THE ECONOMIC AND FINANCIAL APPRAISAL FOR PHASE 1 OF "THE RAIL BALTICA" PROJECT

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1. INTRODUCTION

In Lithuania's national transport policy, the connection with Central and Western Europe by a direct, efficient and high-quality railway link has high priority. Moreover, the project is supported by the EC politics on transport.

The railway line of Rail Baltica can be divided in two sub-sections:

1. Polish / Lithuanian border – Mauručiai Subsection (68 km). The Government of the Republic of Lithuania already approves the alignment of this sub-section;
2. Mauručiai – Kėdainiai Subsection (by-pass of Kaunas). Following three alignment alternatives were considered for this subsection:
1. Eastern by-pass 1 (75.5 km). Crossing the river Nemunas over the Kaunas Sea dam and continuing northwards through Neveronys. Construction of a new interchange station in Palemonas;
2. Eastern by-pass 2 (73.9 km). Crossing the river Nemunas over the Kaunas Sea dam and continuing northwards through Karmėlava. Construction of a new station close to Taikos Avenue (the station will only serve the new line, no interchange will be available);
3. Western by-pass (62 km). Construction of a new 2.024 km long viaduct to cross of the river Nemunas and construction of a new interchange station in Mauručiai has been going on at present.

Presently, there is not an adequate railway link available from the Polish border to the North direction that forms a part of the TEN Corridor I from Helsinki through Tallinn, Riga and Kaunas to Warsaw. The cross-border railway section Mockava (Lithuania) – Trakiszki (Poland) currently used for the international rail traffic was closed up to the early nineties. Before the independence of Lithuania international traffic from Vilnius to Warsaw ran through Hrodna in Byelorussia. By providing an appropriate link from Finland and the Baltic countries to Poland, Western and Southern Europe, this multimodal corridor will play an eminent economic and political role for the overall European integration and development and specifically for the integration of the Baltic countries in the trans-European rail network.

2. FINANCIAL ANALYSIS

The construction of the new line will result in an improvement of the transit capacity through the trans-European Corridor I, in the reduction of maintenance and operation costs and in increasing safety standards. The financial computation for different alternative will rest upon cash-flow analysis. For the considered assessment period (30 years) the streams of financial flows relating to each of the alternatives are compared: capital investment costs, operation and maintenance costs, revenues: actualised cash-flow tables can then be worked out and the corresponding FIRR – Financial Internal Rate of Return and NPV – Net Present Value directly estimated. In order to undertake the economic and financial evaluation, the various investment proposals have been grouped together and are here described as investment scenarios. These scenarios represent the various stages of investment, which are necessary in order to resolve the bottlenecks and enable the forecast tonnage to be transported.

The alternatives initially developed can be summarised as follows:

- Western by-pass of Kaunas;
- Eastern by-pass 1 of Kaunas;
- Eastern by-pass 2 of Kaunas

The main assumptions taken for the Economical and Financial are the followings:

- Lithuania and all other candidate countries successfully joined in EU in May 2004;
- Geopolitical changes will not affect EU countries;
- International trends in commerce will be not altered significantly;
- International tariffs for freight and passengers' transportation will remain on the same level (in constant Euros).

The cost of land that should be acquitted for construction of the railway had been calculated on the bases of land value. For calculation of land acquisition costs the alignment of all three alternatives was divided in 6 segments: AB, BE, BC, CD II, CD III, DE.

