**ANNEX No4**

***CASE STUDIES***

***ANNEX 4 TO EVALUATION REPORT ON EVALUATION OF IMPACT AND EFFECTS OF IMPLEMENTATION OF OPERATIONAL PROGRAMME ON TRANSPORT 2007-2013***

***Contract NoD-4/06.02.2020 „Evaluation of the impact and effects of the implementation of Operational Programme “Transport” 2007-2013 and evaluation of the progress under Operational Programme “Transport and transport infrastructure” 2014-2020 and contribution to the EU Strategy”***

**December, 2020**

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# **LIST OF ACRONYMS**

AM Motorway

AF Application Form

AIS Automatic Identification Systems

ASTR Automatic System for Traffic Recording

BAS Bulgarian Academy of Sciences

BULRIS Bulgarian river information system

BPIC Bulgarian Ports Infrastructure Company

CCH Central City Hall

CBA Cost-benefit analysis

CRC Communications Regulation Commission

CMC Code of Merchant Shipping

CF Cohesion Fund

CM Council of Ministers

CIW Construction and installation works

DDP Detailed development plan

ERTMS European Rail Traffic Management System

ETCS European Train Control System

EBRD European Bank for Reconstruction and Development

EIB European Investment Bank

EC European Commission

ESF European Social Fund

ERDF European Regional Development Fund

EU European Union

EA Executive Agency

EIA Environmental Impact Assessment

EUREF Regional Reference Frame Sub-Commission for Europe

FNPV Financial net present value

GA Grant Agreement

GC Grant Contract

GD General Directorate

GDP Gross Domestic Product

GEMP General Environment Monitoring Plan

GMDSS Global Maritime Disaster and Safety System

GIS Geographic Information System

GTMP General Transport Master Plan

ISPA Structural Policies for Accession Policy

IRR Internal rate of return

LMSIWP Maritime Spaces, Inland Waterways and Ports of the Republic of Bulgaria

MA Managing Authority

MC Monitoring Committee

MRDPW Ministry of Regional Development and Public Works

MS Metro station

MTITC Ministry of Transport, Information Technology and Communications

MF Ministry of Finance

NAVTEX Navigational text messages

NRIC National Railway Infrastructure Company

NPV Net present value

NCSIP National Company "Strategic Infrastructure Projects"

OP Operational Programme

OPT Operational Programme on Transport 2007 - 2013

OPTTI Operational Program "Transport and Transport Infrastructure" 2014-2020

PPA Public Procurement Act

RTA Road traffic accident

RIA Road Infrastructure Agency

RIS River Information System

DCM Decision of the Council of Ministers

SE State Enterprise

SCF Structural and Cohesion Fund

SM Sofia Municipality

SPA Spatial Planning Act

SRR Sofia Ring Road

SCADA Systems for remote control of subscriber stations

SSN Community system for the control of ship traffic and information services

TEN-T Trans-European Transport Network (TEN-T)

ISMM Information system for management and monitoring of EU funds in Bulgaria 2020

VAT Value added tax

VTMIS Maritime Traffic Management Information System

VTS Vessel Traffic Service

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# **INTRODUCTION**

The current Annex contains detailed information to Section V of the Evaluation Report “Evaluation of impact and effects of implementation of Operational Programme on Transport 2007-2013”. It includes detailed case studies of projects implemented during programming period 2007-2013, within the framework of Contract NoD-4/06.02.2020 „Evaluation of the impact and effects of the implementation of Operational Programme “Transport” 2007-2013 and evaluation of the progress under Operational Programme “Transport and transport infrastructure” 2014-2020 and contribution to the EU Strategy”, assigned by the Bulgarian Ministry of Transport and Information Technology and Communications to the Consortium “European Evaluation".

The case studies included in the report include 12 investment projects implemented under OPT 2007-2013, as follows:

• 3 major investment projects under Priority Axis 1 and Priority Axis 2 respectively

• 2 major investment projects and one small investment project under Priority Axis 3

• 3 small investment projects under PA 4.

The case studies were carried out as part of the overall evaluation of the impact and effects of the implementation of OPT 2007-2013. The project selection criteria include the completion stage, period of operation and availability of reporting data on key parameters in the operation phase.

The choice of case studies as an evaluation method is based on features of OPT, which is focused on large-scale infrastructure projects, with a long-life cycle and a high degree of complexity in preparation and implementation. Projects in the transport sector require a relatively long period to achieve results due to their complexity and scale. Often the problems are related to delays in implementation, rising costs and problems in long-term financial sustainability. The method involves in-depth case studies through a combined quantitative and qualitative analysis of data. These studies aim to complement the impact assessment of the program carried out under the Activity 1 of technical offer.

The following documents and information were used to carry out the case studies:

* Text of OPT and its modifications
* Materials and minutes of the Monitoring Committee’s meetings
* Annual reports and Final report on the implementation of OPT
* Application forms, CBA, ex-post financial analyses and final project reports
* Data from the Monitoring Model used for preparation of the Final Report of OPT
* Data from the beneficiaries and the public official website of RIA on registered traffic data on the built infrastructure for the period 2016-2019
* Data from NSI
* Information the survey and interviews with the stakeholders, including project beneficiaries and the MA.

# **SUMMARY**

Case studies belong to impact assessment methods, applied for current evaluation for in-depth analysis of 12 investment projects under Priority Axes 1, 2, 3 and 4 of OPT, of which 8 major projects and 4 small projects. The budget of major projects implemented under OPT occupies a significant share of the paid amounts under the programme, which is why their in-depth analysis is an essential part of the evaluation. This approach is based on good evaluation practices at EU level for the programming period 2007-2013, applied in two main impact assessment reports which has been reflected in two of the main impact reports[[1]](#footnote-1), and most of the elements examined in case studies under current evaluation have also been studied within the evaluation reports at EU level. Major projects account for about 30%[[2]](#footnote-2) of the ERDF and CF budget at EU level, and half of them have been implemented in the transport sector. Their ex-post evaluation explores their input to the economic development and quality of life and compares the forecasts with achieved benefits in mid-term and long-term periods.

The effects of the implementation of large investment projects at the macro level are analyzed in detail in Section IV of the evaluation report using the SIBILA 2.0 method. In the case studies, the assessment is complemented by the following additional assessment sections:

* ***Retrospective cost-benefit analysis***, which compares the achieved project results until 2019 with the forecast levels in ex-ante CBAs, incl. investment costs, operating revenues and costs, reported traffic, achieved economic benefits during the period of operation;
* ***Problem analysis and analysis of good practices*** in the phases of preparation, implementation and operation;
* ***Qualitative analysis*** that summarizes and complements the results under different projects and transport sectors.

The evaluation is based on a documentary analysis and conducted interviews with respondents (representatives of the MA and the beneficiaries) which cover questions related to projects effectiveness and efficiency, as well as the added value achieved as a result of projects implementation. The projects have been grouped within the tables in this section by sectors (*road, rail, metro, water transport*) and not by priority axes, in order to highlight sectoral trends.

***Project effectiveness***

The majority of projects have met the objectives and project indicators. There has been a drop-off of activities in three of the projects, two of which are phased out in the next programming period and one is implemented in full using national funds. Delays in implementation are mainly observed in the railway sector and some road projects, as well as the projects under THE 4. The metro extension projects have the highest degree of complex efficiency – both in terms of the set scope and in terms of implementation in the set schedule.

The majority of projects have achieved their objectives and indicators. Three projects were completed in reduced scope, excluding some activities, two of them being phased out to the next programming period and one has been completed with national funds. Delays in implementation have mainly been observed in the railway sector and some road projects, as well as the projects under PA 4. Projects for metro extension have been assessed as highly efficient compared to the others both in terms of scope and time efficiency.

***Added value of projects***

The achieved project benefits have been evaluated via a retrospective cost-benefit analysis in the implementation phase and a comparison of the projected benefits. Most projects demonstrate a high level of achieved economic benefits (above 30%). The achieved benefit ratio is the lowest for projects in the rail sector and one of the projects for metro extension, due to significantly lower reported traffic data (including transported passengers and freight) compared to the forecasted values. This is due to the optimistic forecast in the ex-ante CBA, as well as reduction in volumes of passenger and freight flows in the railway sector, following the global economic crisis in 2008-2010. Road projects report high level of fulfillment of traffic forecasts, and therefore the economic benefits are considered to have been achieved to a high degree.

Times savings are the most significant economic benefit, with highest share in all projects (over 50% of all benefits for all projects), followed by reduced vehicle operating costs, increased travel safety, reduced carbon emissions and other environmental benefits. The degree of achievement of economic benefits is highly dependent on the change in the value of time, which in the ex-ante CBA has been linked to GDP growth. Overall, the ex-ante CBA had a very optimistic forecast for GDP growth, respectively for the growth of the value of time. Historical data show a lower rate of GDP growth, which is the reason to observe lower achieved benefits from time savings by 2019 than forecasted.

Most road projects have negative environmental impacts, but these are offset by the other positive economic benefits.

The optimistic ex-ante forecasts of traffic and benefits are typical to many projects across the European Union, as highlighted in the Evaluation Report on major projects financed by the ERDF and CF in the period 2000-2013[[3]](#footnote-3).

**Main problems**

Case studies identify the main problems in all phases of the project cycle. Delays in the preparation and implementation of projects are mainly due to problems at design stage, administrative procedures and procedures for settlement of ownership, problems in the implementation of PPA, SPA and FIDIC, procedures with archaeological sites, appeals of public procurement procedures. Delays in the preparation and implementation of large-scale infrastructure projects are typical not only for Bulgaria, but for the entire European Union, as reported in the ex-post evaluation of major projects financed by the ERDF and CF during the 2000-2013 programming period.

In some cases, there have been difficulties in provision of own funds for projects implementation, as well as for financial corrections under commercial contracts, which are also among the significant problems during implementation.

Data from the operation stage show significant deviations of reported traffic and passenger flow compared to the forecasts, which reflects on financial sustainability and achieved economic benefits.

**Main recommendations**

Based on the experience gained and the reported data in operation phase, it is advisable to carefully set assumptions for passenger flow and cargo flow values in the preparation of subsequent CBA, which are feasibly achieved.

It is recommended that the MA, together with the beneficiaries, timely identify sources of funding for own funds, including the EIB and other international financial institutions.

Increasing the administrative capacity of beneficiaries to implement PPA and SPA is a key prerequisite for successful implementation and prevention of financial corrections caused by legislative violations.

It is recommended to monitor project parameters in the future sustainability reports on an annual basis (per calendar year), including traffic, passenger and cargo flows data, as these are the main source of data for the preparation of retrospective cost benefit analyses within future estimates.

Table **I‑1** contains the **structure of the investment costs** of projects. The main sources of funding to all projects are European funds and national co-financing at programme level. Beneficiaries' own funds include ineligible expenditure and co-financing as calculated by the CBA for revenue-generating projects, such as:

* Expenditure incurred outside the eligibility period, including expenditure on activities implemented after 2015 due to delays in projects implementation;
* Financial corrections on eligible costs as a result of infringements and irregularities committed by beneficiaries;
* Ineligible expenditure identified as such by the MA due to budgetary constraints of the programme.

Projects in the rail and metro sectors are defined in the CBA as revenue-generating, respectively the beneficiaries have their own contribution based on the financial deficit estimated through the CBA.

Table I‑1: Structure of investment costs

| **Sector** | **Project** | **National funding** | **EU funding** | **Beneficiaries own financing** | **Loans/Other** |
| --- | --- | --- | --- | --- | --- |
| **Rail** | BG161PO004-1.0.01-0005  Plovdiv – Svilengrad Railway | ✓ | ✓ | ✓ | ✓ |
| BG161PO004-1.0.01-0008  Railway line Septemvri - Plovdiv |  |  |  |  |
| BG161PO004-3.0.01-0008  Station complexes |  |  |  |  |
| **Road** | BG161PO004-2.0.01-0004  Trakia Motorway |  |  |  |  |
| BG161PO004-2.0.01-0009  Struma Motorway |  |  |  |  |
| BG161PO004-2.0.01-0015 Western Arc of SRR |  |  |  |  |
| **Metro** | BG161PO004-1.0.01-0006 Metro extension, Stage II, lots 1 and 2 | **✓** | **✓** | **✓** | **✓** |
| *BG161PO004-3.0.01-0001* Metro Extension, Line 2, Stage I | **✓** | **✓** | **✓** |  |
| *B0161P0004-3.0.01-0005 Metro* Extension, Line 1, Stage III | **✓** | **✓** | **✓** |  |
| **Water** | BG161PO004-4.0.01-0003 Bulris |  |  |  |  |
| BG161PO004-4.0.01-0005 VTMIS, Phase 3 |  |  |  |  |
| BG161PO004-4.0.01-0007 Navigation and topohydrographic measurement systems on the Danube River |  |  |  |  |

*Source: Final project reports, own calculations*

Table I‑2 summarizes the changes in projects investment costs. The investment costs in all sectors tend to decrease. The largest deviations from the forecasted values were reported in the railway sector, where major changes in the structure of investment costs took place. The comparison of the results by projects and sectors shows that the smallest deviations between the forecasted and the paid amounts were reported in all projects for metro extension. In the road sector the deviation in two of the projects is up to 30%, but in the project BG161PO004-2.0.01-0015 Western Arc of SRR there are deviations accounting for more than 30% in the different cost categories.

The reasons for deviations in investment costs are analyzed in detail in the detailed case studies and include drop-out of activities due to delays in implementation, lower value of construction contracts, unforeseen project costs and others.

Table I‑2: Change in investment costs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sector** | **Project** | **Total investment costs** | **Awarded Grant** | **Ineligible costs** |
| **Rail** | BG161PO004-1.0.01-0005  Plovdiv – Svilengrad Railway | **0** | **-1** | **3** |
| BG161PO004-1.0.01-0008  Railway line Septemvri - Plovdiv | **-2** | **-1** | **-3** |
| BG161PO004-3.0.01-0008  Station complexes | **0** | **1** | **-1** |
| **Road** | BG161PO004-2.0.01-0004  Trakia Motorway | **-1** | **-1** | **1** |
| BG161PO004-2.0.01-0009  Struma Motorway | **0** | **-1** | **-** |
| BG161PO004-2.0.01-0015 Western Arc of SRR | **-3** | **3** | **3** |
| **Metro** | BG161PO004-1.0.01-0006 Metro extension, Stage II, lots 1 and 2 | **0** | **0** | **0** |
| BG161PO004-3.0.01-0001 Metro Extension, Line 2, Stage I | **0** | **0** | **0** |
| B0161P0004-3.0.01-0005 Metro Extension, Line 1, Stage III | **0** | **0** | **0** |
| **Water** | BG161PO004-4.0.01-0003 Bulris | **-1** | **-1** | **-1** |
| BG161PO004-4.0.01-0005 VTMIS, Phase 3 | **0** | **0** | **0** |
| BG161PO004-4.0.01-0007 Navigation and topohydrographic measurement systems on the Danube River | **-3** | **-3** | **0** |

*Source: Final project reports, own calculations*

Legend of evaluation scoring:

*(-3) – a reduction of more than 50 %*

*(-2) – reduction between 30 and 50%*

*(-1) – decrease from 10 to 30%*

*(0) – deviation up to 10% - increase or decrease*

*(1) – increase from 10 to 30%*

*(2) – increase from 30 to 50%*

*(3) – increase above 50%*

The performance assessment relates to the degree of achievement of the objectives and indicators of the project, as well as compliance with the set timetable and budget. The following tables present evaluation results, which reveal that the best performance rates have been achieved in metro extension projects and two of the road projects.

