THE ANALYSIS OF FACTORS INFLUENCING ON THE PROCESS OF PLANNING AND IMPLEMENTATION OF TRANSPORT INFRASTRUCTURE PROJECTS

Algirdas Griškevičius1, Aušrinė Griškevičiūtė-Gečienė2
1 Vilnius Gediminas Technical University, Department of Transport Management, Plytines 27, Vilnius LT-10105
E-mail: griskevicius.algirdas@gmail.com
2 Vilnius Gediminas Technical University, Department of Urban Engineering, Saulėtekio al.11, Vilnius LT-10223
E-mail: aushgri@yahoo.com

Abstract. During 2003–2008 years first fundamental transport infrastructure projects financial supported by the EU funds were being implemented in Lithuania. The study of the problematic situation of the implementation of following projects was accomplished in 2008. The results of analysis show that proceeding of project preparation and implementation has some particular obstructions and delays. The results of analysis of projects’ implementation confirmed that exist few important factors influencing on final economic result of projects’ implementation. Unforeseen risk was correlative with the delay of competitive procedures or financing incongruity to the seasonal periods, and increased cost of construction works. The economic calculations of the great part of the projects which have been finished during 2006 year were accomplished in 2004–2005. Exactly during this period the prices of fuel and material have been changing. Seeking to implement projects of the EU support the Ministry of Transport and Communications additionally budgeted the significant share of the total finance for road sector.

Keywords: transport infrastructure projects, external and internal factors, planning and financing procedures, the evaluation of constructions costs, unforeseen risk for projects, the EU financial support.

1. Introduction

Transport is an important part of economic and social infrastructure of the Republic of Lithuania having a direct effect on the economic growth of the State via local and foreign trade, tourism. Since Lithuania is transit State, roads and railways have to be attractive to international transport.

At present days large changes appear in the improvement and the development of transport sector comparing to 2000–2003. The State is responsible for the maintenance and the development of transport infrastructure, governmental programmes are prepared for its development. Transport and communication sector is sphere, where the Government sees the biggest potential to invest. For the period of 2008–2010 the Government intends to invest even 14 times more then to public order.

The substantiation of the State investment depends on the resources necessary for economic and social development and dedicated for investment of the State. The development of transport infrastructure enhances the prestige of the State and has directly influence on the implementation of the transport policy. Furthermore, the construction of infrastructure objects requires scientific and industrial capabilities of the State, increases the employment and the productive level of different sectors of the Economy [1–2, 9].

It is also necessary to corporate with member states of the EU, follow general legislation specified on development of transport in process of improving and developing Lithuanian transport sector. Thus Lithuanian role in Europe and international arena would be strengthened. Compatibility of the EU multimodal transport network and a part of Lithuanian transport network would be ensured first of all implementing regional and interregional projects [9].

The aim of this research is to analyse the factors influencing on the process of planning and implementation of transport infrastructure projects prepared for the financial support of the EU.

2. The EU position on the planning of transport investment projects

The EU regional policy is seeking to help regions having thin time adapt to changing economical and social circumstances. The important role falls to transport infrastructure — suitably functioning transport infrastructure network compensates uneven distribution of economic potential in different regions, enables trade to widen realization markets, and stimulates labour mobility and social cohesion.

The analysis of the process of implementation of the projects prepared for the EU financial support in 2004–2007 was accomplished during the period of
2007–2008. According to the results of analysis during the first programming period of 2004–2006 the European Commission validated 94 applications of Lithuanian transport infrastructure development projects for Structural funds – 21 national significance projects and 59 local significance projects from 44 local regions and municipalities, and 15 applications of national significance projects for Cohesion Fund. Total value of all projects was over 2 459,62 mill. LT, Structural funds committed over 498,01 mill. LT and Cohesion fund – over 1 194,39 mil. LT. National input consists of separate national development programmes funding. The finance of State Investment programme (2007–2009) for transport sector consisted of 486,68 thousand LT of national budget; 18,83 thousand LT of loan with state guarantee and 459,65 thousand LT of the EU support [3, 12, 15].