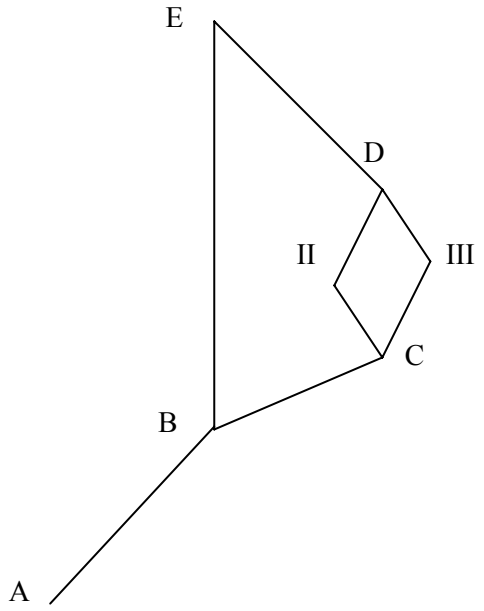

Figure 1. *The alignment of alternative segments*

The land cost was calculated separately for the areas with forest and separately for agricultural land areas. Although the biggest part of land types along alignment variants has agricultural use, other two types – land of gardeners' communities and in urbanised area the land of industrial (and depot, storehouse) use was distinguished from other types. For the calculation the width of band of land was defined in the following way. In all cases the upper width of track bed formation was accepted as 13.3m (The source: Project "European Gauge Railway Polish-Lithuanian border - Kaunas". Feasibility study. TRRI. 1998). In forest area the width of band was defined 103.3m (13.3m plus twice 45 metres; both sides). In area without forest – 53.3m (13.3m plus twice 20m). In both cases it was made according to the width of railway protection zone defined in paragraph 8 of Lithuanian normative document ("Special regulations of land and forest use", approved by Government of Lithuanian Republic on 29 December 1995, Number 1640). Cost of land in areas outside the forest area was calculated on the base of special average land cost area maps prepared by Lithuania cadastral offices for different municipalities. The maps and tables with average costs of different types of land in certain areas are in website of State enterprise "VĮ Žemės registrų centras" (http://www.kada.lt/vzvertes/). Average land cost is in Litas/hectare (100x100m) or Litas/area (10x10m). During the calculation it was defined the length of parts of land band along the alignment that are related with the certain land cost zone. Cost of forestland area consists from the cost of land itself and cost of forest stands in that land area. For both cases the area of forestland plots along railway have been calculated. As the average amount of forest stands in territories of different forest enterprises is different (source: the table in the website of State Enterprise Institute of Forestry (VĮ Valstybinis miškotvarkos institutas; http://www.lvmi.lt/) it was decided to find out which parts of all railway alignment variants are located in the territory of certain forest enterprise (miško urėdija) and area of plots of forest land belonging for certain forest enterprises have been defined. Later the average

amount of forest stands for different segments was calculated. For calculating of the cost of forest stands in defined areas the average cost of forest stands 76 Litas/m3 was accepted (cost 2004 January-June) (Source: website of General Forest Enterprise: http://www.gmu.lt/uredijos.html; Generalinė miškų urėdija). On this base the cost of forest stands for certain segments have been calculated. In calculation of cost of forestland itself in segments the average cost of forestland itself belonging to any forest enterprise the value 401 Lt/ hectare is used. The source is Methodical of land Evaluation (Žemės įvertinimo metodika), approved by Lithuanian Government 1999 February 24, Resolution number 205. The following Tables summarise the land acquisition costs for each segment and each segment and each alignment alternative.

Table 1. Final cost of land in segments (kEuro)

Segments	AB	BE	BC	CD II	CD III	DE
1	2	3	4	5	6	7
Cost of land	115.0	70.4	20.1	111.1	123.1	45.1
Cost of forest stands	563.4	1263.3	946.2	281.6	265.8	1090.5
Cost of forest land itself	7.6	17.4	11.0	4.0	3.9	16.7
Total	686.0	1351.1	977.3	396.7	392.8	1152.3

Table 2. Final cost of land for each alternative (kEuro)

Section	Alternative		
	Eastern By-pass 1	Eastern By-pass 2	Western By-pass
PL-LT Border – Mauručiai (AB)	686.0	686.0	686.0
Mauručiai – Kedainiai (BE)			1351.1
Mauručiai – Dam (BC)		977.3	
Dam – Kalneniai (through Neveronys) (CDIII)	392.8		
Dam – Kalnenai (through Karmėlava) (CDII)		396.7	
Kalnenai – Kedainiai (DE)	1152.3	1152.3	
Total construction cost (MEUR)	3,212.1	3,208.3	2,037.1

The construction cost was calculated on the basis of average figures for this type of the lines and taking into account the specific characteristics of the project. The following Tables show the construction costs for different sections that constitute the assessed alternatives of the railway line. Table 7 summarises the construction costs for each alternative.

