

## QUALITY MEASUREMENT IN PUBLIC TRANSPORT IN THE SLOVAK REPUBLIC

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### Abstract

The public transport organisations manage the activities with the aim to fulfil the requirements of all the interested parties and subjects such as customers, owners, suppliers, and regional authorities. They intend to satisfy the customers and other stakeholders while minimising the costs of achieving the satisfaction. The standard CEN 13816 provides the basis for the customer satisfaction measurement and for the organisational performance measurement in the public transport. In the article the applications of the mentioned approach in the Slovak Republic will be outlined, the existing gaps and the improvement possibilities will be presented. The results of the customer satisfaction measurement and the process performance measurement, organised by the university research centres in the Slovak Republic during the past years, will be shown.

Keywords: Public transport; Quality measurement; Benchmarking

Topic area: B1 Public Transport and Intermodality

### 1. Introduction

Slovak Republic, as a typical example from among the transition countries, has undergone the intense and rapid changes in the transport service sector in the past 10-15 years:

- Transition from the central transport control and central management authority to the regional and local agencies – weakening government influence and consequently self-administration competence reinforcement in the public transport sector;
- Privatisation of the organisations providing the public passenger transport services and elaboration of the instruments sustaining the government influence concerning universal and regional transport services;
- Increasing requirements on the subject mobility – ratio growth of employment mobility on the overall population mobility concerning the number and the distance;
- Regional and administration division changes of the Slovak Republic resulting in the shift of accessibility of the centres (Jánošíková, 2003);
- Environmental and ecology requirements, transport security – solution to the pollution and the accident rate problems – building the infrastructure, resolution of the urban congest, enhancement of the transport fleet;
- Sudden increase in the cross-border traffic and the turn of the traffic flow routing (from the direction east-west to north-south direction);
- Decreasing ratio of the public transport usage – with the rising motorisation the demand for the public transport is declining.

In order to handle the impact of the above changes, the Government Transport Policy had been elaborated and updated in 2001. The fundamental of the policy is provision of a

sustainable way of transfer for persons and subjects as an essential precondition for the citizen rights observation and for the fulfilment of the trade development requirements. The policy execution proceeds via solving the tasks and problems in the range of the law, infrastructure, transport fleet, tariff policy, and the integrated transportation systems.

## 2. Statistical demonstration of the transport development in Slovakia

Geographic position, function, shape and size are the major factors, which influence the process of transport and the spatial arrangement of the communication network in the territory of Slovakia (Bezák, 2002). From this point of view it is possible to classify the population structure of Slovakia as that of an urbanized country where more than 56% of the population live in the towns of over 5,000. Within this composition, most of the settlements are small and middle sized (table 1). The capital of the country, Bratislava, has currently around 450,000 inhabitants, one-tenth of the population of the country as a whole.

Table 1: The settlements structure of Slovakia Bezak et al.,2002)

Settlement type /inhabitants/	Number of settlements		Number of inhabitants	
	Amount	%	Amount	%
< 1999	2 462	87,3	1 620 900	30,7
2000 – 4999	237	8,4	695 900	13,2
5000 – 9999	50	1,8	346 200	6,6
10 000 – 49 999	61	2,1	1 293 900	24,5
50 000 – 99 999	9	0,3	640 000	12,1
> 100 000	2	0,1	677 400	12,9
<b>TOTAL</b>	<b>2 821</b>	<b>100</b>	<b>5 274 300</b>	<b>100</b>

Recently there has been an abrupt increase in the development of motorisation degree in Slovakia. Despite this fact, Slovakia has not yet reached the standard of the developed countries. However, there are regions where this degree is substantially higher than the national average. For example the Bratislava region has a motorisation degree of almost 400 vehicles per 1000 inhabitants, and the capital itself has attained the standard of the European countries with a motorisation degree of 455 vehicles per 1000 inhabitants and auto-mobilisation of 405 passenger vehicles (PV) per 1000 inhabitants.

Table 2: Degree of motorisation and automobilisation of Slovakia (Bezak et al.,2003)

Year	Number of inhabitants (Thousands)	Number of motor vehicles	Number of passenger vehicles	Degree of motorisation (Vehicles/1000 inh.)	Degree of auto-mobilisation (PV/1000 inh.)
1963	4 314	222 357	43 599	52	10
1980	4 996	789 806	551 724	158	110
1990	5 311	1 116 400	876 024	210	165
2000	5 401	1 751 840	1 274 247	324	236

From the above data it is clear that the increase in the number of passenger cars is higher than the growth of the motor vehicles number (table 2). In the light of the decreasing demographic development, this has an influence on the rapid increase in the rate of auto-mobilisation.

