# Challenges for a transport policy in Rostov-on-Don

## Le choix de la politique de transport à Rostov-sur-le Don

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ABSTRACT: The paper discusses the processes of development of public transport in Rostov-on-Don, one of the cities of Russia. The basic directions of policy of municipal authorities on reforming public transport are subjected to the analysis: development of a management system of urban public transport, regulation of mobility providing equilibrium between a level of transport loading and level of service of the transportation system, maintenance of guarantees of qualitative service by public transport for those social layers of the population, which have no vehicles, optimization of a routing network of public transport.

RÉSUMÉ: Cet article analyse le processus de développement du transport public à Rostov sur le Don, une ville russe. On analyse les principales orientations des autorités municipales en matière de réformes relatives au transport public: mise en place d'un système de management du transport public urbain, régulation de la mobilité assurant un équilibre entre la capacité et la qualité de service du système de transport public, préservation de garanties de service pour les usagers appartenant à des catégories sociales où l'on ne possède pas de véhicule, optimisation du tracé des lignes du réseau.

## 1 INTRODUCTION

Rostov-on-Don is situated in a southern part of Russia and is the main city of a Southern federal district. The city has about 1 million inhabitants (with cities – satellites 1.3 million) and surface area of 324 sq. km. Total length of a road network of city achieves 1200 km. In Rostov-on-Don there are three main means of public transport: 1200 buses (plus 400 micro-buses), 120 trolley buses, 85 trams. The transportation of the passengers in city is carried out on 96 bus routes, 11 trolleybus routes and 6 tram routes. The opportunity of designing of a monorail road is studied. Projected length of the first line is 12 km.

In city quantity of private vehicles intensively grows and it results in occurrence of problems connected to decrease of speed, occurrence of congestions, traffic pollution.

By the most difficult period at maintenance of mobility of the population were the years of transition to market economic policy. The management system of public transport has changed, there was a sharp reduction of the subsidies to passenger transport. The incomes of the population have decreased and it has resulted in growth of categories of the passengers having the right on free-of-charge or partially paid trip on their social status. The expenditure of the operators for transportation of these passengers were not to the full compensated by state and municipal authorities and it worsened a financial position of the transport companies.

The overall transport strategy of authorities of city consists in implementation of the priority tasks of development of a urban transport system on the basis of a set of methods institutional regulation, increases public-private partnership in public transport, traffic engineering providing a given level of a transportation service at rational usage of financial assets. For achievement of these purposes the program of development of public passenger transport was developed. The municipal authorities of city received the credit of the IBRD for development of public transport. These financial resources were used on purchase of buses, formation of the Center of management of public transport, service Center on diagnostics of buses.

## 2 MANAGEMENT OF URBAN PASSENGER TRANSPORTATIONS

The changes in economy of Russia last decade have required also cardinal reforms in management of urban public transport. From system of complete state

regulation it was necessary to proceed to competitive system with participation of the operators of various patterns of ownership. In this period many inconsistent processes simultaneously developed. In this period many inconsistent processes in policy, economy, social sphere simultaneously developed. The number of private vehicles has increased, but the number of the inhabitants requiring for social protection has increased also. Manufacture at one enterprises was reduced, but there were new centers of business activity. In these conditions realization of a principle "the mobility for all" has required development of the system decisions for increase of efficiency of functioning of transport system of city of Rostov-on-Don.

The overall characteristic of a situation can be submitted as follows. First of all level of motorization considerably has grown. For the rather small period of time the level motorization has increased with 78 up to 200 automobiles per 1000 inhabitants (Fig.1).

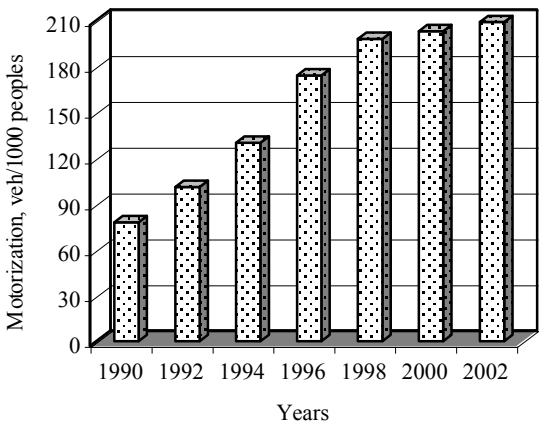


Figure 1. Change of a level motorization in Rostov-on-Don.

Hence, the significant share of the owners of private vehicles has appeared. For them the conditions of mobility are implemented with management of road traffic. However number of the inhabitants simultaneously has increased, for which the mobility is connected only to public transport. About 450 thousand city inhabitants have the right to the free-of-charge or partially paid trip on public transport.