Table 3. Construction costs. Polish/Lithuanian border – Mauručiai

POLISH – LITHUANIAN BORDER – MAURUČIAI SECTION	
Item	Cost Estimation (MEUR)
• Detailed design	7.293
• Earthworks	35.762
• Drainage	3.481
• Structures	25.951
• Access and service roads, fencing, etc.	6.330
• Services reallocation	1.899
• Track superstructure	23.115
• Electrification	20.896
• Signalling and telecom	23.942
• Gauge changing facilities	0.310
• Station platforms and buildings	4.178
• Works supervision (5 %)	7.293
• Incidental expenditure (15 %)	24.067
Overall PL / LT Border – Mauručiai section	184.517

Table 4. Construction costs. Mauručiai – Neveronys – Kėdainiai section

MAURUČIAI – NEVERONYS - KEDAINIAI (EASTERN BY-PASS 1) SECTION	
Item	Cost Estimation (MEUR)
• Detailed design	8.994
• Earthworks	55.672
• Drainage	5.556
• Structures	26.777
• Dam crossing	0.446
• Neris Bridge	4.344
• Access and service roads, fencing, etc.	9.400
• Services reallocation	4.111
• Track superstructure	25.088
• Electrification	18.060
• Signalling and telecom	25.738
• Station platforms and buildings	4.693
• Works supervision (5 %)	8.994
• Incidental expenditure (15 %)	29.680
Overall Mauručiai – Neveronys - Kėdainiai	227.553

Table 5. Construction costs. Mauručiai – Karmėlava – Kėdainiai section

MAURUČIAI – KARMĖLAVA - KEDAINIAI (EASTERN BY-PASS 2) SECTION	
Item	Cost Estimation (MEUR)
• Detailed design	9.498
• Earthworks	54.376
• Drainage	5.056
• Structures	27.629
• Dam crossing	0.446
• Neris Bridge	4.344
• Access and service roads, fencing, etc.	22.235
• Services reallocation	4.014
• Track superstructure	24.634
• Electrification	17.857
• Signalling and telecom	25.403
• Station platforms and buildings	3.973
• Works supervision (5 %)	9.498
• Incidental expenditure (15 %)	31.349
Overall Mauručiai – Karmėlava - Kėdainiai	240.312

Table 6. Construction costs. Mauručiai – Kėdainiai section (Western by-pass)

MAURUČIAI – KEDAINIAI SECTION (WESTERN BY-PASS)	
Item	Cost Estimation (MEUR)
• Detailed design	8.337
• Earthworks	45.624
• Drainage	2.341
• Structures	15.728
• Nemunas Viaduct	31.424
• Access and service roads, fencing, etc.	7.655
• Services reallocation	1.924
• Track superstructure	20.694
• Electrification	16.271
• Signalling and telecom	20.865
• Station platforms and buildings	4.217
• Works supervision (5 %)	8.337
• Incidental expenditure (15 %)	27.514
Overall Mauručiai – Kėdainiai	210.931

Table 7. Summary construction costs

Section	Alternative		
	Eastern By-pass 1	Eastern By-pass 2	Western By-pass
PL-LT Border – Mauručiai	184.517	184.517	184.517
Mauručiai – Neveronys - Kedainiai	227.553		
Mauručiai – Karmėlava - Kedainiai		240.312	
Mauručiai – Kedainiai			210.931
Total construction cost (MEUR)	412.070	424.829	395.448

The following Table summarises the construction costs taking into account different alternatives, as well as phasing of the project.

Table 8. Summary construction costs phasing

Alternative	Before 2010 (MEUR)	Before 2014 (MEUR)	TOTAL COST (MEUR)
Eastern by-pass 1	184.517	227.553	412.070
Eastern by-pass 2	184.517	240.312	424.829
Western by-pass	184.517	210.931	395.448

The following milestones have been considered for the phasing of the project:

- Completion of the Polish – Lithuanian Border – Kaunas section before the end of 2010.
- Completion of the Kaunas – Riga section before the end of 2014.

This phasing is important for the calculations of the financial and economical analysis.

According to the methodology of this study operation and maintenance costs considered do only refer to the infrastructure. Rolling stock operation and maintenance costs are covered under the infrastructure usage charges and are not considered as a separate item. Namely, the operation and maintenance costs include the following concepts:

- Embankment maintenance;
- Structures maintenance;
- Track maintenance works;
- Culvert and drainage facilities cleaning and maintenance;
- Access and service road maintenance;
- Station buildings and platforms maintenance;
- Overhead contact line and power substation maintenance;
- Signalling and telecommunication systems maintenance;
- Traffic and fixed facilities control (operational staff);
- Provision for periodical modernisation and up-grading of the facilities

Operation and maintenance costs are calculates by means of average figures for this type of railway lines. Following table summarises the operation and maintenance costs for each alternative.