Apart from the number of passenger cars, the structure of the vehicle fleet has also changed in favour of more powerful and faster cars, while the average age of the vehicle has reduced. These facts strongly influence the requirements on the road network. Ownership and usage of an automobile have become a symbol of status for certain social groups, as well as an inevitable requirement for the performance of certain professions. Ever-higher demands are being placed on the quality of the road network, and are accompanied by the need for parking and road infrastructure for the automobile traffic.

Due to the life-style and mobility changes, specifically the individual automobile transport mobility, the purposes of travel and the time variations of the distribution of traffic loading of the road network have changed. In particular the volume of commercial passenger vehicles has grown significantly, which, together with the decline of large, centrally-managed companies and the progressive emergence of a large number of small private companies and family firms, has caused a greater dispersion of inter-area transportation relations, mostly in the environs of larger towns as well as cross-border urban areas.

The difference between rush-hour and off-hour traffic intensity has lessened, and the traffic loading of the road network is more equally distributed throughout the day and the week. While 20 years ago the share of rush-hours was from 10-15% of the daily loading, nowadays it represents 8-10% of outskirts and 6-8% of urban all-day intensity.

The passenger occupancy of passenger cars has also decreased sharply, with the average during the working day hovering around 1.5 persons/car as opposed to more than a 2.3 rating 20 years ago.

The increase in the number of motor vehicles and the radical decrease of state subsidies for operation of the city's public transport system, caused changes in the Modal-split and in mobility, not only within the city but also in external transportation through the city's borders. The most outstanding change in the course of the last decade is demonstrated by the significant shift in the volume of passenger transportation from public transport to individual automobile transport (Figure 1).

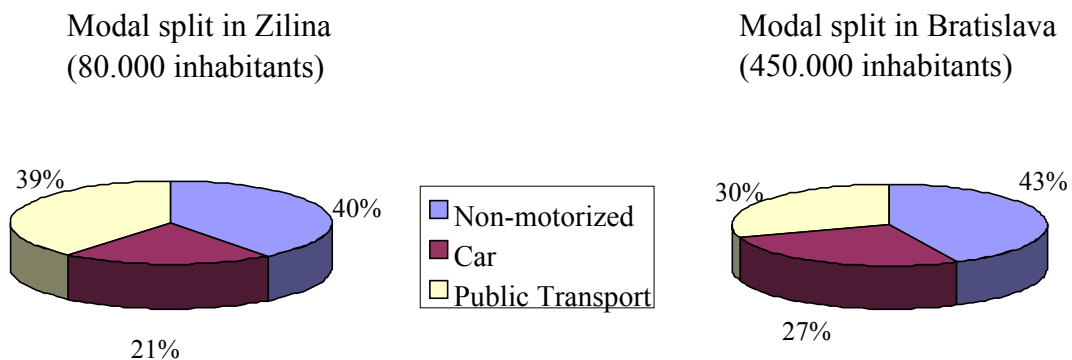


Figure 1: Modal split in large cities in Slovakia in 2000 (Holarek et al.,2002)

The phenomenon of the ration decline of the public transport compared with the individual motorised transport is the most noticeable in the larger cities in Slovakia, and is associated with a reduction in subsidies and a concomitant increase in public transit fares. This leads to its inability to compete with private travel, which has the flexibility needed for the dispersed locations and purposes of transportation activity. Despite the fact that this trend can be considered as negative from the viewpoint of sustainable development and the quality of life of less solvent city inhabitants, therefore requiring a change, the share of

mass transit in Slovak towns and cross-border transportation of build-up territories is still higher than in EU or North American cities.

As far as travel purpose, there is a little difference between the urban and rural settlements; predominant is commuting to work (40%), to schools (25%) and travelling for the private purposes (20%); visiting and leisure time make only 15% of daily travel rate.

The daily travel rate (journey per person per day) in rural areas is around 1,8, whereas in urban zones the number is higher depending on the town size. The average daily travel rate of the chosen Slovak towns is shown at the figure 2.