Table I‑3: Achievement of project objectives

| **Sector** | **Project** | **Score** | **Justification** |
| --- | --- | --- | --- |
| **Railway sector** | BG161PO004-1.0.01-0005  Plovdiv – Svilengrad Railway | 4 | The project was implemented in full scope during the programming period 2007-2013 and has achieved its targets and objectives. The project was completed with delay of 30% compared to the initial timetable. |
| BG161PO004-1.0.01-0008  Railway line Septemvri - Plovdiv | 3 | The project was implemented with a substantial delay and a reduced scope between 2007 and2013. Some activities were excluded due to the risk of not being completed during the programming period, so some target indicators were partially achieved. |
| BG161PO004-3.0.01-0008  Station complexes | 4 | The project was implemented within the planned scope, with a delay in relation to the schedule. |
| **Road sector** | BG161PO004-2.0.01-0004  Trakia Motorway | 5 | The project was implemented within the set scope and there was no delay in its implementation. |
| BG161PO004-2.0.01-0009  Struma Motorway | 5 | The project was implemented within the set scope, although some delay in implementation was reported. |
| BG161PO004-2.0.01-0015 Western Arc of SRR | 3 | The project has been implemented in a reduced scope. Due to a delay in the start of the implementation activities of Section 2 of the project, Section 2 was proposed for phasing-out. |
| **Metro** | BG161PO004-1.0.01-0006 Metro extension, Stage II, lots 1 and 2 | 5 | The project was implemented in full scope during the programming period 2007-2013 and has achieved its objectives. |
| BG161PO004-3.0.01-0001 Metro Extension, Line 2, Stage I | 5 | The project was implemented in full scope during the programming period 2007-2013 and has achieved its objectives. |
| B0161P0004-3.0.01-0005 Metro Extension, Line 1, Stage III | 5 | The project was implemented in full during the programming period 2007-2013 and has achieved its objectives. |
| **Water sector** | BG161PO004-4.0.01-0003 Bulris | 4 | The project has been implemented in a reduced scope and with some delay. Phase 3, which concerns the deployment of new technologies, was excluded due to specific legislative changes at EU level. Nevertheless, all project target indicators have been achieved. |
| BG161PO004-4.0.01-0005 VTMIS, Phase 3 | 5 | The project was implemented in full scope with some delay, which did not jeopardize the achievement of its results. |
| BG161PO004-4.0.01-0007 Navigation and topohydrographic measurement systems on the Danube River | 3 | The project has been implemented in a reduced scope – a major activity related to the supply of a hydrographic ship has been excluded due to delays in the procurement procedures and appealing against the decision for selection of contractor. |

*Source: Final project reports, own calculations*

***Legend of evaluation scoring:***

*1 – the project did not achieve the expected objectives due to internal(endogenous) factors*

*2 – the project did not achieve the expected objectives due to external (endogenous)* *factors*

*3 – the project has partially achieved its objectives and/or was implemented in a reduced scope*

*4 – the project achieved its objectives with a significant delay in implementation (over 30 % delay compared to the planned implementation period)*

*5 – the project has achieved all the objectives set and was implemented in full scope within the planned implementation schedule.*

Table I‑4: Achievement of economic benefits

| **Sector** | **Project** | **Score** | **Justification** |
| --- | --- | --- | --- |
| **Rail** | BG161PO004-1.0.01-0005  Plovdiv – Svilengrad Railway | 3 | The value of the economic benefits for the period 2017-2019 is about 40% below the forecast in the original CBA due to the lower traffic volume and the higher forecasted growth value of time in the initial CBA, which have been adjusted in the OPT monitoring model from 2016. |
| BG161PO004-1.0.01-0008  Railway line Septemvri - Plovdiv | 4 | The value of the economic benefits for the period 2017-2019 is about 25% below the forecasted values in the initial CBA due to the lower traffic volume – by about 15% in passenger transport and about 42% in freight transport. However, the project generates significant benefits and given the upward trend in rail traffic for the period 2017-2019, the value of these benefits is expected to increase during the reference 30-year period of the project. |
| BG161PO004-3.0.01-0008  Station complexes | N/P | N/P |
| **Road** | BG161PO004-2.0.01-0004  Trakia Motorway | 5 | The reported traffic in the period 2016-2019 is higher than the forecasted in the initial CBA, with the exception of bus transport, which was much below the forecast values. The economic and environmental benefits of the project are deemed to be achieved in so far as their forecast stems from projected traffic, which has exceeded the forecasted values. |
| BG161PO004-2.0.01-0009  Struma Motorway | - | It is not able to analyze the extent to which the reported traffic in the period 2017-2019 demonstrates significant deviations from the forecasted values in the CBA due to lack of its Excel model, however for the reference period there was a smooth increase in traffic. Key indicators such as road travel time saved, and value of road travel time saved reported a sustainable upward trend between 2013 and 2019. |
| BG161PO004-2.0.01-0015 Western Arc of SRR | 5 | The reported traffic in the period 2016-2019 demonstrates significant deviations from the forecast in the ex-ante CBA for two of the years examined, significantly exceeding the forecast for the respective year in 2016 and reporting a decrease in 2018. In so far as the economic benefits are based on the volume of traffic, they experience the same deviations. |
| **Metro** | BG161PO004-1.0.01-0006 Metro extension, Stage II, lots 1 and 2 | 3 | The estimated benefits were achieved at 58 %. This is because the projected benefits are linearly dependent on the passenger flow, which in the ex-ante CBA (during the project preparation) was 40% more than the passenger flow reported in the ex-post CBA in 2016 (in which the benefits were not calculated). |
| BG161PO004-3.0.01-0001 Metro Extension, Line 2, Stage I | 5 | The comparison of data from the ex-post CBA prepared in 2016 and the recalculated basic parameters show a high degree of consistency both in terms of passenger traffic and operating income and expenditure. The projected economic benefits have been achieved and even exceeded by about 3% according to calculations based on real historical data; |
| B0161P0004-3.0.01-0005 Metro Extension, Line 1, Stage III | 3 | The projected benefits were achieved at 50,39 %. This is because the benefits under consideration are linearly dependent on passenger traffic, and in the project preparation the number of passengers estimated exceeds two times the reported number. |
| **Water** | BG161PO004-4.0.01-0003 Bulris | N/A | N/A |
| BG161PO004-4.0.01-0005 VTMIS, Phase 3 | N/A | N/A |
| BG161PO004-4.0.01-0007 Navigation and topo hydrographic measurement systems on the Danube River | N/A | N/A |

*Source: Final project reports, own calculations*

***Legend of evaluation scoring:***

*1 – the project has achieved benefits that are less than 30% of the forecasted in ex-ante CBA*

*2 – the project has achieved benefits that are between 30 and 50% of the forecasted in ex-ante CBA*

*3 – the project achieved benefits that are between 50 and 70 % of the forecasted in ex-ante CBA*

*4 – the project achieved benefits that were between 70 and 90 % of the forecasted in ex-ante CBA*

*5 – the project has achieved benefits that are over 90% of the forecasted in ex-ante CBA*

The achieved project benefits were assessed through a retrospective cost-benefit analysis in the operation phase and comparison of the forecasted benefits. Most projects have a high degree of achievement of the forecasted economic benefits (over 30%). The lowest is the coefficient of achievement of the benefits in the railway projects and one of the projects for metro extension, due to significantly reduced reported traffic (including transported passengers and cargo) compared to the forecasted values. Road projects have a high degree of fulfillment of traffic forecasts, which is why the economic benefits are considered to have been achieved to a high degree. The degree of implementation of economic benefits is highly dependent on the change in the value of time, which in the CBA has been linked to GDP growth.

Table I‑5: Distribution of economic and environmental benefits

| With **hector** | **Project** | **Benefits / Effects** | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Travel time saved | Reduced operating costs for PS | Improved  safety | Reduced carbon emissions | Climate change | Noise |
| **Rail** | BG161PO004-1.0.01-0005  Plovdiv – Svilengrad Railway | **+++** | **N/P** | **++** | **++** | **N/P** | **N/P** |
| BG161PO004-1.0.01-0008  Railway line Septemvri - Plovdiv | **+++** | **++** | **++** | **+** | **N/P** | **N/P** |
| BG161PO004-3.0.01-0008  Station complexes | N/P | N/P | N/P | N/P | N/P | N/P |
| **Road** | BG161PO004-2.0.01-0004  Trakia Motorway | **+++** | **N/P** | **++** | **N/P** | **N/P** | **N/P** |
| BG161PO004-2.0.01-0009  Struma Motorway | **+++** | **++** | **++** | **-** | **-** | **+** |
| BG161PO004-2.0.01-0015 Western Arc of SRR | **+++** | **++** | **++** | **-** | **-** | **-** |
| **Metro** | BG161PO004-1.0.01-0006 Metro extension, Stage II, lots 1 and 2 | **+++** | **++** | **++** | **+** | **N/P** | **N/P** |
| BG161PO004-3.0.01-0001 Metro Extension, Line 2, Stage I | +++ | ++ | ++ | + | N/P | N/P |
| B0161P0004-3.0.01-0005 Metro Extension, Line 1, Stage III | **+++** | **++** | **++** | **+** | **N/P** | **N/P** |
| **Water** | BG161PO004-4.0.01-0003 Bulris | **N/P** | **N/P** | **N/P** | **N/P** | **N/P** | **N/P** |
| BG161PO004-4.0.01-0005 VTMIS, Phase 3 | **N/P** | **N/P** | **N/P** | **N/P** | **N/P** | **N/P** |
| BG161PO004-4.0.01-0007 Navigation and topo hydrographic measurement systems on the Danube River | **N/P** | **N/P** | **N/P** | **N/P** | **N/P** | **N/P** |

*Source: Project CBA, own calculations*

**Legend of the evaluation scoring:**

*(-) the effect is negative for the project, but its impact is offset by other positive effects*

*(+) the effect is positive for the project with a total contribution to the benefits below 5%*

*(++) the effect is positive for the project with an overall contribution to the benefits of 5% to 50%*

*(+++) the effect is positive for the project with a total contribution to the benefits over 50%*

*N/A - the effect is not relevant to the project /* *no CBA has been prepared for the project / no data are available to calculate the effect*

Time savings have the highest share in the structure of economic benefits in all projects (worth above 50% benefits in all project), followed by reduced vehicle operating costs, and increased travel safety, reduced carbon emissions and other environmental benefits. Most of the road projects have negative environment impact which is offset by the other positive economic benefits.

# **PROJECT LEVEL STUDY - PRIORITY AXIS 1**

# ***BG161PO004-1.0.01-0005 Reconstruction and electrification of Plovdiv - Svilengrad railway line of corridor IV and IX, Phase 2: section Parvomai-Svilengrad***

## **Project summary**

|  |  |
| --- | --- |
| **BG161PO004-1.0.01-0005 Reconstruction and electrification of Plovdiv - Svilengrad railway line of corridor IV and IX, Phase 2: section Parvomai-Svilengrad** | |
| Priority Axis | Priority Axis 1 |
| Category | Major project |
| Beneficiary | National Railway Infrastructure Company |
| Budget | BGN 302 827 166,92 |
| Implementation period | 06.03.2012 – 16.12.2016 |

*Source: Final Report of OPT*

The project includes the following components:

* Construction on facilities, railroad and electrification - design and construction for railway stations from Dimitrovgrad to Svilengrad (from km 231+560 to km 298+800) and to the border with Greece;
* Construction of systems for signalization, telecommunications and SCADA for the entire railway line from Plovdiv to Svilengrad and Turkish border - completion of design and construction activities started under the ISPA programme;
* Implementation of additional works necessary to complete the overall project.

The project represents the final part of the project "Reconstruction and electrification of the Plovdiv - Svilengrad – Turkish border and corridors IV and IX". The project achieved complete reconstruction and electrification of the railway section Parvomai-Svilengrad, including built traction power substations, signaling, telecommunications and SCADA (telecontrol of the energy system), small and large facilities to allow future doubling of the entire railway, modern and comfortable road and pedestrian overpasses and subways. The project implementation ensured high exploitation parameters: design speed for passenger trains – 160 km/h (for tilting trains – 200 km/h), Ballasted Continuously Welded Track railways with steel-concrete sleepers with elastic type fastener, meeting European requirements for traffic safety, ensuring energy efficiency and environmental protection, interoperability of the national rail network with the European rail network. Completion of this railway section contributes to overall optimization of maintenance and implementation activities performed by NRIC. More globally, the project contributes to the growth and development of railway transport on the Belgrade-Nis-Sofia-Istanbul line and significant growth in transit traffic from Turkey and Greece, contributes to the economic growth and development of the transport sector, saving travel time, reducing transport incidents, reducing operating costs and attracting traffic from road transport.

The main characteristics and elements of project infrastructure include:

* Increase the design speed to 160 km/h for passenger trains and up to 120 km/h for freight trains
* ERTMS level 1 signaling system, centralized traffic management established in Plovdiv for the entire line to the Greek and Turkish borders
* The route has been equipped with GSM-R communication
* Information system for passengers provided in each railway station.

The project was implemented through interventions in three sections:

* *Section Parvomai – Dimitrovgrad*
* *Section Dimitrovgrad – Harmanli*
* *Section Harmanli - Svilengrad*

The beneficiary of the project is NRIC – a national company established in 2002 as a state enterprise and the sole manager of the railway infrastructure in Bulgaria. The Company organizes, implements and is responsible for the fulfillment of obligations under a long-term contract concluded with the state, and plans the overall development of the railway infrastructure in accordance with this contract. The company develops and maintains the railway infrastructure on the basis of long-term 10-year railway infrastructure development programs and annual business plans. For the implementation period of OPT 2007-2013 and in the five-year period after the end of the programme by 2020, currently the NRIC continues to perform its functions.

## **Project preparation**

The project preparation started inn 2000 funded by ISPA programme, and the beginning of the feasibility studies dates back to 1994. The project represents the final part of the project "Reconstruction and electrification of the Plovdiv - Svilengrad – Turkish border and corridors IV and IX". Due to delays in the implementation of the full scope of project under programme, ISP funding was reduced to cover only the section from Plovdiv to Dimitrovgrad (excluding railway station in Dimitrovgrad) and the completion of Phase 2 has been transferred to OPT, through Decisions of EC from December 2011. The section from Parvomai station to Dimitrovgrad station (29,3 km) was completed under ISPA. The reasons for the delay in implementation are related to late mobilization of resources, land acquisition procedures, delayed statements from municipal and state institutions, archaeological excavations and sites, etc.

The investment studies were prepared in 2001 for the purposes of the implementation of the ISPA project, and in 2010 an update of the cost-benefit analysis was carried out for the purposes of applying for the OPT. The EIA procedure was carried out in 2001 and the Decision under the Biodiversity Act (Natura 2000) was issued by the MOEW in 2008. Within the framework of the OPT, an Application Form was approved by EC Decision C(2011) 9936 of 22.12.2011 which covered all remaining components of the works in order to fulfil the scope and objectives of the ISPA Financial Memorandum, Measure No 2001/BG/16/P/PA/003.

The project traffic forecast foresees the modernization to increase transport flows by 170% in passenger transport and 10% in freight transport respectively. The assumption was based on the road traffic forecast model in GTMP and the attraction of road traffic flows. The increased design speed and electrification of the section are expected to shorten the journey time by 47 minutes for fast and international passenger trains and 33 minutes for freight trains, respectively. The financial indicators of the project are negative and prove the need for EU funding. The estimated economic benefits of the implementation of the project over the 30-year period amount to EUR 201,490 000 and include:

* Travel time saved for passenger (27%) and freight respectively (26%);
* Level crossing benefits from saved time and increased safety (17%);
* Benefits of reduced transport incidents (19%);
* Environmental benefits (16%).

There are also additional benefits of temporary employment created during preparation and construction – in total 1430 jobs. Other economic benefits include improved quality and access to rail services, including for people with disabilities, ensured compatibility with the EU rail network, contribution to economic development and Bulgaria's cross-border links with neighboring countries.

## **Project implementation**

The grant contract for the project was implemented within the period 06.03.2012 – 16.12.2016. All construction works were accomplished, and the upgraded and electrified railway has been in operation since December 2016, which introduced also a new timetable for trains allowing electric-powered traffic. The implementation of the main activities was awarded under the terms of the FIDIC Yellow Book in the following contracts:

* **Lot 1**: Reconstruction and electrification of the railway section Dimitrovgrad – Harmanli, with an approximate length of 34 km;
* **Lot 2:** Reconstruction and electrification of the railway section Harmanli-Svilengrad with an approximate length of 32 km and rehabilitation and electrification of the railway line Svilengrad – border with the Hellenic Republic with an approximate length of 3 km;
* **Lot 3:** Construction of new traction substations in Simeonovgrad and Svilengrad and extension of the existing traction substation in Dimitrovgrad;
* **Phase Systems** covers design and construction signaling, telecommunication and SCADA systems for the entire railway line.

The project includes the contracts concluded by MTITC pursuant to the Financial Memorandum under CF 1164/94/ISPA, for which the EC approved the transfer from ISPA to OPT by Decision No C (2011) 9936 of 22.12.2011. As a result, additional annexes were signed with the contractors under which the NRIC takes over the rights and obligations of contracting authority.

The grant contract awarded on 06.03.2012, with an initial implementation period until 30.09.2014 (about 2 years and 7 months). Afterwards three annexes have been concluded to extend the deadline and to revise technical mistakes: the first one in 2014 for extension of implementation to 31.12.2015 (one year and three months) because of overall delay in implementation and high risk category of project, the second one in 2015 for additional extension because of delay in implementation (till 31.01.2016, one moth), and a third annex on 29.12.2015 for revision of texts due to technical mistakes. Thus, the overall implementation of the grant contract was 46 months (about 30% longer than planned).