Table 9. Summary operation and maintenance costs

Section	Alternative		
	Eastern By-pass 1	Eastern By-pass 2	Western By-pass
PL-LT Border – Mauručiai	0.530	0.530	0.530
Mauručiai – Neveronys – Kedainiai	0.589		
Mauručiai – Karmėlava – Kedainiai		0.577	
Mauručiai – Kedainiai			0.484
Total maintenance cost (MEUR)	1.119	1.107	1.014
• 2010 – 2014	0.530	0.530	0.530
• From 2015	1.119	1.107	1.014

As per their nature the revenues considered for the financial and economical analysis of the project can be divided in the following way:

- Revenues due to the infrastructure usage charges paid by the operators. These revenues are calculated using the traffic forecast and hypothetical infrastructure usage charges based on the figures from various EU countries' rail infrastructure management bodies.
- Revenues due to the merging of the rail traffic from the existing line to the new line. The main effects of this merger will be the following:
  1. Reduction of the risk of accidents (e.g. on the level-crossings);
  2. Reduction (or elimination) of the maintenance and operation costs of the existing railway line
- Other revenues due to merger of the traffic from the road network to the railway:
  1. Reduction of the maintenance costs of the "Via Baltica" highway;
  2. Reduction of the road traffic accidents

The main part of the revenue will be originated by the infrastructure usage charges paid be the freight traffic operators. This traffic is not sensitive to the election of the alternative of the by-pass (either Western or Eastern). Thus the revenue calculation figures used are the same for each alternative.

Following table summarises the revenues for the assessment period (up to 2040).

Table 10. Summary revenues

Year	Total traffic revenues (EUR)			Total other revenues (EUR)	Total financial revenues (EUR)			Total econ. revenues (EUR)
	Low Scenario (1)	Average Scenario (2)	High Scenario (3)	(4)	Low Scenario (5)=(1)+(4)	Average Scenario (6)=(2)+(4)	High Scenario (6)=(3)+(4)	(7)
2008	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2009	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2011	485.5	562.4	653.6	1,604.0	2,089.5	2,166.4	2,257.6	1,350.3
2012	505.7	588.4	688.3	1,604.0	2,109.7	2,192.4	2,292.3	1,356.4
2013	524.5	616.7	724.7	1,604.0	2,128.5	2,220.7	2,328.7	1,362.7
2014	544.7	647.2	763.8	1,604.0	2,148.7	2,251.2	2,367.8	1,369.4
2015	663.7	872.4	1,124.2	1,604.0	2,267.7	2,476.4	2,728.2	1,445.3
2016	687.8	912.9	1,186.5	1,604.0	2,291.8	2,516.9	2,790.5	1,455.7
2017	810.9	1,086.2	1,428.4	1,604.0	2,414.9	2,690.2	3,032.4	1,535.3
2018	835.2	1,127.1	1,493.3	1,604.0	2,439.2	2,731.1	3,097.3	1,549.9
2019	856.5	1,171.8	1,560.6	1,604.0	2,460.5	2,775.8	3,164.6	1,565.2
2020	880.6	1,216.2	1,632.2	1,604.0	2,484.6	2,820.2	3,236.2	1,581.1
2021	909.9	1,264.8	1,708.4	1,604.0	2,513.9	2,868.8	3,312.4	1,597.8
2022	935.5	1,317.4	1,787.8	1,604.0	2,539.5	2,921.4	3,391.8	1,615.2
2023	963.5	1,369.5	1,871.9	1,604.0	2,567.5	2,973.5	3,475.9	1,633.5
2024	992.8	1,429.9	1,959.0	1,604.0	2,596.8	3,033.9	3,563.0	1,652.6
2025	1,020.8	1,490.2	2,053.7	1,604.0	2,624.8	3,094.2	3,657.7	1,672.5
2026	1,053.8	1,550.2	2,153.7	1,604.0	2,657.8	3,154.2	3,757.7	1,693.4
2027	1,087.3	1,619.4	2,257.2	1,604.0	2,691.3	3,223.4	3,861.2	1,715.2
2028	1,120.3	1,687.6	2,370.0	1,604.0	2,724.3	3,291.6	3,974.0	1,738.1
2029	1,157.3	1,764.6	2,486.7	1,604.0	2,761.3	3,368.6	4,090.7	1,761.9
2030	1,193.0	1,845.3	2,616.3	1,604.0	2,797.0	3,449.3	4,220.3	1,786.9
2031	1,228.6	1,926.0	2,745.6	1,604.0	2,832.6	3,530.0	4,349.6	1,811.9
2032	1,264.2	2,006.7	2,874.8	1,604.0	2,868.2	3,610.7	4,478.8	1,836.9
2033	1,299.9	2,087.4	3,004.4	1,604.0	2,903.9	3,691.4	4,608.4	1,861.9
2034	1,335.5	2,168.1	3,133.7	1,604.0	2,939.5	3,772.1	4,737.7	1,886.8
2035	1,371.1	2,248.8	3,263.0	1,604.0	2,975.1	3,852.8	4,867.0	1,911.8
2036	1,406.9	2,329.5	3,392.6	1,604.0	3,010.9	3,933.5	4,996.6	1,936.8
2037	1,442.4	2,410.2	3,521.8	1,604.0	3,046.4	4,014.2	5,125.8	1,961.8
2038	1,478.0	2,491.0	3,651.1	1,604.0	3,082.0	4,095.0	5,255.1	1,986.7
2039	1,513.8	2,571.7	3,780.7	1,604.0	3,117.8	4,175.7	5,384.7	2,011.7
2040	1,549.3	2,652.4	3,910.0	1,604.0	3,153.3	4,256.4	5,514.0	2,036.7

