the entrance by allowing them to simultaneously apply to several higher schools.

Based on this programme, an applicant is given an opportunity to choose a higher school and a study programme according to his/her order of preference and depending on the marks obtained in a secondary school. An applicant submits an application to any of the higher schools of the Association allowing him/her to select a number of study programmes in several higher schools (Kliukas *et al.* 2006; Prentkovskis *et al.* 2007 and 2008).

Seventeen university-level higher schools and two non-university-level higher schools formed the Association (sixteen higher schools are state-owned and three higher schools are private): The General Jonas Žemaitis Military Academy of Lithuania (LKA), International Business School at Vilnius University (VU TVM), Kaunas University of Medicine (KMU), Kaunas University of Technology (KTU), Klaipėda University (KU), Lithuanian Academy of Music and Theatre (LMTA), Lithuanian Academy of Physical Education (LKKA), Lithuanian University of Agriculture (LŽŪU), Lithuanian Veterinary Academy (LVA), Mykolas Romeris University (MRU), Šiauliai University (ŠU), University of Management and Economics (ISM), Vilnius Academy of Fine Arts (VDA), Vilnius College of Higher Education (VK), Vilnius Gediminas Technical University (VGTU), Vilnius Law and Business College (VTVK), Vilnius Pedagogical University (VPU), Vilnius University (VU), Vytautas Magnus University (VDU).

In 2008, Lithuanian higher schools participating in the joint applicants' admission programme offered 732 study programmes including full-time (daytime) studies, part-time (evening) studies, part-time (extra-mural) studies in 62 fields falling into 6 groups of study areas: technological sciences, social sciences, physical sciences, biomedicine sciences, humanities and fine arts (Prentkovskis *et al.* 2008; Database of Joint Admission …).

A chart and description of the main parts of the joint applicants' admission programme to Lithuanian higher schools are presented in other papers (Prentkovskis *et al.* 2007 and 2008; Daniūnas *et al.* 2007; Kliukas and Vadlūga 2008).

The main parts of the above introduced programme:

- starting joint applicants admission (April 15, 2008) – accepting applications to Lithuanian higher schools from applicants (personally and via the Internet);
- carrying on entrance examinations;

- correcting study programmes indicated in the application (if requested by an applicant);
- accepting and considering applicants appeals for correcting errors in evaluating examination marks;
- registering documents;
- announcing the competitive marks of applicants;
- accepting and considering applicants appeals for correcting errors in calculating competitive marks;
- announcing the lists of applicants admitted to higher schools for all available study programmes;
- officially registering the admission of applicants to particular higher schools;
- completing joint applicants admission (August 1, 2008) – announcing information about the vacancies left.

An applicant participating in the joint admission programme is offered the possibility of choosing up to sixteen study programmes (choices) in the application to study at any Lithuanian higher school. The chosen study programmes are arranged in the order of preferences in the application. The name of a higher school, a form of studies and financing are indicated for every study programme. The applicant is admitted to a higher school to study one of the study programmes included in his/her application determined by computer after calculating his/her competitive mark. When the first study programme from the list of the applicant preferences for which the calculated competitive mark satisfies the requirements of admission is found, all other study programmes given below in the list are not considered (though the mark is sufficient for an applicant to be admitted to study).

The applicants to Lithuanian higher schools are admitted based on their competitive marks calculated for each study programme mentioned in each application. Competitive marks are calculated for particular study programmes according to the standing rules of particular schools. Actually, there are no entrance examinations to Lithuanian higher schools. They should be taken only by the applicants to some specific study programmes such as architecture, arts, design, fire prevention, aircraft piloting, aircraft traffic control etc.

Competitive marks (Website of Vilnius Gediminas …; Website of the General …; Prentkovskis *et al.* 2008) of the applicants allowing them to study according to the programmes of *Transport Management* at two Lithuanian higher schools are presented in Table 8.

6. Some Statistical Data on the Popularity of Study Programmes Chosen by the Applicants Participating in the Joint Admission Programme for Lithuanian Higher Schools

6.1. General Statistical Data

General statistical data are given based on the Database of Joint Admission to Lithuanian higher schools.

The number of the groups of study areas in school-leavers' applications in 2008 are presented in Fig. 8 (the number of applicants for all six groups of study areas is assumed to be equal to 100 %). As mentioned above, there are six groups of study areas in Lithuania: Technological Sciences, Social Sciences, Physical Sciences, Biomedicine Sciences, Humanities and Fine Arts. As shown in Fig. 8, the major part of applicants (46.72%) makes a motivated choice of the study programme in a particular field of knowledge.

The average number of study programmes in school-leavers' applications is presented in Fig. 9. The average number of study programmes chosen by school-leavers has been constant for some years and makes about 9 points.

