Formation of minimum social standards in the field of public transport services for the provinces of Syria

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Abstract. The problem of planning public transport in most Syrian cities is an essential problem since until now almost no one has addressed it. The reasons for this are the lack of adequate information about volumes of passenger traffic and the work of urban passenger transport, which affects on the quality of decisions made by the management of transport organizations, which, as a rule, choose either unsuitable systems for organizing urban passenger transport (UPT), or allow private operators to make their own decisions. Depending on the results of practical researches of passenger transportation in the province of Latakia, as well as after studying the social standards of different countries of the world, including the Russian Federation, authors have defined some parameters which that characterize the passenger experience before, during and after each trip. These materials have allowed to formulate recommendations in the field of public transport passenger service in the form of minimum social standards. These standards should become the basis for Improving public transport services for passengers not only in Latakia province, but also in Syria as a whole.

1. Introduction

1.1. Minimum social standards in the field of public transport services (MSSPTS)

The development of minimum social standards in the field of public transport has a very significant socio-economic importance because of the fact that the efficiency of social activities and various production sectors is greatly influenced by the level of transport services for the population, which in turn affects the economic situation of society [1].

The required transportation system should ensure, as far as possible, the mobility requirements of the population, and the budget allocated to activate this system should be directed towards improving the status of transportation system services in the community. According to this, the required transport system should:

- take into consideration all possible modes of transportation services (public, commercial, individual);
- apply the specified standards for the quality of the transportation service (safety, reliability, comfort, environmental protection and rational use of natural resources);
- be comfortable and accessible to all segments of the population.

The social norms taken in the field of transportation service for passengers are scientifically based on the quantitative and qualitative characteristics of the optimal state of the city environment, which depend on transportation and affect the working life of a person. [2].
1.2. The objectives of the development and use of minimum social standards in the field of public transport services (MSSPTS) are:

- Long-term planning for the development of the place, taking into account the planning of buildings and the economic and social characteristics of this place.
- Creating a new mechanism to finance the development of the passenger transport system, with the aim of increasing the efficiency of the use of budget funds and the operation of the passenger transport system.

2. Examples of social standards in the field of public transport services in different countries and regions

Social standard of transport services for the population in the implementation of passenger and baggage transportation by road and urban land electric transport was approved by the order of the Ministry of Transport of the Russian Federation of January 31, 2017 No. NA-19-R [3]. An analysis of the use of MSSPTS on the territory of the Russian Federation showed that the system of minimum social standards for transport has been developed and operates in the following regions: the Republic of Bashkortostan, Kabardino-Balkaria, Karelia, Tatarstan, Sakha – Yakutia, Krasnodar territory, Arkhangelsk, Astrakhan, Kirov, Sverdlovsk regions and others. Each region in the Russian Federation has approved this standard on its own territory. Examples are given for the Krasnodar territory and the Moscow region in table 1 [4], [5].

Table 1. Minimum social standards in the sphere of public transport services in the Moscow region and Krasnodar territory.

| Indicator                                                   | Moscow region | Krasnodar region |
|-------------------------------------------------------------|---------------|-----------------|
| Reliability level of public transport modes, %              | +             | +               |
| Comfort level of passenger transportation, people / m²^2    | +             | -               |
| Minimum number of trips public transport to sparsely populated towns and villages with the resident population, trip/day | +             | +               |
| Level of saturation of the region with bus fleet, units/1000 citizen | +             | -               |
| Level of saturation of the region with passenger seats, seats / 1000 citizen | +             | -               |
| Maximum allowable interval of urban transport, min         | +             | -               |
| Distance of localities from public transport lines, km     | +             | +               |
| Share of transport in environmental pollution, %           | -             | +               |
| Specific lost free time fund (for 1 person per week), h    | -             | +               |
| Road accident rate, units/100,000 trips                    | -             | +               |
| Annual mobility of the population with socio-cultural goals, % | -             | +               |
| Ratio costs between infrastructure and bus fleet, %        | -             | +               |
| Share of public transport in passenger movements, %        | -             | +               |
| Level of development of muscular modes of transport (such as bicycles) in urban and suburban communications, % | -             | +               |
| Effectiveness of financing of road economy                 | -             | +               |

Note. “+” – the indicator exists in the district; “-” – the indicator does not exist in the district.

In foreign countries, much attention has also been paid to the current state of public transport in cities and to ensuring the convenience of a passenger travel route that suits all sectors of society - both the poor and the rich. In many of them, including the countries of the European Union, Latin America and others, studies were carried out on this problem, specific recommendations were proposed to improve passenger service and ways to implement some of them [6, 7, 8, 9, 10].

3. Evaluation of the significance of standards by experts in the field of passenger transport.

Having studied the experience of foreign countries in improving the quality of passenger transport on public transport and taking into account the peculiarities of the Syrian provinces and the current state of passenger traffic in them [11,12,13], the following indicators were proposed, which are important in terms of improving the quality of passenger service and improving the efficiency of the passenger transport system.

