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Key Mistakes in Development of Transport Planning Documents

Kozelsky, Ivan Yu., *Russian Road Research Institute, Moscow, Russia*.*

Ivan Yu. KOZELSKY

ABSTRACT

Sustainable development of any of the systems is impossible without long-term planning. The mechanism for implementing long-term planning in terms of providing transportation services to the population is development of relevant transport planning documents, namely: programs for integrated development of transport infrastructure, integrated traffic management schemes, integrated schemes for organizing public transportation services for the population.

This article is devoted to the analysis of typical mistakes that can be made by developers of relevant documents. The objective of the article is to highlight key errors, to reduce their number, and to improve, accordingly, quality of the documents being developed.

In preparing the article, the author used the comparative analysis of transport planning documents developed and approved by the authorities of large and largest cities, as well as the requirements regarding their content established by regulatory documents.

The article, referring to Russian practices, provides a breakdown of transport planning documents by key mandatory sections. Typical mistakes in development of each of them are highlighted. The article ends with description of key areas capable to reduce risks in development and further approval of transport planning documents.

General approaches revealed in the research are to great extent of universal nature, so the results can be applied to development of other transport documents besides those mentioned in the article, as well as in other countries.

Keywords: transport planning documents, errors in development, program for integrated development of transport infrastructure, comprehensive traffic management scheme, comprehensive scheme for organizing public transportation services for the population.

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*Information about the author:
Kozelsky, Ivan Yu. – Deputy Head of the Unit of Methodological Support for Transport Planning of the Transport Planning Department of the Russian Road Research Institute (FAU ROSDORNII), Moscow, Russia, KozelskyIY@rosdornii.ru.

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For the original Russian text of the article please see p. 108.

Background.

Recently, domestic and foreign authors have published a significant amount of works on development of urban transport systems, particularly, in the field of transport planning (E. M. Lobanov [1], G. I. Klinkovshtein, M. B. Afanasyev [2], V. Vuchik [3], and others). These works emphasize the importance of a systematic approach in implementation of transport projects, that are implemented through transport planning documents. So, their developers should possess the ability to work with a large amount of information and versatile knowledge, both in the field of road design, traffic management and passenger transportation, and in certain areas of sociology and economics. At the same time, in the process of this work, errors inevitably arise that cast doubt on correctness of the work results. The article considers key mistakes made by the customers and contractors in development of transport planning documents, which entail a decrease in quality of the developed documentation.

In preparing the article, the author used the comparative analysis of transport planning documents developed and approved by the authorities of large and largest cities, as well as the requirements regarding their content established by regulatory documents in Russia, in particular by the Decree of the Government of the Russian Federation of December 25, 2020 No. 1440, Order of the Ministry of Transport of the Russian Federation of December 26, 2018 No. 480, guidelines for development of transport planning documents for the constituent entities of the Russian Federation.

The *objective* of the article is to collect and systematize typical mistakes made by developers when preparing transport planning documents. It is the knowledge of typical mistakes that improves quality of work performed and contributes to respect of the principles of sustainable development.

The materials were prepared using a comparative analysis of the current regulatory legal documents and the methodological base that determines the composition of the documents and of the documents themselves. At the same time, the content of the documents under consideration was analyzed regarding their compliance with the current regulatory and technical documents, the depth of elaboration, and the use of advanced domestic and foreign experience. The errors revealed during the analysis were collected and systematized according to certain normative legal and methodological documents of the work sections.

It is important to note that the documents taken into account for the article were developed by various legal entities; accordingly, it is incorrect to assert that each of the documents contains a complete list of errors indicated in the article. However, each of the errors reduces the quality of the developed documents and can also lead to a deterioration in traffic conditions. And, on the contrary, the possibility of identifying and eliminating the most typical errors reflected in the article will help reduce risks in development and approval, as well as achieve, referring to Russian practices, the goals of the national project in the field of safe and high-quality highways.

Results.

Within the framework of the article, the following transport planning documents are considered:

1. Program for comprehensive development of transport infrastructure (PCDTI).

2. Comprehensive traffic management scheme (CTMS).

3. Comprehensive scheme for organizing public transportation services for the population (CSOT).

It is important to note that the occurrence of errors in development of documents depends on both the customer and the contractor.

Errors depending on the customer:

1. Setting tight deadlines for development.

At present, the responsible authorities of the constituent entities participate in tenders for development of transport planning documents based on the requirements of the national Safe and high-quality highways project [4].