The financial implementation of the investment costs almost coincides with the planned budget, but the financial structure has changed. The value of grant was reduced by 14% (incl. the CF and national contribution), and the value of ineligible costs was increased by 80%. Ineligible costs include VAT costs, own contribution of beneficiary due to financial corrections imposed and expenditure on activities paid outside the eligibility period in 2016, due to delays in implementation. The financial corrections were imposed because of violations of the Public Procurement Act in contracting the project activities.

Table 1‑1: Changes in project budget

|  |  |  |
| --- | --- | --- |
| **Categories of expenditure** | **Initial budget** | **Financial implementation** |
| **Total** | **424 352 978,21** | **427 848** **540,05** |
| CF | 225 023 799,56 | 192 519 295,15 |
| National co-financing | 56 255 949,89 | 48 129 823,74 |
| Other /loans, own funds, etc./ | 72 676 043,22 | 62 178 048,03 |
| **Total eligible costs** | **353 955 792,67** | **302 827** **166,92** |
| **Ineligible costs** |  |  |
|  |  |  |
| Source 1 | 70 397 185,54 | 70 811 320,08 |
| Source 2 |  | 54 210 053. 05\*\* |
| **Total ineligible costs** | 70 397 185,54 | 125 021 373,13 |
| **\*\* The amount includes unverified project costs and expenditure paid in 2016.** |  |  |

*Source: Final project report, reporting data on the financial implementation of PO 1 by 2020, Final Report of THE OPT 2007-2013*

Figure 1‑1 Changes in investment costs

*Source: Own calculations, Source: Final project report, reporting data on the financial implementation of PA 1 by 2020, Final report of OPT*

Initially, the NRIC had problems to secure its own contribution, but in 2012 the company received financing through a Credit Agreement with the EIB for the project.

Indicators for the project implementation presented in the following table. All planned construction activities have been finalized and the target values of the main result indicators have been achieved, some even exceeding the target values due to additional activities implemented.

Table 1‑2: Indicators for project implementation

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Unit of measure** | **Target value** | **Value achieved** |
| Length of the reconstructed route | Km | 67,2 | 70,475 |
| Installed contact network per km of track | Km | 70,9 | 73,666 |
| Railway bridges, incl. large underpasses/overpasses | Number | 45 | 45 |
| Length of railway bridges, including large underpasses/overpasses | M | 2 359 | 2 733 |
| Level crossings removed | Number | 12 | 11 |
| Stations with renewed signaling | Number | 6 (excluding Krumovo station) | 7 |
| Stations with renewed track development | Number | 4  (excluding Train Stations Simeonovgrad and Harmanli) | 6 |
| Built disinfection framework in Svilengrad station | Number | 1 | 1 |
| Facility for servicing wagons with dangerous goods in Svilengrad detention (loading) station | Number | 1 | 1 |
| Veterinary disinfectant station built in Svilengrad detention station | Number | 1 | 1 |
| Equipment of stations with water pipes for fire and emergency needs | Number | 6 | 6 |
| Demolished depreciated scrapped buildings | Number | 30 | 30 |
| Reconstruction of Dimitrovgrad traction substation | Number | 1 | 1 |
| Built new traction substations | Number | 2 | 2 |
| New sub-area built | Number | 1 | 1 |
| Long lines | Number | 2 | 2 |
| Installation of GSM-R towers and facilities | Number | 8 | 8 |
| Installation of telecommunications facilities in traction substations and main sectional posts | Number | 5 | 5 |
| Installation of SCADA equipment at operating points | Number | 7 | 7 |
| Installation of SCADA equipment in traction stations and TPs and CAP | **Number** | 7 | 7 |

*\*Achieved values of indicators do not include the part of Phase 2 implemented within the scope of ISPA*

*\*\* Source: Final report of OPT*

In the long term, the implementation of the project led to reduction in operating costs and better technical efficiency of maintenance of the track and operation of the network, as well as a higher safety level. The electrification of the railway line reduced the negative environment impacts, since diesel traction was replaced by electric. The project also contributed to higher energy efficiency, installation of ERTMS to comply with European signaling systems. Uniform automatic speed control was introduced via the project. Reduction of noise and vibration levels in the urban environment were achieved, as well as reduction in travel time. The project has achieved complete modernization and increased railway competitiveness, as well as electrification of the line along European Transport Corridor No IV.

**The main problems in the implementation phase which caused the significant delays include:**

* *Complicated and slow administrative and land acquisition procedures.* These delays were the major risk to project implementation within the extended deadlines. As a corrective measure, the beneficiary has mobilized highly specialized legal assistance to speed up the procedures. Replacement national financing was ensured to cover the construction carried out in 2016.
* *Delay in issuance of the building* permits.
* *Undetermined ownership of the land for the extension of station Dimitrovgrad. I*t was identified that the property of station Dimitrovgrad was not entirely municipal, which caused 3 years’ procedures changing the ow ownership and acquisition of the property by NRIC.
* *Numerous claims submitted by the contractors under the design and construction contracts (a total of 97 claims).*
* *Ambiguities and inconsistencies arising from the interaction of FIDIC and SPA conditions in design and construction* contracts.
* *Problems with NEOCHIM JSC.* The implementation of the track and electrification in the Dimitrovgrad-Nova Nadezhda intersection (from km 234+290 to km 240+000) requires: crossing the new railway line with air electro ducts 110 kV and 20 kV and 20 kV cable electro pipeline owned by "NEOCHIM"; it is crossed on the new railway line with 2 water pipe lines owned by NEOCHIM; explosion works with possible impact on the work of NEOCHIM. In 2012, NEOCHIM JSC initially rejected the technical project of the contractor and subsequently agreed it with firm limiting conditions. Due to impossibility to remove high voltage lines by second half of 2015, the construction of the track and electrification in the Dimitrovgrad-Nova Nadezhda section was delayed by approximately three years
* *Delays and temporary suspension of construction in some areas due to a number of newly discovered archaeological sites* and the need to carry out unforeseen rescue archaeological excavations under the Cultural Heritage Act. As a corrective action, unforeseen archaeological excavations have been contracted, completed and financed.
* Problems in *the preparation and conduct of tendering* *procedures* by the Beneficiary which have led in some cases to complaints from participants or to financial corrections
* *Ineffective management of construction contracts, due to inconsistencies in contracts* arising from contradictions in FIDIC and SPA conditions, insufficient tools to impact on contractors’ execution and unrealistic deadlines implementation.
* *A shortage of* funds to finance the beneficiary's own contribution and ineligible costs, as well as a lack of long-term planning of NRIC's own contribution by end of 2014.
* *Financial corrections* on the value of commercial contracts concluded by the NRIC, imposed by MA and caused by violations of Public Procurement Act, which range from 5 to 25% of the value of commercial contracts.

## **Operational phase**

In the operational phase, the NRIC submits to the MA annual sustainability reports, in accordance with paragraph 16.1.3 of the Procedural Manual for the Management and Implementation of the Operational Programme "Transport".

The maintenance of the Section Parvomai – Svilengrad is carried out by a sub-district / Energy distribution – Dimitrovgrad and sub-district /Energy distribution – Svilengrad.

Monthly and annual schedules according to operating instructions, ongoing maintenance and repair of the contact system are carried out. Service and functional tests are carried out under the adopted procedure. In order to maintain the parameters of the railway section Partomai- Svilengrad according to the regulations, checks and measurements are carried out in accordance with the current Rules for the ongoing maintenance of the track. Axle and level corrections with heavy road mechanization at stations are also carried out. Periodically, felling of trees and shrubs is carried out to provide gauge and visibility, mowing of tall grasses, cleaning ditches and safety channels. The maintenance of the technical parameters of the railway section facilities is carried out through ongoing and planned maintenance, as well as by timely repair of damage to the equipment. The ownership of the assets has not been amended as provided for in the AF.

An updated financial analysis of the project was prepared in 2016 for the purposed of closure of programming period 2007-2013 and Article 55 of Regulation (EC) No 1083/2006. The results of the analysis show that for the period 2011-2016, lower project revenues were generated than forecasted in the CBA for the following reasons:

* Changes in the tariff policy of the NRIC;
* Reduced traffic during the construction period;
* Changes in macro-economic situation resulting from the world economic crisis from 2009-2011 and the general trend for a decrease in the volume of railway transport in Bulgaria, which could not be taken into account when preparing the ex-ante CBA and AF.

The reduction in the freight traffic was higher (a total decrease of 23% for the period 2009-2015), while the decrease in passenger traffic was smaller (4 % per year).

The revenues were recalculated to include income from renting of spaces in the stations.

Reported expenditure for the period 2011-2016 exceed the forecasted values in the CBA for the following reasons:

* Changes in the accounting system for expenditure on sections of a railway network, as a result of which the reported costs on the line are about 20 % above the forecasted values;
* The technical need to appoint additional station staff responsible for managing train traffic during the construction period, when automated train running systems have been switched off. This has led to an increase in costs on average per year by about 24%.

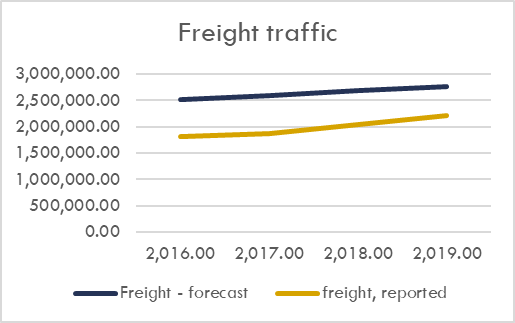
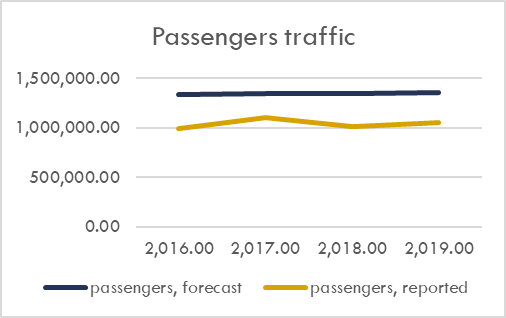
As a result of the above reasons, the reported expenditures in the first years of the project were significantly higher than forecasted values, while in 2015 and 2016 the estimated costs began to approach the reported costs. The results of the updated financial analysis confirm that the project needed to receive a grant aid. The financial deficit has been recalculated from 91.34% in the initial AF to 91.40%, so no equalization payment was necessary.

The comparison between forecasted and reported traffic for the period from 2016 to 2019 reveals that reporting data still show lower traffic than forecasted – around 22% lower passenger traffic and around 24 % lower freight traffic. However, there is a trend of increasing traffic volume during this period and in the long term the forecasted benefits of increased rail traffic are likely to partially offset lower value in the beginning of exploitation period.

Figure 1‑1 traffic

Фигура 1‑2: Traffic data

Figure 1‑2: Traffic data



*Source: NRIC*

The economic benefits appraised in the CBA are directly dependent on the volume of traffic, which is why for the period 2016-2019 the estimated benefits are about 40% lower than forecasted.

Figure 1‑3: Economic benefits

Source: NRIC, own calculations

## **Conclusions**

On the basis of the project information examined in the preparation, implementation and operation phase, the following conclusions can be drawn:

* Significant delays have been made both in preparation and implementation phase of the project. The preparation of the project dates back to 1994 and the actual implementation was launched in 2012. The project duration has been extended twice in the course of implementation. The project was classified as high-risk in 2013 and corrective measures have been taken for its successful implementation under OPT 2007-2013.
* Despite these circumstances, NRIC accomplished and reported all project activities within the OPT 2007-2013;
* The main problems of the project are related to the delayed preparation, delay in land acquisition procedures and implementation of the Cultural Heritage Act for archaeological sites, Public Procurement Act /long appeals, financial corrections on contracts/, difficulties in provision of NRIC own contribution, delayed execution of construction contracts.
* The financial implementation of the investment costs almost coincides with the planned budget, with a changed structure – the share and amount of grant was reduced, and the amount of ineligible costs was significantly increased. Ineligible costs include VAT, beneficiary’s contribution arising from financial corrections and expenditure on activities paid outside the eligibility period in 2016 due to delays in implementation. The assumptions of the ex-ante financial analysis were revised in the operational phase through elaboration of an ex-post financial analysis in 2016. The calculations carried out show lower traffic than forecasted and, accordingly, lower revenues, as well as higher costs for maintenance and operation of the section due to a change in the way they are reported and additional costs during construction. Financial sustainability is ensured by own revenues and national subsidy received by the beneficiary. The financial parameters in ex-post financial analysis carried out in 2016 confirm the need for EU funding.
* The value of the economic benefits for the period 2017-2019 is around 40 % below that forecasted in the ex-ante CBA due to the lower traffic volume and the higher value of time in the ex-ante CBA, which was adjusted in OPT monitoring model from 2016. Nevertheless, the project generated significant benefits and taking into account the increasing traffic trends for the period 2006-2019, these benefits are expected to also to increase within the reference 30-year period.
* The corrective measures taken for timely project completion proved to be a good practice, since the project was successfully accomplished and put into exploitation phase within OPT 2007-203 eligibility period.

# ***BG161PO004-1.0.01-0008 „Modernisation of Septemvri-Plovdiv Railway section, part of the Trans-European Railway Network”***

## **Project summary**

|  |  |
| --- | --- |
| **BG161PO004-1.0.01-0008 „Modernisation of Septemvri-Plovdiv Railway section, part of the Trans-European - Railway Network”**  http://rail-infra.bg/assets/Documents/SRIP/ОПТ/karta-SP-PO.jpg | |
| Priority axis | Priority Axis 1 |
| Category | Major project |
| Beneficiary | National Railway Infrastructure Company |
| Budget | BGN 168 875 273.07 |
| Implementation period | August 2011 – June 2017 |

*Source: Final Report of OPT*

The project „Modernization of Septemvri-Plovdiv Railway section, part of the Trans-European - Railway Network” is part of the broader project "Modernization of the Sofia-Plovdiv railway", situated on a railway route of high national and international importance, passing through the territory of Bulgaria along Trans-European transport corridors IV and IX and representing the main railway link of European countries with Turkey and the Central Asia and Middle East directions.

The project implementation included modernization of the existing route to achieve a design speed of 160 km/h for conventional rolling stock and 200 km/h for tilting trains, in the section between Septemvri station (from entrance from Sofia at km 102 + 011) and Plovdiv station (entrance from Sofia at km 155 + 607) with a total length of 53.596 km double track. Modernization includes renewal of the main tracks, concrete sleepers and elastic fasteners, track leveling’s and partial changes in single curves, ground lane strengthening, renewal of the track ballast and superstructure, complete renewal of the OLE equipment and modernization of traction power substations, replacement of existing train management systems with, ensuring a higher level of safety. The main objectives of the modernization of the existing route are related to increased speed for trains , increased competitiveness of railway transport; increased traffic security by installing the European Train Control System (ETCS) level 1, installation of GSM-R train traffic, removal of level crossings and replacing them with grade separated crossings.

The project implementation in programming period 2007-2013 includes three sections, with three separate design and build contracts:

* *Section 1: Septemvri– Pazardzhik;*
* *Section 2: Pazardzhik* –Stamboliyski;
* *Section 3: Stamboliyski – Plovdiv*.

The project beneficiary is NRIC – a national company established in 2002 as a state enterprise and the sole manager of the railway infrastructure in Bulgaria. The Company organizes, implements and is responsible for the fulfillment of obligations under a long-term contract concluded with the state, and plans the overall development of the railway infrastructure in accordance with this contract. The company develops and maintains the railway infrastructure on the basis of long-term 10-year railway infrastructure development programs and annual business plans. For the implementation period of OPT 2007-2013 and in the five-year period after the end of the programme by 2020, currently the NRIC continues to perform its functions.

## **Project preparation**

The preparation of the investment project was initially financed by the ISPA programme in the pre-accession period, and in the period 2008-2012. JASPERS also participated in the preparation. The project was set out in the initial version of OPT as a priority project. The modernization of the railway line Sofia - Plovdiv (and the respective preliminary designs) was divided into three sections: two "plain terrain projects" /Sofia-Elin Pelin and Septemvri-Plovdiv/ and one "mountain terrain project" – Elin Pelin-Septemvri. In 2009, Elin Pelin - Septemvri section was postponed for the next programming period, and in 2010 a decision was taken that within programming period 2007-2013 only one section – Septemvri – Plovdiv was going to be implemented. The changes in the project scope required revisions in the technical documentation, CBA and AF. On 16 January 2012, the AF was approved for implementation under OPT with EC decision C (2012) 23.