The popularity of study programmes according to the groups of study areas in 2008 is given in Fig. 10. For many years, *Social Sciences* have remained a popular area of education. Unfortunately, 'more difficult' *Tech-*

Table 8. Competitive marks (without any additional points) of applicants to study according to the programmes of *Transport Management* at Lithuanian higher schools in 2005–2008

Examination mark at secondary school	Weighted coefficient	A yearly mark in school-leaving certificate at secondary school	Weighted coefficient	The highest competitive mark (without any additional points) available at higher school
Vilnius Gediminas Technical University				
Transport Engineering Economics and Management – *Bachelor of Management and Business Administration*				
mathematics	0.50	history	0.15	21.35
the Lithuanian language	0.20			
a foreign language	0.15			
The General Jonas Žemaitis Military Academy of Lithuania				
Transport Engineering Management – *Bachelor of Management and Business Administration*				
mathematics	0.45	mathematics	0.04	21.35
a foreign language	0.25	a foreign language	0.04	
the Lithuanian language	0.15	the Lithuanian language	0.04	
professional aptitude test	0.00	history	0.03	

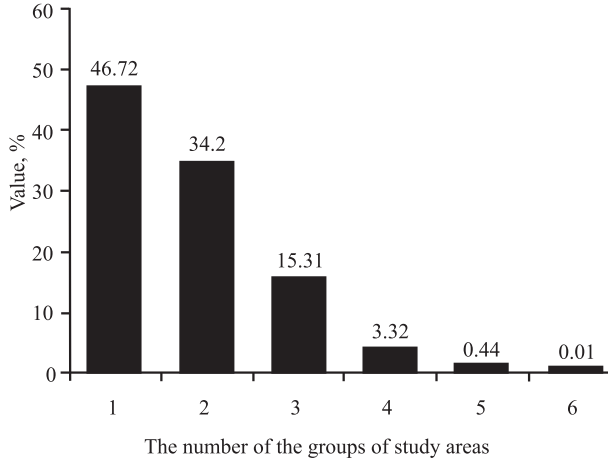

Fig. 8. The number of the groups of study areas in school-leaver's applications in 2008 (the number of applicants for all six groups of study areas is assumed to be equal to 100 %)

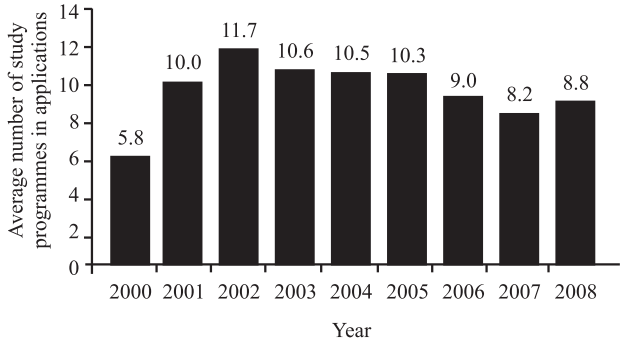

Fig. 9. The average number of study programmes in school-leaver's applications in 2000–2008

nological, *Physical* and *Biomedicine Sciences* are not very popular among the school-leavers though the graduates have been guaranteed employment and a high salary.

The popularity of the groups of study areas reflected in school-leavers' applications (based on choice No 1) and the state-fixed quotas at higher schools in a particular group of study areas in 2003–2008 are presented in Fig. 10. The study programmes of *Transport Management* refer to the group of *Social Sciences*. The study programmes of *Social Sciences* are approximately twice as popular as those of *Technological Sciences*. Nowadays, *Social* and *Technological Sciences* are the most popular study programmes (see Fig. 11). In the last six years, on the contrary to *Technological Sciences,* the popularity of *Social Sciences* among the applicants has been decreasing.

6.2. The Popularity of the Study Programmes of Transport Management

The popularity of the study programmes of *Transport Management* in school-leavers' applications (competition based on choice No 1 and all choices) in 2003–2008 is shown in Fig. 12. A comparison of the popularity of two study programmes in the area of *Transport Management* reveals that the most popular programme (according to the competition or number of applicants per vacancy) is *Transport Engineering Economics and Management* at Vilnius Gediminas Technical University while the less popular programme in *Transport Engineering Management* is found in The General Jonas Žemaitis Military Academy of Lithuania. This may be accounted for by the fact that the study programme at Vilnius Gediminas Technical University is intended for civilians (in particular, specialists in transport economics and transport logistics are trained), whereas the study programme offered by The General Jonas Žemaitis Military Academy of Lithuania is specific (being intended for training not only specialists in transport economics and transport logistics but also military specialists – *Platoon Commanders*). The applicants for the Academy are required to be in a good physical form and professionally fit while school-leavers, as a fact, do not like it.

