

THE INFLUENCE OF THE PASSENGERS' TRANSPORT SYSTEM CONVENIENCE ON THE LIVING STANDARDS IN VILNIUS CITY

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Good quality of life depends on a whole series of factors, including having enough money and dwelling with good communication conditions. The level of usage of public transport practically depends on both the level of system's development accessible for all passengers and the level of citizen living standards, their lifestyle and financial possibilities. The regular route public transport system has serious competition from the side of private transport means in Lithuania. Selective data interrogation of Vilnius citizens seeking to explain their socio-economic possibilities to use public transport services or private cars was accomplished in 2007. The survey results show, that the main factor for the choice of public transport service is the purchasing power or life quality level of urban residents, and, on other hand, combination of the public transport service with the usage of private car for the sustainable development of communication systems in urban and suburb territories.

Keywords: *public transport system, car competition, passenger market, living standards, expenses of household member, demand of suburban passengers*

1. Introduction

Sustainable development is a top priority for the EU, which takes environmental concerns into account in all its policy-making. A good life quality depends on a whole series of factors, including financial security and dwelling with good communication conditions. The level of usage of public transport practically depends on both the level of system development accessible for all passengers and the level of citizen living standards, their lifestyle and financial possibilities.

Public transport services always were popular in Lithuania. The regular route public transport system has serious competition from the side of private transport means. The expanding car fleet and the increasing transport mobility pose increasingly serious traffic problems, particularly in the largest cities of Lithuania. Obviously, it is important to support the public transport system, and combine it with travelling by private cars in the city territory.

The most serious problems occur in Vilnius city. Special research using survey data was executed in this city in 2007. The research was directed to collect information about possibilities of inhabitants to chose and use public transport services and necessity to use private cars where public transport services don't meet the requirements or are inaccessible. The survey results show, that the main factor for the choice of public transport service is the purchasing power or life quality level of urban residents, and, on other hand, combination of the public transport service with the usage of private car for the sustainable development of communication systems in urban and suburb territories.

2. The EU Objective – The Balanced Life Quality

The material standard of living in the State can be measured by the total value of everything that the State produces in the calendar year (gross domestic product - GDP) by the number of inhabitants. The standard of living in the EU varies from state to state. GDP per inhabitant or purchasing power standard is lowest in the Baltic States.

A good life quality mostly is determined by the economical factors. It depends on the enough income and expenses for one family member. As the prices vary from one state to another, according different economies, it is more acceptable to put into practice measuring the price of a comparable and representative "basket" of goods and services in each state. This figure is given not in national currency units but in a common artificial currency purchasing power standard (PPS). Comparing GDP per inhabitant in PPS gives a fair comparison of the standard of living in different states (Fig. 1). The analysis of living standard shows, that Lithuanian inhabitants are living in reduced circumstances than EU-25 average, despite of growing GDP (Fig. 2) [1].

Europe is dealing with the growing challenges of globalisation, rapid technological change and developing knowledge society; maintaining employment and social cohesion are further challenges. The Lisbon Agenda seeks to meet these challenges by making more competitive, flexible and adaptable economy of Europe. Greater labour mobility between places of residence, dwelling regions and between jobs is a crucial element in this [2].

This way quality of transport system service is one of the key components. Particularly public transport is the main constituent of passenger transport system for daily communications.

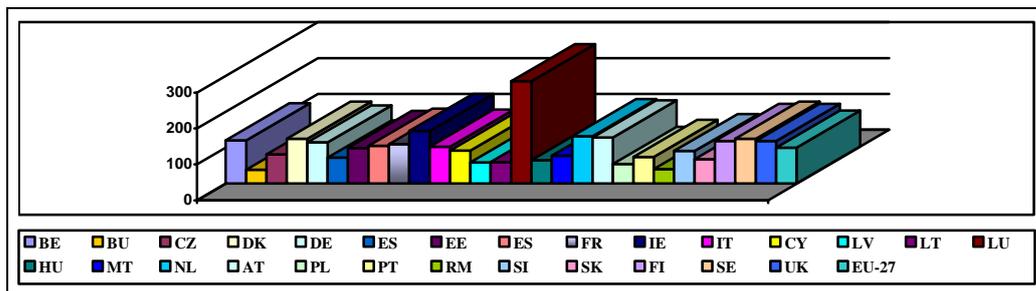


Figure 1. GDP per inhabitant in PPS, 2007 [1]

Public transport takes significant influence to the life style of inhabitants and city economy. It is incontestably the importance of public transport for the passenger communications in Lithuanian cities, as the usage of the regular transport services is more than 60 % and it has considerably less influence on environment, infrastructure requirement, and decreases problems of vehicles parking comparing with usage of private cars. Therefore, the cities authorities agree that it is necessary to ensure beneficent functioning of public transport, especially buses and trolley-buses in the largest cities of Lithuania [3, 4].