Normally, any investment, which is made, has a finite life. If the evaluation undertaken is for a period, which is shorter than this "life", a "residual value" of the asset is calculated, normally on a pro-rata basis. In other words, this is normally a financial benefit to the investment calculation. Any additional residual value in terms of scrap or spare parts is also included. For such a complex system as a railway line is, the lifetime cannot be identified in unique figure. Different subsystems have different lifetime, while e.g. land acquisition investment costs have infinite lifetime.

Fifty percent (50%) net residual value after the years 30 since the commissioning of the first stage have been considered.

3. ECONOMIC ANALYSIS

The cost/benefit analysis will measure the impact of the modernisation project on the Lithuanian economy. The economic ratios are computed from the streams of costs and revenues assessed over a 30 years period. Economic benefits result from additional benefits and costs (called "external"), which are not in direct relation with rail traffic levels.

Because of the deteriorated condition of the existing railway infrastructure on the considered section, an important programme of work has to be scheduled for the coming years; these works are to cost of Euro 400 million approximately. The construction of the new line will increase the capacity of the trans-European Corridor I. This improving of the capacity makes possible the increasing of the freight and passenger traffic and will generate additional demand.

Three scenarios of traffic increment are considered in this paper:

- Low scenario
- High scenario
- Average scenario

The capital investment is scheduled in two phases:

- Polish/Lithuanian Border – Mauručiai section: 2008 - 2010
- Mauručiai – Kedainiai section: 2010 - 2014

The project will generate revenues since the completion of the first stage, i.e. since 2010. As the main part of the revenues is due to the infrastructure usage charges to be paid by the rail operators and according to the traffic forecast, the revenue will increase on yearly basis. Substantial revenues increasing are expected for the years 2015 (envisaged completion of the Kaunas – Riga section) and 2017 (envisaged completion of the Riga – Tallinn section).

To convert a future stream of revenues over the assessment period to its present value, a discount rate must be used. This rate should normally equate to what is known as the opportunity cost of capital that, for practical purposes, can be interpreted to mean the long term borrowing rate plus a risk premium. In the absence of a centrally determined discount rate within the EU, the practice in the Cohesion Fund has been to use a rate in the region of 6 – 8%. This corresponds closely with rates used in some Member States.

There are several theoretical schools trying to evaluate the price of public funds, however it is difficult to apply it in practice. In several EU countries the discount rate is set according to the rate of Government long-term bonds. This would be applicable for the countries were Government long-term bonds are with a single digit number.

It should be noticed that this rate is usually expressed in "real terms", i.e. before allowing for inflation in order to facilitate the analysis (so, for example, if price inflation is running at 3% on average, then with 5% "real" discount rate the nominal rate is around 8%.

