

# QUALITY MANAGEMENT OF PUBLIC TRANSPORT

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*Summary: While researching and evaluating quality in public passenger transport, it is necessary to consider basic principles in this kind of transport as well as role and meaning of individual parties. As the mid-point in all contemplation customer and his expectations must be considered.*

*Key words: quality in public transport, solutions in public transport, quality management in public transport, quality indicators*

## 1. INTRODUCTION

Article deals with problematic of quality of public passenger transport from the passenger's view. Mentioned indicators come out from author's own proposal. Quality of passenger transport is needed to be evaluated in shorter time periods, while in longer intervals the significance of indicator is not correctly appreciated [1]. These are examples of non-conformities in transport from the reason of delays in bad weather conditions and/or non-functional climate units etc. Introductory part comes out from official transport policies of EU and Czech Republic.

## 2. BASIS FOR PUBLIC TRANSPORT

- society requires higher mobility in connection with enlarging of EU,
- growth in some types of land transport is not extensive and it deepens the gap in the division of transportation labour,
- transport in the Czech Republic (CR) is a full and integral part of European transport area, therefore, there must be created conditions for maintaining the competitiveness of Czech carriers,
- congestion is manifested on the main roads and in towns (over 10 thousand inhabitants),
- public transport is operated by separate transport systems; integrated transportation systems are organized in limited areas with limited functionality and without more significant link between the regions (the transport conditions are deteriorating due to frequent transfers),
- public rail transport and regular public transport provide, in most cases, services at low level with insufficient mutual interconnection,
- the connecting of all regions to transport infrastructure of good quality is not finished, neither road nor rail transport,

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- there are disparities in terms of access to certain types of transport infrastructure and to its usage,
- transport generates high traffic noise emissions and harmful substances; it is necessary to reduce them in accord with European legislation.

### **3. ROLE OF THE STATE**

The state must provide such conditions to an access on the transport market which allow taking an advantage of individual type of transport [2]. The obligation of carriers is to meet the needs of users (passengers) at least in the quality set by the state.

The division of labour in public rail and road transport develops, with respect to maintaining sustainable development, in wrong direction in the CR. The development of the division of labour between public and individual transport of passengers tends to threats of functional transport system relating to congestion on the roads, and to inadequate transportation negative effects on the environment on the one hand and to lack of takings and over-dependence on grants of public transport on the other. The reason for this development is the increasing availability of private transport and faster improvement of road infrastructure compared with the rail infrastructure. Rail carriers have not responded with adequate offer of good quality service to this development yet.

Public transport cannot do without the public support, even not in developed countries [2]. The agreements about public service obligations are concluded in cases if it is not possible to provide the desired operation on commercial basis and when the operation of public transport services is in the public interest. Public finances allow the existence of this transport as functioning transport network. However, these funds must be used effectively. It can be offered to carrier who is able to provide services of specified quality and these services are guaranteed by him. Appropriate interventions in the transport division of labour between the modes can be carried out only in accordance with the rules of competition and equal access to the market. Conclusion of contracts for short-term obligations of public service restricts the possibilities for renewal of rolling stock in public transport, thus, it has been established at the state level, that these agreements will be concluded for at least 5 years, usually for 10 years.

The security parameters of railway transport are generally very good in the CR and the EU, especially compared to road transport. Safety is seen as the safety of passengers against violence while transiting (theft of personal things, injury, etc.) and from the viewpoint of traffic safety (traffic accidents caused by a failure of human factors, engineering or safety equipment). The introduction of centralized management, automatic train control systems, vehicles with higher resistance to impact, together with the management of modern security have been participating on significant reduction of fatal injury over the last 30 years on railways.