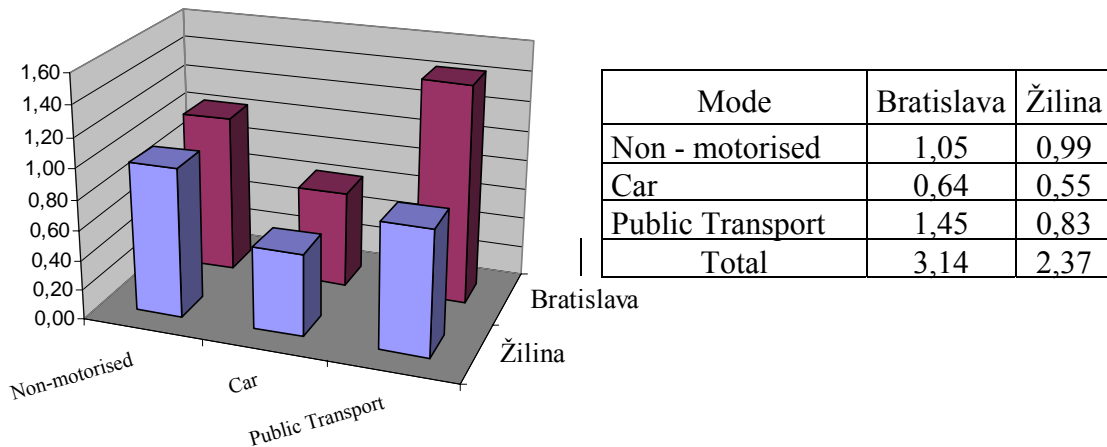


Figure 2: Comparison of daily trips per person in selected cities in Slovakia in 2000 (Hollarek et al. 2002)

Despite the low totals, public transport in the Slovak towns still conveys a greater share of population than the comparable centres of the Western Europe. The sudden increase in the number of motor vehicles together with the lack of financial resources for repair, maintenance and construction of the transport infrastructure, have led to improper roads and an overall increase in the number of traffic accidents. Despite these negative development trends in road transport, according to the general public opinion concerning problems of city dwellers, a greater concern for crime, health and the environment due to the present unfavourable social situation, has pushed this area into a secondary position. On the contrary, public transport and environment problems rank at first place in the West European and North American cities.

### 3. Quality approaches and measurement results of the Slovak PPT

Recently there have been several activities targeting the quality measurement of public passenger transport (PPT) in Slovakia. The CEN 13816 recommendation, built on the loop of quality, formed the basis for the quality measurement. The quality measurement according to CEN 13816 starts from the comparison of the quality views as shown in Figure 3.

We can state that the differences between the two quality views as shown in Figure 3 demonstrate three levels of service management:

- Level of customer satisfaction – the difference between the sought and perceived quality;
- Level of the service providers ability to direct his efforts to the spheres, which are the most important for the customer – the difference between the sought and targeted quality;

- Level of achievement effectiveness of the quality targets – the difference between the targeted quality and the delivered quality.

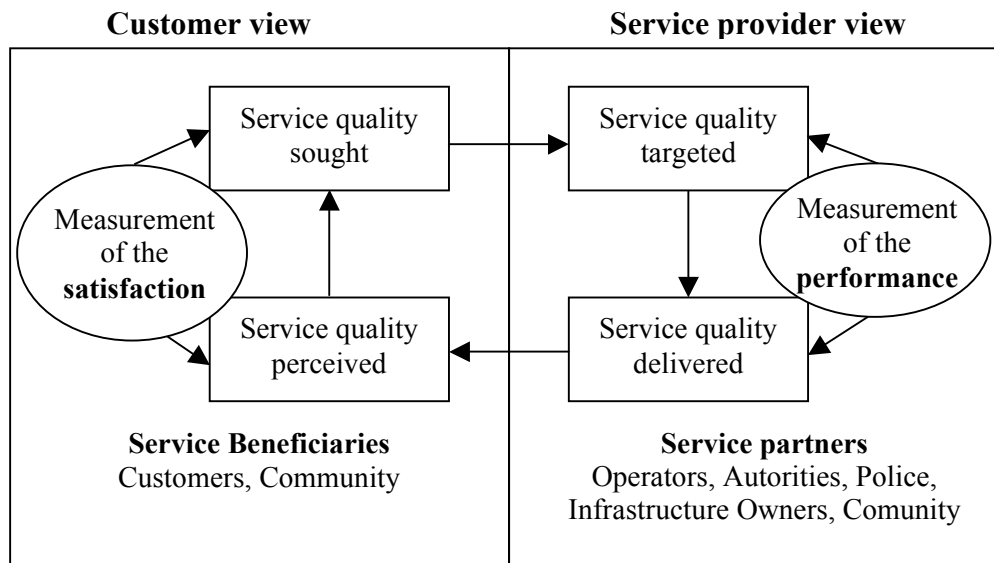


Figure 3: Starting views of quality and its measurement (CEN 13816)