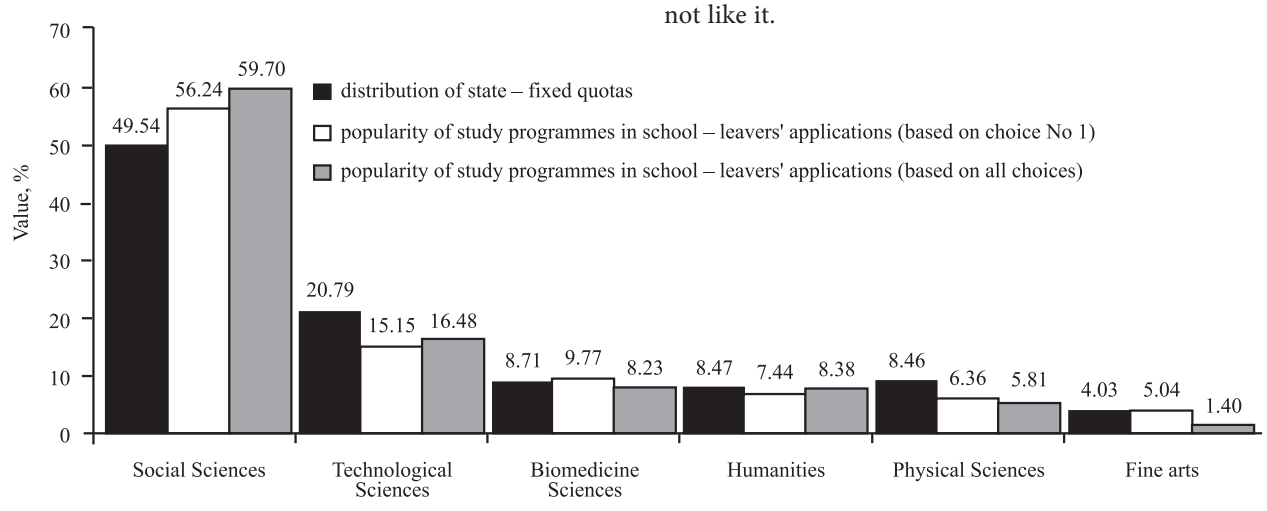

Fig. 10. The popularity of study programmes according to a particular group of study areas in 2008

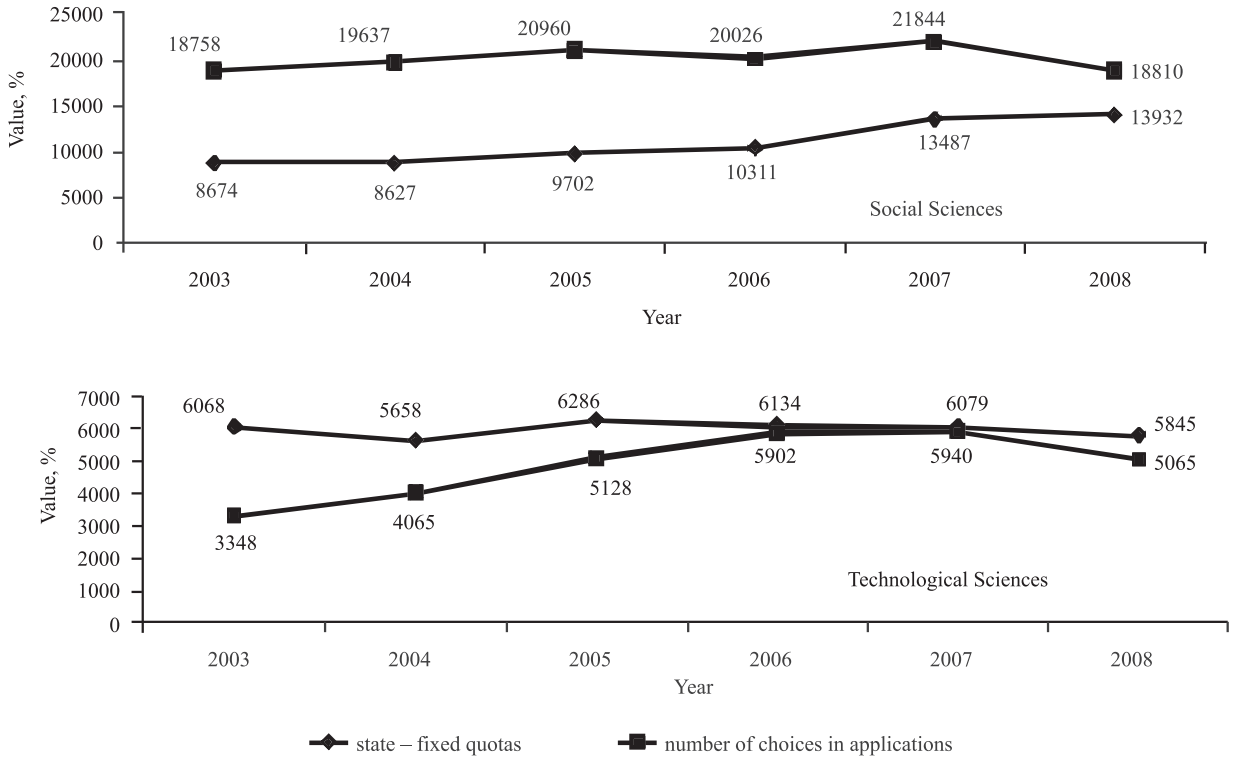

Fig. 11. The popularity of the groups of study areas in *Social* and *Technological Sciences* reflected in school-leavers' applications (based on choice No 1) and the state-fixed quotas at higher schools in particular study area groups in 2003–2008