#### 4. CURRENT SITUATION AND SOLUTIONS

Traffic problems are concentrated mainly in urban areas. The proportion of public transport to the individual transport was 80:20 in the early nineties; it is about 50:50 at present [1]. Interconnections of urban, suburban and regional transport are not at sufficient level, there are no conditions created for higher use of cycling. Especially road transport in regions is provided by the regional and local authorities. At their level, it must be dealt with according to the principle of subsidiary. It is also necessary to ensure balanced development in different regions.

a) Improvement of transport activities in public passenger transport

- establish the conditions of transport services so that the rail transport would form the backbone of the system,
- provide public support only to carriers that are economically stable and able to provide transportation services in the required quality and guarantee these services,
- promote a competitive environment to ensure transportation services in the public interest,
- establish a methodology for providing obligatory services by the public service,
- expand the territorial scope and functionality of integrated transport systems,
- promote information and telematic systems for public transport,
- provide comparable taxation and pricing of rail and bus transport,
- introduce advanced technology in rail transport (light vehicles),
- the development of rail passenger services to compete with air transport for short and medium distances.

b) Improvement of transport services for users

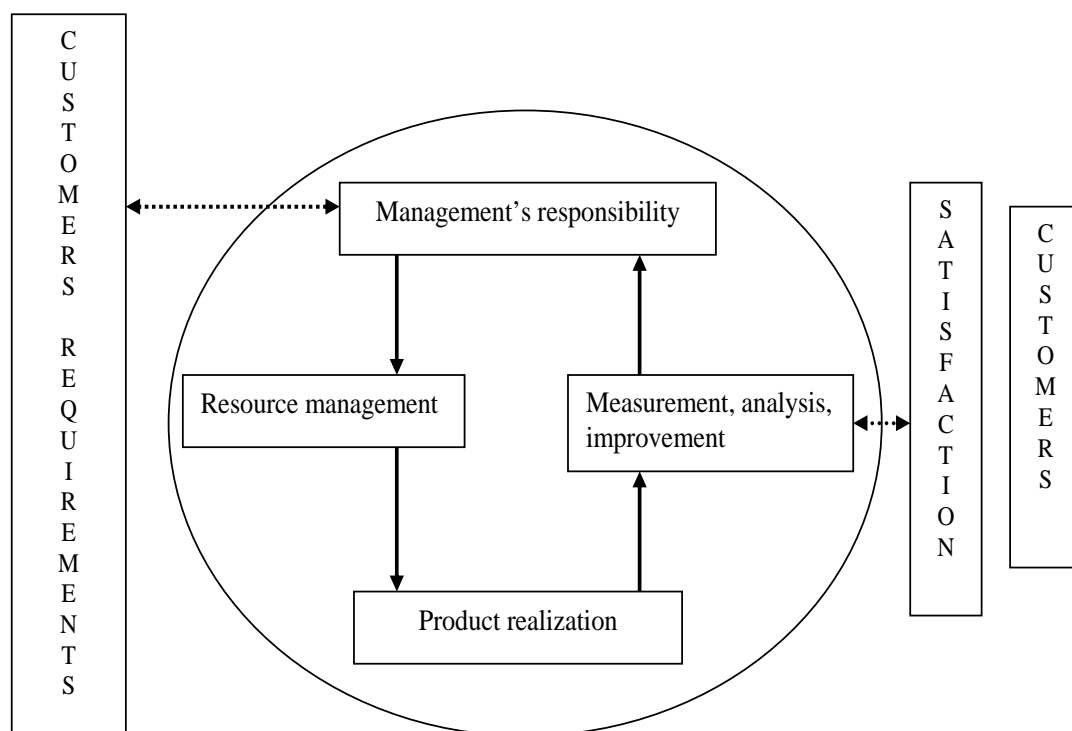
- elaborate standards of service in public transport,
- set the rights to transport passengers within a specified quality, including regulation of competence compensations,
- in the framework of the public interest, to determine as a separate criterion the economic stability of the carrier and the carrier's ability to provide services at specified quality of the user's perspective while choosing the carrier,
- access all kinds of public passenger transport for people with limited mobility or orientation,
- enhance awareness of users in passenger traffic by building a comprehensive information system,
- modernization of public service,
- optimize the volume range of public services and create conditions for the stabilization of the system through organizational, legislative, technical and financial measures,
- ensure greater effectiveness of state professional supervision in public passenger transport.

c) Funding for restoration of transport means

- create a program to develop financial resources for the reconstruction of the vehicle fleet,
- give advantage to the rolling stock meeting the environmental requirements, requirements of access and movement of people with reduced mobility.

## 5. QUALITY MANAGEMENT

Quality management system must be, on the level of transport service provider (carrier), constantly evaluated and improved. The carriers must identify customer requirements, evaluate them and apply into their processes (see Fig. 1).



