

# ANALYSIS OF THE QUALITY OF SERVICE OF THE RIGA COACH TERMINAL FROM THE VIEWPOINT OF TRAVELLERS

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In this research the main attention is paid to the analysis of the reasons – why travellers choose train rather than bus in some regional directions in Latvia. This analysis is done on the basis of the results of questionnaire and in future it may be the basis for the Discrete-Choice models application. Also the analysis of the travellers' attitude to service of the Riga Coach Terminal is fulfilled on the basis of the annual questionnaire data.

**Keywords:** *coach terminal, passengers, service quality, transportation, transit capacity*

## 1. Introduction

The joint stock company „Rīgas Starptautiskā Autoosta” (Riga International Coach Terminal) being a leader in the area of passenger bus transportation services in Latvia, provides the international, intercity and regional trips. The objective of the development concept of the JSC “Riga International Coach Terminal” is as follows: „To develop the JSC Riga International Coach Terminal as a new passenger modular transfer and service point meeting the future requirements for high culture and diversity of passenger services and interlinking with other types of public transport – railway, urban public transport, sea port and airport” [1]. Recent studies on the role of buses and coaches seem to confirm the already excellent safety, environmental and social record of bus and coach transport [2]. In Latvia this mode of transport is in competition with railway (and private cars also) that is why the quality of services is of great importance from the viewpoint of travellers. At present the problem of raising the quality of transport services is one of the main conditions of competitiveness of one or another transport enterprise.

## 2. Present-Day Situation with Passenger Transportation by Buses and Coaches

To become aware of a significance of the bus transportation quality service improving, it is important to be conscious of the existing situation in this area and the most considerably influencing factors and risks. The main topical issues were emphasizes at the 31st IRU World Congress on 15-16th May, 2008 in Istanbul [3]:

- The area of the passenger transportation is always regulated on a state and the EU scale, and also in the international cooperation world;
- Rapid growth of petrol price.

During the period of 1991-2000 the price of petrol has been rising to an average annual rate of 3.5%, which is more than twice the diesel rate. Road fuel prices in 2007 were dramatically higher than in 2000.

**Table 1.**

	<b>2000</b>	<b>2007</b>
Unleaded petrol	0,90	1,30
Diesel	0.70	1.10

- Also other costs that provide the qualitative and secure bus transportation management have grown: staff payments (wages/salaries), insurance, safety and environmental protection arrangements, various payments;
- State of roads - road and traffic safety;
- Economic activity recession, government work decrease in connection with the budget fiscal restrictions;
- Priority of private car from the viewpoint of traveller's choice, as well as a low prestige of the passenger transportation in comparison with other modes of transport of the passenger transportation [4].

For the further development of this area in conditions of difficult period it is important to ensure the attraction of customers-travellers by performing services that comply with the high quality standards.

### 3. Review of Approaches to Determination of Transport Service Quality

Nowadays a great attention is paid to the problems of passenger service quality both in theory and in practice. Let's consider several version of rating the measure of quality.

So, V. G. Galaburda [5] examines the methods of quality rating of transport services and gives the following definition of the "quality" concept. By the quality of goods and services the totality of typical properties, characteristics and peculiarities is implied that distinguishes them from other goods and services having the consumer value, i.e. capable to satisfy certain needs of users. On the basis of this definition the author makes several generalizations and conclusions relatively the quality of the transport output:

- relativity of the quality concept, and, it means that the quality coefficients should be defined not only in the absolute expression, but also in relative expression in comparison with the corresponding standards and coefficients achieved by competitors;

- a priority of the final consumer ratings of the quality coefficients compared to the intra-sector coefficients (the quality coefficients should comply with the customers' requirements and take into account the users' interests to the maximum);

- natural but not the value terms of quality. In market conditions the cost of transportation should be determined as a correlation of demand and supply for transport services (cost is an important indicator of competitiveness of the transport output, but not always it meets its quality);

- fixity and comparability of the quality coefficients of the transport services by modes of transport independently of their technological characteristics;

- necessity of the general integral coefficient of transport services quality determination for the generalizing assessment of the competitive possibilities of the uniform transport system elements.