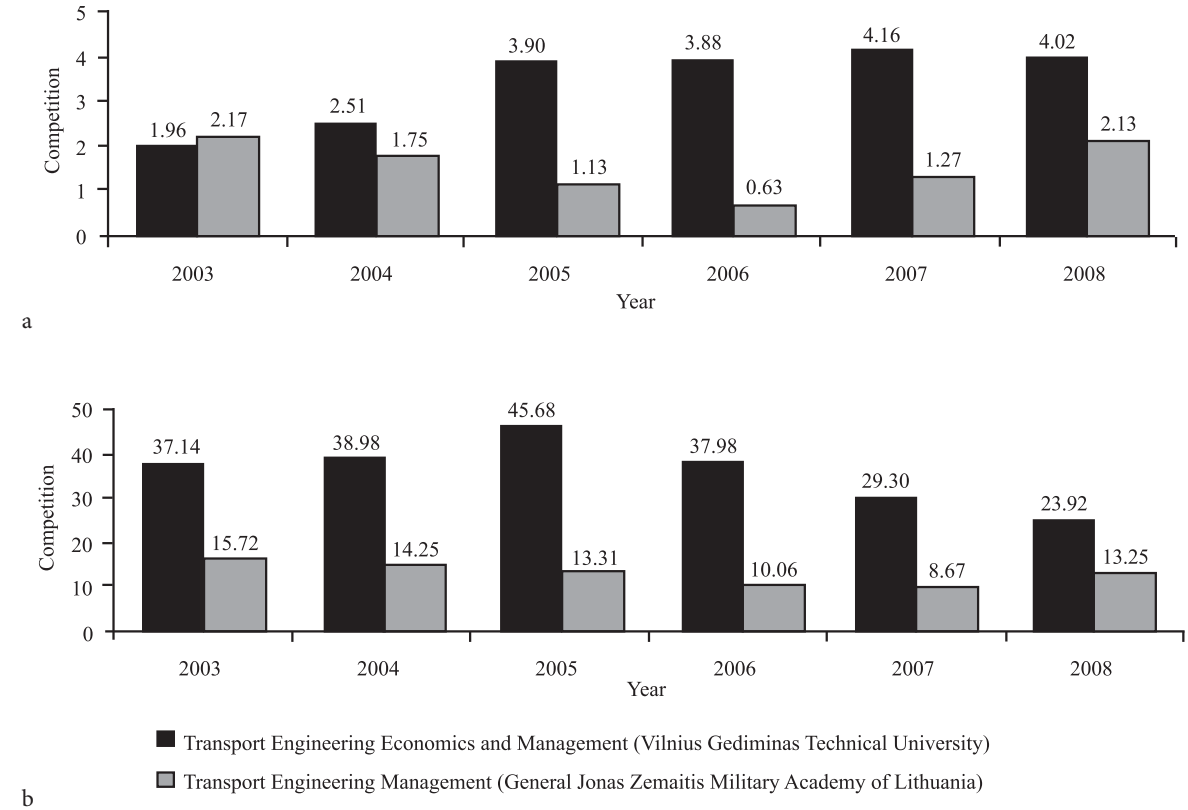

Fig. 12. The popularity of the study programmes of *Transport Management* in 2003–2008: a – competition based on choice No 1; b – competition based on all choices

6.3. Competitiveness Index

The *competitiveness index* (Kliukas *et al.* 2006; Prentkovskis *et al.* 2007 and 2008) shows preparation for studies and the intellectual potential of the admitted to a particular study programme. It is calculated as the average mark of the key subjects in the school-leaving certificates of all admitted to study this programme.

The competitiveness index of the admitted to study a particular study programme is calculated in the following way:

$$I_c = \frac{\sum_{i=1}^{m}\left(\frac{LL+M+P+FL+H}{5}\right)_i}{m}$$

where: I_c is the competitiveness index of the admitted to a particular study programme; m is the number of the admitted to the study programme; LL is a mark for the Lithuanian language in school-leaving certificate; M is a mark for mathematics in school-leaving certificate; P is a mark for physics in school-leaving certificate; FL is a mark for a foreign language; H is a mark for history in school-leaving certificate.

To calculate I_c, a mark obtained at secondary school-leaving state examination (Kliukas *et al.* 2006) is considered. In case this exam was not taken, the mark obtained at school-leaving examination is considered.