The analysis of the supported spheres shows that the structure of the EU financial support for the second programming period of 2007–2013 is planned quite similar to the structure of 2004–2006 period and is as follows:

- The installation of traffic safety means – the reconstruction of bridges, crossings and crossroads, the building of cities bypasses and missing junctions between TEN-T roads in cities areas; pedestrian and bicycles paths and other means and etc.;
- The installation of environmental protection means – the installation of acoustic walls, net fences, underground animal crossings, sewage cleaning systems, the changes of dwellings windows and etc.;
- The improvement of state and regional significance transport infrastructure – the asphalting of gravel roads, the reconstruction of pavement of state, region and local roads, the enlargement of connective lines of railways; the improvement of service quality of public passenger transport and etc.;
- The development of regional water transport infrastructure – the development of infrastructure for local and regional navigation, the improvement of capability of passenger servicing and etc.;
- The development of capability of international airports infrastructure [1–2, 7, 9].

The structure of planned financing of the EU funds is shown in Table 1.

<table>
<thead>
<tr>
<th>Priority directions</th>
<th>The EU financial support for period of 2007–2013, Euro</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economic Growth Action Programme: Transport networks</strong></td>
<td></td>
</tr>
<tr>
<td>Railways</td>
<td>22 942 119</td>
</tr>
<tr>
<td>Mobile railway actives</td>
<td>8 097 218</td>
</tr>
<tr>
<td>National significance roads</td>
<td>229 773 241</td>
</tr>
<tr>
<td>Regional (local) significance roads</td>
<td>49 592 529</td>
</tr>
<tr>
<td>Public transport</td>
<td>74 388 793</td>
</tr>
<tr>
<td>Ports</td>
<td>52 103 840</td>
</tr>
<tr>
<td>Inland waterways</td>
<td>5 808 874</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>442 706 615</strong></td>
</tr>
</tbody>
</table>

| **Economic Growth Action Programme: Transeuropean transport networks** | |
| Railways (TEN-T) | 535 359 806 |
| Highways (TEN-T) | 232 609 105 |
| National significance roads | 164 968 683 |
| Multimodal transport (TEN-T) | 63 616 796 |
| Air ports | 48 066 024 |
| Ports | 42 846 184 |
| **Total** | **1 087 466 598** |

| **Cohesion Promotion Action Programme: Environment and sustainable development** | |
| Stimulation of clean city transport | 40 652 957 |

The results of analysis show that the criteria of evaluation of investment projects can be grouped:

- Relevance – determine, if given problem corresponds to present social-economic problems and helps to seek the aims of the EU regional policy;
- Effectiveness – determine, if given problem can be express by quantitative indexes helping measure result and effect;
- Efficiency – determine, if suggested means of problem solutions are achieved by minimum inputs and the EU contribution helps to seek financial vitality of the project;
- Utility – determine, if suggested means of problem solutions are useful for publicity;
- Sustainability – determine, if suggested means of problem solutions are long-term [3–5, 7].

The effect of these criteria to procedures and final results is shown in correlation scheme (Figure 1). Evaluating the implementation of transport investment projects the EU support refers economic efficiency where main attention is paid to the valuation of effectiveness criteria. It is important that given problem would be express by quantitative indexes helping measure performance of transport systems and their outcomes (effect and results) which could be conditionally express by money terms. Exactly performance of transport systems and their outcomes have great influence on the evolution of public processes, health, working capacity, quality of lifestyle of residents, conditions of natural and anthropogenic environment [3, 8].
The effect of the EU support for State economy and transport sector can be difficult to evaluate without determination of direct and indirect influence of separate means. For this purpose special factors can be determined. Next chapter reviews few factors influencing on the implementation of concrete road sector investment projects which were finished in period of 2004–2005.

3. The factors influencing on the implementation of transport investment projects

The research of whole process of implementation of road sector investment projects was accomplished during the period of 2003–2008. The task of research was to determine both external and internal factors influencing on the transport planning and projects preparing processes. The results shows that problems have already appeared in 2006 implementing road transport projects coo-financed by the EU funds due to the procedures of preparation, evaluation, coordination and financing of these projects and changes in construction market.