Thus, the quality management of the transport output is formulated as the integrated and coordinated rating of the quality coefficients and decision-making on the best (optimal) transport support of users on the existing or potential transport resource basis and the solvent demand of customers. In [5] the dividing of quality coefficients into three groups is suggested:

- 1) indices of the transport supply and accessibility of territory for transport resources. This group of indices refers to a category of the general transport problems and it requires, as a rule, the considerable investments for modernization of the whole transport system. The analysis of these indices is necessary, first of all, for the development of the transport infrastructure, and the strategic regulation is needed for this purpose;
- 2) figures of the field (technological) operation of transport, which reveal mainly the departmental interests of the efficient use of the available transport resources;
- 3) factors of the passengers transport services, such as: speed, safety, service, level of time-schedule observance; level of passenger ride comfort.

N. M. Sheremet [6] in his works suggests considering a problem of quality from the point of view of the process approach. The given approach allows identifying and systemizing the quality coefficients in the sphere of passenger transportation by the following groups:

1. The quality coefficients of the transport output (the result of process, which functionality lies in changing the location of the transported object while maintaining constant it's all other properties) that include:
  - delivery of travellers to the destination point;
  - safety of travellers' luggage;
  - safety of travellers' health and life.
2. The quality coefficients of a single process, including:
  - observance of transportation terms;
  - technological safety – reliability criterion of the transportation process fulfilment from the point of view of the accident rate.
  - ecological compatibility of the process – a level of the ill effects of the transport industry on nature when performing the transportation process.
3. The quality coefficients of resources, including.
  - own quality of the used resources (by modes: a rolling-stock, staff etc.)
  - quality of the use of resources
4. The quality of the attendant and additional services, including: a range and level of services.
5. The quality of the transport company as a whole system, including:
  - accessibility of services.
  - availability of choice of services use.
  - transport communicativeness – coordinating in time the interaction of company with its customers.
  - reliability.

The measures of bus intercity, regional and international transportation quality can be classified in 2 groups by TCQSM (Transit Capacity and Quality of Service) [7] (see Table 2). The first group of measures provides availability. *Availability* is foremost provided by a network, within the limits of which service is carried out by a certain mode of transport and time-schedule (by time and frequency, to the proper queries of users). The second group of measures provides comfort and convenience from the traveller’s viewpoint by a certain mode of transport. *Comfort and convenience* are connected with reliability of service, first of all, its interlinking with other modes of transport and passenger seating capacity. The given measures are closely interconnected.

**Table 2.** Quality of services, which are considered in TCQSM [7]

Service measures			
	Transit stops	Roads Segments/ Corridors	System
<i>Availability</i>	Frequency	Hours of service	Service coverage
<i>Comfort and convenience</i>	Passenger load	Reliability	Travel Time

From the viewpoint of travellers, the level of bus service can be assessed by different metrics. Unfortunately, a majority of them is qualitative but not quantitative. For example, reliability is one of the qualitative measures. It represents a very complex concept and can be defined in different ways. It is assumed that a punctuality of bus operation is a measure of reliability, which is a subject of the qualitative definition and consists of due fulfilment and stable uninterrupted traffic of bus sequence by TCQSM [7].

#### 4. Quality of Transport Service at JSC Riga International Coach Terminal

The coach terminal services are connected with the bus transportation services that are provided by the partner-transportation companies. From the viewpoint of a traveller as a user, this is a united service starting from information obtaining, making a choice, ticket purchasing, boarding, debussing, transit ensuring and other services that compile the satisfaction of needs of one trip (travelling).

Taking into account the above mentioned it is possible to distinguish the service quality coefficients that are significant just to the coach terminal activity as the transport infrastructure activity and that are still impossible to separate from transportation itself.

At the JSC Riga International Coach Terminal the quality management system that meets the ISO 9001:2000 standard requirements has been introduced.

The activity area of the quality management system is the passenger transportation services and supply, ticket sale and trip accounting management that is the base of the JSC Riga International Coach Terminal activity. [1].