The competitiveness index shows the competitiveness of an applicant to study any programmes at a higher school (compared to other applicants). The higher is the competitiveness index of a study programme the higher is the general level of education of a person admitted to study a particular programme.

The highest possible competitiveness index of the best applicant is equal to I_c = 23.00.

The competitiveness indices of full-time studies in *Transport Management* study programmes are given in Fig. 13. As shown, more qualified applicants were admitted to study *Transport Engineering Economics and Management* programme at Vilnius Gediminas Technical University.

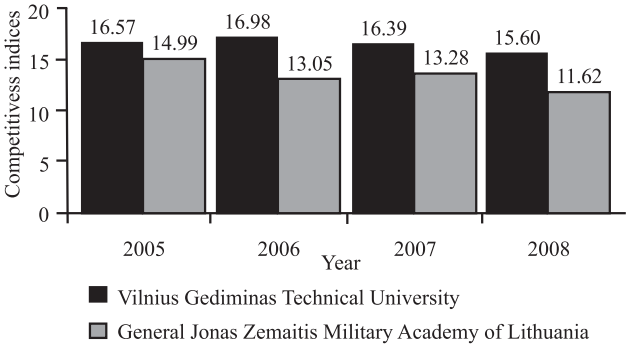

Fig. 13. The competitiveness indices of full-time studies in Transport Management university-level study programmes in 2005–2008 (the best possible value of the competitive index is 23.00)

6.4. Average Competitive Mark

The preparation level of the admitted to study according to a particular programme may be determined based on the average competitive marks of all admitted students, particularly, taking into account that the competitive mark (21.35) is the same for the above discussed two study programmes (*Transport Engineering Economics and Management* and *Transport Engineering Management*). Average competitive marks for full-time studies in *Transport Management* study programmes are given in Fig. 14. As shown above, more qualified applicants were admitted to study *Transport Engineering Economics and Management* programme at Vilnius Gediminas Technical University.

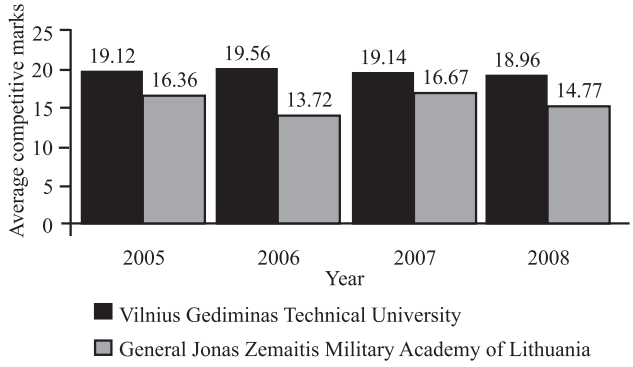

Fig. 14. The average competitive marks of full-time studies in Transport Management university-level study programmes in 2005–2008 (the best possible value of the average competitive mark is 21.35)

6.5. Motivation Index

Training a qualified specialist depends not only on the number of qualified university teachers, well-equipped laboratories and training centres but also on the thirst for knowledge and the eagerness of an applicant to become a qualified specialist in the selected field, i.e. his/her motivation that is reflected by the order of preference given by an applicant to a particular study programme in the application to a higher school.

The *motivation index* (Kliukas *et al.* 2006; Prentkovskis *et al.* 2007 and 2008) is calculated by the formula:

$$I_m = \frac{\sum_{i=1}^{m} O_i}{m},$$

where: I_m is the motivation index of a particular study programme; O_i is the order of preference (No) given by the i-th applicant to a particular study programme; m is the number of applicants admitted to a particular study programme.

The lower is the index value the higher is the motivation of applicants taking a particular study programme. The ideal motivation index is I_m = 1.0 when all school-leavers admitted to a particular study programme mention it in the application as choice No 1.

The motivation indices of full-time studies in *Transport Management* study programmes are given in Fig. 15. As shown, higher motivated applicants (eager to make a career in National Defence) were admitted to study *Transport Engineering Management* programme at The General Jonas Žemaitis Military Academy of Lithuania.

