ENVIRONMENTAL ENGINEERING

The 8th International Conference
May 19–20, 2011, Vilnius, Lithuania
Selected papers

ISSN 2029-7106 print / ISSN 2029-7092 online
ISBN 978-9955-28-829-9 (3 Volume)
ISBN 978-9955-28-827-5 (3 Volumes)
http://enviro.vgtu.lt

THE EX-POST ASSESSMENT OF TRANSPORT INFRASTRUCTURE INVESTMENT PROJECTS

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Abstract. The assessment of transport investment projects is a very difficult process using different methods involving various aspects to determine economic benefit for transport sector and the society. The implementation of projects to optimally, qualitatively and effectively use financial support of the EU is a very important issue. The support refers to economic utility evaluating the efficiency of projects. Due to the necessary determination of direct and indirect influence of separate factors it is very difficult to evaluate the financial impact on national economy and transport sector. For this purpose the indicators providing a numeric expression of the determined development goals have to be chosen. In other words, due to efficiency indicators the progress comparing basic situation with achievement of formed goals has to be assessed. There is a problem whether expressions of indicators forecasted during the preparation of projects are achieved after the implementation of projects. For this reason project monitoring is carried out. The present practice shows that project monitoring composed of technical-economic monitoring and ex-post assessment (final evaluation) is a basic mean to determine and compare changes of indicators and forecasts after the implementation of projects.
The goal of this article is to analyze the process of ex-post assessment of projects including general practice of project monitoring, the comparison of changes of key factors and aspects, and the determination of basic impacts and possible long-term effects of the projects.

Keywords: transport infrastructure, cost-benefit analysis, post-opening assessment, ex–post social-economic evaluation, project monitoring.

1. Introduction

Since transportation is a very important factor for the stimulation of social-economic development of separate regions, it is very important to properly define and assess the influence of various direct and indirect impacts on implementation of transport infrastructure projects. Method of cost-benefit analysis (further – CBA) defining economic approach of transport infrastructure is often used for the assessment of transport investment.

Traditionally the CBA focuses on economic efficiency, therefore often public (also private) interests are not answered and social-economic benefit is not received. Current practice of both foreign countries and Lithuania shows that still there is a lack of investment for the transport sector in order to determine and maximize the benefit to society. This requires detailed evaluation of various effects/ impacts of transport infrastructure projects (*Guide to Cost-benefit Analysis ….* 2008)

Due to the necessary determination of direct and indirect influence of separate factors it is very difficult to evaluate financial impact on national economy and transport sector. For this purpose the indicators providing a numeric expression of the determined development goals have to be chosen. In other words, due to the efficiency indicators the progress comparing basic situation with achievement of formed goals has to be assessed. There is a problem whether expressions of indicators forecasted during the preparation of projects are achieved after the implementation of projects. For this reason project monitoring is carried out. Present practice shows that project monitoring composed of technical-economic monitoring and ex-post (final) evaluation is a basic mean to determine and compare changes of indicators and forecasts after the implementation of projects (Griskevičius *et al.* 2004, *Developing Harmonized European Approaches* 2005)

There is also a problem concerning correspondence to the requirements of basic regulations of spatial planning in order to prepare separate stages of transport infrastructure development projects. Often basic objective of impact assessment on solutions is ignored guiding principal of one-day benefit. Therefore it is widely debated to improve the system of planning, consultation

and development in the sphere of new forming solutions of spatial development in the country. However more progressive and developed countries also experience these problems. Although they have more practice, but similarly form planning objects to strengthen transport sector. (Burinskiene e*t al*. 2006, Juskevicius e*t al.* 2006*)*

Optimal effects can be expected only adequately motivating basic solutions. According to the Governments it is authorized to interpret assessing impacts of projects solutions. Since there is no basic definite methodology the effects of interpretations are experienced in various social-economic, engineer-technical and natural environments inseparable from each other and having additional and continuing connections. Therefore problem occurred in one sphere (environment) can cause more negative short-term or long-term effects. (Rudzkiene *rt al.* 2007, Newman *at al.* 2004).