The information systems are becoming tools of the service process management and control. A very important step for the improvement of the JSC Riga International Coach Terminal activity has been done when developing and introducing a new ticket sales and trip accounting program „Baltic Lines” (BL) at the enterprise.

The quality management system of the JSC Riga International Coach Terminal consists of three hierarchical levels:

1st level – the quality policy documents, which include the enterprise’s quality policy, formulation of tasks, organizational structure, certification sphere, quality management etc.;

2nd level – all processes ongoing at the enterprise (total 32 procedures);

3rd level – data base that maintains the activity of the enterprise (methods of work performance, instructions, normative documents, ticket sales and trip accounting program „Baltic Lines” data base).

The introduced digital quality management system has helped:

- to improve more the activity of the enterprise;
- to define more precisely duties and the degree of responsibility of each employee;
- to improve the activity of each structural unit, to perform both internal and external audits;
- to determine the customers’ needs and to try to satisfy them to the maximum;
- to have mutually beneficial cooperation with all those who need the coach terminal services.

According to the ISO quality management standard requirements, the JSC Riga International Coach Terminal has determined the main and support processes, developed the control criteria and procedures of these processes, organized opportunities for monitoring and gathering of the necessary statistic information for analysis and improvement.

- B01-B08 processes of the main activity are the most significant and they characterize the main directions of the enterprise’s activity;
- C01-C15 supporting processes are of the instruction type and they characterize the everyday processes and regulate the JSC Riga International Coach Terminal internal activity, infrastructure and staff issues;

- D01-D07 system current processes describe preventive, correction activities and are considered as the obligatory ISO standard documentary procedures, especially D01, D02, D06 and D09, these processes characterize the enterprise's management and internal audit issues.

For each of the main activity processes (B01-B08) the quantitative control criteria are distributed, statistical data is generalized and diagrams are applied. Based on the collected information about separate criteria, there appears an opportunity to measure and analyse processes and to perform activities that would be directed to the results achievement and improvement. Every quarter the main activity process criteria are generalized.

For example:

- ✓ *B03 system application organizational management recommended by BL*

Criteria:

- Amount of the sold tickets of JSC Riga International Coach Terminal
- Amount of the sold tickets in other coach terminals for trips that are performed from the JSC Riga International Coach Terminal
- Amount of incorrect, wrongly printed tickets
- Amount of the returned tickets
- Income from tickets
- Income from ticket reservations and paid information
- Amount of the sold tickets in Internet
- Amount of tickets for travellers with discounts foreseen by the standard acts (100%, 50%)

- ✓ *B04 Bus time-schedule changes management*

Criterion:

- Amount of the done changes in bus time-schedules

- ✓ *B08 Controllers work*

Criteria:

- Amount of the cancelled trips
- Amount of the performed trips
- Complaints about controller's work
- Drawn up statements about violations

The statistical information about these criteria is submitted by the managers of the structural units.

The passenger transportation punctuality is necessary and it is the main parameter for the use of bus just at the *coach terminal or other stops*, where travellers start, continue or finish their trips. These passenger transportation infrastructure objects themselves cannot influence the service performance punctuality (or observance of time-schedule by bus), nevertheless it is important to inform travellers about variances, to help to make decision about their further actions (to wait, to change a trip route, time, to refuse from a service, to obtain compensation etc.), thus the services of the coach terminal are also considerable when supplying the transportation services.

Still, the main aim of the transportation punctuality analysis is to identify and to prevent delays and to escape risks in the scheduled transportation plan to the maximum.

In [8] research the main attention is paid to measure of reliability of coach and bus service and analysis of different factors influencing on this index. Because this mode of transport is in competition with railway (and private cars also) in Latvia the measures that represent comfort and convenience are very important. Railway is the mode of transport, which doesn't feel the influence of congestion or weather conditions, and that's why it is more reliable mode of transport and also is the winner in competition with bus by travel time. On the other hand, it yields to bus transportation by the level of availability (absence of network in some districts, foremost). In this competition, multiplying comfort and service of bus transportation can play a solution role in the choice of this mode of transport. And, while time of travelling often differs insignificantly (example), reliability can become the problem for a bus travel. The exact observance of time-schedule becomes the important quality. Reliability is a measure determining bus service level from the viewpoint of users as well as operators. The considered reliability measure by [8] is a punctuality index. Punctuality of bus operation is a quantitative measure of reliability from the viewpoint of users. This index indicates the magnitude of time gap between actual and scheduled arrival times. Research of this index in combination with different factors influencing on this index and in an ideal development of the model for evaluation of punctuality is the important task for Quality monitoring.