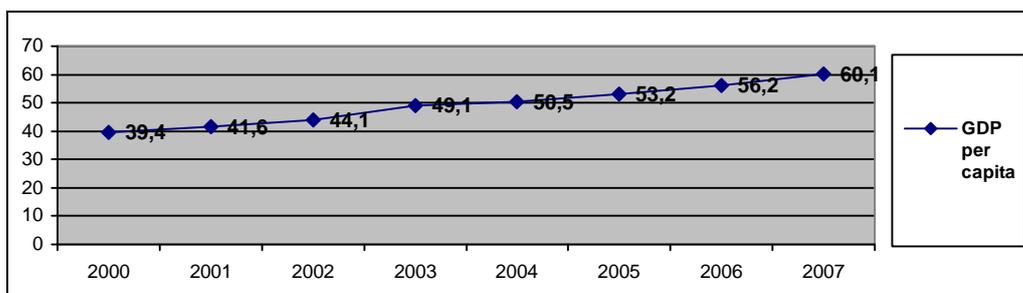


Figure 2. GDP per capita in Lithuania (in PPS Purchasing Power standards; EU-27 =100) [5]

3. Transport - the Key Unit of Living Standard

Transport and communication factor is very important for the business sphere as well as for social living conditions in the State. Since the transport as well as energy, communications and environment are the key infrastructure for the economical and social life, transport expenses are compulsory for all population. The needs of Lithuania for transport communication and demands for public service are comprehensive to everybody.

Public transport services always have been popular in Lithuania. Traditionally passengers use bus and railway transport in the long-distance journey in the countryside and different capacity bus, trolleybus and taxi transport for urban communication. In last few years passenger mobility is being noticed to grow in long distance and local bus transport although a number of city passengers is almost stable (Fig.3). The flows of passengers constantly grow due to increasing income of inhabitants and different interests.

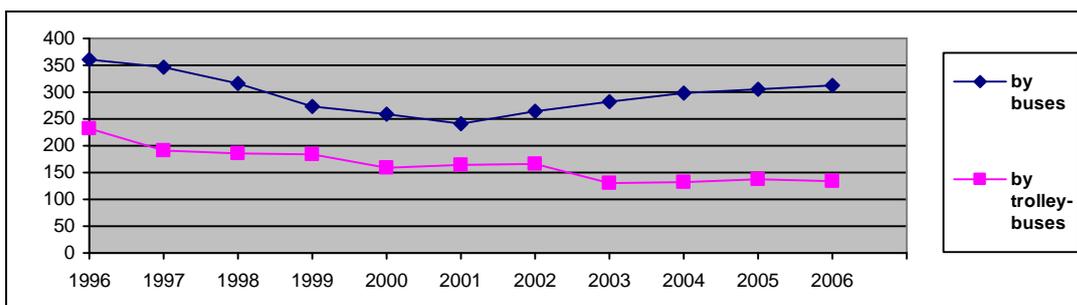


Figure 3. Passenger traffic by public road transport in Lithuania, thousand [5]

The research shows, that the demand of territorial servicing and work schedules has changed a lot since 1991. Public transport system badly operating due to wicked economic support doesn't meet the needs of passengers. More and more people have to use individual transport means. Lithuanian phenomenon affirms it also – despite economically hard conditions automobilization level has began to increase since 1995. It increased due to second-hand cars, which mass supply was going from West Europe. The possibility to use private automobile for the different purpose whole day outrivald the inflexible route transport system [6, 7].

The average lever of the cars per 1000 capita has increased during the last 5 years due to market in Lithuania to 472 in 2007 (Fig. 4). The prognosis of usage of private cars depends on the level of development of public transport system and capacity of the road/street network. It is expected that the level of cars per 1000 capita will increase up to 560 in 2015, but their usage is going to depend on the development of traffic control and improving of capacity of streets and sections.