The following Tables summarise the results of the Financial Appraisal for each alternative.

Table 11. FIRR and NPV East by-pass 1 alternative

EAST BY-PASS 1 ALTERNATIVE				
Discount rates	FIRR (%)	NPV (MEUR)		
		Scenario		
		5%	7.5%	10%
Low scenario	-1.79	-282.490	-282.215	-271.030
High scenario	-1.37	-270.612	-274.750	-266.124
Average scenario	-1.59	-277.068	-278.815	-268.800

Table 12. FIRR and NPV East by-pass 2 alternative

EAST BY-PASS 2 ALTERNATIVE				
Discount rates	FIRR (%)	NPV (M EUR)		
		Scenario		
		5%	7.5%	10%
Low scenario	-1.81	-290.860	-290.145	-278.295
High scenario	-1.40	-278.982	-282.680	-273.389
Average scenario	-1.62	-285.438	-286.746	-276.065

Table 13. FIRR and NPV West by-pass alternative

WEST BY-PASS ALTERNATIVE				
Discount rates	FIRR (%)	NPV (M EUR)		
		Scenario		
		5%	7.5%	10%
Low scenario	-1.73	-269.566	-270.322	-260.323
High scenario	-1.29	-257.689	-262.857	-255.417
Average scenario	-1.52	-264.144	-266.923	-258.094

The NPV has been calculated for the following discount rate values: 5%, 7.5% and 10%. As all the calculations are made using constant prices, 5.0% discount rate is taken into account.

Following table summarises the results at 5% discount rate for the three alternatives.

Table 14. Summary NPV for 5 % discount rate

Scenario	NPV (M EUR)		
	Alternative		
	East By-pass 1	East By-pass 2	West By-pass
Low scenario	-282.490	-290.860	-269.566
High scenario	-270.612	-278.982	-257.689
Average scenario	-277.068	-285.438	-264.144

Financial results are quite better for the West By-pass alternative.

This analysis shows that, although the construction of the new line is of a paramount importance for Lithuania, as well as for other Baltic Countries, this project does not offers good financial results so it could be hardly afforded by any traditional funding means. So its acceptance for Cohesion Fund co-funding is vital. Sensitivity analysis is carried out considering the 10% variation (both increasing and decreasing) for the investment costs, operation costs and traffic level. Following tables summarise the IRR calculation results.

Table 15. Sensitivity to revenues

Alternative	Low scenario		High scenario		Average scenario	
	+10%	-10%	+10%	-10%	+10%	-10%
East by-pass 1	-1.70	-1.88	-1.24	-1.50	-1.48	-1.71
East by-pass 2	-1.72	-1.90	-1.27	-1.52	-1.51	-1.72
West by-pass	-1.63	-1.82	-1.15	-1.43	-1.41	-1.64

Table 16. Sensitivity to operation cost

Alternative	Low scenario		High scenario		Average scenario	
	+10%	-10%	+10%	-10%	+10%	-10%
East by-pass 1	-1.83	-1.75	-1.40	-1.33	-1.63	-1.56
East by-pass 2	-1.84	-1.77	-1.43	-1.36	-1.65	-1.58
West by-pass	-1.76	-1.69	-1.32	-1.26	-1.56	-1.49

Table 17. Sensitivity to investment cost

Alternative	Low scenario		High scenario		Average scenario	
	+10%	-10%	+10%	-10%	+10%	-10%
East by-pass 1	-1,84	-1,69	-1,46	-1,26	-1,66	-1,51
East by-pass 2	-1,86	-1,71	-1,48	-1,29	-1,68	-1,53
West by-pass	-1,78	-1,62	-1,38	-1,18	-1,60	-1,43

Results appear to be much sensitive to the revenues than to the investment or operation costs. That means that further efforts should be targeted on increasing the revenues of the project.

Following table summarises the results of economic appraisal for 5% discount rate for the three alternatives.

Table 18. Results of the economic appraisal

Scenario	NPV (M EUR)		
	Alternative		
	East By-pass 1	East By-pass 2	West By-pass
Low scenario	-261.166	-269.536	-248.242
High scenario	-249.288	-257.658	-236.364
Average scenario	-255.744	-264.114	-242.820

Table 19. Benefit / Cost

Scenario	B/C		
	Alternative		
	East By-pass 1	East By-pass 2	West By-pass
Low scenario	-0.629	-0.630	-0.625
High scenario	-0.600	-0.602	-0.595
Average scenario	-0.616	-0.617	-0.611

Economical results are quite better for the West By-pass alternative.