Source: Author

Fig. 1 - Continuous improvement of the quality management system

## 6. QUALITY INDICATORS

a) The delay of trains for passengers according to category (Os, R, Ex, IC, EC, SC) in starting and destination station [%]

$$\frac{\sum N_x^z}{\sum N_x} \quad [\%] \quad (1)$$

Where:

$N_x^z$  ... total number of delayed trains of category x (x = Os, R, Ex, IC, EC, SC),

$N_x$  ... total number of dispatched trains or trains terminating of category  $x$  ( $x = Os, R, Ex, IC, EC, SC$ ).

- b) The delay of passenger trains by category ( $Os, R, Ex, IC, EC, SC$ ) in destination station [min]

$$\frac{\sum T_x^z}{\sum N_x} \quad [\text{min}] \quad (2)$$

Where:

$T_x^z$  ... total delay time of trains in minutes of category  $x$  ( $x = Os, R, Ex, IC, EC, SC$ ),

$N_x$  ... total number of trains terminating of category  $x$  ( $x = Os, R, Ex, IC, EC, SC$ ).

- c) The average capacity of passenger trains by category  $x$  ( $Os, R, Ex, IC, EC, SC$ ) [%]

$$\frac{\sum C_x}{\sum N_x} \quad [\%] \quad (3)$$

Where:

$C_x$  ... total number of passengers on trains by category  $x$  ( $x = Os, R, Ex, IC, EC, SC$ ),

$N_x$  ... total seating capacity of trains by category  $x$  ( $x = Os, R, Ex, IC, EC, SC$ ).

- d) The coefficient of capacity for higher car class [%]

$$\frac{\sum K_{1TR}}{\sum K_C} \quad [\%] \quad (4)$$

Where:

$K_{1TR}$  ... capacity (seats available) on the 1st class wagon trains by category  $x$  ( $x = R, Ex, IC, EC, SC$ ),

$K_c$  .....total Capacity of trains by category  $x$  ( $x = R, Ex, IC, EC, SC$ ).

- e) The coefficient of equipment failure [%]

The coefficient can be calculated with malfunctioning toilets in the reference period (non-functioning toilets, lack of water for washing, lack of hygienic devices), air conditioning equipment, heating equipment, etc.

$$\frac{\sum Z_x}{\sum Z} \quad [\%] \quad (5)$$

Where:

$Z_x$  ...total number of failures of equipment  $x$  ( $x = WC, bathroom, air conditioning, heating, etc.$ ) in the reference category of train ( $Os, R, Ex, IC, EC, SC$ ),

$Z$  ... total number of devices in reference category of trains ( $Os, R, Ex, IC, EC, SC$ ).

f) The transport time acceptable for achieving the aim[*min*]

It is acceptable time for transport needed to achieve the objectives in terms of passengers who commute daily for example to work, school, etc. It is critical transport distance, but the arrival time.

g) The level of services offered in passenger transport by categories of passenger trains

Based on the survey, in which the passengers marks the criteria voting 1-5, with 1 being the worst mark, 5 the best mark.

The monitored criteria could be - the behaviour of board staff, timeliness and accuracy of the information, clarity, traceability links, heat, cold, clean windows, shading the sun or outdoor lighting, etc.

h) Passengers safety

The indicator shows the number of passengers injured during transport, such as theft of personal things, a detriment to health, etc.

## 7. CONCLUSION

Article solves quality of transport services in public passenger transport from the view of the customer. Theoretically is based on recommendations of Czech Transport Policy and EU law. Level of transport services is possible to be evaluated by measurable indicators. Some of these indicators are proposed in this article. If provider of transport services won't consider level of provided services, then he won't provide services which will ensure satisfied customer.

## 8. ACKNOWLEDGEMENT

This work has been supported by the Institutional research "Theory of transport systems" (MSMT 0021627505) University of Pardubice.

## POUŽITÁ LITERATURA

- [1] Christopher, M.: Logistika v marketingu, Praha 2000, ISBN 80-7261-007-4.
- [2] Krampe, H.: Grundlagen der Logistik, Hussverlag Mnichov 2001, ISBN 3-931724-36-0.