### 3.1. Quality measurement of service provided – measurement of performance

The performance measurement of an organisation providing service is a necessary activity not only for stating the quality level but also for mutual comparison of organisations with similar functions and activities (known as benchmarking) and for the processes of planning, managing and enforcing the organisational strategies (Balanced Score Card approach). The measurement of organisational performance reveals how suitable are the converting capacities of an organisation for fulfilment of the customer demands.

The public transport organisations in Slovakia implement the detailed performance measurements of the organisational processes, though till lately not being evaluated systematically. In 2002 a pilot project called “Benchmarking of the Public Transport Organisations” with the participation of the operators in two large was carried out. The choice of the towns was based on the similarity of the selected items (number of inhabitants, transport line length, number of vehicles in the fleet, output in km, number of the transported persons, ratio revenue/costs) and also on the achieved maturity and advance rate of the organisations. The fundamental of the benchmarking process was the performance measurement based on the recommendations of the EQUIP project results, wherein the methodology was slightly modified due to the conditions in the Slovak Republic as follows:

- Planning and data collecting – the phase consisted of the critical success factor selection and definition, indicator allocation, the indicator values;
- Data analysis – comparison of the acquired values, exploration of the linkage with the other performance indicators;
- Integration – the improvement potential detection, identification of the substantial processes being improved, building of the benchmarking partnership;
- Action – improvement planning and implementation via the best practice adoption from the benchmarking partners.

Figure 4 illustrates the cumulated results of the comparison of 19 indicators clustered into 8 groups. From among the concrete indicators, the most significant differences were manifested in the security indicator (crashed vehicles), vehicle fleet maintenance (personnel task management, plant equipment), human resource management (personnel selection, personnel training and control) and in the fare policy building too.

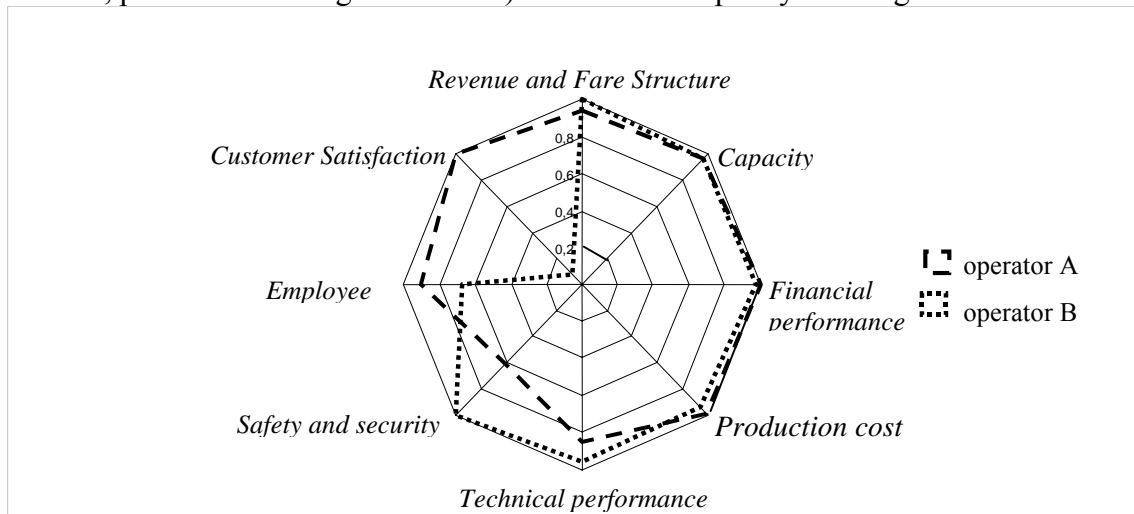


Figure 4: Benchmarking results among selected public transport operators in the Slovakia (Hrnčiar et al.,2002)

### 3.2. Measurement of customer satisfaction

Performance measurement and high work productivity are not sufficient for successful management of an organisation. Performance and productivity must be interrelated with the fulfilment of the customer requirements, which has to be reflected in the customer satisfaction. To determine the customer satisfaction it is not sufficient to observe the number of customer complaints. Complaint is only one of the ways, in which a customer reacts to a service that has not been provided in accordance with the promised service quality. The unique and often the only way of obtaining the authentic end-user data of the service provision is the direct ascertainment with the customers.