## 5. Questionnaire as the Constant Process in Quality System

Questionnaire is constantly activated in the process of quality monitoring in the "Riga International Coach Terminal" JSC. On the basis of the questionnaire the management of the terminal analyses the coach

operation, discovers merits and demerits of the offered services and introduces amendments or improvements as far as possible.

During the first part of 2008 two questionnaires were fulfilled.

One of them is the annual one starting from 2005, which has been performed from 19 February to 7 March 2008. *The aim of questionnaire is:* to study wishes and needs of the customers of the coach terminal, as well as to analyse the obtained information for the further perfection of the offered services. 100 respondents were covered. Three students of the Transport and Telecommunication Institute took part in organization of this questionnaire this year.

New questions, which concern the punctuality of trips, were included this year. We consider only answers on these questions.

The results of the respondents' answers on the question – How often do you use services of the coach terminal? – are presented on Fig. 1.

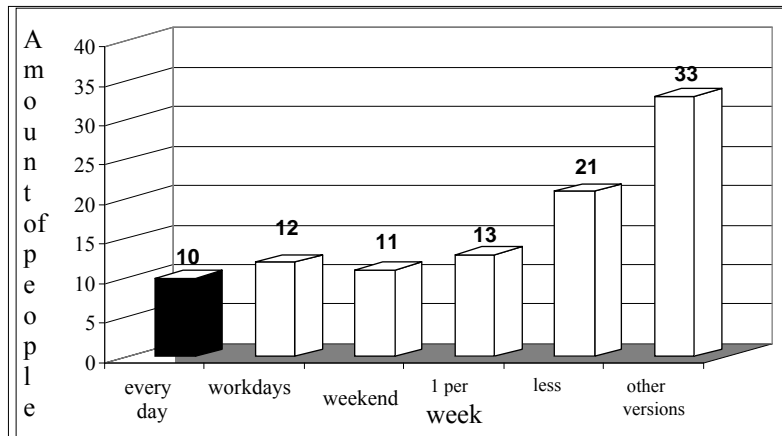


Fig. 1. Results of answers on question –How often do you use services of the coach terminal?

As it seems from the diagram on Fig.1 about 70% of customers use services of the coach terminal once per week and more seldom. Therefore, a great significance belongs to attracting these customers to the coach terminal services owing to satisfaction of their expectations. The distribution of the respondents' answers on question – Have you experienced the scheduled buses being late? – is presented on Fig 2. The results of the respondents' answers on question – When a bus was late, was it late during its departure or arrival? – are presented on Fig. 3. As shown in the diagram there is no evident differences in the previous experience of a customer between the departure service and the arrival service.

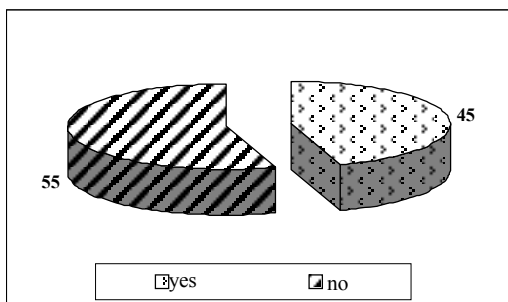


Fig. 2. Results of answers on question – Have you experienced the scheduled buses being late?