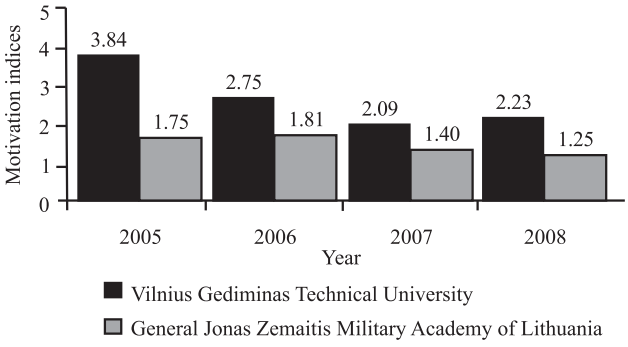

Fig. 15. The motivation indices of full-time studies in Transport Management university-level study programmes in 2005–2008 (the best possible value of the motivation index is 1.00)

7. Conclusions

1. The accession of Lithuania to the European Union made transport one of the most important branches of national economy. Presently, economic development is hardly possible without an efficient transport system (providing both local and international transportation). The operation of industrial, construction and agricultural enterprises as well as work efficiency and a public opinion largely depend on the reliability and effective performance of transport systems.
2. The effective performance of the transport system is not possible without qualified specialists (for example, in the area of *Transport Management*, etc). Nowadays, the study programmes of *Transport Management* are available at two higher schools in Lithuania – Vilnius Gediminas Technical University and The General Jonas Žemaitis Military Academy of Lithuania. Vilnius Gediminas Technical University offers study programmes at all three stages of training including Bachelor's, Master's, and Doctor's degrees. At The General Jonas Žemaitis Military Academy of Lithuania, only the Bachelors of *Transport Management* are trained. The graduates are awarded not only the Bachelor's degree but also a military rank of Platoon Commander. For getting Master's and Doctor's degrees, the graduates should choose another study programme or a higher school (university) in Lithuania or abroad which poses some additional problems to undergraduates and graduates.
3. The managers of transport enterprises raise their own demands to specialists in *Transport Management*. The analysis has shown that the educational level of the staff members of transport/logistics enterprises varies considerably being represented by higher education (58.37%), secondary education (20.16%) and professional training (21.47%). Therefore, the respondents unanimously (93.55%) agreed that when training specialists, universities should cooperate with the enterprise leaders to determine their needs and to find out requirements for specialist qualification to be able to better satisfy these needs.
4. The key criteria describing the competence of transport managers and economists under the conditions of market competition are as follows: professional skills (experience) in a particular area (74.19%), foreign languages (61.29%), information technologies (58.06%) and personal characteristics: honesty (87.10%), responsibility (74.19%), the ability to independently initiate things (64.52%) etc.
5. The leaders of transport/logistics enterprises not only assessed the competence of their future employees but also indicated some shortcomings not allowing them to solve the arising problems of business: inability to identify, analyse and solve the current problems (80.65%); inability to plan activities (64.52%); a poor knowledge of the practical side of enterprise activities (45.16%); a poor knowledge of foreign languages (51.61%). Some of these drawbacks result from the insufficiently developed practical skills of transport specialists in the following areas: carrying on negotiations (71.42%), rhetoric (19.35%), business ethics (29.03%) and the way of behaviour (19.35%). In addition to the above mentioned shortcomings, the executives of the enterprises emphasized some more essential drawbacks of student training for professional activities. The most important of those are professional skills (competence) (29.03%) and practical training (87.10%).
6. It seems that the obstacles on the way of keeping employees and preventing the brain drain may be limited by the possibilities of enterprises raising the payment, lack of staff motivation, local problems occurring at an enterprise etc. Therefore, to keep qualified specialists at an enterprise, strong motivation is required. The respondents believe that the best reasons for employees to stay at a particular enterprise are as follows: the awareness of work importance (25.81%); knowledge of the final results, aims etc. (22.58%); responsibility in seeking for better results (19.25%). The employers also recommend to take the following steps to ensure so that specialists in transport could easier get a job after graduation in the future: to pay more attention to organizing practical training (22.58%); to closer coordinate study programmes with the needs of the labour market (45.16%); to inform students about vacant workplaces at the final stages of studies (38.71%); to harmonize the content of studies with demands raised to transport specialists by employers (64.52%).
7. There are six groups of study areas in Lithuania: Technological Sciences, Social Sciences, Physical Sciences, Biomedicine Sciences, Humanities and Fine Arts. Study programmes referring to Social Sciences (including the programmes of *Transport Management*) are more popular among the applicants to higher schools than the study programmes refer-

ring to another group of the study area (for example, Technological Sciences, Biomedicine Sciences etc.).