More attention was paid to international road transport projects financed by the EU funds and Road Maintenance and Development Programme which were finished during 2006. Implementing these projects more then 219 mill. LT were realized from the EU funds means [6, 10].

The economic calculations of the great part of these projects were accomplished in 2004–2005. First problems appeared during this short period – the prices of fuel and materials have been changing. The construction cost had increased constantly till 2007 and their change grew over 10 % every year. The decrease of these changes was noticed only in 2008. Attention was paid to changes of separate types of expenditures: labour expentidures, machinery exploitation, building materials input and direct expenditures in the total construction cost. Insufficient situation in the labour market caused constant increase of the share of labour expenditures in the total construction cost. Expenditures of machinery exploitation increased more rapidly than labour payment. Probably it was stipulated by both the increase of labour payment and the increase of costs of energy resources, especially fuel. The share of building materials input reduced comparing with the increase of labour payment and the share of mechanical exploitation. The share of direct expenditures in the total construction costs of contractor part decreased. Therefore indirect expenditures, consisting of the extra charges and estimated profit, increased respectively.

The results of accomplished research and analysis of 2007–2008 determine that calculating prices of construction, reconstruction, repair, correction and maintenance works of automobile roads have increased on an average index of 1,14, the prices of material and products – 1,10, the labour payment – 1,23, the exploitation of machinery – 1,10 during this period (Table 2).

Table 2. The indexes of changes of calculating prices of road transport infrastructure (2007 03–2008 03)

<table>
<thead>
<tr>
<th>Construction works</th>
<th>Labor payment</th>
<th>Material</th>
<th>Machinery</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction works</td>
<td>1,23</td>
<td>1,13</td>
<td>1,11</td>
<td>1,15</td>
</tr>
<tr>
<td>Road structure</td>
<td>1,10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repair works</td>
<td>1,23</td>
<td>1,09</td>
<td>1,07</td>
<td>1,12</td>
</tr>
<tr>
<td>Pedestrian lanes</td>
<td>1,23</td>
<td>1,11</td>
<td>1,04</td>
<td>1,15</td>
</tr>
<tr>
<td>Average annual index</td>
<td>1,23</td>
<td>1,10</td>
<td>1,14</td>
<td>1,14</td>
</tr>
</tbody>
</table>

These changes had influence on economic indexes of the evaluation of the projects: the net present value would be even better if all calculations were accomplished in 2006. The internal rate of return of implemented projects was more than 24 %. Seeking to implement projects the Ministry of Transport and Communications additionally budgeted for road sector over 2 073 mill. LT. The estimate of Road Maintenance and Development Programme for governmental road projects was enlarged with 874.1 mill. LT: in July (2006) over 1 039,8 mill. LT (extra sum – 165,7 mill. LT) and in September – over 1 068,5 mill. LT (extra sum – 28,7 mill. LTL). [6, 10–11, 13–14]

The analysis confirmed that few important factors influencing on final economic result of the implementation of these projects exist:
1) the external macroeconomic factors:
   - the backwardness of development of social-economic indexes from business and common economic results;
   - the emigration of qualified labour force into better paid markets;
   - the growth of inflation and the increase of costs of materials and services;
   - the stabilization of growth tempo in construction sector and the decrease of activity;
   - the troubles of reckoning of materials supply and construction services and the stagnancy in real estate market.

2) the internal factors of organizers, estimators and contractors of projects:
• the infrastructure projects prepared for financial support of the EU were evaluated without probable risk;
• the duration of preparation and acceptance, financing and implementation of projects was too long;
• the complexity, the proceedings and the duration of procedures of preparation, evaluation, financing and construction of transport infrastructure investment projects didn’t correspond to the changes of realistic construction seasonal periods;
• the risk due to the increase of the prices of contract works was not sufficiently evaluated in prepared projects.