Besides the main effect of the increased speed in the section of the railway line Septemvri - Plovdiv, the project sets a number of socio-economic goals related to increased mobility of the population, improved rail services, improved connections between Bulgaria- Turkey and Bulgaria – Greece. The project forecasted generation of diverted traffic to railway transport by 10% and increase in passenger traffic, and as a consequence - a reduction in carbon emissions and a reduction in road accidents. Removed level crossings (overpasses) generated road safety benefits and reduced traffic delays.

The feasibility study analyzed three alternatives, which were compared through multi-criteria analysis and CBA. The financial analysis of the project was based on the model and demand forecasts in the General Transport Master Plan of Bulgaria developed in 2010. The project envisages increased speed and reduced journey times for the Septemvri - Plovdiv section (53.6km), 12 minutes for fast and international passenger trains and 3.25 minutes for freight trains. The model envisages increase in freight and passenger traffic (by 10% and 13% respectively), as a result of shorter travel time and improved infrastructure.

The financial indicators of the project are negative and prove the need for EU funding. The estimated economic benefits of the implementation of the project include:

* *Time saving benefits* in passenger and freight trains, with share 57.3% and 6.8%, respectively;
* *Time savings due to removed level crossings* - with a share of 21.2% of the total benefits;
* *Reduction of road accidents due* to the diverted road traffic – 1.1% for freight transport and 2.5% for passenger transport respectively;
* *Environment benefits –* 0.04% for freight and 0.39% for passenger transport
* *Reduced vehicle operating costs –* 4.65% for freight and 5.9% for passenger transport.

The total discounted value of the valued benefits for the reference 30-year amounted to EUR 291 534 570 and the project demonstrated positive economic indicators (IRR and NPV).

The qualitative benefits are related to improving access and quality of rail services, providing access for people with disabilities, improved safety, improved compatibility with the EU rail network, improved cross-border connections, etc.

The following problems in preparation phase can be listed:

* Delayed and incomplete preparation of the investment project. Preliminary design was accepted only as the basis for subsequent detailed design. Due to incompleteness in the volume, scope and quality of the designs, a penalty of 10 % of the value of the technical assistance contract financed under the ISPA programme has been imposed.
* The amendment in the project scope required revisions of the project documentation, including the CBA, which further delay the process of preparation and submission of AF under the programme.

## **Project implementation**

The project implementation started with signature of the Grant Contract 11/05.08.2011 on 05.08.2011. between the MA of OPT and the NRIC, which envisaged project completion on 30.09.2015 (total duration of appr. 49 months). Due to significant delays in implementation, in 2013 the project was categorized as high-risk by the Managing Authority and additional measures were taken for its successful completion in programming period 2007-2013. As a result, implementation was extended by four months and the scope of activities in initial project was reduced, excluding activities related to the construction of four road overpasses and land acquisition, implemented after eligibility period of expenditure. In 2016, an Annex was signed on the basis of a final payment request, which changed the financial parameters and the distribution of costs.

The implementation of the design and construction contracts for the different sections was awarded through separate contracts launched in December 2012 with the development of technical design. After its completion, a conformity assessment of the projects was carried out and building permits were issued in 2013 and 2014 respectively for the different sections. The implementation of the construction contracts ended in 2016 and 201 for the different sections.

The amendments to the project budget are presented in the following table and are due to the following reasons identified in the ex-post financial analysis carried out in 2016:

* Change of the indicative values included in the AF with the actual values of the concluded contracts, which led to a decrease in the total investment costs by appr. 35%.
* Excluding and modifying project activities, as well as savings from tendering procedures, redistribution of costs due to financial corrections.
* Excluding of project costs for activities beyond the eligibility period of expenditure,

i.e. costs incurred after 31.12.2015.

As a result of the reduction in the scope of the activities, the total budget of the project was reduced by almost half in 2015, mainly due to a decrease in the value of ineligible costs and due to the lower values of commercial contracts concluded. The initial grant budget did not include BGN 294 372 746.8 due to budget limitations of OPT. This sum was afterwards decreased to BGN 31 152 868.44 due to tender savings and the total beneficiary’s contribution was reduced to BGN 112 261 927.78. The original value of the EU contribution was reduced from BGN 160 million to BGN 128.5 million, however the share of EU contribution increased from 25.3% to 41.2%. In 2016, a final adjustment was made to all financial parameters of the project after the project completion.

Initially, the NRIC had difficulties with provision of own contribution, but in 2012 the company received financing through a Credit Agreement with the EIB for the project.

Table 2‑1 Changes in the project budget

|  |  |  |
| --- | --- | --- |
| Sources of funding | Initial project budget | Financial implementation |
|  | Value in BGN | Value in BGN |
| Total project value | 630 626 259,27 | 319 872 094,32 |
| CF/ERDF | 160 000 000,00 | 128 150 956,29 |
| National co-financing | 40 000 000,00 | 32 037 739,06 |
| Other | 0,00 | 8 686 578,07 |
| *Total ineligible costs* | *430 626 259,27* | *150 996 820,90* |

*Source: Final project report, data on the financial implementation of OPT*

Figure 2‑1 Investment costs

*Source: Final project report, data on the financial implementation of THE MA*

The comparison between planned and reported revenues for the period 2011-2016 shows a lower level of revenues than planned, due to tariff changes and decreased total volume of rail transport in Bulgaria after the economic crisis of 2009-2011, as well as reduced railway during construction activities. The ex-post financial analysis took into account the revenues from rent of spaces in the stations. The amount of expenditure for the period 2011-2016 was also decreased due to a change in the system for reporting costs on sections of the railway network. The recalculated financial indicators show that the project still needs a grant, as the financial IRR was below 5% and the NPV was negative. The revenues from infrastructure charges cannot cover the costs of operation and maintenance, which necessitates national subsidies to ensure the financial sustainability of NRIC.

**Achievement of target values of indicators**

The target values of the project indicators have been achieved, some of them partially, as shown in the following table:

Table 2‑2: Implementation of project indicators

|  |  |
| --- | --- |
| Implementation of project indicators | |
| Length of rehabilitatedtrack | 33.6 miles. |
| Railroads built | 122,118 km. |
| Upgraded track developments at stations | 5pc |
| Established contact network | 146.376 km |
| Refurbished and upgraded bridges: | 23 shares |
| Replacement of contact network poles | 2116 shares |
| Renewed signaling at stations | 3 pcs.\* (from 5 pcs.) |
| Installed GSM-R base stations and antennas | 15 pcs.\* (from 20 pcs.) |
| (Sofia-Plovdiv); |  |
| Fiber optic cables from Sofia to Plovdiv: | 184 km; |
|  |  |
| Built ETCS Level 1 for the Septemvri-Plovdiv section | 0 pcs.\* (from 1 pc.) |
| Installed telecommunications equipment at stations: | 12 pcs.\* (from 16 pcs.) |

\**Partially implemented indicators cover activities excluded from the scope of the project, which have been implemented until 2017 due to the general delay in implementation.*

*Source: Final project report*

The following **problems** were reported during the implementation phase:

* *Delay in the project start and resulting financial claims from three contractors under construction contracts.* The delay was due to an appeal of the public contract for construction supervision, which generated a total delay of implementation by 17 months. A workforce within NRIC has been established to calculate the penalties and sign agreements with the contractors.
* *Delay of the procedures for approval of detailed construction plans and land acquisition, necessary for construction of* 4 road overpasses, due to the appeal of the procedure for the selection of a Project Consultant (supervisor);
* *Generated delays and extensions of the construction contracts,* including uptake of guarantees for failures to fulfil obligations under the contracts. The delays and extension led to increase in the value of contract for supervision.
* *Difficulties in provision of beneficiary’s co-financing of the project and funding the ineligible costs, including VAT and financial corrections.* Co-financing is required due to the fact that the project is revenue-generating and requires co-financing, and in addition some of the costs have been classified as ineligible due to budget limitations of OPT funding. To solve these problems, in 2013 a loan from EIB was agreed at national level.
* In the course of theproject implementation, financial corrections were imposed on several commercial contracts – under the construction contracts (between 5 and 10% of their value) and other contracts. This was an additional financial burden to the NRIC.
* *Technical problem with GSM-R* - The radio spectrum in which the GSM-R system operates was defined by the technical specifications for GSM-R of UIC (EIRENE FRS v.7, EIRENE SRS v.15). The frequency bands used were 876 –880 MHz and 921–925 MHz and are used by all countries in the European Union. The authorisation of a limited resource – radio spectrum, which is carried out by the Communications Regulation Commission (FDC), depends on the consent of the Ministry of Defence. Corrective actions have been carried out to ensure the spectrum for GSM-R in the Sofia - Plovdiv section. Three temporary permits were received for a period of 6 months for the use of a limited resource – frequency spectrum.

The delays listed above have led to a general delay in the project and the need to reduce its scope at the end of its implementation in order to complete the project under the eligibility period of OPT 2007-2013.

## **Operational phase**

In the operational phase, the NRIC submits annual sustainability reports to the MA in accordance with paragraph 16.1.3. Management and Implementation of the Operational Programme "Transport". The reports contain information on the measures taken to maintain the modernized infrastructure and the results achieved. NRIC performs the following actions in this direction:

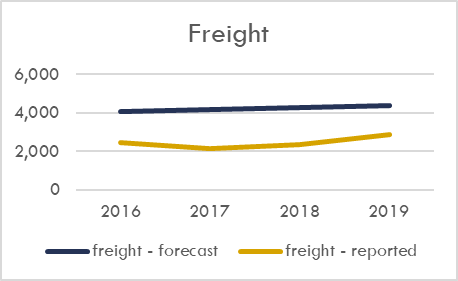
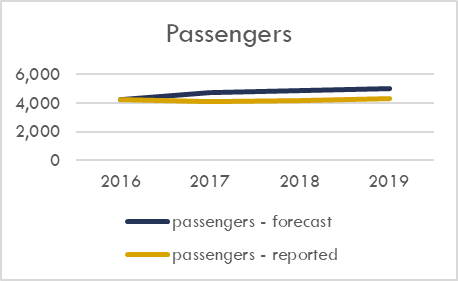
* Inspections and measurements for maintenance of the railway section Septemvri – Plovdiv, according to the Rules for operational maintenance of the track;
* Maintenance of rehabilitated buildings, platforms, vertical planning, underpasses and facilities;
* Maintenance of the contact system;
* Signaling and telecommunications support.

The reports include a description of the above measures and expenditures for maintenance and operation. The assets acquired as a result of the project implementation have been transferred for management to the respective divisions in the structure of the NRIC. The reports provide up-to-date traffic data as well as information on on-the-spot checks and controls carried out by the beneficiary.

The review of reported traffic data for the period 2017-2019 shows an increase compared to the period 2011-2016, but the values are still below the forecasted traffic volumes in the ex-ante CBA.

Passenger traffic is on average 15% lower than forecasted and freight is 42% below the forecasted value. The forecasted traffic volumes in ex-ante CBA are based on GTMP from 2010, which did not take into account the effect of reduction in traffic due to economic crisis in the period 2008-2011. Despite this deviation, in the period 2017-2019 there has been an increase in both passenger and freight traffic volumes, which in the long term is possible to partially compensate for the observed deviations of volumes and, accordingly, in the economic benefits of the project.

Figure 2‑2 Passenger and freight traffic



*Source: NRIC*

The economic benefits calculated in the ex-ante CBA are mainly based on traffic volume, so the ratio between the forecasted and reported benefits follows the trend of deviations between forecasted and reported traffic.

The total volume of forecasted benefits for the period 2017-2019 amounts to EUR 13 396.6 thousand and the recalculated benefits based on the lower volume of traffic are worth EUR 10 186.5. The greatest share of the benefits is the time saved in passenger transport (over 40%), followed by the benefits of reduced level crossings, which are also associated with time saved due to the elimination of traffic delays (about 23%). The share of benefits of reduced maintenance costs is also significant.

Figure 2‑3 Economic benefits

*Source: Own calculations, NRIC, CBA*

## **Conclusions**

**On the basis of the project information examined in the preparation, implementation and operation phase, the following conclusions can be drawn:**

* Significant delays have been made both at the preparation and implementation phase of the project. In the course of the project preparation and implementation, the scope of the project has been redefined several times due to budgetary and time constraints. As a result, in 2013 the project was identified as high-risk by the MA and specific corrective measures were taken to minimize the risk of non-completion.
* Despite these circumstances, NRIC completed successfully the majority of planned activities within the scope of OPT 2007-2013 OPT.
* The main problems of the project were related to the delayed preparation, implementation of the Public Procurement Act (long appeals, financial corrections on contracts conducted), difficulties in provision of beneficiary’s contribution, additional construction works incurred as contingencies, delayed implementation of construction contracts;
* There was a significant decrease in the reported investment costs compared to the initially planned budget, as well as amendment in the structure of the investment. The changes are due to procurement savings, exclusion of activities due to expiration of eligibility period. The investment structure was changed with increase in the share of EU contribution, and financial correction were reported as ineligible costs.
* The assumptions in the ex-ante CBA project were examined in the operational phase through an updated financial analysis in 2016. The calculations show lower traffic volumes than forecasted and respectively – lower revenues. The reported operational costs were also lower than forecasted because of change in accounting policy. Financial sustainability is ensured by own revenue and a subsidy from the state budget. The calculated financial parameters in 2016 confirm the need for EU support;
* The value of the economic benefits for the period 2017-2019 is about lower 25% than the forecasted values in the ex-ante CBA, due to the lower traffic volumes – by about 15% in passenger transport and about 42% in freight transport. However, the project generates significant benefits and given the upward trend in rail traffic for the period 2017-2019, the value of these benefits is expected to increase during the reference 30-year period.

# ***В0161Р0004-3.0.01-0006 „Project for extension of Sofia Metropolitan: Phase II, lot 1 – Obelya – Nadezhda and Lot 2 – Mladost – Tsarigradsko shose”***

**short name Metro extension, Stage II, lots 1 and 2**

|  |  |  |
| --- | --- | --- |
| Line Scheme    **STAGE 2 - LOT 1**  **STAGE 2 - LOT 2**  **STAGE 1 – CENTRAL SECTION** | | |
| Priority axis | ***Priority axis 1*** |
| Category | **Major project** |
| Beneficiary | *"Metropolitan" EAD* |
| Budget | **Total budget:**  BGN 705 852 958,53  EUR 360 896 887,01 |
| **Eligible costs:**  BGN 567 831 257,17  EUR 290 327 511,68 |
| **Grant:**  BGN 456 219 816.41  EUR 233 261 488.17 |
| **EU funding**  BGN 364 975 853,13  EURO 186 609 190,54 |
| Implementation period | 22.02.2011 - 30.06.2013 |

*Source: Project Final Report*

**Description of the project and basic data**

The project for the expansion of Sofia metro was implemented with funds from operational program "Transport" in two stages. The two lots included in Stage II provide for an extension of the underground railway route from "Mladost 1" district to Blvd. "Tsarigradsko Shose" and from “Obelya” District to “Nadlez Nadezhda”. Thus, the total length of the metropolitan metro becomes 31 km with 27 metro stations.

The stage covers the following stations:

* Lot 1 line 2, section "Obelya – Nadezhda District – Nadezhda Road Junction" from km.0+048 to km. 4+139,236. It is the beginning of the 2nd metro diameter and has a length of 4.2 km and includes 4 metro stations.
* Lot 2 line 1, “Mladost I section (MS 13) – Blvd. Tsarigradsko Shose (MS 19) with buffer underground parking”. It is an extension of the first metro diameter of the largest residential complexes of the city - Mladost district in the direction of Druzhba district and Sofia Airport. The section passes through Mladost III district and reaches the main entrance, eastern road artery in the southeastern part of the city – Tsarigradsko Shose Blvd. The metro section has a length of 2.5 km, of which 2.2 tunnel sections and 2 underground metro stations.