The aim of this article – is to analyze the process of ex-post assessment of projects including general practice of project monitoring, the comparison of changes of key factors and aspects, and the determination of basic impacts and possible long-term effects of the projects.

2. Key Aspects of Ex-ante Assessment of Transport Infrastructure Projects

The assessment of investment projects is systematic and objective determination of relevance, efficiency, utility and sustainability of separate planned, being implemented and completely implemented project. The assessment has few separate phases according to the decision making stage of project.

Ex-post assessment or in other words – final evaluation is carried out after the complete implementation of the project during the period of economic-technical monitoring. The main purpose is to determine whether the planned results and benefit are received and what a possible long-term effect of project is. The final assessment should include the use of resources, financial effectiveness and main impacts. Factors influencing on successful or unsuccessful implementation of the project, achievement of results must also be included in the final evaluation. In order to assess whether initial results are achieved actual effect of project implementation, influence on regional policy, Trans-European networks and general transport policy, influence of used means on environment have to be assessed as well. Ex-post assessment is planned, organized and carried out according to the basic principals – proportionality, independence, partnership and transparency. As ex-post assessment often is carried out after the complete implementation of project it can also be called post-opening evaluation. (*Guide to Automobile Road…* 2006; *Impact of Transport Infrastructure…* 2002).

The accomplished analysis of assessment procedures in foreign countries shows that ex-post assessment is widely used in order to determine influence of transport infrastructure investment on regional development tendencies. However, during the last few decades results of ex-ante and ex-post assessments started to be compared to supervise and intervene into changes of regional development due to the changes of transport infrastructure.

Ex-post assessments often are performed few years after the complete implementation of projects determining first forecasts of projects element variations according to project life-circle. For example, in Great Britain, Netherlands, Austria ex-post assessments often are carried out 5 years after the complete implementation, in France and Norway – 3 years and etc. If necessary, ex-post assessment can be performed longer – 10-20 years (Geurs *et al.* 2003*,* Kjerkreit *et al.* 2008) after the complete implementation of projects.

Every country uses different procedures for the ex-post assessment due to various distinctive features of transport infrastructure, size of country or region, social-economic sphere and etc. One of these features – complicated determination of project impact on development of separate region. This problem is relevant to the projects implemented in the territory of two or more countries having the same infrastructure in different parameters (length, width, location etc.). The other difference is the complicated determination of separate transport mode infrastructure effects. Ex-post assessments are often performed only for determination of one transport mode (usually road or railway) effects avoiding the evaluation of multimodal and intermodal transport projects. One more difference is a lack of relevant and reliable information. Corresponding data defines methods used to evaluate effects therefore it is complicated to combine them and the evaluation results concentrate various types of data: quantitative forms as monetary value, trading units or emissions etc.; also quantitative forms as culture, accessibility, convenience etc. It is important to give values of these effects in comprehensible and accessible way using databases for better and easier creation of evaluation criteria systems. (Rus 2006; *Impact of Transport Infrastructure…* 2002).

Detailed ex-post assessment is performed in the level of transport infrastructure investment projects analysing received benefit or damage. Quite often CBA method is used to determine the benefit/ damage for local users, rarely – for bigger audience of regional level. CBA concentrates on determination of direct effects having monetary values such as the reduction of travel time value, vehicle operating or infrastructure maintenance costs without determination of more wide scope of social-economic indirect effects as opportunities of road and street networks connection, installation of intermodal junctions or increase of business effectiveness, decrease of negative transport impact on environment etc. (*Guide to Cost-Benefit Analysis…. 2008).* Table 1 shows summerized criteria groups used in the ex-post assessment of various transport infrastructure objects of foreign countries.