The research of process was based on road transport infrastructure project “The Development of I transport corridor “Via Baltica” in the years 2004–2005”. The Investment Projects was prepared in 2003. Whole process of the implementation of this Project was presented in the Investment Project. The EC committed application for assistance development of I transport corridor in December of 2004. Total value of this project consisted of more than 24,36 mill. Euro. The part of the EU financial support was about 20,76 mill. Euro. The project was divided into 2 phases, 3 competitions were organized, 2 work contracts and 1 technical supervision contract were signed. The works planned in the Technical Projects were compared with works determined in the Investment Projects and the Purchase documents. All the works foreseen in the Technical Projects were included into the Purchase documents. Unforeseen works were determined during the reconstruction process. These extra works required about 456,75 thousand LT (about 1% of total price). The duration since the beginning of the Investment Project till the finishing of works – 2 years (2004–2006). The Purchase documents were prepared during 2004. The period since the preparation of the Application till the decision of the European Commission extended up to 12 months. Economic price of reconstruction works foreseen in the Investment Project was 17,26 mill. Euro. During implementation economic price increased about 20% – to 20,76 mill. Euro. Other economic indexes of implementation also changed after finishing of works: net present value was 56% lesser, rate of return was 30% lesser then planned values. [10–11, 13]. This confirmed the influence of definite factors on the implementation processes of investment projects and their construction costs.

4. Conclusions

1. The EU Structural and Cohesion Funds are main financial support means for the transport sectors’ projects. These means are seeking to help regions having thin time adapt to changing economical and social circumstances. The EU initiates these transport projects which are financed by the government and correspond to common policy of the EU.

2. Transport sectors investment projects usually consists of justification from safety, technical, social-economic, financial, environmental, special planning and other aspects. The aim of evaluation of investment projects is to determine economic benefit both to transport sector and publicity, and partly more optimal, qualitative and effective use financial support of the EU.

3. The effect of the EU support for State economy and transport sector can be difficult to evaluate without determination of direct and indirect influence of separate means. For this purpose special factors can be determined.

4. During latter years the increase of construction costs of transport infrastructure have become heavy interruption in the process of new investment planning and also have required the additional means for the finishing of formerly started constructions. During the period of 2003–2007 construction costs have increased constantly and their change grew every year. The decrease of these changes was noticed only in 2008.

5. The analysis confirmed that few important factors influencing on final economic result of the implementation of these projects exist: 1) the external macroeconomic factors: the backwardness of development of social-economic indexes from business and common economic results; the emigration of qualified labour force; the growth of inflation and the increase of costs of materials and services; the stabilization of growth tempo in construction sector and the decrease of activity; the troubles of reckoning of materials supply and construction services and the stagnancy in real estate market. 2) the internal factors of organizers, estimators and contractors of projects: the infrastructure projects prepared for financial support of the EU were evaluated without probable risk; the duration of preparation and acceptance, financing and implementation of projects was too long; the complexity, the proceedings and the duration of procedures of preparation, evaluation, financing and construction of transport infrastructure investment projects didn’t correspond to the changes of realistic construction seasonal periods; the risk due to the increase of the prices of contract works was not sufficiently evaluated in prepared projects.

6. Transport infrastructure Feasibility Studies (Investment projects) do not present precise works and their volumes. The cost of works determined in Feasibility Study (Investment project) can only be used for the approximately planning of means, preparation of the Application for the financing support of the EU. Any later covering of increased costs falls to the financed share of the Republic of Lithuania.

7. The amount of the EU financing share of I Transport Corridor (Via Baltica) Project was not
changed after the decision on the project availability for financing of the Cohesion fund, therefore increased costs of project implementation were covered by the Republic of Lithuania.

8. The main cause of increased costs can be considered changed indicators of project and enlarged amounts of works after preparation of Technical Projects and also changes of work costs per long years. According the official price catalogue these prices increased about 10% every year.

9. Planning new projects for the financial support of the EU, the mechanism of the evaluation of prices change should be described in the work implementation contract – it is necessary to index prices (during fixed and concerned period of time), as the implementation of transport project isn’t possible during short time – it takes few years till contract signing. Also construction works can be performed during few years.

References