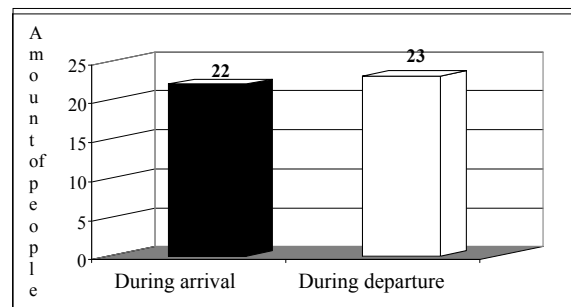


Fig. 3. Results of answers on question –When a bus was late, was it late during its departure or arrival?

The respondents' answers on question – What was the delay? – are presented on Fig. 4. As it is shown in the diagram most often the delay was 10 to 20 minutes. The respondents' answers on question – What delay of a bus is allowable from your viewpoint? – are presented on Fig. 5. As indicated in the diagram on Fig.5 the allowable delay of a bus from the viewpoint of the respondents is 5 to 10 minutes.

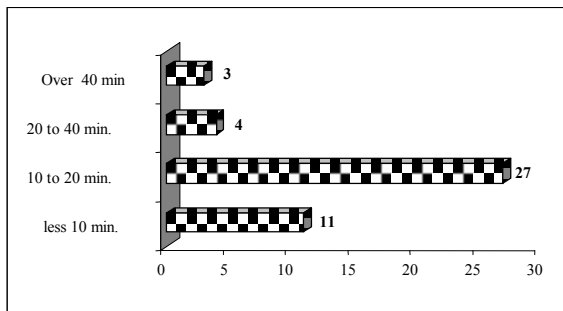


Fig. 4. Results of answers on question –What was the delay?

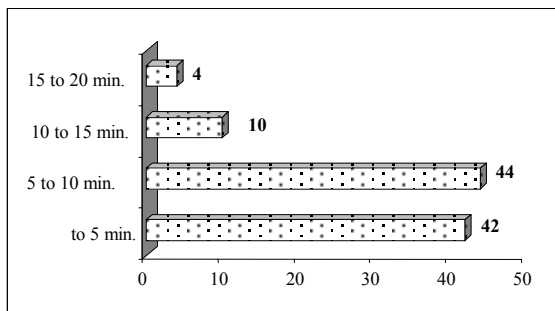


Fig. 5. Results of answers on question –What delay of a bus is allowable from your point of view?

Also, the questionnaire has allowed getting to know the wishes of travellers relatively the perfection of the coach terminal operation. It is possible to mention the following fact – travellers who use services of the coach terminal seldom are contented with everything. But, travellers who use services of the coach terminal every day have expressed many wishes. Complaints of travellers are always brought to the notice of the coach terminal management and problems of the JSC Riga International Coach Terminal are widely discussed in mass media.

### 6. Questionnaire as the Method of Analysing the Attitude of Users to a Certain Mode of Transport

As it has been earlier already mentioned the bus transport in Latvia has a strong competitor in many directions – it is railway. What is a determinant when choosing one or another mode of transport operating in one direction? Is it ticket price, travelling time, departure time, etc.? These questions can be set and solved on the basis of the Discrete-Choice models theory, which is developed by Ben Akiva, Lerman and others [9]. In this disaggregate models it is necessary to take into account the next factors affecting the generation and attraction of trips: social status, life style and other characteristics of an individual. Finally parameters of transport, such as travel costs, travel time, punctuality, comfort, availability and quality of the transport infrastructure have an influence on the behaviour of individual. To expose influence of numerous factors on the amount of passenger flow and to take into account transport necessities of every separate traveller is a very complex practical problem that requires the well-developed system of Transport Survey.

This year in the JSC Riga International Coach Terminal the pilot project of such kind of Transport Survey was implemented. The aim of questionnaire is to collect data on travellers' attitude. It is necessary to obtain data from surveys about passenger market situations. Survey data have been collected on bus-based travellers and it concerns a very popular direction – **Riga-Daugavpils**.

Travellers have a choice between the railway transportation, i.e. a passenger train, and the bus transportation services. In the questionnaire month the amount of travellers with the initial point Riga to the end point Daugavpils is revealed in Table 3 showing the amount of tickets in the VIPUS ticket system (passenger train) and the sold BL tickets (buses and coaches) In fact, the amount of travellers is larger because tickets are also purchased directly from the bus driver. But there is an opportunity to use the mentioned vehicles for routes where Daugavpils is a transit point, for example, in July 2008 this opportunity has been used by 533 bus travellers.