Table 1. Summarized criteria of ex-post assessment on transport infrastructure projects used in foreign countries

Object / Criteria	Cities bypasses	Motorways, highways (major projects)	Streets-Road networks connections	Bridges, viaducts
Direct Impacts				
Travel Time Savings	-	+	+	+
Vehicle Operating Cost	+	+	+	+
Safety	+	-	+	-
Induced travel	-	+	+	+
Service Quality	-	-	+	+/-
Environmental Impacts				
Noise	+	+/-	+	+/-
Emissions	+	+/-	+	+/-
Nature and landscape	+/-	-	+/-	+/-
Natural resources	-	-	+/-	+/-
Economic Indicators				
Investment costs	+	+	+	+
User benefits	+	+	+	+
Indirect Social Economic Impacts				
Land Use	+/-	+/-	-	-
Modal shift	-	-	-	+/-
Employment	+	+	+	+
Social Inclusion	-	-	+/-	-
Reliability	-	-	+/-	+/-
Accessibility	-	+	+	+
Efficiency and Output	-	+/-	-	-

Data presented in Table 1 confirm that ex-post assessment uses only these criteria that help to compare project results before and after the implementation. And these criteria often have monetary values. Direct impacts are determined evaluating changes in transport volumes including attracted transport flows and changes in flow structure. Safety criterion is important to urban transport infrastructure projects evaluating increase of pedestrian and bicyclist safety due to decrease in transport volumes. In road transport projects safety criterion can be combined with changes in infrastructure maintenance and repair. Economic evaluation includes comparison of investment and construction costs, basic economic indexes as project payback time, net present value (further – NPV), internal rate of return (further – IRR). Financial analysis is mostly used for major or commercial project receiving financial profit (public transport fees, road taxation etc.). Monitoring of environmental impacts is also performed. This type of monitoring mostly includes the qualitative evaluation of noise and air pollution indicators without the determination of variation trends. Accessibility and employment are mostly common evaluated indirect social-economic impacts. Social inclusion, service level and quality, territorial distribution, reliability and other indirect impacts helping to analyse support measures for separate regions in order to increase benefit of transport infrastructure and decrease negative effects are rarely included in basic project substantiations (cases of separate countries).

3. Current Practice of Ex-Post Evaluation of Transport Infrastructure in Lithuania

Ex-post assessment of transport development projects is not systemic process in Lithuania as it is in other countries. Therefore, it is a lack of qualitative information about investigations and analysis and analyzed indicators having influence on the scope of decision-making. Lithuanian experience shows that transport projects are mostly assessed in order to determine the realized profit (project efficiency) and receive financial support despite of basic objective of ex-post assessment – to determine the project contribution to regional development and direction of transport sector policy planning. It is quite difficult to determine this contribution since no common system of project assessment and relevant financing of transport infrastructure is framed. Therefore preparation and assessment of transport development projects are guided by the EU experience.

During the period of first decade after the Independence and after the beginning of Lithuanian membership, the EU tended and continues to finance transport infrastructure projects supported by the Government and which correspond to general regional policy of the EU – to reduce regional disparities and help regions having thin time adapt to changing economical and social circumstances. The important role is assigned 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.

During these periods the biggest attention was focused mostly on major projects of transport infrastructure such as the implementation of projects on the Development of IA Transport Corridor for 2001-2004; the Development of IXD Transport Corridor for 2004-2006; the Development of IXB Transport Corridor for 2001-2004, the Development of I Transport Corridor (Via Baltica), the Development of Vilnius or Klaipeda cities Bypasses and etc. The analysis of the achieved results were based on technical, economic and environmental monitoring performed often for 3-5 (or 6) years after the complete implementation of these projects.

The EU support was and still is based on principle of economic efficiency which mostly focuses on the assessment of efficiency criteria. In order to assess the efficiency it is important to frame problem in quantitative indicators allowing measuring performance and effects of transport systems and separate elements. Effects can be framed in monetary values as precisely the performance of transport systems and effects have the largest influence

on development of social processes, state of inhabitant health, employment, life quality, natural and anthropogenic environment.