The summer of 2019 was identified by the national project as the deadline for development of most documents, nevertheless, the large amount of work required to conduct competitive procedures led to a significant reduction in time required for development of the documents themselves. In turn, tight deadlines are a significant reason for the decrease in quality of transport planning documents, which manifests itself in an insufficiently deep study of the available data and errors in performance of work.

2. Partial lack of initial information from behalf of the customer.

The incompleteness of the information provided may result from both the lack of monitoring of road conditions, and from insufficient attention to it. Nevertheless, the lack of official information significantly increases labour costs of the contractor and forces him to either ignore relevant parts of sections of documents or use information from open sources. Moreover, the information obtained in this way may be unreliable and data may be contradictory, which will inevitably lead to errors in performance of work.

For the convenience of assessing possible errors on the part of the contractor, it is proposed to highlight general sections in the documents. So, in transport planning documents named above, regardless of their specific purpose, the following general sections can be distinguished [5–7]:

- analysis of the current situation;
- conducting transport and sociological research;
- forecast of socio-economic development;
- development of a transport model;
- selection and justification of the design option;
- development of a list of relevant activities;
- an integrated cost estimate of the proposed activities;
- assessment of the socio-economic efficiency of the proposed measures.

When analyzing the current situation, the key task of the contractor is to collect and process initial information, including that obtained during surveys, and to formulate correct conclusions. At the same time, the contractor in most projects does not have an exhaustive amount of information. The reasons for this may be both a request for an incomplete list of data, and a partial lack of necessary information within the data provided by the customer. Nevertheless, the lack of the necessary list of initial data results in incorrect conclusions based on the results of the analysis, incomplete amount of necessary conclusions, partial absence of annexed materials in the text of the transport planning document, unnecessary consolidation and generalization.

At this stage, it is proposed to consider the most important initial data: socio-economic statistics of the territory under consideration, information on the route network of public passenger transport (including information on passenger traffic in the context of routes), information on organization of traffic (including information on arrangement of technical means of organizing road traffic), information on accidents, information on the events planned by the responsible executive authority.

The most common mistakes are: using incorrect data, which are subsequently used in the analysis and development of the transport model; development in the course of assessment of contradictory strategic planning documents; incorrect assessment of development of the system and of the vector of city development (planning documents should focus on it); the absence or incomplete accounting by the contractor of the road accidents (the reduction of which is a key focus area of the national Safe and High-Quality Highways project), analysis of performance characteristics using unreliable open sources; using the practices of analyzing the transport system without presenting a detailed justification of the methodology; lack of analysis of the budgetary capacity of the territory under consideration.

It is also important to note that the stage of analysis of existing conditions is the foundation on which further work is based, and so, the interaction of the contractor and

the customer is critically important at this phase.

For the stage of transport and sociological research, as components of the analysis of the current situation, the most important thing is to ensure a sufficient sample during the sociological survey, as well as to identify a sufficient number and correct location of survey points.

The key mistakes at this stage are associated with incorrect placement of survey points or their insufficient number; ignoring intersections in the peripheral parts of the territory under consideration; reduction of number of inspection periods or reduction in time in order to reduce the cost of related work; ignoring pedestrian and passenger flows; incorrect formulation of sociological research questions; incorrect conduct of the polls themselves (leading questions or intonation for certain answer options); lack of distribution by the contractor of potential respondents across the territory; insufficient number of questions; misinterpretation of the results of relevant studies.

It should be added particularly that often some of these errors are caused by an attempt to save money both by the customer when setting a low cost of a public contract, and by the contractor when trying to reduce costs when performing work.

However, it is important to note that transport and social studies are part of the background information needed to describe the status quo. Thus, the contractor must agree with the customer on research methods and quote in full their results in transport planning documents.

The forecast of socio-economic development should consider not only the population statistics, but also other statistics, which must be taken into account both in the transport model and in determining development of the territory, for example, the number of jobs, the number of university students, the number of the working-age population and the number of school students. The correctness of these indicators is fundamentally important when considering future development of the territory, as well as for subsequent assessment of effectiveness of measures.

The key mistakes when building a forecast are linked to incomplete accounting of strategic and territorial planning documents, ignoring information about promising investment projects. So, without analyzing the data provided, it is impossible to build a correct forecast of socio-economic development, which will in turn result in incorrect assessment of effectiveness of the proposed measures and thus is unacceptable in strategic planning of the transport system.

A multimodal transport model is one of the key tools in development of transport planning documents, and ensuring its quality is an essential condition for successful development of documents.