Therefore activity of urban administration is directed on the decision of the following tasks:

Development of a management system of urban public transport;

Regulation of mobility providing equilibrium between a level of transport loading and level of service of the transportation system;

Maintenance of guarantees of qualitative service by public transport for those social layers of the population, which have no vehicles;

Optimization of a routing network of public transport;

Decrease of toxic emissions of traffic flows.

The basic classification attributes of management of urban passenger transportations for development of new structure of management of urban public transport were investigated. Use of market-oriented methods of regulation public transport was elected to reduce expenses of the urban budget, to create a competition in the market of transportations and to increase a role of private operators. Consistently, step-by-step rigid completely planned approach was replaced by market elements, is especial at increase of quality of transportations.

*Social - private partnership.* The competitive decisions in public transport were realized by social - private partnership and involving of the private investments for creation of the independent operators. In result the number of buses on urban routes has increased with 410 in 1992 up to 1160 in 2002 (Fig. 2). The all this increase of quantity of buses has taken place in the private companies. The change of structure of number of buses on a pattern of ownership is given in a Fig. 3.

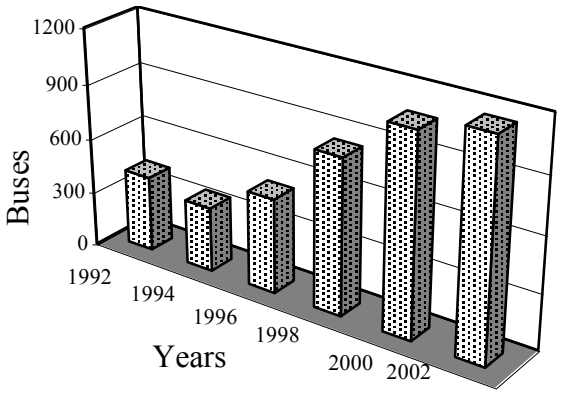


Figure 2. Number of buses on a routing network in Rostov-on-Don.

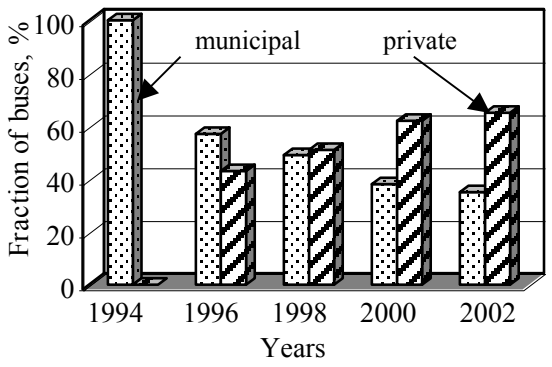


Figure 3. Distribution of buses on a pattern of ownership

*Competition and contestability*. All operators receive the right of entry on the market of transportations only as a result of competition. Now on competition each route on a urban network is exposed.

At realization of competition many factors estimating opportunity of the operator are considered. Into conditions of competition enters: a technical condition of buses, traffic safety, ecological safety, quality of transportations, opportunity to carry out transportations at tariff restrictions established by municipal authorities. The operators, who have gained competition, receive the right to conclude the contract on the municipal order on performance of transportations of the passengers on the appropriate routes. It is necessary to pointed, that the competition between the operators occurs only during competition, but on routes everyone work by uniform rules, the form of a competition is only level of quality of transportations.

*Control of fares*. There are following methods of fares policy. The concrete fare for transportation of the passengers for the municipal bus company is established. Only top border of the fare is established for the private bus companies. All these fares are accepted by municipal authority on the basis of accounts of the fares represented by the operators. Hence, the private transport companies have certain freedom at formation of the fares policy.

The evolution of methods of management of public transport in city of Rostov-on-Don can be presented on the basis of the analysis of the following major factors (table 1).

Table 1. Methods of management of public transport in Rostov-on-Don.

| The main changes in public transport policy 1992-2002 | 1992 | 2002 |
|---|---|---|
| Management system | Full planned system of transportations, technical and financial activity of the operators | Mixed planned/market management system of public transport |
| Regulation of entry on the market of transportations | The exclusive rights to the state transport companies. | Competition and competitive conditions of entry on the market to the operators of any pattern of ownership. |
| Fare system and control of fares | The uniform fare on the basis of a priority of social functions of urban passenger transport. | Fare system guided on accounts of the fares by the operators. More flexible approach to the control of the fares for the private bus companies. |
| Type of operating subsidies | The subsidies without dependence from results of transportations. | The subsidies for a covering of loss of the incomes from transportation of social categories of the passengers free-of-charge or under the reduced fares |

All these decisions have allowed to liquidate crisis of system of public transport in Rostov-on-Don.

## 3 INCREASE OF EFFICIENCY OF MUNICIPAL TRANSPORT

The elements of market strategy can not be realized to the full for such short term. The real social and political situation does not allow refusing municipal transport. In these conditions the decisions on more effective work of municipal public transport were developed.