**Table 3.** Amount of travellers Riga-Daugavpils in July 2008

Indices	Train	Bus
Amount	124	357
Sold tickets Riga-Daugavpils	8490	9941

The dates of questionnaire: 1<sup>st</sup> July, 2008 – 10<sup>th</sup> July, 2008. Interviewing was carried out face-to-face using an interview questionnaire. The distribution of the places for questioning is presented on Fig.6 (Riga Coach Terminal is the main one). The total amount of the filled in questionnaires is 117. There are some incorrect questionnaires, which have been detected in the described analysis. The 1<sup>st</sup> and 18<sup>th</sup> questionnaires are with answers only on half of questions, that's why they have been removed from further analysis. Consequently, 115 questionnaires have resulted in the following analyses.

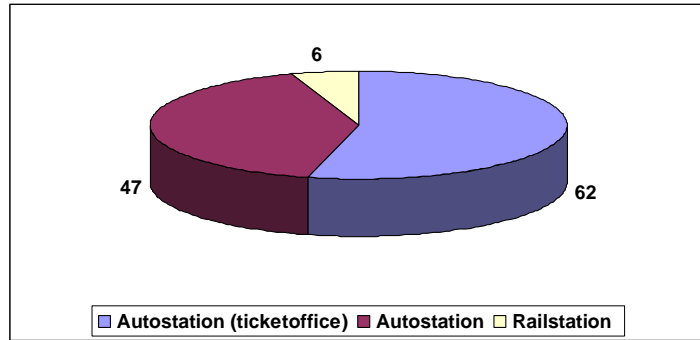


Fig. 6. The distribution of the places of interview

### 6.1. Common Analysis of Sample Structure

For the beginning let’s mention that about one half of all passengers participated in questioning has an own car. This very fact is an interesting one and deserves a separate analysis. On Figures 7 and 8 a distribution of the respondents by age and sex is indicated. Mainly there are women and age of a half of the respondents is in the age interval 20 to 40.

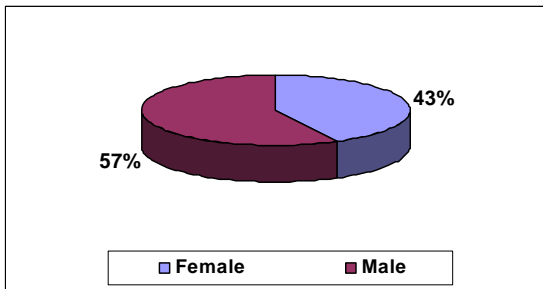


Fig. 7. The sample structure: sex

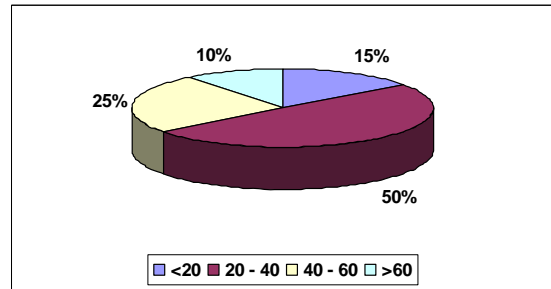


Fig. 8. The sample structure: age

A majority of the respondents has chosen Latvian as the language of communication (see Fig.9). Fig. 10 is of interest, where a distribution of income per head in a group of the respondents is presented; a majority has indicated a sum of income 200 to 500 Ls. But, among the users there are 17 % of those who have an income per head over 500 Ls.