Table 3‑1 Project implementation

|  |  |
| --- | --- |
| **Grant Contract** | **22.02.2011** |
| Annex to the Grant contract in connection with completed tender procedures - the value of the Grant contact of BGN 488 957 500 decreased to BGN 456 219 816.41. The total eligible costs of the project are decreased from BGN 616 797 201,36 to BGN 567 831 257,17. | 22.02.2013 |
| **LOT 1 Section of Km. 0+048 to km. 4+139.40 and MS 1 II, 2 II, 3 II and 4 II** | |
| End date of implementation of the project according to an initial approved project proposal/grant contract | 30.06.2013 |
| End date of implementation of the project, according to accepted amendments to the grant contract | 30.06.2013 |
| Commissioning | 29.08.2012 |
| Actual completion of the project | 16.01.2013 |
| **LOT 2 "Mladost 1 (MS 13) – Blvd. Tsarigradsko Shose (MS 19) with underground parking"** | |
| End date of implementation of the project according to an initial approved project proposal/grant agreement | 30.06.2013 |
| End date of implementation of the project, according to accepted amendments to the grant agreement | 30.06.2013 |
| Commissioning | 25.04.2012 |
| Actual completion of the project | 27.11.2012 |

*Source: Final Report of the Implementation of the OPT, Final Report on project implementation*

**Problems encountered during the implementation of the project**

*Technical problems:*

* In the course of construction, technical problems arise, which are solved in an operational order and have not led to a violation of the project schedule.
* *Financial problems*
* At the end of the project, a financial problem arises because Metropolitan EAD does not have the funds to finance the final payment of the project which amount is 60.90 million BGN. Of these, 11.90 million BGN are provided by Sofia Municipality and the rest of the state budget, which makes possible payment of all project costs.

**Comparison of project effects forecasts and actual achievements**

*Financial implementation*

The project was implemented with the help of a grant in the amount of BGN 456,219,816.41 / EUR 233,261,488.17 (ERDF and national co-funding) and other sources in the amount of BGN 249,633,142.12 / EUR 127,635,398.84 (own funds and EIB loan).

The total eligible costs of the project are intended for:

• Design and preparation - ~ BGN 1.9 million, 0.35% of the total eligible costs, 0.28% of the total project costs (including ineligible)

• Construction and building - ~ BGN 273 million, 48% of the total eligible costs, 38.8% of the total project costs (including ineligible)

• Equipment - ~ BGN 136 million, 24% of the total eligible costs, 19% of the total project costs (incl. Ineligible)

• Rolling stock - ~ BGN 154 million, 27% of the total eligible costs, 22% of the total project costs (incl. Ineligible)

• Supervision during the implementation - ~ 2.4 million BGN, 0.4% of the total eligible costs, 0.3% of the total project costs (incl. Ineligible)

The level of financial implementation of the project is very high as the costs for grants are reimbursed 99.00%, and ineligible costs are paid by Metropolitan EAD in the amount of 99.77% of the originally planned. Table 3‑2 presents the value of the total project costs, the amount of the awarded grant and the ineligible costs upon approval of the project and after its implementation and final payment.

Table 3‑2 Financial performance in terms of investment costs

|  |  |  |  |
| --- | --- | --- | --- |
|  | **implementation of** **the project** | **after verification of**   **expenditure** | **level of financial implementation** |
| eligible costs | BGN 567 831 257,17 | BGN 562 137 346,56 | 99.00% |
| of which Grant | BGN 456 219 816,41 | BGN 451 644 787,56 | 99.00% |
| ineligible costs | BGN 138 021 701,36 | BGN 137 700 218,92 | 99.77% |
| **Total project size** | BGN **705 852 958,53** | BGN **699 837 565,48** | **99.15%** |

*Source: Information from the MA, ISUN, final report on the implementation of the OPT, final report on the implementation of the project*

This analysis is based on information received from the beneficiary "Metropolitan" JSC using the methodology adopted in the Cost-Benefit Analysis, developed in the preparation of the project in 2010 and updated in 2016. All data in the analysis cover only the two lots of the Metro Extension, Stage II, Lots 1 and 2.

*Number of trips*

An important parameter in each road investment project is the number of passengers (passenger traffic) who will benefit from the implementation of the project. It is the starting point for determining almost all the benefits of the project– financial, economic, social and environmental. Therefore, its accurate forecasting plays a key role in achieving the values of the project impact indicators. Consequently, this report compares the historical data on passenger traffic for the post-commissioning period of the line, namely 2013-2019, compared to the forecasted one in Table 3‑3 They are presented in Table 3‑3.

Table 3‑3 Number of trips, Metro Extension, Stage II, Lots 1 and 2

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Number of trips** |  | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** |
| **Forecast** | trips | 15 024 679 | 18 187 503 | 16 483 168 | 15 123 576 | 15 220 236 | 15 310 478 | 15 363 530 |
| **REAL DATA** | trips | 15 024 679 | 18 187 503 | 16 483 168 | 15 400 222 | 15 160 026 | 13 838 485 | 13 857 662 |

*Source: CBA, data from Metropolitan EAD*

The data for the period 2013-2015 coincide, as the actual data for these years were entered during the updating of the CBA in 2016. For the following years the deviation is small in the direction of reducing the real number of trips/passengers by about 10%. This is due to a reduction in the travel of passengers entering Mladost 1 station - most likely because initially this metro station took passengers from the Mladost 2 and Mladost 4 neighborhoods, and later when the metro to the Business Park is completed, this number of passengers decreases.

The graph shows visually the comparison between the forecasted and actual number of passengers, as well as the percentage deviation.

Figure 3‑1Comparison of the forecasted with the real passenger flow on the Metro Extension, stage II, lots 1 and 2

*Source: CBA, data from Metropolitan EAD, own calculations*

*Revenue*

This report reviews the operating costs and revenues based on historical data resulting from the operation of the Metro Extension, Stage II, Lots 1 and 2 and their comparison with those planned for the line in the CBA. Data on operating revenues, operating expenses and real passenger trips provided by Metropolitan EAD were used for their recalculation.

The revenues realized by Metropolitan EAD after the commissioning of the line are examined and compared with the ones set in the CBA in Table 3‑4*.* There are presented both the total revenues from operating activities and the incremental revenues without additional compensations, which Metropolitan receives from Sofia Municipality and the state budget. The inherent revenues according to the approach used in the CBA include revenues from ticket and card sales, rents, advertisements, etc. Thus, the recalculations were made, which are based on real historical data for the period under consideration. The revenues presented are only those due to the transport of passengers on the Metro Extension, stage II, lots 1 and 2 in the sections covered by the project, and not for the entire metro network.

Table 3‑4 Comparison between recalculated and forecasted revenues due to the operation of the Metro Extension, Stage II, Lots 1 and 2

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TOTAL**  **operating**  **income** | | **total for the** **period** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** |
| Forecast | *€* | **40 051 647** | 4 417 957 | 8 321 026 | 8 890 168 | 6 956 471 | 7 183 218 | 7 218 931 | 6 502 372 |
| RECALCULATED 2020 | *€* | **38 968 872** | 4 417 957 | 8 321 026 | 8 890 168 | 6 457 477 | 6 451 910 | 6 679 088 | 6 896 720 |
| **incremental income net of compensation** | |  | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** |
| Forecast | *€* | **32 328 951** | 4 417 957 | 6 013 644 | 6 270 894 | 5 714 668 | 5 933 478 | 5 961 781 | 5 704 266 |
| RECALCULATED 2020 | *€* | **26 003 455** | 4 417 957 | 6 013 644 | 6 270 894 | 3 713 485 | 3 996 210 | 3 733 858 | 3 359 256 |

*Source: CBA and own calculations based on Data from the Metropolitan*

A clear vision of the comparison between planned and realized revenues is shown in the graphs below.

Figure 3‑2 Comparison of forecasted and actual revenues from the Metro Extension, Stage II, Lots 1 and 2

|  |  |
| --- | --- |
|  |  |

*Source: CBA and own calculations based on data from the Metropolitan*

The **high degree of overlap** of the projected compared to the realized total revenues is visible, although the number of passengers has decreased. This is due to the additional compensation that the company receives for the performance of passenger transport activities.

The comparison of the projected with the recalculated revenues, based on real data, shows that the total revenues of Metropolitan EAD due to the commissioning of the Metro Extension, Stage II, lots 1 and 2 are close to the forecasted ones. Thus, their total value for the period 2013 - 2019 (discounted by 5.5%) gives a deviation of **-2.7%**. This approximation of the real with projected revenues is due to the fact that in addition to revenues from ticket and card sales and revenues from compensation that depend on passenger traffic, there are revenues from compensation that do not depend on passenger traffic, but are determined on the basis of investment value of the lines. In addition, revenues from compensations increased in the period 2016-2019 by approx. 29%, which compensates for the decrease in incremental income.

*Costs*

In terms of costs, the analysis shows lower real operating costs than projected.

The table below presents the amount of operating costs for the period 2016-2019 and forecasted under the CBA.

Table 3-5 Comparison between recalculated and forecasted costs due to Metro extension, Stage II, Lots 1 and 2

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Operating costs** |  | **Total for the period** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** |
| **FORECAST 2012** | ***€*** | **44 404 893** | 7 214 947 | 5 605 127 | 8 872 900 | 8 483 578 | 8 688 066 | 8 085 448 | 8 166 998 |
| **RECALCULATED 2020** | ***€*** | **32 322 810** | 5 040 083 | 5 055 316 | 4 837 367 | 5 714 632 | 6 370 275 | 6 373 132 | 6 945 803 |

*Source: CBA and own calculations based on data from the Metropolitan*

A visualization of the data on the forecasted and real costs is presented in the following graph.

Figure 3‑3 Comparison of forecasted and actual operating costs for the Metro Extension, Stage II, Lots 1 and 2

*Source: CBA and own calculations based on data from the Metropolitan*

The amount of total operating expenses (discounted by 5.5%) for the period 2013-2019. according to the CBA amounts to EUR 44 404 893 and the amount of the recalculated total operating income for the same period is EUR 32 322 810, which makes a difference of approx. 27%.

The comparison of the operating revenues to the operating costs of the Metro Extension, Stage II, lots 1 and 2 shows the possibility to cover the operating costs from the realized revenues for the considered period for the sections, subject of the project, i.e. the financial stability of the project is ensured.

Figure 3‑4 Comparison of recalculated operating revenues and costs for the Metro Extension, Stage II, Lots 1 and 2

*Source: CBA and own calculations based on Data from the Metropolitan*

*Economic benefits*

The Sofia metro is planned as the backbone of public urban transport and aims to ensure the efficient transport of large passenger trips in the city, while achieving significant traffic relief and reduction of air pollution. The project is related to the construction of environmentally sustainable transport networks in the urban environment. With the implementation of the Extension of the Metro, Stage II, Lots 1 and 2, accessibility to the transport system of the city is provided, which leads to the following benefits:

• Reduction of urban land transport traffic, which will lead to a reduction in the number of used cars, reduction of traffic accidents and incidents;

• Reduction of harmful air emissions;

• Shortened duration of the trips along the route of the sections covered by the project.

As a result of these benefits, economic benefits from the project implementation are derived in the stage of project preparation. According to the CBA and the recalculations made on the basis of the real passenger trips following the model of the approved CBA, the total (discounted by 5.5%) values of these benefits for the period 2013-2019 are as follows:

Table 3‑5 Value of the economic benefits from the commissioning of the Metro Extension, Stage II, Lots 1 and 2

|  |  |  |  |
| --- | --- | --- | --- |
| **Total for the period 2013-2019 value of economic benefits** |  | **Forecasted**  **2012** | **Recalculated**  **2020** |
| Vehicle Operation Costs | € | 43 585 078 | 25 550 126 |
| Value of time | € | 130 529 153 | 75 970 066 |
| Accidents | € | 34 150 421 | 19 984 497 |
| Benefits from decrease of Emissions | € | 4 414 849 | 2 579 199 |
| **TOTAL ECONOMIC BENEFITS (COSTS SAVED)** |  | **212 679 501** | **124 083 887** |

*Source: CBA and own calculations based on data from the Metropolitan*

These data show that the recalculated benefits are 58% from the forecasted. The reason for this is that the projected benefits are linearly dependent on the number of passenger trips, which in the initial CBA (during the preparation of the project) was approx. 40% more than the passenger trips in the updated CBA in 2016 (in which the benefits are not calculated). However, the contribution of benefits remains almost the same, with travel time saved with the largest share (just over 60%) and followed by the benefits of reduced maintenance costs for other vehicles. The distribution of the share of each of the economic benefits is shown graphically in the following figure.

Figure 3‑5 Percentage contribution to the economic benefits of the project

|  |  |
| --- | --- |
|  |  |

*Source: CBA and own calculations based on data from the Metropolitan*

In addition to the economic benefits achieved, the following should be noted for the implementation of the project and its benefits:

* The schedule for development and implementation of the project has been observed, and the same has been completed ahead of schedule by several months;
* The main indicators for result have been achieved - 6.7 km of metro lines with 6 metro stations have been built, 18 wagons have been purchased;
* Access for disadvantaged people is provided;
* Buffer parking lots have been built - Lot 1-2 with 600 parking spaces and Lot 2 - 1 pc. with 1300 parking spaces;
* In order to reduce the noise level from the passing trains in the area of the overpass between Obelya 2 metro station and Beli Dunav metro station, a rail track has been installed with specially installed noise-absorbing rubber strips, the track is covered with elastic fastenings and the metro section is covered with polycarbonate coating;
* Conditions have been created to carry out new 92,460 thousand trips on average per day or 19 618 750 trips per year by metro on the sections of this line;
* The additional number of the population that can benefit from the improved public transport with the construction of these sections of the metro is 190 thousand;
* With the commissioning of 18 new metro cars, the capacity of the metro is increased, creating conditions for increasing the average speed of movement and thus improving the quality of the transport service;
* The sustainability of the investment is guaranteed by:
  + Maintenance of the created infrastructure by Metropolitan EAD. With the commissioning of the section of the Metro Extension, stage II, lots 1 and 2, an additional 251 new permanent jobs have been created in the company. The established operational services of the Metropolitan are specialized according to the specifics of the individual activities. In order to provide the necessary key specialists in the separate operational services, emergency groups and brigades for repair and maintenance of the facilities, constant work on the training and qualification of the personnel is carried out. The company has implemented a training system according to which, in addition to the individual units, the relevant trainings are conduct and regular exams are held.
  + Updating the tariff policy (in 2016) taking into account the price levels that can be borne by customers and providing additional financial resources in the form of compensation from Sofia Municipality and the State Budget.

**Conclusions**

* The schedule for development and implementation of the project has been observed.
* There are no significant deviations in the amount of investments - after the tender procedures for selection of contractors, the project costs have decreased by just under 8%;
* 99% of the eligible costs incurred have been verified;
* The main problems of the project, which are in the stage of its implementation, were of a technical nature and corrective measures were taken.
* At the end of the project, the beneficiary had difficulty securing the last 10% of the investment costs;
* The assumptions of the preliminary financial analysis of the project by the CBA were examined in the operational phase through an updated financial analysis in 2016. The calculations performed prove once again the need for EU support. Financial sustainability is ensured by own revenues and compensations from the state budget and from the budget of Sofia Municipality;
* The value of economic benefits for the period 2013-2019 is about 42% lower than projected, due to the lower passenger flow compared to the forecast;
* Without the compensations that Metropolitan EAD receives from the Municipal and State budgets, the project would be financially unsustainable;
* Travel time saved has the largest share (just over 60%) of all benefits, followed by the benefits of reduced maintenance costs for other vehicles.

# **PROJECTLEVEL STUDY** **- PRIORITY AXIS 2**

# ***Project BG161PO004-2.0.01-0004 "Completion of Trakia motorway, Lots 2, 3 and 4"***

## **Project summary**

|  |  |
| --- | --- |
| **Project BG161PO004-2.0.01-0004 "Completion of Trakia Motorway, Lots 2, 3 and 4"** | |
| Priority axis | Priority axis 2 |
| Category | Major project |
| Beneficiary | *Road Infrastructure Agency* |
| Budget | Budget[[4]](#footnote-4)\*: BGN 503 165 876.24 |
| Implementation period | 23.04.2010 - 15.07.2013 |

*Source: Project* *Final Report*

Trakia Motorway is part of Pan-European Transport Corridor No 8 (Albania - Macedonia- Black Sea), which connects Sofia with the Black Sea city of Burgas.

The length of the motorway of 116.6 km is divided into three lots:

* Lot 2 "Stara Zagora – Nova Zagora" from km 210+100 to km 241+900 – length 31.8km;
* Lot 3 "Nova Zagora – Yambol" from km 241+900 to km 277+597 – length 35,697km;
* Lot 4 "Yambol - Karnobat" from km 276+200 (coincides with km 277+597 from Lot 3) to km 325+280 - length 49,080 km.

The main objectives of project Trakia Motorway are the following: improving the regional economy of southern Bulgaria as in general, reducing the number of accidents, time saving for light and heavy goods vehicles, reducing harmful gas emissions, improving the environment for those living in towns and villages along the existing route, reducing the operating costs of light and heavy goods vehicles, etc. By implementing the project, the shortening travel time from Sofia to the city of Burgas is achieved by increasing the travel speed from the average speed of 68 km/h to 105 km/h, thus the distance Sofia - Burgas is traveled for 3 and a half hours.