Measure of customer satisfaction is the expression of the difference between service quality sought and perceived. By means of the direct examination, we can state not only the level of the customer satisfaction but at the same time identify which features of the service have participated in the customer satisfaction, or dissatisfaction (Figure 5).

The most recent customer satisfaction measurement has been carried out in the various Slovak towns on the sample of 1033 respondents, which is a sufficient number in the terms of Slovak Republic. Questioning aimed to measure the values of the individual quality components of the public passenger transport service and also to determine the level of customer satisfaction. The 7 quality criteria, which have been studied from the value and satisfaction point of view, were based on the CEN recommendation and EQUIP project:

1. Time – extent of the service offered in terms of time, frequency, speed;
2. Security – sense of personal protection experienced by customers;
3. Accessibility – access to public passenger transport system including interface with other transport modes;
4. Reliability – ability to provide the service without any interruption;
5. Comfort – service elements introduced for the purpose of making journeys convenient and leasurable;

6. Information – systematic provision of knowledge about public passenger transport system to assist the planning and execution of journeys, easibility to use a service;
7. Customer care – service elements introduced to effect the closest practicable match between the standard service and the requirements of any individual customer.

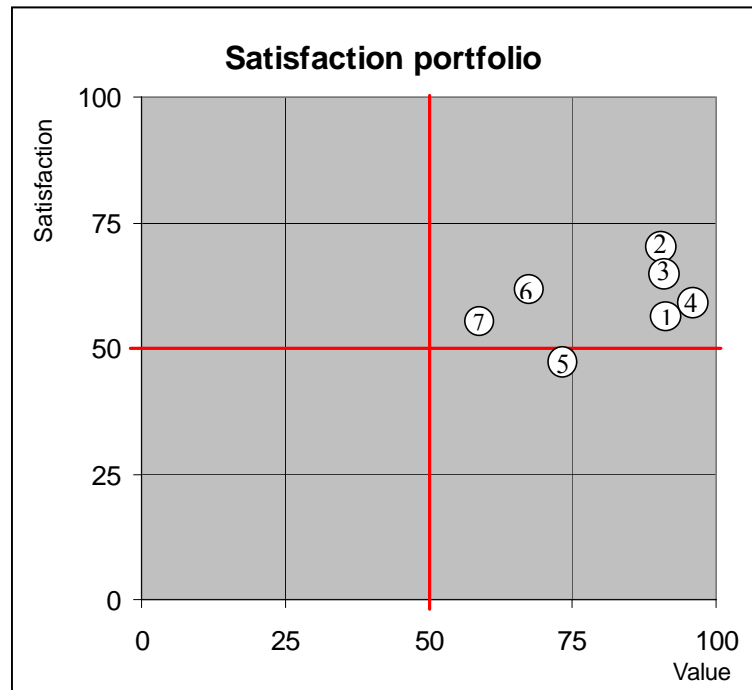


Figure 5: Satisfaction portfolio for public passenger transport (Hrnčiar, 2002)

The results of the customer satisfaction measurement in Figure 5 show that the greatest improvement potential of the public transport in the Slovak Republic resides in enhancing the transport time dispositions (timetables, velocity) and customer care in the public passenger transport services so that the customers' requirements are ensured. The mentioned potential was the most remarkable in the bus transportation.

#### 4. Conclusion

By means of setting the public transport support using the public resources Slovak Republic responded to the requirements of sustainable development of the citizen mobility, contained in the European Commission's White Paper "European Transport Policy for 2010 – Time to Decide". The priorities consist of:

- Ecology transport – to sustain a higher ratio of the transfer performance of public transport in comparison with the individual automobile transport;
- Economised transport – to increase the social effectiveness of public transport where the transfer performance unit costs are lower than in the individual automobile transport;
- Decreasing the transport spatial demands – the individual automobile transport is more spatially demanding than the public transport;
- Social aspects consideration – the offer orientation to the population segments that due to the different reason do not have the possibility to use the individual automobile transport.



Increasing the quality level of public passenger transport is the integral part of these initiatives. Various activities mentioned in this paper (benchmarking, performance measurement, and satisfaction measurement) create the preconditions of the active promotion of quality awareness in the public transport organisations. Despite the fact they are present in the Slovak public transport organisations, the improvement potential of the public transport services is still huge.

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