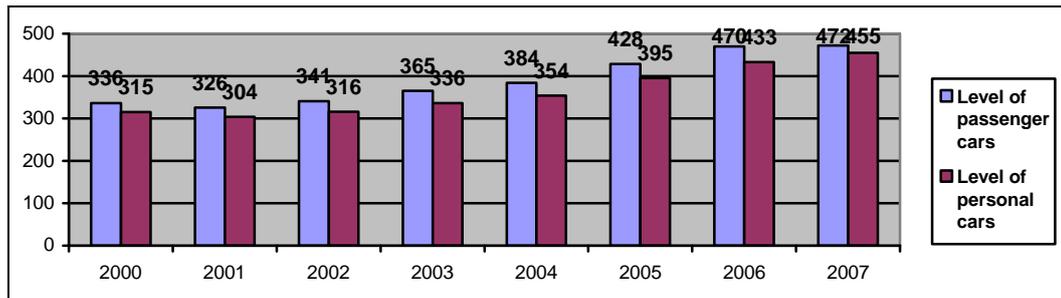


Figure 4. Level of motorization in Lithuania, cars per 1000 inhabitants, end of year [5]

Vilnius, capital of the State, becomes a modern city of the EU. Modern solutions are being accepted and it is reaching to use possibilities of the newest technologies in the residence of modern city. Transport is the domain awaiting important changes. Step by step the projects of automated traffic-light regulation and management systems are being implemented. By the help of centralized city traffic-light regulation system “green wave” street network is going to be formed and controlled according to instantaneous street load. It is expected that this system will help to avoid traffic jams.

At present days Vilnius public transport system consists of trolleybuses, buses and minibuses. After long discussions one more equal public transport mean – tram – is included into the General plan of Vilnius city. Supposedly tram will serve both to improve the quality of passenger conveyance and to decrease the level of air pollution. Besides, tram is a convenient transport mean for inhabitants and city visitors and creates a touch of more modern nuance for the city.

It is necessary to form the attractive public route system for passengers due to the integrated service market of all urban transport modes, and to form useful conditions for the usage of private cars. The regular route public transport system has serious competition from the side of individually own transport means. The expanding car fleet and the increasing transport mobility pose increasingly serious traffic problems. Obviously, it is important to support the public transport system and combine it with travelling by cars in Vilnius city. The priority is given to improvement of infrastructure, modernization of traffic management and control system, balance of public transport service with the usage of car in the city and suburbs [8, 9].

Increasing incomes of inhabitants and growth of mobility, disillusion of public transport and the fact, that cars become more accessible, are inescapable results of high level of automobilization. Following, narrow and sparse Vilnius city streets, radian network are too overcrowded; this determines bigger impurity, increase of accidents, traffic-jams and lack of car parking places in the centre and residential areas of the city. Still increasing problem of traffic-jams has influence on public transport lags, when this makes the system more unreliable: maintenance is rising in price, transportation and competition features of public transport are decreasing. Thus instead of increasing mobility, usage of cars determines absolute loss of mobility in various city areas [9, 10].

4. Socio-Economic and Transport-Communication Factors

The results of 2005 survey induced to correlate problems of transportation of inhabitants to their economy possibilities. Respondents amplified the importance of their financial possibilities to use public transport services and to use private cars for daily travelling (due to still growing fuel prices).

Accomplished detailed analysis of socio-economic situation and its alternation presented many insufficient indexes comparing with the same data of the EU and especially neighbour states. Obviously, positive changes are happening in the State microeconomics – big percents of GDP growing are being sustained, also

socio-economic situation of State inhabitants is being improved – real earning and old-age pension is growing (Table 1). These socio-economic changes are happening both in cities and countryside (Fig.5) [5].