Considering these aspects, the basics elements of ex-post assessment of the projects can be indentified:

- assessment of clearly determined physical indexes according to categories of main construction works and etc.;
- assessment of achieved results (functioning indexes) according to social-economic, financial forecasts; appliance of environmental means etc.

General practice of project assessment on Lithuanian transport sector shows that these basic performance indexes as effects of travel time consumption and transport vehicles mileage, traffic accidents, vehicle noise and air pollution (emissions), psychological discomfort due to territorial separation for communication corridors (barrier effect); territorial and spatial demand for traffic and those efficiency (price) indexes as costs of technical infrastructure maintenance or special equipment for traffic safety are mainly used.

Comparing projects assessment on urban and road (suburban) transport infrastructure no significant differences can be found in choice of assessment methods or techniques. Substantial differences appear identifying and determining projects objects (technical infrastructure, transport users (modes), travel demand and supply, and etc.) and necessary space. Therefore same methods are used to assess economic-financial indicators.

Principal aspects of project ex-post assessment on transport infrastructure are further presented by the example of project assessment on Vilnius city transport infrastructure.

The growth of automobilization level, increase of transit transport and changing lifestyle had influence on increase of traffic intensity and caused considerable traffic flows in the street network of Vilnius City as during the last decade traffic flows increased approx. 2,4 times. Results of traffic speed analysis performed in 2005 by Public Enterprise "Vilnius plan" confirmed that main reasons for traffic jams in the street network of Vilnius City are insufficient geometry of technical infrastructure and inapplicable traffic control system. Dated traffic light control system operating for a quite long period, inapplicable transport flow coordination, and insufficiently flexible traffic regulation caused difficult traffic conditions in the main streets and especially near main street junctions. Therefore, basic transport flows are forced to move to main streets meeting massive travel time and vehicle operating losses due to rush hours traffic jams.

In order to implement Vilnius City Development Strategy and the means of the General Plan, to solve basic transport problems in 2008 Vilnius City Municipality initiated the implementation of two projects – I stage of Trans-European Network Corridor Link – Vilnius City Western Bypass (*Transeuropean corridor link*...2008) and construction and implementation stages of Automated Traffic-Light Control and Traffic Coordination System in Vilnius *(The implementation of automated traffic-light…2005).*

Project "Automated Traffic-Light Control and Traffic Management System" directly concerned with Vilnius City Development Strategy offered to start the modernization of transport traffic control and management system with central city area meeting difficult traffic situation. In these areas 5 transport corridors with major cross-links between them are attempted to be form: No. 1 Airport-City Centre; No. 2 Centre-Žirmūnai; No.3 Centre-Antakalnis; No.4 Naujamiestis-Paneriai; No.5 Station-Centre.

This project suggested changing old-style equipment included in about 42 percent of total traffic light posts into new-type applicable to operate and integrated into solid automated control system controlled from one centre. Since modern traffic control and traffic management based on coordination of transport flows in individual traffic lanes, effect of capacity improvement can be reached in intersections of the main streets and their access if the traffic lights in the main streets are capable to operate on "green wave" principle. This principle reduces real traffic conditions to possibilities of continuous traffic indicating relevant traffic speed for "green wave".

In order to implement whole traffic-light control and management system (total budget 102 mill.LT) new and modernized traffic-light posts (2700) were planned to be implemented. All functional traffic light controllers had to be combined into a single control panel. Centralized control system consisted of a traffic management centre, transport sensors, traffic-light controllers, traffic-light posts, public transport priority systems, driver information scoreboard system, traffic monitoring, information system, and speed measurement system. The basic functions of traffic management centre: to ensure traffic regulation according to existing traffic situation, to select most appropriate traffic control plans according to individual situations and to coordinate the operation of traffic lights.