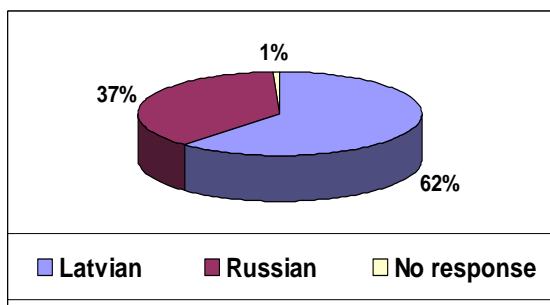


Fig. 9. The sample structure: language (%)

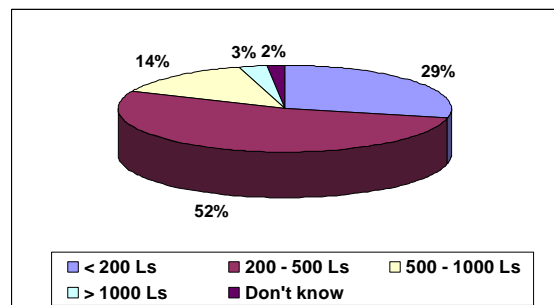


Fig. 10. The sample structure: income per person

### 6.2. Analysis of Trip Characteristics

Let’s consider the answers on question concerning the trip characteristics. Basically, the respondents indicated that their trip had a private character (see Fig.11) and was a direct trip (see Fig.12).

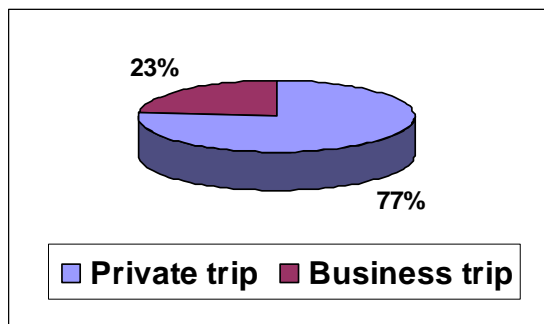


Fig. 11. Type of trip

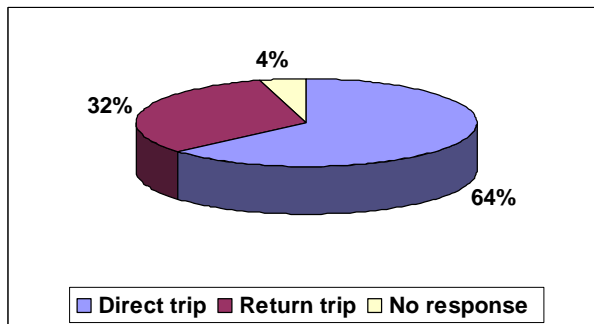


Fig. 12. Type of trip

Over 60% of the respondents have travelled straight to Daugavpils, however, the enough number of the respondents (~16%) has used Daugavpils as a transit point (see Fig.13). As to the departure time, it has been distributed almost equally with a slight advantage of morning hours from 9.00 till 12.00 (see Fig.14). Questionnaire has also shown that 65% of the respondents travel alone and 35% two or three, and 25% with luggage (additional seat).

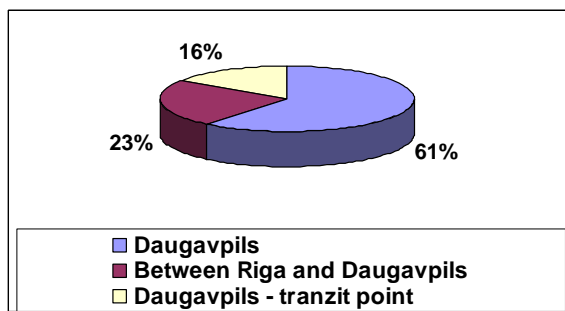


Fig. 13. End point

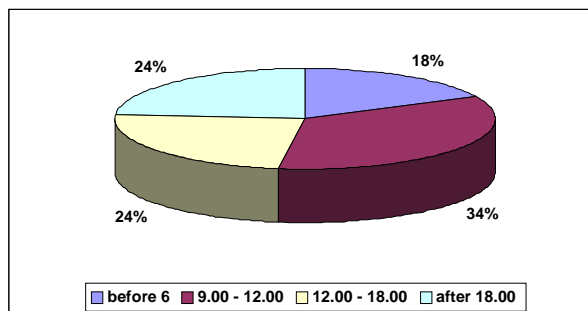


Fig. 14. Time

### 6.3. Analysis of the Attitude to Trip Cost

The answers on questions concerning the preference of one or another mode of transport are of peculiar interest. For the sake of truth, it should be mentioned that among the respondents there were only 5% questioned at Railway Station. So, this information is for the management of the coach terminal concerning the preferences of customers of the coach terminal exactly. In this connection quite a large percentage of those preferring travel by train, car and other modes of transport – over a quarter of the respondents – should be mentioned (see Fig.15).

