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## **THE RESEARCH INTO METHODOLOGY FOR EVALUATION OF TRANSPORT INFRASTRUCTURE INVESTMENTS**

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The major transport infrastructure investments using EU funds are planned in the national programs. The four programs are under implementation for period 2007-2013 in Lithuania. Seven tasks within the programming documents are related to the transport sector among other economics sectors. Analysis shows that the programs are insufficient for evaluation of the achievements. Moreover some baselines are still not indicated. But the main shortage is the concept of measurement criteria represented in the programs. Only output (product) and result indicators are taken into account. The theory of evaluation as well as European Guidelines strongly recommends including impact indicators.

Article deals with the main conceptual principles of programming and evaluation that need to be involved into programming documents.

**Keywords:** *evaluation, transport infrastructure, investments, input, output, result*

### **1. Introduction: The Need of Evaluation**

The important part of public policy is the decision-making for investments. Transport infrastructure is the sector, which attracts a lot of public funds. In consequence the main benefits of those investments should be used by society itself. The main questions are the following: where to invest and why to invest? The programming documents usually include both of answers. The political decisions are based on a lot of economical and social arguments. However the arguments need to be quantified and evaluated after the implementation. So there we need of some measurable indicators.

The use of indicators for monitoring and evaluation in the framework of Structural Funds became established practice in the mid 1990s. From this period a lot of actual guidelines [1-14] are prepared and successful used in Western Europe. Lithuania became an EU member in 2004. The tradition of using modern evaluation practice is still poor as in other EU new member states.

The objective of article is to analyse main transport infrastructure investments for 2007-2013, to find shortage comparing to the Western European practice and conceptualise suggestions for improvement criteria system for transport investment in Lithuania.

### **2. EU Funds for Transport Sector in Lithuania and Main Indicators**

The four programs have been adopted for EU funded projects' implementation in year 2007 in Lithuania. The programs are as follows:

- (1) Operational Programme for the Development of Human Resources for 2007-2013. Programme is dedicated to mobilization of all employable Lithuanian citizens, since investments to knowledge, competence, activity and enterprise of people of Lithuania ensures long term economical growth. 13.8% of EU structural funds are allocated to this program.
- (2) Operational Programme for the Economical Growth for 2007-2013. Here is estimated that the largest part of funds – 45.72%. Extremely important is that 10% will be allocated to scientific researches and technological development of competitiveness and growth of economy.
- (3) Operational Programme for Promotion of Cohesion for 2007-2013. The programme should embody a vision of more harmonious society. For improvement of environment and quality of residency, by minimizing differences between separate regions, it is allocated 39.08% of total funds from EU structural assistance for the period 2007-2013.

- (4) Technical assistance Operational Programme for 2007-2013. It's a special program for administration of thematic programs of actions. 1.4% of EU structural funds were allocated for this program.

Funding of transport projects are framed in the second programme – Operational programme for the Economical Growth for 2007-2013. The programme is divided into five priorities. Specific tasks are described in each priority. Three tasks in 4<sup>th</sup> priority and three tasks in 5<sup>th</sup> priority are related to transport. In the table below the main priority is showed.

**Table 1.** EU funded Transport investments for period 2007-2013

Type of indicators	Indicator	Measures for 2006	Expected measures for 2015
<b>Priority 4 Task 1</b>			
<b><i>Implementation of technical equipment for road safety</i></b>			
Result	Number of reduced black spots	247 <sup>1</sup>	25
Product	Number of implemented engineering equipment for road safety and environment protection	35 <sup>2</sup>	35
<b>Priority 4 Task 2</b>			
<b><i>Improvement of technical parameters of transport infrastructure at State and Regional level</i></b>			
Result	Time saved for goods carriage by rail using reconstructed lines (in mill ton-hours)	Data not available	4
Product	Number of kilometres of newly build and reconstructed roads	19711 <sup>3</sup>	850
	Number of kilometres of newly build and reconstructed railroads	671 <sup>4</sup>	50
<b>Priority 4 Task 3</b>			
<b><i>Development of regional waterborne infrastructure</i></b>			
Result	Annual number of served ships	Data not available	3000
Product	Number of build and reconstructed quays	Data not available	2
<b>Priority 5 Task 1</b>			
<b><i>Development of insufficient land transport connections with EU countries and third countries. Adaptation of TEN-T to the growth of traffic</i></b>			
Result	Increase in annual freight carriage in TEN-T (in mill tons)	110 <sup>5</sup>	133
Product	Number of kilometres of build and reconstructed TEN-T roads	16176	315
	Number of kilometres of build and reconstructed TEN-T railroads	1100 <sup>7</sup>	170
<b>Priority 5 Task 2</b>			
<b><i>Increasing of competitiveness and better utilisation of potential of Klaipeda Sea Port as the main transit node in the country</i></b>			
Result	Increase in freight transportation by Ro-Ro and Ro-PAX ships (in mill tons)	3 <sup>8</sup>	1,5
	Increase in passenger transportation by Ro-Ro and Ro-PAX ships (in thousands of passengers)	166 <sup>9</sup>	83
Product	Build and reconstructed quays (in metres)	17859	775
<b>Priority 5 Task 3</b>			
<b><i>Development of infrastructure capacities of international airports</i></b>			
Result	Additional number of served passengers (in mill tons)	1,44 <sup>10</sup>	1,16
Product	Number of implemented projects	5 <sup>11</sup>	6