The project is not revenue-generating and subsequently no ex-post CBA has been made to update the data on the economic and environmental benefits.

The project does not include State aid.

Lot 2 "Stara Zagora- Nova Zagora", from km 210+100 to km 241+900 has a length of 31.8 km and passes through two districts – Stara Zagora and Sliven.

Lot 3, Nova Zagora - Yambol, from km 241+900 to km 277+597 has a length of 35,697 km and is located in two districts – Sliven and Yambol.

Lot 4, "Yambol - Karnobat" is from km 276+200.

## **Project Preparation**

The project "Completion of Trakia Motorway– Lots 2, 3 and 4" was included in the program with its first amendment in 2011. At the time priority was given to projects under implementation or projects in the most advanced phase of preparation thus minimizing the risks associated with the delayed financial and physical implementation of the programme. The project was originally planned for implementation through a public-private partnership (concession). After that the government decided to use EU funding instead of applying public-private partnership approach to the project. The maturity of the project, the fact that it is a part of Pan-European Transport Corridor No 8 and of Pan-European Transport Network in Bulgaria were taken into consideration and the project was involved in the list of OPT projects.

Additional importance for the inclusion of Trakia Motorway in the first amendment of the program is the publication in 2009 of the Communication of the Committee "Sustainable Future of Transport – Integrated, Technology-Based and User-Friendly System" so that the programme meets the new guidelines for:

* fully integrated and optimized networks that function as a whole and
* full integration ***and interoperability of*** individual parts of the network.

This leads to the inclusion of new projects that are under the TEN-Ts directions but are not part of the priority axes.

At the stage of the project inclusion in the program the following are available:

* technical design drafted;
* prepared tender procedures;
* prepared expropriation procedures.

The comparative project maturity at the stage of its inclusion in the programme, resulted in lack of significant problems at the preparation stage reported under the OPT.

The tender procedures for selection of a contractor and a consultant (construction supervision) for the three Lots were carried out between November 2009 and 2010.

The expropriation procedures for the direct route took place between 2004 and 2009. The supporting infrastructure expropriation procedures were implemented in 2010.

The route of Trakia Motorway Lot 2 and Lot 4 was exempted from archaeological research in 2010, and the Lot 3 sites were developed in 2011.

The prepared Cost-Benefit Analysis provides an estimated analysis of the car’s motorway load. Forecasts for 2015, 2020, 2025 and 2030 have been prepared, with 2008 taken as a base year.

## **Project Implementation**

The project start is on 23.04.2010. with a grant agreement DBFP No DOPT-1/23.04.2010 signing.

Physical start of the implementation is on 09.06.2010 and the end of the project on 15.07.2013.

* **Project implementation time:**

There was no delay in the project implementation, the sites under the three lot were put into operation in phases, the actual completion of the project was 14.07.2013 – issued permission for use of the last section, at the end date of the project implementation according to the initially approved project proposal/grant contract - 31.12.2013 – term of the grant contract from 23.04.2010 and final date of project implementation, according to accepted amendments to the grant contract - 31.12.2013

* **Financial implementation of the project/ amendments to the grant contract**

The grant contract No DOPT-1/23.04.2010 with total sum of BGN 709 166 776.03, of which: grant - BGN 699 648 287.32 (CF - BGN 559 718 629.86; NC – BGN 139 929 657.46) and ineligible costs – BGN 9 518 488.71. The contract was signed on the basis of the prepared (and subsequently approved by EC) project application form, at indicative values, prior to contracting the contractors. After the contracts signing with contractors, a significant decrease in the total budget is reported. As a result, on 30.11.2012 Annex No 1 was signed with No SUPT-23/30.11.2012 to a contract SUPT-1/23.04.2010, which changed the total value of the project to BGN 709 166 775.89, of which: grant BGN 513 970 279.58 (CF – BGN 411 176 223.66; NC – BGN 102 794 055.92) and ineligible costs – BGN 10 508 620.30.

Only the actual ineligible costs are increased by 10% compared to what was planned in the initial budget of the project.

Table 4‑1 Project budget amendments

|  |  |  |
| --- | --- | --- |
| Categories of expenditure | Initial project budget | Budget after annex, 2012 |
| Sources of funding | Amount in BGN | Amount in BGN |
| Total project amount | 709 166 776,03 | 524 478 899,88 |
| Eligible costs | 699 648 287,32 | 513 970 279,58 |
| CF/ERDF | 559 718 629,86 | 411 176 223,66 |
| National co-financing | 139 929 657,46 | 102 794 055,92 |
| *Total eligible costs* | 699 648 287,32 | 513 970 279,58 |
| Total ineligible costs | 9 518 488,71 | 10 508 620,30 |

*Source: Information from the MA, UMMIS final report on the implementation of the OPT, final report on the implementation of the project*

Figure 4‑1 Project budget amendments

*Source: Information from the MA, UMMIS final report on the implementation of the OPT, final report on the implementation of the project*

* **Implementation of the indicators**

The project indicators’ target value is fully met as shown in the following table:

Table 4‑2 Implementation of project indicators

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Unit of measure | Base Value | Target value | Value achieved |
| **Motorway built** | Km | 0 | 116.6 km | **116.6 km** |
| **Built road junctions** | Number | 0 | 5 | **5** |
| **Built bridges (total length)** | Number | 0 | 10 | **10** |
| **Road overpasses built** | Number | 0 | 16 | **13** |
| **Road underpasses built** | Number | 0 | 3 | **3** |
| **Overpasses built on railway roads** | Number | 0 | 3 | **3** |
| **Built overpasses on agricultural roads** | Number | 0 | 22 | **23** |
| **Built underpasses on agricultural roads** | Number | 0 | 12 | **12** |
| **Built rest/service places** | **m2** | **0** | **20 160** | **20 160** |

*Source: Project* *Final Report*

* **Degree of project objectives implementation**

The following project objectives the have been met:

* + The technical condition of the national and Trans-European road network has been improved by the completion of the southern part of the motorway ring in Bulgaria. The project implementation provided a connection between the Italian port of Bari and the Black Sea port of Burgas through the direction of Durres-Tirana-Skopje-Sofia;
  + The travel time from Sofia to Burgas has been reduced by increasing the travel speed - the average speed of 68 km/h is increased to 101-105 km/h, thus the distance Sofia - Burgas is traveled for 3 and a half hours;
  + Fatal accidents have been reduced;
  + The capacity limit on the first-class road passing through settlements, which leads to the formation of congestions, has been removed. The built motorway of 116.6 km does not pass through settlements and has two traffic lanes;
  + Better conditions for passengers and goods (domestic and international) transportation have been created, leading to better development of the region and the economy as a whole;
  + Pollution from harmful emissions and noise levels in settlements is reduced by transferring the traffic outside the settlements.

The achievement of the relevant socio-economic and environmental benefits related to the objectives set out in the project proposal are explored in Part 4 below.

* **Problems in project implementation and measures taken to address them**

The problems identified in the project implementation are typical for the most projects under the PA 2 of OPT 2007-2013: a need for additional actions on expropriation procedures, which delayed the project implementation, a need for changes in the investment project at the construction phase due to circumstances not reflected in the investment project, as well as problems with the implementation of environmental protection measures.

For each of the defined problems, mitigation and management measures have been taken in a timely manner so that they have a significant impact on the initially set time and financial framework for the implementation of the project.

The measures taken included:

- laboratory tests in relation to the quality of the materials used,

- timely measures to move facilities to other departments not reflected in the investment project;

- additional expropriation procedures implementation;

- timely resolution of geological issues occurring through land-based stabilization activities under a lot 4;

- implemented environmental measures concerning the protected areas through which lot 3 and Lot 4 route passes.

## **Operational phase**

For the management of Trakia Motorway, a Plan for management and use of the project results has been created and implemented as follows:

According to the Road Act, Trakia Motorway Is part of the Republican Road Network and has the status of exclusive state property, which is managed by the Road Infrastructure Agency.

According to the Regulations on the structure, functions and organization of the Agency's performance, the Directorate "Development of Road Infrastructure with Budget Funds" manages, organizes, coordinates and controls the activities of construction, repair and maintenance of the Republican roads.

In the operational phase, RIA is responsible to submit annual sustainability reports to the MA in accordance with paragraph 16.1.3 of the Procedure Manual for the Management and Implementation of the Operational Programme Transport.

The sustainability reports include a description of the above measures and the maintenance and operation funds allocated. The reports provide up-to-date traffic data as well as information on on-the-spot checks carried out by the beneficiary. The quantitative survey outlined a problem concerning provision of funds for the repair and maintenance of sections of the motorway built under the project.

For the purposes of this study, the traffic data of the sites of the three lots of Trakia Motorway from ASTR were used. The review of the real traffic data for the period 2017-2019 shows an increase compared to the period 2011-2016 , which is reported in the Monitoring Model prepared to take into account the implementation of the OPT, and in all major categories – cars, heavy vehicles and light commercial vehicles significantly exceeds the forecast values for the period. Only a serious negative deviation from the forecast is observed in bus traffic, as shown in the figures below.

Figure 4‑2 Real and forecast traffic data of Lot 2, Trakia Motorway in the period 2017-2019

*Source: Monitoring model prepared for reporting OPT indicators, traffic data from ASTR, CBA of the project*

The real traffic data for Lot 2 for the period 2017-2019 exceeds with 75% the estimated in the CBA car traffic, with 162% for heavy vehicles and 376% for light commercial vehicles. The only negative deviation from the forecast is the data concerning the bus traffic – only 32% of the forecast is achieved.

Figure 4‑3 Real and forecast data on lot 3 traffic, Trakia Motorway in the period 2017-2019

*Source: Monitoring model prepared for reporting OPT indicators, traffic data from ASTR, CBA of the project*

The real traffic data for lot 3 for the period 2017-2019 exceeds by 3% the traffic forecast in the CBA for cars, by 42% for heavy vehicles, by 348% for light commercial vehicles. The only negative deviation from the forecast is the data concerning the bus traffic – only 12% of the forecast is achieved

Figure 4‑4 Real and forecast traffic data for Lot 4, Trakia Motorway in the period 2017-2019

*Source: Monitoring model prepared for reporting OPT indicators, traffic data from ASTR, CBA of the project*

The real traffic data for lot 4 for the period 2017-2019 exceeds by 25% the traffic forecast in the CBA for cars, by 13% for heavy vehicles, by 251% for light commercial vehicles. The only negative deviation from the forecast is the data concerning the bus traffic – only 10% of the forecast is achieved.

Figure 4‑5 Road travel time saved

*Source: Monitoring model prepared to take into account OPT indicators, traffic data from ASTR, CBA, own calculations*

Figure 4‑6 Value of road travel time saved

*Source: Monitoring model prepared to take into account OPT indicators, traffic data from ASTR, CBA, own calculations*

The forecast traffic has been based on the 2009 CBA, which has not been updated because the project is not revenue-generating and does not take into account the effect of a decrease in traffic due to the economic crisis in the period 2008-2011.Nevertheless in the period 2017-2019 there is an increase in both passenger (excluding bus) and freight transport, which also determines the achievement of the calculated economic benefits of the project, as far as the calculation in the CBA is based on traffic.

The economic benefits calculated in the CBA are mainly based on traffic volume, so the ratio between the estimated and reported benefits follows the trend of achieving the forecast traffic as discussed above.

Figure 4‑7 Economic benefits, recalculated based reported traffic data

*Source: Monitoring model prepared to take into account OPT indicators, traffic data from ASTR, CBA, own calculations*

The main economic benefits of the project implementation – reduction of accidents and time saved, recalculated according to traffic reports for the period 2016-2020. In EUR 100 million show minimal growth.

On the basis of an analysis of the impact of OPT projects on the workload of the transport network within EQ 1– Impact assessment of the OPT can be concluded, that the road capacity is increased by 3=5 to 4 times. The capacity load by 2005 is 40.7% and as of 2019 – 18.7 %. Despite the increase in traffic by over 60%, the implementation of the project has helped to reduce the road load by 22 percentage points.

Good efficiency in terms of reducing the workload of the transport infrastructure shows the Trakia Motorway project because traffic growth has been reported, but the infrastructure load is lower compared to the base year due to the increased capacity.

The project contributes to achieving a very high degree of integration to the TEN-T, fulfilling the most essential technical condition for a motorway or high-speed road – lack of crossing on the same level by rail lines, there are built stop and rest zones and only there are no safe and secure parking lots for trucks. Failure to comply with this requirement should not be interpreted as a disadvantage of the programme as clarity on the minimum requirements for these car parks was only achieved in early 2019 following the conclusion of a deliberate study commissioned by the EC.

**Conclusions**

On the basis of the project information examined in the preparation, implementation and operation phase, the following conclusions can be defined:

* The project contributes to achieving a very high degree of integration into the TEN-T network;
* The available project maturity at the time of its inclusion in the programme allowed its timely and effective implementation with minimal amendments to the grant contract;
* No significant delays were observed in the implementation phase, though they are typical of most complex infrastructure projects;
* There are no significant deviations from the budget that require its increase and therefore create problems with the provision of additional funding. Grant contract activities are implemented with a decrease compared to the pre-set and approved budget due to a reduction in tendering phase;
* The main project problems are related to the need for additional expropriation procedures, geological surveys and management of environmental measures, which are typical narrow places for most infrastructure projects. Adequate and timely measures have been implemented to manage the identified problems;
* The realized traffic in the period 2016-2019 marks an increase compared to the forecast in the CBA prepared in 2009, with the exception of bus and coach transport, which has a minimum performance when compared to the forecast data;
* Under Lot 3 and Lot 4 of Trakia Motorway, a sustained reduction in accidents and the number of casualties and wounded cannot be reported. Lot 2 has provided a decrease in the number of accidents compared to previous years, including 2013 - the year of commissioning of Trakia Motorway, but with a reduced number of accidents there is no decrease in the number of victims and wounded. [[5]](#footnote-5);
* Economic and environmental benefits of the project should be achieved as far as the forecast derive from traffic forecast in the CBA, which reports an increase compared to the forecast data;
* Trakia Motorway leads to a reported decrease in load, an increase in average speed, respectively shortening travel time, improved traffic security and comfort.

# ***Project BG161PO004-2.0.01-0009 "Struma Motorway", lots 1, 2 and 4"***

## **Project summary**

|  |  |
| --- | --- |
| **Project BG161PO004-2.0.01-0009 "Struma Motorway", lots 1, 2 and 4"**  Struma 3 (2) | |
| Priority axis | Priority axis 2 |
| Category | Major project |
| Beneficiary | *Road Infrastructure Agency* |
| Budget | BGN 525 125 520,32 |
| Implementation period | 01.12.2011 - 28.12.2015 |

*Source: Project* *Final Report*

The Struma Motorway e is a part of corridor No IV of the Trans- European Transport Network. The entire corridor IV provides a connection between the Danube Bridge at Vidin in Romania via Sofia to the Greek border to the South near Kulata.

The length of the motorway, to be built, is divided into 4 lot and is as follows:

* Lot 1 "Dolna Dikana - Dupnitsa" from km 305+220 to km 322+000 (length- 16,780km) – the technical project was developed in 2008 and approved by the l Regional Development Ministry in September 2011;
* Lot 2 "Dupnitsa - Blagoevgrad" from km 322+000 to km 359+483.52 (length- 37,483.52 km) - the technical project was developed simultaneously with the implementation of the Construction Works in the period 2013-2015;
* Lot 3 "Blagoevgrad - Sandanski" from km 359+483.52 to km 423+800 is implemented under operational program "Transport and Transport Infrastructure 2014 -2020";
* Lot 4 "Sandanski - Kulata" from km 423+800 to km 438+500 ( length- 14,700km )- the technical project was developed in 2008 and approved by the Regional Development Ministry in April 2012 for sections from km 423+800 to km 424+640 and from km 435+560 to km 438+500 and in June 2012 for the section of km 424+640 to km 435+560 and stage connection at km 438+500 (from km 438+500 to km 438+780).

Lot 1, 2 and 3 are included in the OPT funded project. The aims of the project are following: to improve the regional economy of South East Bulgaria in general, to reduce the number of accidents, to save time for light and heavy vehicles, to reduce harmful gas emissions, to improve the environment for those living in towns and villages along the existing route, to reduce the operating costs of light and heavy vehicles, etc.

For the entire motorway, an Environmental Impact Assessment Report was prepared, and a Decision of the Ministry of Environment was issued on 15.01.2008.