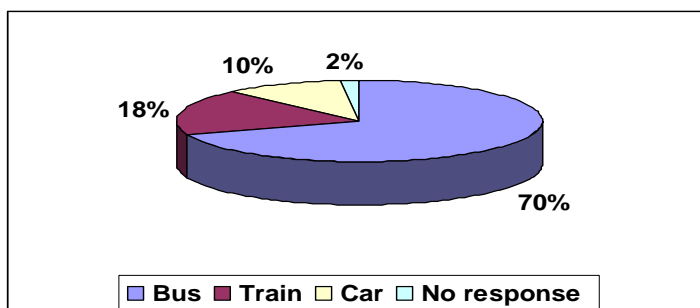


Fig. 15. Preference by modes of transport

On Fig.16 a distribution of reasons influenced on the coach terminal customers' choice in favour of bus is presented. In the first place is a suitable departure time and comfort, then – the nearness of a bus stop to the aim of trip (by the way, it could be the main advantage of bus over train).



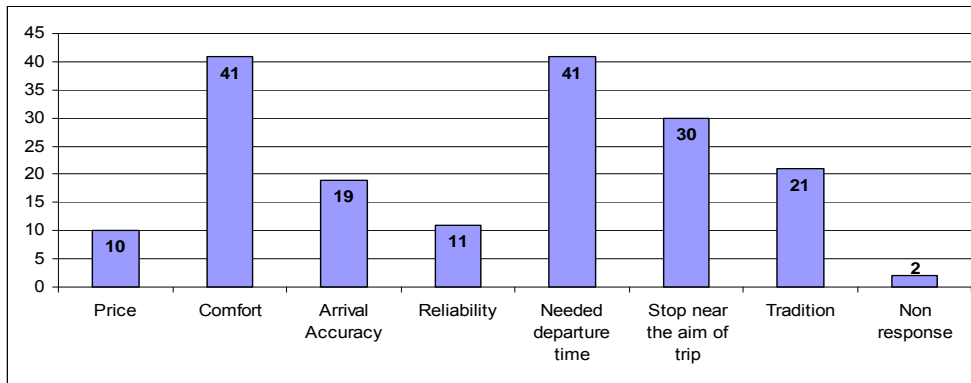


Fig. 16. Reason of choice of bus as a mode of transport

The fact that cost is in the last place attracts attention. In July a rise in the ticket prices took place that changed the tariff structure for bus services, as a result the bus ticket prices are more expensive, i.e. for trains depending on train ticket type prices are Ls 3,57 to Ls 4,57, and for buses depending on time and a carrier the prices are Ls 5 to Ls 5,60. At that, one of the following questions of the questionnaire is about the cost, namely: cheaper or more expensive is the price for the alternative modes of transport? Then, 41% responded that they did not know, and 34% – that for other modes of transport (train) it was more expensive.

## Conclusions

Transport plays a significant role in a modern world and competition between various modes of transport including the public transport, and the public and private modes of transport is growing more and more. Therefore, in this competitive struggle a special attention is paid to the problems of the rendered services quality for the passenger transportation. In the paper a survey of the existing approaches to the analysis of the transport service quality, in particular, the passenger transportation service is performed. The passenger service quality system in the JSC Riga International Coach Terminal is examined in details, and data obtained in the process of questioning of the customers of the JSC Riga International Coach Terminal is analysed. One of the questionnaires performed at the enterprise has been directed to data collection and analysis for determination of the transport mode preference of the customers travelling on Riga-Daugavpils route. Social and economic characteristics of travellers of this route are considered as well as the reasons of their preference of bus over train. The given research might become a basis for the Discrete-Choice models construction in future.

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