Type of indicators	Indicator	Measures for 2006	Expected measures for 2015
Priority 5 Task 4 <b>Reducing of accidents and congestions in TEN-T</b>			
Result	Saving time (in mill vehicles hours)	Data not available	18,4
Product	Build and reconstructed roads (in kilometres)	4 <sup>12</sup>	24

<sup>1</sup> Length of Lithuanian State level roads and railroads (excluding TEN-T)

<sup>2</sup> Length of Lithuanian State level roads and railroads (excluding TEN-T)

<sup>3</sup> Year 2005

<sup>4</sup> Total length of road and railroad TEN-T in Lithuania

<sup>5</sup> Total length of road and railroad TEN-T in Lithuania

<sup>6</sup> Year 2005

<sup>7</sup> Year 2005

<sup>8</sup> Year 2005

<sup>9</sup> Year 2005

<sup>10</sup> Year 2005

<sup>11</sup> Lithuanian Single Programming Document 2004-2006 period

<sup>12</sup> Lithuanian Single Programming Document 2004-2006 period

The indicators are divided in two groups here: result and product. The measures for 2006 (or 2005) are presented. However 3 result indicators measures and 1 product indicator measure are totally missing for 2006. It is a fundamental question how these measures are planned for 2015 if it is no data available for current situation. The next one fundamental question is product indicators in the main programming documents. Product indicators are answering the question about implementation of planned projects physical dimensions but not about benefits for society. It means that the aim of the project is the project. It doesn't answer a lot of questions such as: what is the value-added of the project? Is the project cost efficient? Is the project coherent with the other projects? What the benefit is expected? What are negative impacts of the project? So further the main objectives for the planning of transport projects and evaluation of achievements are presented.

### 3. Towards Improving the Evaluation Methodology in Lithuania

Usually several indicators are taken into account in evaluations procedure. The simple Input-Output analysis as matter of Theory of Productivity however is not enough in our case. In parallel to inputs and outputs the results and impacts are need to be considered.

Input indicators mostly refer to the budget allocated to each level of the assistance. The main input indicators should be financial indicators. Financial indicators allow monitoring progress in terms of the costs and payments of the funds available in relation to its eligibility rules. Usually, eligibility of costs means, that all procurements and payments are done according EU and National Law. However it's not evaluating the efficiency prices for works and services. The evaluation of eligibility is superficial, because the procurements and payments may be issued according formal rules, however prices for the same amount of the same services may differ several time. Here the next indicator is very closely related. It is an output indicator. Output indicators relate to activity. They are measured in physical units (e.g., length of road constructed, number crossroad implemented, etc.). Output indicators usually may help to complete cost eligibility evaluation. The several methodologies allow evaluating the input-output relation. The method of comparable (with other similar cases) cost effectiveness analysis here is a method mostly used. The productivity theory, of Cost-Benefit Analysis, the comparable analysis as well as trade-off methods are used.

However the principles of evaluation of input-output analysis imply us to evaluate process of implementation, in terms of costs efficiency. The question still is not answered – what benefit produces the output.

Result indicators relate to the direct and immediate effect on direct beneficiaries brought about by a programme. They provide information on changes to, for example, the behaviour, capacity or performance of beneficiaries. Such indicators can be of physical ones (reduction in journey times, number of roads accidents, etc.). Such indicators can be monetary ones (decrease in transportation cost, etc.).

The last kind of indicators is Impact indicators, which refer to the consequences of the programme beyond the immediate effects. The transport investments impacts are consequence of transport policy. Actually, taking about transport policy impacts, there is needed to evaluate both positive and negative impacts.