Tender procedures for the selection of contractor were launched in March 2011 for Lot 1; in June 2011 for Lot 4 and in February 2012 for Lot 2.

The project is not revenue-generating and subsequently no ex-post CBA has been made to update the data on financial implementation and socio-economic benefits.

The project does not include State aid.

## **Project preparation**

Struma Motorway project was included in the first version of the OPT and the IPA , but in a different form ( Lot 1 and Lot 4 were planned for 2008) and Lot 2 and Lot 3 (which had no technical projects) were planned for in 2009-2010. The delay in the Lot 1 and Lot 4 start is almost three years compared to the IPA, and the reason – insufficient financing for land expropriation and archaeological studies and long coordination procedures with the municipalities. Due to a lack of sufficient administrative capacity, the Lot 3 application form could not be initiated. The lengthy coordination procedures with the Public Procurement Agency, and the corresponding edits in the tender documents for the preparation of lot 1, 2 and 4 application form, as well as the preparation of the tender documents for the technical design of Lot 2, have also led to delays in the preparatory stages of the project. A delay is also reported in relation to reflecting JASPERS's comments on the EIA report. Lot 3 was removed from the scope of the OPT project and transferred for OPTTI funding. The delay in the start of the project made the project risky for completion within the programming period, but the efforts of the beneficiary and the MA lead to its successful completion.

Funding under PA5 has been used for the preparation of Struma Motorway project proposal through two contracts: BG161PO004-2.0.01-0003-C0001 Providing consulting services for filling out application forms for financing of the project "Construction of Struma Motorway" by Cohesion Fund and BG161PO004 -2.0.01-0002-C0001 “Preparation of technical project of a site: Struma Lot 2, Dupnitsa - Blagoevgrad section from km 322+000 to km 356+000”.

It should be noted that no contractor for the first project has been selected for two years due to the return of tender procedures. The second project also has a suspended tender procedure and a subsequent decision to amend the strategy for the implementation of the infrastructure project for the construction of Struma Motorway.

Jaspers' final consultant and expert assistance was used prior to submitting the project proposal to the EC.

The strategy adopted for the implementation of the project is an engineering (Design & Build) approach for each of the three lots.

Financial analysis assumptions made were that the investment period was from 2011 to 2015, operational life is 30 years – from 2015 to 2044.

For the purposes of the CBA, regardless of the “phasing” approach of Struma Motorway project, a simplified approach is adopted to examine the impacts of the construction of the entire motorway.

For the entire motorway there is a report on environmental impact assessment and a decision of the Ministry of Environment and The Ministry of Environment and (MOEW) no 1-1/2008 of 15 January 2008.

In March 2011 the tender procedure for the selection of a contractor for Lot 1 began, in June 2011 – for the selection of a Lot 4 contractor, and in February 2012 for the selection of a contractor for Lot 2.

The expropriation procedures for lot 1's track ended in 2011, Lot 4 in 2012 and Lot 2 in 2013.

Archaeological studies were carried out, with the route of Struma Lot 1 being exempted in 2012 and Lot 2 in 2015.

## **Project Implementation**

The start of the project is on 01.12.2011 with grant contract signing between the MA of OPT and RIA as a direct beneficiary DOPT-18/01.12.2011. In the course of the project implementation, three amendments were made, objectified by: Annex No 1 No SUPT-35/16.10.2013; Annex No 2 No SUPT-15/01.08.2014 and Annex No 3 No A-2/01.09.2015.

Physical start of the project implementation is on 01.10.2011, the end of the project is on 28.12.2015 and the implementation of the individual sites is as follows:

**Lot 1, section "Dolna Dikana - Dupnitsa" from km 305+220 to km 322+000**  **with length - 16,780 km is**  put into operation with permission for use of the site No ST-05-2494/22.12.2015.

**Lot 2, Section "Dupnitsa - Blagoevgrad" from km 322+000 to km 359+483.52**  **with length - 37,483.52 km** is put into operation with permission for use of the site No ST-05-2090/11.11.2015.

**Lot 4, section "Sandanski - Kulata" from km 423+800 to km 438+500**  **with length - 14,700 km** is put into operation with permission for use of the site No ST-05-1488/10.09.2015. for direct route and No 05-2566/28.12.2015 for the railway line.

**Project implementation time:**

The start of the project is on 01.12.2011. with the grant contract signing between the MA of OPT and RIA as a direct beneficiary of DOPT-18/01.12.2011.

On 01.09.2015 Annex No 3 to the grant contract was signed with reg. No A-2 between Ministry of Transport (Contracting Authority) and RIA (Beneficiary).

The duration of the grant contract is extended until 31.12.2015. 2 and the amount of the project eligible costs is changed on the basis on implemented and planned tender procedures.

Physical start of the implementation is on 01.10.2011, the end of the project is on 28.12.2015

**Financial implementation of the project/ amendments to the grant contract**

On 16.10.2013 Annex No1 to the grant contract was signed with reg. No DOPT-35 between Ministry of Transport (Contracting Authority) and RIA (Beneficiary).

The amount of eligible project costs is changed, and funds are allocated for the preparation of lot 3 of Struma Motorway, with beneficiary National Company Strategic Infrastructure Projects.

On 01.08.2014 Annex No 2 to the grant contract was signed with reg. No DOPT-15 between Ministry of Transport (Contracting Authority) and RIA (Beneficiary).

The amount of eligible project costs is changed on the basis of implemented and planned tender procedures, eligible costs are included, which will not be grant funded.

On 01.09.2015 Annex 3 to the grant contract was signed with Reg. No A-2 between Ministry of Transport (Contracting Authority) and RIA (Beneficiary), which changes in addition to the project duration the amount of the eligible project costs on the basis of implemented and planned tender procedures.

Table 5‑1 Project budget amendments

|  |  |  |
| --- | --- | --- |
| Categories of expenditure | Initial project budget | Final budget |
| Sources of funding | Value in BGN | Value in BGN |
| Total project amount | 669 969 029,03[[6]](#footnote-6) | 669 969 029,03[[7]](#footnote-7) |
| Eligible costs | 669 969 029,03 | 538 031 140,30 |
| CF/ERDF | 535975222,9 | 430 424 912,24 |
| National co-financing | 133993805,7 | 107 606 228,06 |
| *Total eligible costs* |  | 538 031 140,30[[8]](#footnote-8) |
| Total ineligible costs | 0 | 0 |
| *Source: Information from the MA, UMMIS, final report on the implementation of the OPT, final report on the implementation of the project* | | |

Figure 5‑1 Project budget amendments

*Source: Information from the MA, UMMIS, final report on the implementation of the OPT, final report on the implementation of the project*

**Implementation of project indicators**

The project indicators target values were largely met as shown in the following table:

Table 5‑2 Implementation of project indicators

| Indicator | Implementation |
| --- | --- |
| Building new roads (TEN) | 70.34km |
| Construction of a motorway | 68.96km |
| Building an expansion of a first-class road | 1,375km |
| Construction of traffic lanes (two plus one emergency in the direction) | 2+1pc |
| Construction of road junctions and connections | 10 shares |
| Construction of road overpasses | 10 shares |
| Construction of road underpasses | 8 shares |
| Passing over railway lines | 6 shares |
| Construction of agricultural overpasses | 4 shares |
| Construction of agricultural subways | 16 shares |
| Construction of animal overpasses | 1 pc. |
| Construction of animal underpasses | 1 pc. |
| Construction of drains | 201 shares |
| Construction of noise protection walls | 3,879 m |
| Construction of elastic fences and protective fences | 279,395 m |
| Construction of safety nets | 133,636 m |
| Construction of bridges | 30 shares |
| Total length of all bridges | 6,719.59 m |
| Displacement of a railway line | 4.75818 km |
| Construction of a railway bridge | 1 pc. |
| Construction of a railway underpass | 1 pc. |
| Construction of a tunnel | 2 pcs. |
| Total length of the tunnel | 730 m |
| Construction of walls for protection from turtle crossing | 7380 m |
| Construction of lighting of road junctions and connections | 9 shares |
| Construction of a retaining wall to protect an archaeological site | 1pc |

*Source: Project* *Final Report*

According to the application form, the key indicator is the construction of new roads (TEN)- 68.48 km.

**Degree of implementation of the project objectives**

The main objectives of the project are:

* Improving the efficiency of the national and Trans-European network by ensuring high quality of the motorway route from Dolna Dikana to the Greek border;
* Reducing the number of road accidents;
* Reducing congestion and increasing the travel speed by removing capacity constraints, especially by avoiding populated areas;
* Capacity to cope with passenger and freight traffic growth, leading to the development of regional and international economies;
* Reducing people's exposure to air pollution, noise and traffic accidents;
* Provision of improved travel conditions and improved services for consumers.

**Problems in the project implementation and measures taken to address them**

The problems identified in the course of the project implementation are typical for the projects under PA 2 of OPT 2007-2013: uncompleted expropriation procedures, archaeological studies, need for additional actions under expropriation procedures, which delays implementation, need for changes in the investment project at the construction phase due to circumstances not reflected in the investment project, as well as the occurrence of force majeure – severe climatic conditions.

For each of the problems defined, management measures have been taken in a timely manner:

* *Implementation of expropriation procedures– forest fund;*
* *Implementation of an archaeological survey of Struma Lot 2 despite* its delay due to a lack of interest from the archaeological stakeholders for participation in the procedure;
* *Completed(e) additional expropriations* as a result of errors fixed in the design project;
* Coordination and preparation *of a bypass route on route I-1 (E79) at Lot 4;*
* Measures to mitigate the impact of *force majeure* - severe weather conditions by changing the works schedule by transferring activities from one stage to another stage by grouping the activities.

## **Operational phase**

According to the Road Act, Struma Motorway is part of the Republican Road Network and has the status of exclusive state property, which is managed by the Road Infrastructure Agency. According to the Rules of Structure, Functions and Organization of the Agency's performance, the Road Infrastructure Maintenance Directorate manages, organizes, coordinates and controls the repair and maintenance activities of the Republican roads.

In compliance with the provisions of the Road Act, namely ensuring the normal functioning and operating conditions of sections of the national road network, the Road Infrastructure Agency manages the site by signing contracts for its maintenance and ensuring operating conditions on the motorway.

In the operational phase, RIA is responsible for submitting annual sustainability reports to the MA in accordance with paragraph 16.1.3. Management and implementation of the Operational Programme "Transport". The reports should contain information on the measures taken to maintain the built/modernized infrastructure and the results achieved.

The sustainability reports should include a description of the above measures and the funds used for maintenance and operation of the sites. At the time of the evaluation, the Contractor was provided with a sustainability report only for 2018 and therefore cannot use data on the maintenance, repair and reconstruction of the sections built under the Struma Motorway project for the period 2015-2019 for comparison with the forecast data in the CBA and analyze accordingly the extent to which the related economic effect has been achieved.

The main economic benefits under consideration in the project's CBA are: value of time, operating costs for vehicles, accidents, air pollution, climate change and noise. All of them are derived from traffic forecasts. As far as the Evaluator does not have the CBA of the project in excel, in which the forecast data for the years examined are available, this study examines the trend in real traffic for the period of operation of Struma Motorway, as well as the achieved values of indicators for saved travel time and value of travel time saved using the Monitoring Model for OPT indicators.

For the purposes of this study, the traffic data of the sites of the three lots of Struma Motorway from ASTR were used. The review of traffic reporting data for the period 2015-2019 shows a smooth increase across all major categories and due to the absence of the CBA in excel, no comparison can be made for the implementation of the forecast data for this period.

Figure 5‑2 Real traffic data - average 24/7 annual traffic intensity of lot 1, Struma Motorway in the period 2015-2019

*Source: Monitoring model prepared for reporting OPT indicators,* *traffic data from ASTR*

Figure 5‑3 Real traffic data - average 24/7 annual traffic intensity of lot 2, Struma in Motorway the period 2015-2019

*Source: Monitoring model prepared for reporting OPT indicators,* *traffic data from ASTR*

Figure 5‑4 Real traffic data - average 24/7 annual traffic intensity of lot 4, Struma Motorway in the period 2015-2019

*Source: Monitoring model prepared for reporting OPT indicators,* *traffic data from ASTR, own calculations*

Figure 5‑5 Road travel time saved

*Source: Monitoring model prepared for reporting OPT indicators,* *traffic data from ASTR, own calculations*

Figure 5‑6 Value of road travel time saved

*Source: Monitoring model prepared for reporting OPT indicators,* *traffic data from ASTR*

As presented on Figure 5‑5 and Figure 5‑6 the saved travel time on Struma motorway and the value of the saved time increases sustainably after the sites are put into operation.

The economic benefits calculated in the CBA are mainly based on the traffic volume, but because of unavailable CBA in excel, it is impossible to compare the projected v/s actually achieved figures.

On the basis of an analysis of the impact of OPT projects on the workload of the transport network within EQ 1 – Impact assessment of the OPT can be concluded that as a result of the implementation of the project, the road capacity was increased from 3.5 to 4times.

Good efficiency in terms of reducing the workload of transport infrastructure shows the Struma Motorway project because traffic growth has been reported, but the infrastructure load is lower than the base year due to increased capacity.

The project contributes to achieving a very high degree of integration to the TEN-T, fulfilling the most essential technical condition for a motorway or a high-speed road – lack of crosses on the same level by rail lines, there are built stop and rest zones and only there are no safe and secure parking lots for trucks. Failure to comply with this requirement should not be interpreted as a disadvantage of the programme as clarity on the minimum requirements for these car parks was only achieved in early 2019 following the conclusion of a deliberate study commissioned by the EC.

## **Conclusions**

On the basis of the project information examined in the preparation, implementation and operation phase, the following conclusions can be defined:

* There are significant delays in the preparation phase of the project – the submission of the application form is delayed by 3 years compared to the schedule, due to a change in the implementation strategy, as well as delays in the tender procedures for the selection of consultant and designer – contractors under technical assistance contracts under PA 5;
* JASPERS expert assistance supports the process of finalizing and approving the application form;[[9]](#footnote-9)
* There are no significant delays in the implementation phase typical of most complex infrastructure projects;
* No essential changes were observed to the initial budget, the funding structure remained unchanged;
* There are three amendments to the grant contract, which have budgetary implications related to savings from realized tender procedures, as well as the transfer of lot 3 for financing in the following programming period under OPTTI;
* The main problems of the implementation phase are related to pending expropriation procedures, archaeological studies, need for additional actions on expropriation procedures, which delays implementation, need for changes in the investment project at the construction phase due to circumstances not reflected in the investment project, as well as the occurrence of force majeure – severe climate conditions;
* There is no delay in implementation due to tender procedures for the selection of contractors of the main project activities, which is untypical for such complex infrastructure projects;
* It is not possible to analyze the extent to which the realized traffic in the period 2017-2019 suffers significant deviations from the forecast in the CBA as CBA in excel is not provided for the purposes of the analysis, but for the examined period a smooth increase in traffic is identified;
* Key indicators such as road travel time saved, and value of road travel time saved demonstrated a sustainable upward trend between 2013 and 2014;
* Lot 1 of Struma Motorway provides a sustainable decrease in accidents and the number of victims and injured in the period 2017-2019 compared to previous years. Lot 2 and 4 do not present a tendency to reduce the number of accidents compared to previous years.[[10]](#footnote-10)
* Good efficiency has been reported in terms of reducing the workload of transport infrastructure.

# ***Project BG161PO004-2.0.01-00015*** ***"Construction of Kallotina –Sofia Motorway - lot 1:, Western Arch of SRR***

## **Summary**

|  |  |
| --- | --- |
| **Project BG161PO004-2.0.01-00015 "Construction of Kalotina – Sofia - Lot 1: "Western Arc of Sofia ring road"**  http://www.api.bg/files/4013/6931/0212/ZAPADNA_DAGA_lot1.png | |
| Priority axis | Priority axis 2 |
| Category | Major project |
| Beneficiary | *Road Infrastructure Agency* |
| Budget | BGN 64 929 582,17 |
| Implementation period | 21.08.2012 - 29.12.2015 |

*Source: Project Final Report*

The project "**Construction of Kalotina–Sofia Motorway, Lot 1: Western Arc of SRR"** is a natural extension of Lyulin Motorway. The project provides a link to Serbia with the building motorway ring in The Republic of Bulgaria and provides a conflict-free distribution of local and transit traffic. The project has an effect on cross-border connectivity by homogenizing the transit flow in the direction north-south. Sofia Ring Road is an important road artery on which European roads E79, E80 and E 871 pass.