At the first stage four municipal bus enterprises were incorporated in the municipal transport company. The reforming of structure of municipal transport has resulted in significant improvement of financial parameters of the company. The improvement of management has allowed to reduce number of the personnel to 1258 peoples at the same volumes of transportations. The optimization of material and financial flows has reduced expenses of the municipal transport company.

As a result of improvement of operational work of municipal transport the incomes on one bus for last three years have grown on 21.7 %. The cost value of transportations of the passengers in the municipal transport company "Rostovpassagirtrans" is lowest in Russia for cities with the population about 1 million inhabitants. On results of activity for 2001 profits of the company has made of 2.4 million roubles.

Annual volume of transportations by buses of the municipal transport company on urban routes is about 160 millions passengers. Municipal transport guarantees mobility to the socially unprotected categories of the population. From these 160 millions passengers approximately 58 % have the right to the free-of-charge or partially paid trips. In such form municipal transport became the important factor in system of urban public transport.

## 4 TRANSPORT PLANNING

The integrated decision of problems of transport planning consist in monitoring traffic flows and flows of the passengers, estimation of quality of operation of a road network, development of the projects of development of a network.

One of the main problems of urban passenger transportations is the definition of a configuration of a routing network. For the decision of this problem first of all it is necessary to investigate demand for transportations. The mathematical models of transport planning were used at the analysis of points of origin, destination, volumes of trips between various zones of city. The model is based also on such data as density of the population in various zones, allocation of objects of business activity, universities and shopping centers. The city was divided into 282 zones. During modeling the matrixes O-D and diagrams of distribution of volumes of transportations of the passengers on a network are constructed (Fig.4).

Figure 4. The diagram of distribution of volumes of transportations of the passengers on a network of city of Rostov-on-Don.

On the basis of transport planning the perspective urban routing network is designed. It has allowed to open 23 new bus routes, to reduce average trip time of the passenger and number of transfer to buses of other routes.

The high volume of traffic flow on an urban network complicates conditions of movement of buses. Now in the basic streets the traffic volume is about 6000 veh/hour (in both directions), the average speed at the CBD 20-24 km / hours, and on some sites is reduced till 6-12 km / hour. The relationships between stop time and trip time are given in a fig. 5.

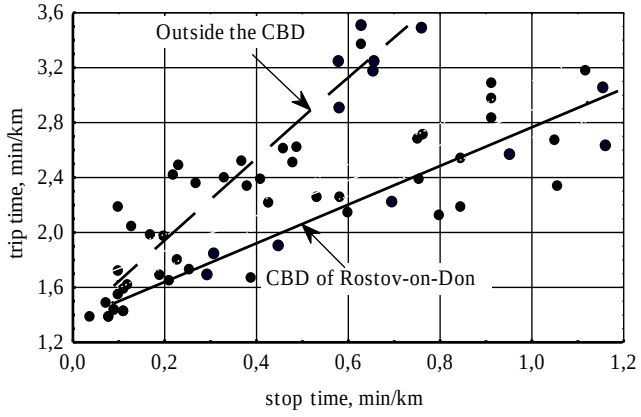


Figure 5. The relationships between stop time and trip time

Therefore the important problem in modern cities is the development of methods of an estimation quality operation of an urban network. The traffic management systems have many sources of information about the characteristics of traffic flows and condition of a network. The functional capabilities of new technology of control allow to change methods of monitoring of the characteristics of traffic flows and buses. In particular, in Rostov-on-Don there is a control Centre, which provides definition of a location of the bus in any point of a routing network of city.

For usage of these data at an estimation of quality of operation of an urban network it is necessary to decide following problems: to determine parameters of an estimation of traffic conditions; to establish duration of data acquisition for a statistically reliable estimation of conditions of traffic services in a network; to determine conditions, at which one there will be no difference between network and elective values of parameters; to investigate relations between these parameters and to determine boundary values for a prediction of traffic conditions.

For the solution of these problems the experimental researches and computer simulation were carried out. The specific character of urban traffic largely limits an opportunity of realization of experiments with the previously given characteristics of a road situation. In these conditions the mathematical modeling at the decision of road traffic problems is at present by a integral part investigation and also processes of traffic management. The microscopic simulation of movement of vehicles in a urban network provides the most reliable data.

For study of influencing of volume traffic flow, methods of traffic control, network topology the model experiments were conducted. It is relations between average fraction of vehicles stopped in network, trip time, stop time, velocity, concentration at different traffic situation. The movements, received at modeling, results have allowed to reveal some features of change of parameters of models.

These researches are a significant step towards to development of a transport infrastructure of city of Rostov-on-Don.

## 5 CONCLUSIONS

In a difficult economic and social situation the optimum transport policy has allowed to overcome the crisis effects and to ensure mobility of the population. The created control system of urban public transport has supplied cooperation with private sector. Up to 63 % the share of buses of the private companies on urban routes for last 10 years has grown. The further directions of development of transport system of city include the integrated transport planning, information service of the pas-

sengers, application of technologies of intelligent transport systems.