Table 1. Main indicators of economic and social development

Indexes	2003	2004	2005	2006	2007
Changers of GDP, %	10.3	7.3	7.9	7.7	8.7
Inflation (XII compared to XII previous year), %	- 1.3	2.9	3.0	4.5	8.1
Average net monthly earnings of employees in the whole economy, LTL	786.4	835.5	916.7	1092.9	1359.3
Indexes of real earnings of employees in the whole economy, %	109.2	104.9	106.8	114.9	117.7
Average old-age pension, LTL	340.5	371.6	420.3	476.9	

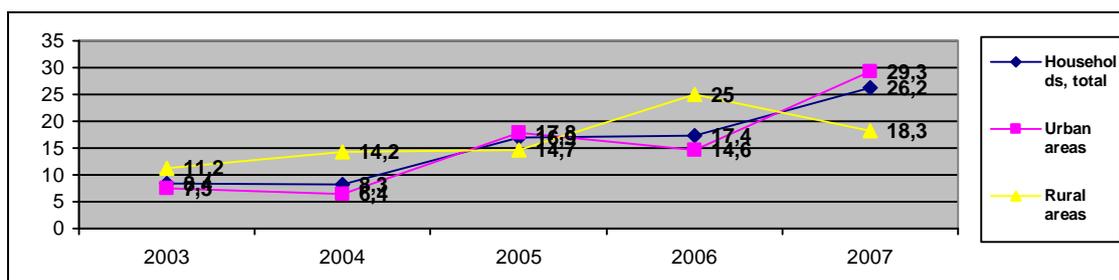


Figure 5. Disposable income changes, comparing with previous year, per cent

These socio-economic changes are happening because of both the development of economic potential and the State social policy, as big part of special socio-economic indexes is being determined by the Government (Table 2). Present economic situation of the State shows the concern due to raised level of inflation, which has negative influence on social life. The average level of annual inflation was 5,8 % in 2007, comparison with the EU inflation (2,3 %) doesn't give hope for the rapid improvement of this index.

Table 2. The rates are approved by the Government of the Republic of Lithuania

Indexes	2003	2004	2005	2006	2007	2008
Base earnings	105	115	115	115	115	128
Basic non-taxable amount of income	290	290	290	290	320	320
Minimum living standard	125	125	125	125	130	130
Minimum monthly earnings	450	500	550	600	700	800
Base pension	152	172	200	230	266	316

As the statistic data of the State macroeconomic doesn't reflect real economical situation of inhabitants and perfunctory shows their level of living, the family/ household indexes as a total sum of income for one family member or real income, balance of family income/expenses are being analysed. The detailed analysis of social indexes performed during research showed that the position of Lithuania is one of the last comparing with socio-economic indexes on the scale of enlarges EU. Therefore, the point of view and methodology of evaluation of social and economic inequality of this State are special.

The services economics requires specific access to the methodology of the research. It consists of questions of transportation services directly methodological interdependent and also coherent to social economics. The researches of needs of transport passengers are performed according to the base of socio-economic researches.

5. Basics of methodology of survey

Two years later in 2000 new interrogation of Vilnius active inhabitants was accomplished. The substance of this interrogation was socio-economic factors, which had influence on choice to travel in urban and rural areas by using public transport or private cars. The practice of various states shows that inhabitants earning less than the middle income or inhabitants having good access to public transport network (schoolchildren and students, pensioners, small part of working people) are usually using public transport services. Statistically inhabitants are categorized into 5 groups according to their living age (Fig. 6). The main attention is given to 20-25 years old young people beginning their carrier of active working and studying youth group in this interrogation.

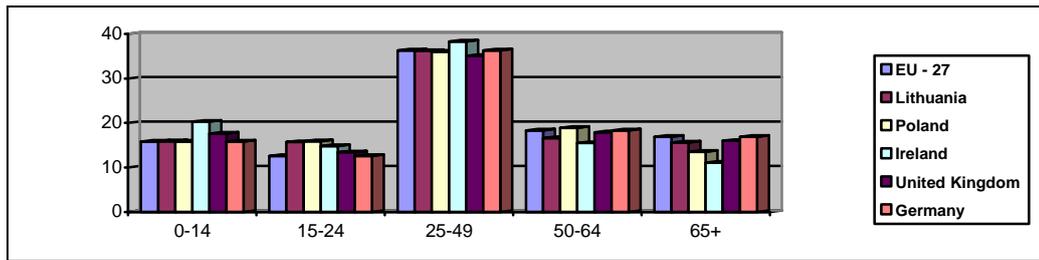


Figure 6. Population by major age group, % (2007)

There is one more important subject having influence on the choice of transport services aside age and employment factors. This is a territorial distribution of attraction objects, long distance of living place from work place location, distribution of other daily-use objects in a whole territory of the city. The planning logic of these geographic trips is very important for every resident seeking to accomplish tasks in shorter time costs despite of different type of transport mean resident uses. In this attitude total level of life quality consists of time factor.

