The Methodology for Economic Assessment of Planned Investment

J. Hudenko[1,2], I. Jurgelana Kaldava[2], A. Lapans[3], V. Ozoliņa[2]

[1]JSC LatRailNet, Latvia
[2]Riga Technical University, Latvia
[3]Vidzeme University of Applied Sciences, Latvia

Abstract

The paper presents the unified transport investment assessment methodology developed for Latvian transport policy planning, that consists of mapping which allow comprehensively review transport infrastructure and links to the national energy and climate plans as well as connectivity of regional and local communities.

The study consists of seven tasks: (1) Analysis of transport infrastructure and its influencing indicators; (2) System analysis of transport planning data; (3) Mapping of transport infrastructure and policy interventions; (4) Initial evaluation of transport policy interventions; (5) Methodology of economic evaluation of planned investments; (6) Evaluation of policy interventions scenarios; (7) Recommendations for future development of comprehensive transport planning.

The methodology was provided on the base of comparative advantage analysis – Analytic network process that allows assessment of transport investments in cases with many missing and incoherent data and IT assets deficiency.

Keywords: assessment of investments, TEN-T, transport investments.

1   Introduction

The paper presents the unified transport investment assessment methodology developed for Latvian transport policy planning, that consists of mapping which allow

comprehensively review transport infrastructure and links to the national energy and climate plans as well as connectivity of regional and local communities.

The methodology comprises investments in the TEN-T core network corridors and identifies the needs of multimodal or transhipment cargo and passenger terminals, which facilitate multimodal transportation. The methodology is a complementary support tool for the transport policy and investment strategy planning, that allows to evaluate and plan the impact of investments on transport flows, connected mobility solutions, climate plans and road safety nationwide. The main research problem solved in the study was unification of incoherent and missing data from many stakeholders: state roads (mainly TEN-T network, but also connections to the TEN-T infrastructure), railways (including perspective railway line – Rail Baltica); nods (including multimodal logistics platforms); air and sea land multimodal infrastructure).

The research is co-financed by the European Social Fund technical assistance project No.10.1.3.0/19/TP/003 "Technical assistance to the Ministry of Transport for the fulfilment of the investment preconditions of the 2021-2027 planning period of the European Union funds". It represents results of a study provided to Latvian Ministry of Transport [1].

2 Methods

The combination of methods was applied in the preparation phase: metadata and data analysis (analysis of the data of data holders and other sources) with the aim to obtain the historical and forecast future development horizon; forecasting (correlation and regression analysis); questionnaires – to obtain information about available data; focus interviews – survey of data holders on the main indicators for the project; data generalization – analysis of planning documents and other binding normative acts; interpretation – analysis of obtained data, deductive analysis.

There were three main crosscuts of data analysis: cargo and passenger transportation volumes versus relevant infrastructure; public and commercial transportation; and renewable resource transports/infrastructure versus non-renewable resource transports/infrastructure.

The methodology was provided on the base of comparative advantage analysis – Analytic network process.[2]

3 Results

The study consists of seven work tasks. The analysis of transport infrastructure and its influencing indicators were performed to determine and understand long-term trends was performed as the first step. The system analysis of transport planning data was made to collect the necessary data, develop metadata model and automated data download model on the second step. On the next step (mapping) the following data were processed and modified: historical and planned investments in TEN-T core

network corridors and its connections; transport infrastructure, including multimodal or transhipment cargo and passenger terminals; historical and modelled transport flows; evaluation of road traffic safety risks; financial resources, which are necessary for current and planned exploitation and maintenance. Following task was initial evaluation of transport policy interventions with two types of scenarios: base scenario with no interventions and top-down evaluation scenario, showed, how the KPI will change depending on the external factors changes. The next step was the development of the methodology of economic evaluation of planned investments that was amassed in a common Excel fail where process described in turn-by-turn manner:

- control list with the basic questions, which are necessary to coordinate investment projects with the planning documents;
- time frame for the process of project development;
- control list of involved persons functions;
- defining of measurements;
- KPI control list (additional measurements can be introduced);
- Balanced Scorecard (additional measurements can be introduced, and unnecessary ones can be excluded upon thorough evaluation) [3];
- forecasts and correlations of basic indicators;
- summary of measurements for further evaluation of projects;
- Super matrix of input/output data;
- data model results.
- The next step was practical application of the developed methodology for economic evaluation of planned investments in Latvia.

The last step was discussions and recommendations for future development of comprehensive transport planning.

The developed tool can be adjusted to the analysis of different scenarios by calibrating (estimating the values of coefficients) it according to the input data: new KPIs and Balanced Scorecard metrics; or by changing its elements, such as measurements and weights.

4   Conclusions and Contributions

The main contribution of the study is development of the assessment methodology of investments in transport for the systems with many missing and incoherent data and IT assets deficiency. The methodology allows further improvements of transport investments' influencing indicators.

References

[1]   Satiksmes Ministrija, "Pētījums par ieguldījumu priekšnosacījumu izpildi visaptverošas transporta plānošanas sistēmas ieviešanai, kas ietver ieguldījumu

kartēšanu un ieguldījumu novērtēšanas metodikas izstrādi", [online] http://petijumi.mk.gov.lv/node/3516, 2020.

[2] T. Saaty, "Theory and Applications of the Analytic Network Process", Pittsburgh: RWS Publications, 2005.

[3] R. Kaplan, D. Norton, "The Balanced Scorecard—Measures that Drive Performance", [online] https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2, 1992.