The investment project on Vilnius City Western Bypass was prepared within a framework of economic-financial assessment: technical solutions of I stage were analyzed and substantiated, transport flows in connected street network were investigated, traffic jams of morning and evening peak hours were defined on the routes, travel time value was determined. New traffic model was composed and transport flows were calculated on new route, new transport forecast was compiled according to the indicators of automobilization increase level, variations of transport mobility demand and also growth of transport congestion in international transport corridors. The speed indicators were analyzed in reliance to traffic intensity changes on separate road sections.

The results of the implementation of I stage are as follows:

- a three-level intersection with two trestles above the Oslo street, entries and exits of intersections constructed, sections of connected streets (Erfurto, Gudelių, Šiltnamių, Lazdynėlių) arranged;

- a new street of A1category 6-lanes and 0,5 km long beginning from the end of tunnel to L. Asanavičiūtė street together with lighting and rain sewage systems built;

- new environmental measures installed: a tunnel of 150 m long near Gudeliai constructed, 655 windows with sound-insulating glass packages changed in 8 flat blocs.

Due to a lack of funding and problems of decision coordination both projects were not completed at the end of 2009. In order to determine the importance of these projects to the city and mutual impact on each other, withal to solve the ever increasing transport problems a comparative analysis of these projects was carried out in the same year (*Griškevičius et al.* 2009). Ex-post assessment was performed to assess the efficiency of automated traffic lights and traffic control system (further – the System). Assumptions to ensure relevant ex-post assessment were formulated as follows:

- ✓ the state of the System was assessed in the end of 2009;
- ✓ factual indicators obtained of the monitoring test results carried out during installation process of the System;
- ✓ factual indicators were compared with the planned indicators of investment project prepared in the year 2005;
- ✓ additionally indicators were evaluated after projected traffic situation of Vilnius City Western Bypass Project;
- ✓ assessment was performed considering that the System is not fully installed and requirements raised in the investment project were not achieved;
- ✓ assessment was performed considering that public transport priority system planned in the investment project had been not yet implemented, therefore factual results did not show general efficiency of the System;
- ✓ assessment was performed considering the changes in social-economic environments; the pessimistic scenario was applied for economic analysis.

Ex-post assessment was carried out using economic evaluation method seeking to specify and to determinate benefits/damage of investment projects. Those stages of ex-post assessment were presented:

- identification and comparison of basic problems of the projects;
- identification and comparison of basic objectives and tasks of the projects;
- definition and comparison of project subjects
- identification and comparison of projects users and beneficiaries;
- comparisons of results of technical analysis of traffic flows;
- identification of components of economic-financial analysis and comparison of their values.

General problems of Vilnius transport infrastructure identified in both projects are as follows: bigger attention was focused to the identification of traffic jams and car parking disturbances, insufficient street network and bad traffic conditions in many parts of the city, increase of automobilization level and etc. Transport situation improvement was forecasted in the initial stage of project assessment (investment project stage). It was forecasted that the System would reduce accident rate approx. 13 percent and traffic jams in the streets, travel time, environmental pollution, noise, fuel consumptions also would decrease, the System would trace traffic offenders, public transport route times would be optimized. Meanwhile Western Bypass project forecasted that traffic intensity in the Bypass section between Oslo and L.Asanavičūtė streets would achieve approx. 53 thousand cars in a day in 2030 if both stages of Vilnius Western Bypass project would be completely implemented. This number would consist of transit transport and generated transport flows attracted from adjacent street network, where traffic intensity would be reduced approx. 18 percent Therefore, traffic jams, noise and air pollution would be reduced. The accident rate would be reduced approx. 9 percent due to the improvement of traffic conditions and appropriate traffic control means.

Systematized results of transport analysis accomplished in 2005 and 2008 indicated variations in transport traffic intensity and transport flows structure, changes in speed rates of selected street corridors, also increase of noise and air pollution in selected areas of the city. These transport indicators were used in economic analysis determining values of benefit and cost components.