Therefore residents selected for interrogation sustain most inconvenience because they are distanced from main attraction objects of the city – live in suburb areas where at best one route transport line can be reached. Two groups of interviewed people are selected for interrogation of territorial integration.

At first, seeking to avoid social disjuncture of rural residents’ active living and working rural residents are selected for interviewing. They are using both public transport services and private cars. The popularity of private cars is still growing.

At second, social supported residents, non-employed pensioners which can pay only a small part of their income are selected for interviewing in attitude of rural territorial service by public transport.

So, in 2007 respondents were grouped according to socio-economic and transport-urban factors:

- 1) young specialists, starting their career;
- 2) active working suburb residents;
- 3) social supported suburb inhabitants (seniors).

This selection was influenced by conclusions of previous accomplished research studies. Precisely these groups are determined to be the most sensitive about all changes of public transport services in Vilnius city.

Seeking to evaluate the level of living the interrogation is supplemented with questions about economic possibilities of family/household, income and expenses used for main requirements and transport needs of one member of family.

6. The Analysis of Economic Possibilities of Transport Users

The group of young specialists. Sustaining results of the survey respondents of the first group belong to social group with income of 700-2500 Lt per month for one member of household. This exceeds statistical average command monetary income of one member of household from 30% up to 362%. Earnings of working young specialists of Vilnius city are bigger then statistical average of the State.

However, costs of social needs are signally bigger in Vilnius city than in other cities. The monthly costs of statistical normal Lithuanian citizen are 17% less than minimal costs of young specialists of Vilnius and 67% less than minimal necessary costs of living in Vilnius of one member of household declared in interrogation answers (Table 5) [5].

According to this difference respondents participated in interrogation are assigned to VII-IX deciles (statistical structured) due to the monthly monetary costs of one member of household. The balance of income-costs of the second investigated group has similar result. Though the structure of costs of this group is apparently differ than the usable costs of the first group and statistical average normal citizen of the State (Fig.7). The level of incomes of the interrogated respondents of the third group usually depends on the government regulated social support and pension system.

Table 5. The variation of usable expenses in 2003-2006

	Usable expenses for a member of household per month, Lt				In 2006 comparison with 2005, %
	2003	2004	2005	2006	
All households	487,2	512,3	578,1	651,5	112,7
In towns	538,4	559,3	644,3	711,1	110,4
In cities	585,3	613,0	709,9	783,3	110,3
In countryside	383,6	418,4	446,3	532,5	119,3

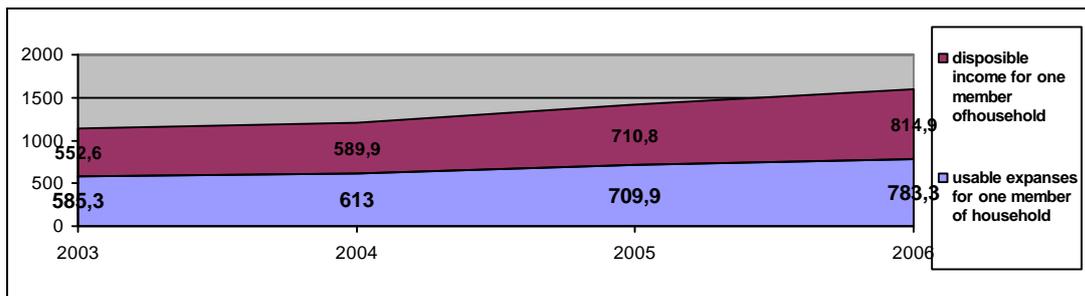


Figure 7. The balance of citizens' income-usable expenses of the biggest cities

The analysis of compulsory expenses for Vilnius citizens shows that the incomes for one member of household are short. Respondents demand more money for the needs according statistical compulsory expenses structure (Fig. 8). The opinion of young specialists shows that in 2007 one citizen of Vilnius needed growing incomes:

- 700-1000 Lt per month for minimal standards of living;
- 1500-2500 Lt per month for normal standards of living (depending on structure of family).

The forecast of young specialists for 5 years period shows, that one citizen of Vilnius will need:

- 5000-6000 Lt per month for minimal standards of living;
- 7000-9000 Lt per month for normal standards of living.