8. Lithuanian higher schools formed the Association of Lithuanian Higher Education Institutions to implement the programme of joint admission helping the applicants to enter a higher school and to reduce the risk of a single possible choice as well as making the selection of potential students more objective. This also simplifies the entrance by allowing school-leavers to simultaneously apply to several higher schools. Based on this programme, an applicant is given the opportunity to choose a higher school and a study programme according to his/her order of preference and depending on the marks obtained at a secondary school. An applicant submits an application to any of the higher schools of the Association, which allows him/her to select a number of study programmes in several higher schools. Most of the applicants to the higher schools of Lithuania indicate study programmes in one or two groups of study areas. The average number of study programmes in the school-leaver's application is about nine.
9. The educational level of the applicants and those admitted to take various study programmes can be defined by their competitive marks and competitiveness indices. The competitiveness index shows the level of preparation for studies and intellectual potential of the applicant admitted to a particular study programme. Average competitive marks for full-time studies in *Transport Management* programmes are given (the best possible value of the average competitive mark is 21.35). As shown in the paper, more qualified applicants were admitted to study *Transport Engineering Economics and Management* programme at Vilnius Gediminas Technical University. The competitiveness indices of full-time studies in *Transport Management* programmes are given (the best possible value of the average competitive mark is 23.00). As indicated in the paper, more qualified applicants were admitted to study *Transport Engineering Economics and Management* programme at Vilnius Gediminas Technical University.
10. Motivation is reflected by the order of preference given by an applicant to a particular study programme in the application for admission to a higher school. The motivation indices of full-time studies in *Transport Management* study programmes are given (the best possible value of the average competitive mark is 1.00). As presented in the paper, higher motivated applicants (eager to make a career in National Defense) were admitted to study *Transport Engineering Management* programme at The General Jonas Žemaitis Military Academy of Lithuania.

References

Baublys, A.; Bogdevičius, M.; Prentkovskis, O., *et al*. 2003. *Transport: Technologies, Economics, Environment, Health:* monograph [Transportas: technologijos, ekonomika, aplinka, sveikata: monografija]. Vilnius: Technika. 876 p. (in Lithuanian).

Baublys, A; Palšaitis, R.; Lingaitis, L. P., *et al*. 1999. *Science and Arts of Lithuania*. *Transport*: monograph. Vol 22 [Lietuvos mokslas. Transportas: monografija. 22 knyga]. Vilnius: Lietuvos mokslas. 716 p. (in Lithuanian).

Boyer, E. L. 1987. *College: The Undergraduate Experience in America: The Carnegie Foundation for the Advancement of Teaching*. New York: Harper and Row Publishers. 328 p.

Burinskienė, M. 2009. New methodology for sustainable development towards sustainable transportation system, *Technological and Economic Development of Economy* 15(1): 5–9.

Daniūnas, A.; Kliukas, R.; Prentkovskis, O. 2007. Attractiveness of engineering study programmes offered by Lithuanian universities, in *11th Baltic Region Seminar on Engineering Education, Seminar Proceedings*, June 18–20, 2007, Tallinn, Estonia, 149–152.

Database of Joint Admission to Lithuanian higher schools [Priėmimo į Lietuvos aukštąsias mokyklas informacijos sistema] (in Lithuanian).

Dubra, E.; Gulbe, M. 2008. Forecasting the labour force demand and supply in Latvia, *Technological and Economic Development of Economy* 14(3): 279–299.

Fila, N.; Misnevs, B. 2008. Methodology development and its implementation in analytical system for transport and logistics educational programs, *Transport and Telecommunication* 9(3): 23–29.

Ginevičienė, V. B.; Ginevičius, A; Tamošauskas, P. 2007a. A feasibility study for the introduction of Master's degree courses into the university curriculum based on multicriteria evaluation methods, in *10th UICEE Annual Conference on Engineering Education, Conference Proceedings – Reinforcing Partnerships in Engineering Education*, March 19–23, 2007, Bangkok, Thailand, 15–17.

Ginevičienė, V. B.; Tamošauskas, P.; Ginevičius, R. 2007b. The formation of a unified system of higher education in Lithuania, in *11th Baltic Region Seminar on Engineering Education, Seminar Proceedings*, June 18–20, 2007, Tallinn, Estonia, 17–20.

Ginevičius, R.; Ginevičienė, V. B. 2009. The compliance of master's degree studies with the economic needs of the country, *Technological and Economic Development of Economy* 15(1): 136–153.

Gromule, V.; Yatskiv, I. 2007. Coach terminal as important element of transport infrastructure, *Transport* 22(3): 200–206.

Jakimavičius, M.; Burinskienė, M. 2009. A GIS and multi-criteria-based analysis and ranking of transportation zones of Vilnius city, *Technological and Economic Development of Economy* 15(1): 39–48.

Jaržemskis, A. 2007. Research on public logistics centre as tool for cooperation, *Transport* 22(1): 50–54.

Kabashkin I. 2007. Logistics centres development in Latvia, *Transport* 22(4): 241–246.

Kaklauskas, A.; Zavadskas, E. K.; Budzevičienė, R. 2009. Web-based model of multiple criteria ethical decision-making for ethical behaviour of students, *Journal of Business Economics and Management* 10(1): 71–84.

Khaki, A. M.; Afandizadeh, Sh.; Moayedfar, R. 2009. Developing the composed probability model to predict household trip production (a case study of Isfahan city), *Transport* 24(1): 30–36.

Kiisler, A. 2008. Logistics in Estonian business companies, *Transport* 23(4): 356–362.

Kliukas, R.; Prentkovskis, O.; Daniūnas, A. 2006. Qualitative analysis of the knowledge of applicants to transport engineering courses of study, *Transport* 21(2): 95–104.