The researchers used a questionnaire method in the studied area, and during the survey, experts (12 experts from Syria working as transport specialists at Tishreen University and institutions affiliated with the Syrian Ministry of Transport) were interviewed to evaluate 16 indicators in the field of public transportation services (PTS). In the evaluation process, a scale consisting of 5 values was adopted. One value is given for each of the 16 indicators, depending on the importance of the indicator, as shown in the following lines:

- The indicator is not meaningful to provide the minimum acceptable level of PTS;
- The indicator is of little significance to ensure the minimum acceptable level of PTS;
- The indicator is unambiguously recognized as significant for ensuring the minimum acceptable level of PTS;
- The indicator is significant for ensuring the minimum acceptable level of PTS;
- The indicator is extremely significant for ensuring the minimum acceptable level of PTS.

Table 2 shows the results of experts' assessment of indicators established as minimum social standards (MSS) in the field of public transport services.

| № | Indicator                                                                 | Evaluation frequency of assessments |
|---|---------------------------------------------------------------------------|-------------------------------------|
| 1 | Transport mobility of the population in accordance with socio-cultural activities | Frequency of assessments 1 2 2 4 3 |
| 2 | Level of integrated transport availability                                | Frequency of assessments 0 0 4 2 6 |
| 3 | Level of reliability of public transport                                 | Frequency of assessments 0 0 0 4 8 |
| 4 | The time spent for the movement of passengers                            | Frequency of assessments 0 0 1 3 9 |
| 5 | Ratio of equipment costs and infrastructure, %                          | Frequency of assessments 1 5 5 1 0 |
| 6 | Level of comfort of transportations of passengers, person/ m²2 (for city buses), the factor of filling microbus is no more 1. | Frequency of assessments 0 1 0 9 2 |
|   | - Temperature of air in a vehicle; – A level height of a floor of buses, mm |                                     |
| 7 | Efficiency of financing of a road facility                              | Frequency of assessments 0 2 5 4 1 |
| 8 | Level of saturation of the region with passenger seats, seats/1000 citizen | Frequency of assessments 2 3 2 4 1 |
| 9 | Level of saturation of the region with bus fleet, units/1000 inhabitants | Frequency of assessments 0 1 1 6 4 |
| 10| Minimum number of trips public transport to sparsely populated towns and villages with the resident population, trip /day | Frequency of assessments 0 2 3 4 3 |
| 11| Availability of schedules indicating working hours and frequency of public transport | Frequency of assessments 0 0 0 5 7 |
| 12| Availability of certain stops on the route                               | Frequency of assessments 0 1 1 7 3 |
| 13| Maximum allowable interval of movement:                                 | Frequency of assessments 0 1 1 5 5 |
| 14| Percentage of buses operating in the Dispatcher control system           | Frequency of assessments 0 2 2 6 2 |
| 15| Safety of movement:                                                    | Frequency of assessments 0 0 0 6 6 |
|   | - speed of bus fleet km/h,                                              |                                     |
|   | - Reliability of functioning of vehicles.                                |                                     |
| 16| Number of transfers in movements:                                       | Frequency of assessments 0 3 0 7 2 |
As a result of the questionnaire survey, it was found that 14 indicators were recommended as MSSPTS that received a good (4) and excellent (5) expert assessment (table 3).

| Indicator name                                                                 | Unit of measurement               |
|-------------------------------------------------------------------------------|-----------------------------------|
| Transport mobility of the population in accordance with socio-cultural activities | movement/year                     |
| Level of integrated transport availability                                    | travel time (hour)                |
| Level of reliability of public transport                                      | trip time (min)                   |
| Time spent for the movement of passengers                                      | min                               |
| Level of comfort of transportations of passengers                              | person/m²                        |
| Level of saturation of the region with passenger seats                         | seats/1000 citizen                |
| Level of saturation of the region with bus fleet                               | units/1000 inhabitants            |
| Minimum number of trips public transport to sparsely populated towns and villages with the resident population | trip/day                          |
| Availability of schedules indicating working hours and frequency of public transport | _                                |
| Availability of certain stops on the route                                     | stop / 1km                        |
| Maximum allowable interval of movement                                         | min                               |
| Percentage of buses operating in the Dispatcher control system                 | %                                 |
| Safety of movement                                                            | number of road accidents / year    |
| Number of transfers in movements                                               | change / movement                 |

4. Conclusion
The task of establishing minimum social standards for public passenger transport is a fundamental and priority task for improving public transport services, and many countries have paid great attention to it. Thus, our study is based on the establishment of minimum standards for passenger transport services in the Syrian Arab Republic. Further research will assess these indicators from the point of view of passengers traveling by public transport, then the adoption of standards in the field of passenger transport which are important to improve the process of mass passenger transport (based on the results of the matrix of indicators).

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