Among positive impacts of transport policy usually are the following:

- Economic development;
- Employment – short-term (building phase);
- Employment – medium/long-term;
- Cohesion objectives – National level
- Cohesion objectives – EU level
- Urbanisation
- Network effects
- Effects on state finances
- Equity

The main negativisms are as follows:

- Air pollution;
- Green-House Gas emission;
- Congestion;
- Accidents;
- Vibration;
- Severance;
- Visual intrusion;
- Loss of important sites;
- Resource consumption;
- Landscape;
- Ground/water pollution.
- Inclusion of reliability,
- Reducing of service quality.

The quite important part is objective of indicators. The product (output) and result indicators are used in Lithuanian National programming documents for EU Structural fund for 2007-2013. In the figure below the concept suggested to be of the EU is summarised.

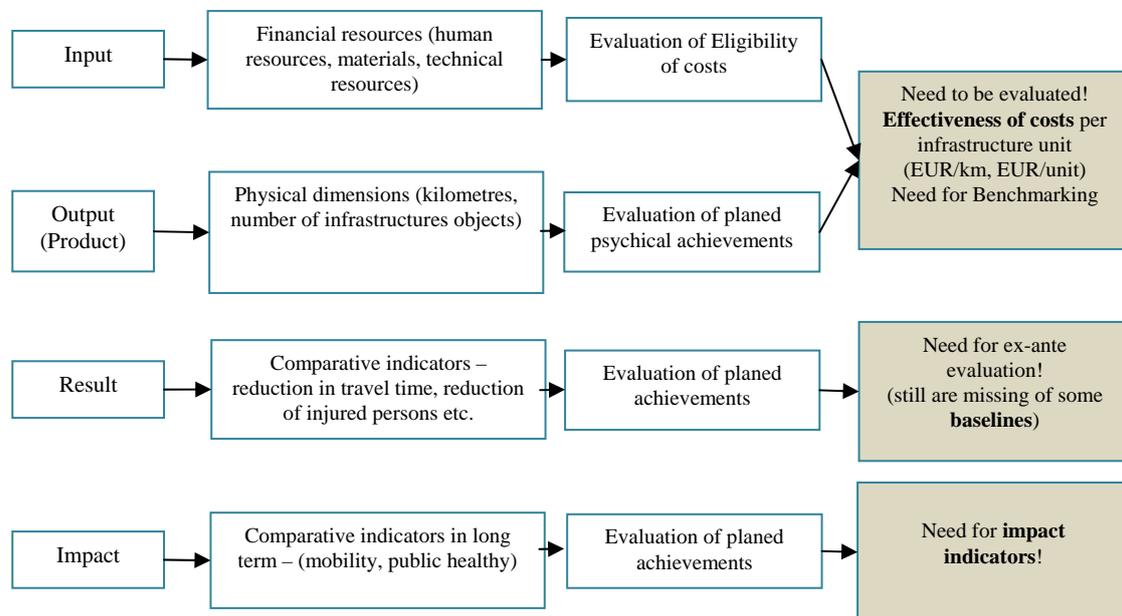


Fig. 1. Evaluation criteria matrix and needs for improvement in Lithuanian case

One of the most important overall objectives of the programming system for Structural Funds is to facilitate the transition from a primarily input-driven implementation system of socio-economic development to results-oriented system. The categories of output and result and impact indicators should

be an instrument for this purpose. This consideration explains the important role of ex ante quantification of programme objectives. Ex ante quantification is one of the most demanding exercises in establishing an indicator system. Indicators need the quantified targets otherwise the extent to which the original objectives are being met cannot be measured. Two first instruments can be used for the quantification of targets: the use of historic time series and the use of reference or benchmark values drawn from prior monitoring and evaluation exercises.

Impact indicators by their nature ask for more developed arrangements to obtain meaningful values than is possible for data that can be obtained from the monitoring system. An improvement in the economic situation, for example, might be due to factors external to the programme. Such result indicators are a necessary building block for a subsequent development of impact indicators. The difficulty is that impact indicators by their nature are often available only after a considerable time lag and they often need substantial methodological input in order to be valid. Output indicators, on the other hand, deliver only information about the physical, not the socio-economic, effects of an action.

#### **4. The Main Conclusions**

1. Effectiveness of cost indicators need to be involved into product (outcome) measures for transport investment projects in Lithuania.
2. Baselines of some result and product (output) indicators are missing in Lithuanian programming documents for EU Structural funds in period 2007-2013.
3. The impact indicators as concept are totally missing in Lithuanian programming documents for EU Structural funds in period 2007-2013.

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