The most frequent mistakes in development of a transport model can be associated with incorrect study of the road network graph and traffic organization, errors in entering the route network of public passenger transport, errors in entering socio-economic statistics, errors in calibrating the transport model. It is important to note that errors in development of a transport model can be minimized if the customer provides a complete list of initial information.

It was also noted that in some cases, the transport model is not developed or is being developed in a software package that does not provide for the calculation according to the classical four-step model. At the same time, the customer, in the overwhelming majority of cases, does not have the necessary software package, and is not able to check the quality of the developed transport models, and what is sometimes being abused by the contractors.

The selection and justification of a design option is also a key sections of transport planning documents. A weak point of this section is the lack of fixed criteria in the regulatory documents that determine the requirements for design options. The lack of approved design options criteria results in the lack of a single approach to their development.

Currently, the most common approaches to development of design options comprise development of fundamentally different, not

related to each other, design options and development of cumulative options, i.e. development of the minimum, optimal and maximum options by adding enlisted activities.

Based on the results of these works, the contractors made the following key mistakes: lack of a description of design options, lack of justification for assembling options, justification of modelling results based on absolute indicators (for example, the volume of transport infrastructure commissioning), assessment and justification of design options without using a predictive transport model, development of activities following predefined scenario.

At the stage of developing activities (measures), the contractor must consider both the results of the analysis of existing traffic conditions and the measures planned by the customer.

Thus, the key mistakes at the stage of developing measures comprise mistakes in the analysis of the current situation, which entails an incorrect definition of the vector of development of the transport system and the identification of an incorrect list of necessary measures; proposal of inexpedient measures, proposal of measures, the implementation of which is impossible financially and physically.

At this stage, as well as at the stage of analyzing the current situation, interaction between the contractor and the customer is of extreme importance. It is necessary to completely understand that approval of transport planning documents imposes obligations on the customer to implement them, therefore, incorrect measures can lead to a deterioration in traffic conditions in the territory under consideration.

Since the approval of transport planning documents imposes expenditure obligations on the customer, the stage of assessing the cost of activities is also important as integral part of transport planning documents. Currently, the most common practices for assessing the cost of activities include assessment by the method of comparable prices and assessment of activities using standard price collections. It is important to note that mistakes made at the stage of assessing the cost of activities are in most cases assessed as critical neither by the contractor or, in the vast majority, by the customer.

Nevertheless, the key mistakes are overestimation or underestimation of the cost for the following reasons: the analogue project was chosen incorrectly, the cost of the analogue project is much lower due to the earlier implementation period, the lack of consideration of certain features of the analogue projects, the lack of inflation accounting when evaluating long-term measures.

Assessment of socio-economic efficiency is a reflection of all previously completed work. This section accumulates all the findings and the results of all the analyses carried out. The section for assessing socio-economic efficiency, as well as the section with the choice and justification of the design option, does not have clear assessment criteria, and therefore assessment is carried out using such methods as assessment of absolute indicators of transport infrastructure commissioning, assessment of net discounted income, assessment indicators, assessment of indicators of the transport model.

Critical mistakes in assessing socio-economic efficiency comprise non-use of the results of transport modelling, as well as artificial «inflating» of the modelling results or of the volume of capital costs to obtain a positive effect. Such errors are critical, since they initially reflect ineffectiveness of the proposed measures, while the contractors are silent about it.

It should be noted that the article contains a list of the most common mistakes made by contractors and customers when developing transport planning documents. The number of possible errors and «pitfalls» is much greater and is not limited to the above list, but depends on care and experience of the developer, while the tolerance of any of them results in inconsistency of the developed document.

At the same time, to reduce the risks of developing and approving low-quality transport planning documents, several key areas can be noted:

• more detailed checking and verification of documents at all stages of their development;

• increasing frequency of traffic monitoring [8], as a way of additional verification of the results and collecting information to be provided as the initial data;

• constant interaction between the customer and the contractor;

• in relation to CTMS, coordination of activities with the responsible authorities of the bordering territories at the final stage of work is needed [9];

• carrying out an independent examination of the work results;

• retraining or advanced training of employees [10];

• setting more stringent criteria for the tender procedure and refusal of the auction as a way to determine the contractor [11];

• real costing of the work, providing that the contractor will not be forced to reduce the quality of work to reduce costs.

Brief conclusions. In conclusion, it should be noted that development of high-quality transport planning documents is the basis for sustainable development of the transport system.

In Russia the quality of their development will be checked as one of the necessary aspects of achieving the objectives of the national Safe and high-quality highways project.

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