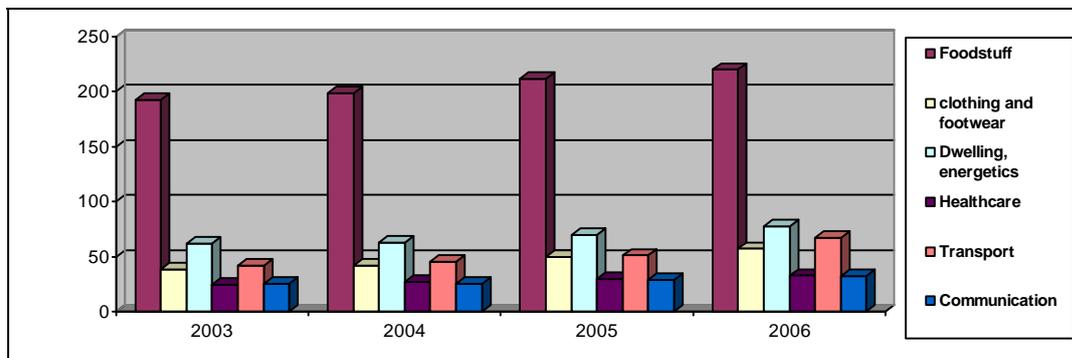


Figure 8. The structure of compulsory expenses basket of citizen, Lt

The group of young specialists monthly spends about 5% of their income for public transport needs and about 15% – for private car exploitation.

Young specialists living in comfortable urban places near bus and trolleybus stops or their work (or study) places, located in convenient accessibility zones, give priority to public transport for work travels combine with living needs, shopping or leisure. Though 92% respondents of this group use private cars of family members for weekend or holiday long distance travels. These respondents are planning to buy private cars in the nearest future and to use cars every day.

The respondents living in block house think that every member of family has to have his (her) own private car. Unfortunately 10-14 years old private cars kept in streets and yards are the most popular. Car parking is the complicate problem in Vilnius. Garages are planned under the new block houses or open parking places near the house usually. Private parking places are very expensive.

Young citizens of Vilnius buy monthly tickets for public transport. 45% of them combine travels by public transport with travels by private cars. 92% of investigated citizens usually get to work or study places combing few public transport routes. It takes about 1 hour 30 minutes to reach work places travelling by public transport and about 10-20 minutes driving trough city territory in radial direction or about 40-50 minutes crossing through city centre and main streets to different side of city territory by private cars. It takes about 35-40 minutes to reach living places also sport, shopping or studying places after work travelling by private cars. 76% of investigated citizens travel about 20-30 km per day.

40% of car drivers pick straight way, 40% pick less crowded, but longer main streets, 20% don't drive in peak hours. Since buses and trolleybuses do not vanquish traffic jams 97% of car drivers think that traffic disturbances are not main reasons to reject private cars in city territory.

The results of accomplished research in 2007 show that:

- obvious priority is given to cars used and forecasted to be used in city territory estranged districts and suburbs or often business trips;

- car is considered to be used as a vehicle but not as prestige or luxury element.
- the income of young specialist as a member of household comparatively fit to an average of whole State. Young specialists earning their living by themselves admit that standards of living are being improved in a period of last few years.
- monthly expenses for automobile fuel are: 300-400 Lt for petrol or 100-180 Lt for diesel, driving in moderation or at weekends, and 300-700 Lt, driving everyday.

Young public transport users consider that the quality of services of present route transport in Vilnius is not sufficient: it is a lack of long and fine route net, more frequent traffic and less waiting time, quicker communication. Inhabitants of suburbs require better services for outskirts and longer work time.

Present public transport tariffs meet the requirements of young passengers of all transport means. Discounts are necessary for students, pensioners and other social supported people. This regulation has no connections with family budget, but refers to social principles. Two different opinions about expansion of tickets spectrum and penalties for travelling without tickets (100-200 Lt) are formed.

Young passengers perceived good changes in public transport services: accessible seats for people with disabilities and people with children, sound and visual information in transport means, classical music in trolleybuses, innovated tickets punch system, installation of electronic ticket in Vilnius.

The group of working suburb residents. Suburb inhabitants confirmed better service of public transport for the second interrogation of 2007. Respondents consider that positive tendencies have happened in service level of Vilnius suburbs in the last 4 years:

- technically better vehicles have been used in routes (82% of responds);
- the buses have been equipped with visual and sound information means (81 %);
- the bus stops have been equipped with bus traffic timetables (67%).