Summarized results of transport analysis (2005) shows, that during morning rush hour minimal hourly speed rates in analyzed street corridors were approx. 4-8 km/h.; maximum speed rates - 26,4-27,4 km/h. During evening rush hour, minimum hourly speed rates achieved approx. 13, 5 km/h. Maximum rate of traffic intensity (6746 car/h to both directions) was stated in section of Geležinis Vilkas street from Geležinis Vilkas Bridge to Ukmerge street. More than 80 percent of all vehicles passing mentioned street corridors consisted of cars. Public transport created approx. 0,5 percent of total transport flows. The results of transport monitoring in 2008 shows positive variations on selected street corridors (table 2).

Table 2. Changes in transport speed on selected street corridors*

Analysed street corridor	**Average transport speed (morning and evening rush-hours) , km/h.**			
	Before	**Planned in 2005**	**After (tentative)**	**Variation**
No. 1	13,65	17,06	19,11	+3,41
No. 2	23,85	27,67	27,67	+3,82
No. 3	27,35	31,73	32,82	+4,38
No. 4	22,90	25,19	27,48	+2,29
No. 5	17,55	20,18	21,94	+2,63

* Source: *The Implementation of Automated Traffic Light….2008*

Table 2 shows that primary results of recent analysis are higher than planned in the investment projects. This indicates the positive impact of implementing System on reduction of traffic jams and improvement of traffic

conditions. Unfortunately detailed transport monitoring of other transport indicators as travel time or street accident was not carried out. Standard calculation assumptions were used for determination of their changes. Table 3 shows changes in travel time and accidents on selected street corridors.

Table 3. Changes in travel time and accidents*

Analysed transport corridor	**Reduction in travel time per vehicle, h/day**			
	Before	**Planned in 2005**	**After (tentative)**	**Variation**
No. 1	0,46	0,37	0,33	-0,09
No. 2	0,16	0,14	0,14	-0,02
No. 3	0,19	0,16	0,16	-0,03
No. 4	0,15	0,14	0,13	-0,01
No. 5	0,29	0,25	0,23	-0,04
Analysed transport corridor	**Changes in accident, percent**			
	Planned before		**After (tentative)**	
No. 1	-13		-20	
No. 2	-13		-20	
No. 3	-13		-50	
No. 4	-13		-20	
No. 5	-13		-20	

*Source: *The Implementation of Automated Traffic Lights…2008*

Analysing Western Bypass project changes of these indicators were forecasted lesser due to used calculation method: forecasted average rate of driving speed for 2015 increases approx. 4,66 km/h or 16 percent, travel time reduces only 2 min.; accident rate reduces about 9 percent

Due to the possibilities to receive financial support of the EU and meeting requirement of normative documentation economic analysis of these projects were accomplished using the CBA method. In general CBA components can be grouped as follows (*Guide to Cost-Benefit Analysis… 2008, Oder on the Approval of… 2003*):

- benefit components:
  - reduction of travel time consumptions;
  - reduction of vehicles operating consumptions;
  - reduction of existing street infrastructure maintenance expenditures;
  - reduction of traffic accident losses;
  - reduction of transport emissions;
- cost components:
  - construction/implementation costs;
  - new infrastructure maintenance costs.

Key assumptions were formed in order to assess the results of economic analysis:

- Investment value - financial resources invested in order to make a profit from investing objects, social result or to ensure state functions implementation;
- Forecasted period – maximum number of the year over which economic-financial analysis is carried out. Forecast of project exploitation is prepared for the period which measures up its economic period of usage and is sufficient to identify the long-term impact. In this case - 15 years.
- Residual value – residual assets value in the end of forecasted period.
- Basic year – for these case studies - 2006 for all economic-financial calculations.
- Value added tax which is received in projects context as relevant expenditure and entered into economic analysis.

Key economic results of analyzed projects are shown in table 4.