The Corridor runs trough two out of ten Lithuanian Counties (Marijampolė and Kaunas) and through seven out of sixty Districts (Kalvarija, Marijampolė, Kazlų Rūda, Prienai, Kaunas, Jonava and Kėdainiai). Many of these areas have high level of unemployment.

The budget of the construction works of the project should be considered divided in the following items:

- Machinery:
  1. Renting of special construction machinery;
  2. Renting of special construction machinery (bulldozers, excavators, cranes, trucks, etc.);
- Materials and equipment:
  1. Rails, sleepers, fastenings;
  2. High-tech components;
  3. Other equipment
- Workforce:
  1. Specialised workforce;
  2. Non-specialised workforce

The total amount of local workforce to be employed in the project depends on the Contractor procedures. Nevertheless, taking into account the extension of the works it seems to be very reasonable that the Contractor will include as much local workforce as possible, even if some special training will be needed. The following local workforce to employ directly has been foreseen for this project:

- General specialised workforce (earthworks technicians, electricians, mechanics, bricklayers, etc.): 3,200 man-years approximately.
- Non-specialised workforce (labourers): 1,500 man-years approximately.

Besides, the local workforce, some materials and equipment can be manufactured in Lithuania.

Moreover, this project will make possible the further development of the railway activity and other business' activities. Indirectly the project will stimulate other industries and services in the zone and stimulate local market, regional growth and employment. But no precise valuation could be done in the scope of this assignment.

4. CONCLUSIONS

According to the results of the technical studies, as well as economical and financial assessments taking into account the phasing of the whole "Rail Baltica" project by the EC, the following solution is the most appropriate one for the stage 1 of the "Rail Baltica" Line (Polish/Lithuanian Border – Kaunas):

- Construction of the Polish/Lithuanian Border – Mauručiai new line section according to the AGC and Interoperability requirements (Standard Gauge 1435mm, 225 kN/axle maximum load, 160 km/h, etc.);
- Implementation of the Intermodal Logistic Centre in Mauručiai Area and its connection to the new "Rail Baltica" line and to the existing wide gauge line Kaunas - Kybartai;
- Connection of the new "Rail Baltica" line to the existing wide gauge line Kaunas - Kybartai by means of implementation of the Gauge Changing Facility in Mauručiai Area;

The Economical and Financial Appraisal show the following:

- The project is of paramount importance for Lithuanian Republic (as well as for all Baltic countries) from a socio-economical point of view;
- Nevertheless, from the financial point of view this project cannot go ahead without Cohesion Fund co-funding;

References

[1] Decision of the European Parliament and of the Council 23 July 1996 on Community Guidelines for the Development of the Trans-European Transport Network.

[2] Convention Concerning International Carriage by Rail (COTIF), 3 June 1999.

[3] Meeting of the Prime Ministers of the Republic of Estonia, the Republic of Finland, the Republic of Latvia, the Republic of Lithuania, Poland and Minister of Transports of the Republic of Italy, 5 September 2003, Vilnius.

[4] Pre-feasibility studies for the European Gauge Railway Link from the Polish Border to Kaunas: GOPA–Consultants (Status Report, September 2000) and AB Kelprojektas and TRRI (Assessment Report, January 2003).

[5] European standard railway line PL/LT border – Kaunas. Construction justification. Transport Road Research Institute (Lithuania), 1998.

[6] European standard railway line Polish/Lithuanian border – Kaunas. Special Plan. Transport Road Research Institute (Lithuania), 1999.

[7] European Union directive 96/48/EB, defining trans-European high-speed railways system interaction.

[8] "Building Construction Justification. Summary" Transport Ministry of Lithuania State. Enterprise "Transport and Road Research Institute", Kaunas 1998.

[9] "Obligatory Documents for Technical Design. Special Plan. Summary." Ministry of Transport and Communications of the Republic of Lithuania Transport Investment Directorate, Kaunas 1999.

[10] United Nations Development Programme. The economic appraisal of railway.

[11] Lithuanian transport ministry. The development of TEN I and IX corridors. OVE ARUP and Partners, 1996.