Kliukas, R.; Prentkovskis, O.; Daniūnas, A. 2007. A system of joint admission to Lithuanian higher schools: the guidelines to entrants, in *11th Baltic Region Seminar on Engineering Education, Seminar Proceedings*, June 18–20, 2007, Tallinn, Estonia, 97–100.

Kliukas, R.; Vadlūga, R. 2008. Analysis of applicants admission system to Lithuanian higher schools, in *6th Association-of-European-Civil-Engineering-Faculties Symposium on Civil Engineering Education in Changing Europe (AECEF)*, May 28–30, 2008 Vilnius, Lithuania, 204–212.

Labanauskas, G.; Palšaitis, R. 2007. Study of possibilities to establish regional transport terminal in Kaunas, *Transport* 22(2): 118–121.

Ledauskaitė, K.; Bazaras, D. 2008. Actual attitudes of demands for specialists in transport sector, *Transport and Telecommunication* 9(1): 29–33.

Lin, C.-T.; Juan, P.-J. 2007. Personnel supply and demand for civil aviators in Taiwan, *Transport* 22(4): 256–262.

Meidutė, I. 2007. Economical evaluation of logistics centres establishment, *Transport* 22(2): 111–117.

Meirane, E. 2007. Research on the structure of cargo flow in Latvia, *Transport* 22(3): 195–199.

Morkvėnas, R.; Bivainis, J.; Jaržemskis, A. 2008. Assessment of employee's knowledge potential in transport sector, *Transport* 23(3): 258–265.

Open Information, Counselling and Guidance System (AIKOS) of Ministry of Education and Science of the Republic of Lithuania (Lietuvos Respublikos švietimo ir mokslo ministerijos Atvira informavimo, konsultavimo, orientavimo sistema AIKOS). Available from Internet: <www.aikos.smm.lt>.

Palšaitis, R.; Bazaras, D. 2007. Theoretical aspects of logistics training process management, *Transport* 22(1): 14–18.

Petravičius T.; Tamošiūnienė, R. 2008. Corporate performance and the measures of value added, *Transport* 23(3): 194–201.

Pocklad, O. 2007. Development of the interurban service by use of alternative commercial road trains, *Transport* 22(2): 90–98.

Prentkovskis, O.; Kliukas, R.; Daniūnas, A. 2007. The popularity of study programmes in transport engineering and telecommunication engineering among the applicants to Lithuanian higher schools, in *Proceedings of the 7th International Conference Reliability and Statistics in Transportation and Communication (Relstat'07)*, October 24–27, 2007, Riga, Latvia, 200–208.

Prentkovskis, O.; Kliukas, R.; Daniūnas, A. 2008. Popularity of study programmes in transport management among the applicants to Lithuanian higher schools, participating in joint admission programme, in *Proceedings of the 8th International Conference Reliability and Statistics in Transportation and Communication (Relstat'08)*, October 15–18, 2008, Riga, Latvia, 256–264.

Stukalina, Y. 2007. Globalisation and engineering education: preparing students for professions of the 21st century in science and technology, *Transport and Telecommunication* 8(1): 30–39.

Stukalina, Y. 2008. How to prepare students for productive and satisfying careers in the knowledge-based economy: creating a more efficient educational environment, *Technological and Economic Development of Economy* 14(2): 197–207.

Susnienė, D.; Jurkauskas, A. 2008. Stakeholder approach in the management of public transport companies, *Transport* 23(3): 214–220.

Tolli, A.; Laving, J. 2007. Container transport direct call – logistic solution to container transport via Estonia, *Transport* 22(4): Ia–If.

Vasilis Vasiliauskas, A.; Barysienė, J. 2008. Analysis of Lithuanian transport sector possibilities in the context of European-Asian trade relations, *Transport* 23(1): 21–25.

Website of the Department of Statistics attached to the Government of the Republic of Lithuania (Statistics Lithuania). Available from Internet: <www.stat.gov.lt>.

Website of the General Jonas Žemaitis Military Academy of Lithuania. Available from Internet: <www.lka.lt>.

Website of the Ministry of Economy of the Republic of Lithuania. Available from Internet: <www.ukmin.lt>.

Website of the Ministry of Finance of the Republic of Lithuania. Available from Internet: <www.finmin.lt>.

Website of the Ministry of Transport and Communications of the Republic of Lithuania. Available from Internet: <www.transp.lt>.

Website of the Vilnius Gediminas Technical University. Available from Internet: <www.vgtu.lt>.

Ziari, H.; Keymanesh, M. R.; Khabiri, M. M. 2007. Locating stations of public transportation vehicles for improving transit accessibility, *Transport* 22(2): 99–104.

Žvirblis, A.; Zinkevičiūtė, V. 2008. The integrated evaluation of the macro environment of companies providing transport services, *Transport* 23(3): 266–272.