Table 4. Key economic results of analyzed projects

Indicator / Project	**Project budget, mill. LT**	**Pessimistic scenario (discount rate – 5,0/ 5,5 perc.)**			
		Present net value, mill. LT	**Internal rate of return, perc.**	**B/C ratio**	**Payback time**
Automated system	140	19,0 (2008-30,0)	22,5	nd	2009 - 2010 year
Eastern Bypass	390,5	622,1	18,6	5,22	2016 year

Primary analysis of CBA components of both projects showed that the results of economic analysis are positive even in the pessimistic scenario. The benefit of automated traffic management system project can be achieved considerably earlier before the benefit of Vilnius City Western Bypass project. Even incomplete automated system creates higher economic benefit than it was planned. However assessing final benefit of these projects to urban development it is necessary to remember, that the effects of projects were evaluated only for certain city areas and only for these areas achieved benefits are adequate.

Systemising the results of project final evaluations basic conclusions affirm that these projects have equal importance on the development of Vilnius City and should be finished in parallel to each other. Moreover completed System could provide prior effect partly attracting transport flows during the construction period of Western Bypass of Vilnius City. Therefore automated traffic-light control and traffic management system could additionally assume special value.

4. Conclusions

1. Ex-post assessment is carried out after the complete implementation of the project during the period of economic-technical monitoring. The basic purpose is to determine whether the planned results and benefit are received and what is a possible long-term effect of the project. Ex-post assessment is planned, organized and carried out according to the basic principals –

proportionality, independence, partnership and transparency.

2. Accomplished analysis of assessment procedures in foreign countries shows that ex-post assessment is widely used in order to determine influence of transport infrastructure investment on regional development tendencies. Every country uses different procedures for the ex-post assessment due to various distinctive features of transport infrastructure, size of country or region, social-economic sphere and etc.
3. Detailed ex-post assessment is performed in the level of transport infrastructure investment projects analysing received benefit or damage to region and society. Often CBA method is used to determine benefit/ damage for local users, rarely – for bigger audience of regional level.
4. Ex-post assessment of transport development projects is not systemic process in Lithuania as it is in other European countries. Therefore, it is a lack of qualitative information about investigations and analysis and analyzed indicators having influence on the scope of decision-making. Lithuanian experience shows that transport projects are mostly assessed in order to determine the realized profit (project efficiency) and receive financial support despite of the basic objective of ex-post assessment. It is quite difficult to determine this contribution since no common system of project assessment and relevant financing of transport infrastructure is framed. Therefore, the preparation and assessment of transport development projects are guided by the EU experience.
5. The EU support was and still is based on the principle of economic efficiency that mostly focuses on the assessment of efficiency criteria. In order to assess the efficiency it is important to frame a problem in quantitative indicators allowing measuring performance and effects of transport systems and separate elements.
6. Basic performance indexes as effects of travel time consumption and transport vehicles mileage, traffic accidents, vehicle noise and air pollution (emissions), psychological discomfort due to territorial separation for communication corridors (barrier effect); territorial and spatial demand for traffic and those efficiency (price) indexes as costs maintenance of technical infrastructure or special equipment for traffic safety are mainly used in the projects assessment of Lithuania transport infrastructure.
7. Principal aspects of project ex-post assessment on transport infrastructure are presented by the example of project assessment on Vilnius city transport infrastructure. General stages of ex-post assessment on Vilnius City Western Bypass Project and Automated Traffic-Light Control and Traffic management Project are as follows: identification and comparison of basic problems of the projects; identification and comparison of basic objectives and tasks of the projects; definition and comparison of project subjects; identification and comparison of projects users and beneficiaries; comparisons of results of technical analysis of traffic flows; identification of components of economic-financial analysis and comparison of their values.
8. Systemising the results of projects final evaluations and basic conclusions affirm that these projects have equal importance on the development of Vilnius City and should be finished in parallel to each other. Moreover, the completed System could provide prior effect partly attracting transport flows during the construction period of Western Bypass of Vilnius City. Therefore, automated traffic-light control and traffic management system could additionally assume a special value.

Acknowledgements

The authors would like to acknowledge private consultative companies and experts from VGTU for cooperation and data provision.

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