Disadvantages are mentioned as well:

- routes of minibuses are reduced or vehicles do not ride (12%);
- bus stops have no awnings (65%);
- buses rides in unlit streets (37%);
- bus stops are unlit and therefore information is not viewable (28%);
- streets have no sewerage of surface water, therefore passengers usually are soused (36%);
- old buses are not equipped with sound information and name of stops (21%);
- nonconformity to timetables during daytime is noticed (15%).

Active suburb inhabitants travel to work place by public transport every workday. Since travels to city centre are always complicated, work travels always are combined with other purposes, changing public transport means or waiting at stops. Such a composite travel is difficult and takes forever. Changes are made by 87 % of suburbanites or working there respondents.

The group of elder seniors noted extra disadvantages (86%):

- bus stops cannot be reached due to unclean streets during winter time;
- unsafe to reach stops due to rebuilt roadsides or paths;
- boarding complicated due to insufficient entrance to bus stops.

Since passengers of this group have no individual cars or cannot drive due to health problems they use services of public transport (89%). Their objective travels are directed to health institutions, pharmacy offices, bank offices, post offices, shops, churches, municipalities and etc. As much as possibly these passengers try to travel not in a peak hour when public transport vehicle are vacant.

The group of social supported suburb senior. The respondents of senior group don't work any more. Their individual cars are 10-20 years old (78%). These cars usually are used during all seasons except wintertime (45%) and always are kept in garages (64 %).

Active suburbanites have or wish to have private cars (89%), because:

- the members of family must use cars certain for business needs (32%);
- it is difficult/ not possible to use public transport to reach workplaces (47%);
- husband drives car and wife has no driving license or driving experience (22%).

Suburbanites respond carefully about opportunity to combine the usage of public transport with private cars. Since individual cars have to be left in parking places near last public transport stops or changes nodes and further travel has to be continue by public transport means many responders have doubts about convenience of this system:

- extra parking fee and payment mechanism would be formed;
- those who must carry heavy weight everyday would like to drive cars to the ending place;
- those who must drive children to kindergartens or schools and other family members to workplaces would be constrained to use individual cars.

The concept of combining public transport services with usage of individual cars is being supported by young people and those who believe that economic-financial factors are major priorities.

Conclusions

The second survey in 2007 was executed by questioning of the most sensitive groups of Vilnius passengers. There were selected three groups of passengers, daily using public transport services, which consist of: young employed and studying persons and young specialists; active employed suburban inhabitants and suburban senior pensioners.

The accomplished survey results show that urban transport communication is very important priority of living standard, which depends on the socio-economic indexes of inhabitants and, on the other hand, on the level of development of urban route transport system and transport infrastructure, as well as the intelligent management and control of traffic, last of all each correlating with logical urban planning:

1. The urban public transport users don't consider car as the alternative to route transport. They are using public transport daily for the individual reasons: problems of driving possibility; parking problems in the city; long time-wasters in the street traffic jams on pick hours;
2. The car users are interested in development and improvement of Vilnius public transport system too, because other members of their family are using the route transport services.
3. The respondents have opinion that usage of own car provides more freedom for activity of Vilnius inhabitants. For this reason car, new or used, is the priority for each family. However, the possibilities are determined by the financial expenditures per one member of household.
4. Vilnius inhabitants agree to joint to the logical and intelligent combined route transport system. The part of suburban people would leave own cars in the safe parking places near the trolleybus (bus) stops (turnaround places, public transport terminals), in the case these public transport kinds will be developing and the car users will be encouraging to return back to public transport.
5. Respondents of survey have emphasised the lacks and gaps of public transport and the needs for modernization:
 - the modernization of transport means;
 - the reconstruction of street network in suburb areas;
 - the reordering of traffic organization;
 - the improvement and controls of traffic timetables;
 - the installation of rapid communication in longitudinal and transverse axles of city;
 - the combination of public transport nodes with construction of parking places of the cars;
 - the formation of acceptable tariff according to the financial possibilities of specific users groups.
6. In accordance with the opinion of the groups of young specialists and seniors, it is necessary to support financially public transport and to improve technologically this system seeking to compete with growing number of individual cars. Further they state, that the public transport tariffs have to meet financial possibilities of social groups of passengers.

Better quality of work and life environment and improved quality of transport communication are the aims, which can be realized by the growing of living standards and directly increasing inhabitants' income.

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