The project "Construction of Kalotina–Sofia Motorway, Lot 1: Western Arc of SRR" is divided into two sections:

Section 1 of Lot 1 forms part of the Western arc of the Sofia Ring Road (SRR) and starts from km 59+400 of the SRR, and the project is in line with Lyulin Motorway project.

The scope of section 1 includes:

* reconstruction and extension of a direct route with a total length of 3.01 km;
* construction of bringing lanes;
* the construction of two road junctions with two estakades (p.i. "Tsaritsa Joanna" km 60+500 and p.p. Slivnitsa km 0+000);
* construction of 2 bridges over the Kakach River (km 0+745 and at Slivnitsa p.d. km 0.000).

In the scope of the project for Lot 1 of Kalotina –Sofia Motorway, according to Annex No3 to the grant contract – DOPT-41/11.12.2015, the construction of the site "Road overpass of Filipovsko Shose " is included. "

Lot 1 section 2 is from km 59+400 to km 6+309 from km 4+437 to 5+000 and from km 6+103,72 to 6+300 – is funded by OPT.

The project "Construction of Kalotina–Sofia Motorway, Lot 1 Western Arc of SRR is part of the so called. 'phased projects', according to European Commission Decision C (2016) 2283 of 19.04.2016. – construction starts with OPT funds and ends with funds from OPTTI. The scope of the project with funding under **the OPT (phase**  **1)** is defined by Annex No 3 to the grant contract – DOPT -41/11.12.2015 **and includes Section**  **1, the** road overpass at **"Filipovsko Shose" above the SRR, and parts of section 2 – from km 1+290, 46 to km 1+634,46 left,** from **km 4+430 to km 4+900 right and from km 6+100 to km 6+308,17 right.** The funding under OPTTI – phase 2 – is implemented by defining the project BG161M1OR001-2.001-0002 for completion of section 2 of lot 1 of the motorway.

The project is not revenue-generating and subsequently no ex-post CBA has been made to update the data on financial implementation and socio-economic benefits.

The project does not include State aid.

## **Project Preparation**

The project is not available in the original version of OPT and IPA, it was included in the list of projects with the first amendment of a programme, and in its second amendment the scope of the project was reduced to "Construction of Kalotina-Sofia Motorway, Lot 1: "Western Arc of the SRR)". In 2011, In 2013, due to the limited funding of the project, the construction of the Northern Speed Tangent (part of Kalotina Motorway) was proposed for funding under operational program "Regional Development" and was removed from the list of projects under the OPT, according to a decision of the CN of 2013. In 2015 it was suggested that Lot 2 of the Western Arc would be phased due to a delay in implementation.

Project "Kalotin -Sofia Motorway", Lot 1: Western Arc of SRR" is in a range from km 59+400 to km 61+629,18=0+000 and from km 0+000 to km 6+309. The project is divided into two sections:

* Section 1 from km 59+400 to km 61+629,18=0+000 and from km 0+000 to km 0+780, with a total length of 3,01 km;
* Section 2 from km 0+780 to km 6+309, with a total length of 5.53 km.

The project also includes the implementation of the site "Road overpass at Filipovsko Shose" over SRR at km 59+500, in the section of Blvd. "Dobrinova Skala" to March 3rd str.

By Decision No 250 of the Council of Ministers of 25 April 2013, the Republican Road SRR - Western Arch section was declared a site of national importance and as a national site, in accordance with the Spatial Development Act and the State Property Act (PDD).

Due to a delayed start of the implementation activities of Section 2 of the project, Section 2 was proposed to be phased. Section 2 activities that were not feasible to be implemented within the period of OPT 2007-2013, were proposed to be included in OPTTI. For the provision of the construction and construction supervision of Section 2, the Council of Ministers agreed that the Road Infrastructure Agency would sign contracts for the implementation of the activities prior to the final approval of its funding under the OPTTI 2014-2020 by the European Commission. This allowed the timely start of construction activities on section 2 of the Western Arc of the Sofia Ring Road.

The technical project for section 1 of Lot 1 was developed in 2009 and was granted by the designer of Sofia Municipality, it transferred its property to RIA. which undertakes activities to implement the investment project, including carrying out the necessary expropriation and tender procedures.

A final decision of MOEW No 34-PR/2010 was issued, according to which there is no need to carry out an environmental impact assessment for an investment project.

For the provision of section 1 of the Western Arc of the SRR, expropriations of private property for state needs were carried out=

In the process of realization of the site, properties – private property were found, which were not the subject of the above-mentioned decisions, as a result of which additional expropriation activities were carried out.

On June 28, 2011, RIA signed contract No RD-27-5/28.06.2011 with Bulgarian Academy of Science for conducting archeological study.

In the prepared Cost-Benefit Analysis, a forecast analysis of the load on the Western Arc of SRR was carried out. Traffic forecasts for the period 2012-2041 (2015, 2020, 2025, 2030, 2040 and 2041) have been prepared, with 2012.taken as a base year.

**Implementation** **of the project**

**Time implementation**

The project started with the of a grant contract signing DOPT-12 on 21.08.2012 with a total value of BGN 250 656 833.04.

On April 30, 2015, Annex No2 was signed to the grant contract – DOPT-12/30.04.2015, postponing the final date for the completion of the project activities until 31.01.2016.

On 11.12.2015 Annex No3 to the grant contract – DOPT-41/11.12.2015 was signed to define the scope of Phase 1 of the project, which included section 1, the road overpass at "Filipovsko Shose" above the SRR, and certain parts of Section 2. The total amount of the project, after conducting the tender procedures for both sections, was BGN 90 617 569.59.

The physical start of the implementation of Kalotina Motorway project is on12.09.2012 and the end of theproject is on 29.12.2015 with issued Protocol Act No 16 for Section 1 on 29.12.2015.

**Financial implementation**

The project started with a total value of BGN 250 656 833.04. and awarded grant of BGN 44 803 075,94

On 19.08.2014 Annex No1 to THE DOPT-12 – SUPT-20/19.08.2014 was signed, increasing the grant funding to the amount of BGN 64 236 872.00.

On 11.12.2015 Annex 3 to the grant contract was signed – DOPT-41/11.12.2015 to define the scope of Phase 1 of the project, which included Section 1, the road overpass at "Filipovsko Shose" above the SRR, and certain parts of Section 2. The value of the project grant amount was increased to BGN 68 385 402.46, the total value of the project, after conducting the tender procedures for both sections was BGN 90 617 569.59.

Table 6‑1 Project budget amendments

|  |  |  |
| --- | --- | --- |
| Categories of expenditure | Initial project budget | Final budget |
| Sources of funding | Value in BGN | Value in BGN |
| Total project value | 250 656833,04 | 92 883 315,28[[11]](#footnote-11) |
| Eligible costs | 44 803 075,94 | 68 385 402,46 |
| CF/ERDF |  | 54 708 321,97 |
| National co-financing |  | 13 677 080,49 |
| *Total eligible costs* |  | 68 385 402,46 |
| Total ineligible costs |  | 22 232 167,13 |

*Source: Information from the MA, UMMIS final report on the implementation of the OPT, final report on the implementation of the project*

Figure 6‑1 Budget amendments of the Western Arc of the SRR

*Source: Information from the MA, UMMIS,* *final report on the implementation of the OPT, final report on the implementation of the project*

The final version of the project differs significantly from the original one, the total cost of the project is significantly reduced due to the “phasing” of parts of the project, with the grant being increased compared to the initial amount due to a higher cost of construction works.

**Implementation of Project indicators**

The project indicators target values are met as follows:

Table 6‑2 Implementation of project indicators

|  |  |  |  |
| --- | --- | --- | --- |
| Project implementation indicators | | | |
| 1. | Built motorway | Unit of measure | Value achieved |
|  | Section 1: from km 59+400 of the SOPs (end of Lyulin motorway) to km 61+629 of SRR (=0+000 – crossing of Slivnitsa Blvd.) and to km 0+780 SRR | Km | 3,009 |
| 2. | Built-in traffic lanes |  |  |
|  | Section 1: from km 59+400 of the SOPs (end of Lyulin motorway) to km 61+629 of the SRR (=0+000 – crossing of Slivnitsa Blvd.) and to km 0+780 SRR | Number | 10 |
| 3. | Built dividing strip | Number | 3 |
|  | Section 1: from km 59+400 of the SOPs (end of Lyulin motorway) to km 61+629 of the SRR (=0+000 – crossing of Slivnitsa Blvd.) and to km 0+780 SRR | Number | 3 |
| 4. | Road junctions built (Tsaritsa Ioane Blvd., Slivnitsa Blvd.) | Number | 2 |
|  | Section 1: from km 59+400 of the SoPs (end of Lyulin motorway) to k m 61+629 of the SRR (=0+000 – intersection of Slivnitsa Blvd.) and to k m 0+780 SRR (Tsaritsa Ioana Blvd. and Slivnitsa Blvd.) |  | 2 |
| 5. | Bridges built (over a river) | Number | 2 |
|  | Section 1: from km 59+400 of the SoPs (end of Lyulin motorway) to k m 61+629 of the SRR (=0+000 – crossing of Slivnitsa Blvd.) andto km 0+780 SRR |  | 2 |
| 6. | Overpasses built over roads (Section 1: Road overpass on Filipovsko Shose over SRR) | Number | 1 |
| 7. | Overpasses built over railway lines, roads | Number | 1 |
| 8. | Шияшве built (parts of road junctions) | Number |  |
|  | Section 1: from km 59+400 of the SRR (end of Lyulin motorway) to k m 61+629 of the SOPs (=0+000 – intersection of Slivnitsa Blvd.) and to km 0+780 SRR | **Number** | 2 |

*Source: OPT* *Final Implementation Report*

**Degree of implementation of the project objectives**

The following objectives of the project have been met:

-The technical condition of the national and trans-European road network has been improved. By completing this project, the degree of integration of national transport infrastructure into the EU transport network has been increased, one of the "missing links" is created in Trans-European Transport Corridor IV, which also houses the newly built Danube Bridge 2 between the cities of Vidin (Bulgaria) and Calafat (Romania).

-The transit movement through the section in the direction of Vidin – Sofia and Sofia- Kalotina is homogenized. More efficient is the traffic passage – time is saved, the average speed is increased, and the road surface is better, with the bearing capacity of the pavement being 11.5 tons/axle;

-Road accidents have been reduced;

-Pollution from harmful emissions, vibrations and noise in the settlement has been reduced by the transferring traffic;

-The capacity limit of the second-class road passing through the territory of Sofia that leads to the formation of a car congestion, has been removed;

-Better conditions for the passengers and goods transportation (domestic and international) have been created, leading to better development of the region and the economy in general;

-New opportunities for tourism development have been created.

**Problems in project implementation and measures taken to address them**

The problems and management measures described in the following part are typical for infrastructure projects of similar complexity under PA 2 of OPT – expropriation procedures, archaeological studies and delay in the procedures under the PPA for the selection of contractors.

Actions on pending/delayed expropriation procedures:

* Delayed conclusion and execution of a contract for carrying out a rescue archaeological survey
* Appeal against the procedure for selecting a contractor for Section 2 and its subsequent termination on two occasions, which led to “phasing“ and transfer of Section 2 to OPTTI 2014-2020.
* the construction of Section 2 started with OPT funds and ended with funds from OPTTI.

## **Operational phase**

For the management of Western arc of SRR, a Plan for management and use of project results has been established and implemented as follows:

After the completion of the project, the newly built section of the Western part of SRR became part of the Republican Road Network and was managed as part of it.

The management of the road network, i.e. the organization, commissioning, financing and control of activities directly related to the design, construction, management, repair and maintenance of roads, is the responsibility of the Road Infrastructure Agency (RIA).

According to the Rules of Structure, Functions and Organization of the Agency's Performance, the Road Infrastructure Maintenance Directorate manages, organizes, coordinates and controls the repair and maintenance activities of the Republican roads. Part of the tasks performed by the Directorate are as follows:

- develop plans, financial estimates and repair and maintenance programmes on the basis of which it makes requests for the allocation of funds;

* approves ongoing repair and maintenance of the Republican road network within the provided annual budget;
* procurement plan related to the directorate's activities.

In the operational phase, RIA did not provide the MA with annual sustainability reports in accordance with item 16.1.3 of the Procedural Manual for the Management and Implementation of the Operational Programme "Transport", as the project was phased and phase two was implemented within the framework of the TTIP.

The review of traffic reporting data for the period 2016-2019 shows significant deviations from the forecast in the prepared CBA for two of the years examined, respectively exceeding the forecast for year in 2016 and in 2018 it is lower than the forecast.

Figure 6‑2 Road travel time saved

*Source: Monitoring model prepared for reporting OPT indicators,* *traffic data from ASTR*

Figure 6‑3 Value of road travel time saved

*Source: Monitoring model prepared for reporting OPT indicators,* *traffic data from ASTR*

Road travel time saved and therefore its value showed the highest figures in 2016, immediately after completion of the project with a subsequent reduction by 2018, as in 2019. again, there was an increase in the values of these two indicators.

The economic benefits calculated in the CBA were mainly based on traffic volume, so the ratio between the estimated and reported benefits follows the trend towards estimated traffic as discussed above.

Figure 6‑4 Economic benefits – forecasts and recalculated based on reported traffic data

*Source: Monitoring model prepared for reporting OPT indicators,* *traffic data from ASTR*

On the basis of an analysis of the impact of OPT projects on the workload of the transport network within EQ 1 – Impact assessment of the OPT can be concluded that as a result of the implementation of the project, the capacity was increased from 3.5 to 4 times.

## **Conclusions**

On the basis of the project information examined in the preparation, implementation and operation phase, the following conclusions can be defined:

* Insufficient project maturity at the time of the project inclusion in the programme, which leads to a change in the initial scope, as well as to “phasing” of the project;
* The project budget has been changed several times due to a change in the scope of the project, following higher costs for construction works as a result of tender procedures compared to the planned;
* The main problems of the project at the implementation stage are related to pending/ additional expropriation procedures, archaeological studies and delay in the selection of the contractor of Lot 2. Adequate and timely measures have been implemented for the management of the identified problems;
* The realized traffic in the period 2016-2019 presents significant deviations from the forecast in the prepared CBA for two of the years examined - in 2016 significantly exceeds the forecast and in 2018 is lower than the forecast;
* As far as the economic benefits calculations are based on the traffic volume, they experience the same deviations as previously mentioned.

1. **CASE STUDIES** **- PRIORITY AXIS 3**

# ***Project BG161PO004-3.0.01-0001 "Project for extension of the Sofia metro: Stage 1 - II metro diameter: Section "Road junction "Nadezhda" (MS 5-II) - Blvd." Cherni Vrah" (MS 11-II)"***

* 1. **Project summary**

|  |  |
| --- | --- |
| **"Project for extension of the metro in Sofia: 1 Stage - II metro diameter: section "Road junction "Nadezhda" (MS 5-II) - Blvd." Cherni Vrah" (MS 11-II)"** | |
| Priority axis | Priority axis 3 |
| Category | Major project |
| Beneficiary | "Metropolitan" EAD |
| Budget | 741 485 759,55 |
| Implementation period | 09.07.2009 – 29.08.2012 |

*Source: Project Final Report*

The aim of this project is to connect the Central Railway Station and the International Bus Station with the Central City Parts and the large residential areas to the east and west by metro.

The project has been pre-planned for OPT funding during its development under Priority Axis 3: Improvement of the intermodally for the transportation of people and freights.

The project for extension of the metro in Sofia, 1 Stage – II metro diameter: section of "Road junction "Nadezhda" (MS 5-II) – Blvd. "Cherni Vrah " (MS 11-II)" constitutes Stage I of the extension of the second metro diameter: Section "Road junction Nadezhda – Central Railway Station – Pl. St. Nedelya Blvd. "Cherni Vrah" and represents 53 % of the length of the second metro diameter, including its busiest central section.

The Sofia metro development scheme is in line with the development of the city, taking into account the construction of large residential areas on the periphery of the city in recent years, where the total population is more than 450 000 people. According to data from the NSI (National Statistics Institute), the population of the territories of the areas through which Metro Line 2 passes is more than 300 000 people by the end of 2019.

The project contributes to the implementation of the strategy of the Master Plan for environmentally friendly and sustainable urban development by displacement and reduction of traffic, especially in the Central City Parts. It allows the formation of areas with reduced traffic - pedestrian zone along Blvd. "Vitosha", the planed archaeological pedestrian passage and uncovered archaeological space in the area of Station 8-II, etc.

The **specific basic parameters** of the project are:

* Construction of the structures of 5 new underground metro stations;
* Rehabilitation and completion of the constructions of two constructed metro stations (MS-9 and MS-10 at the National Palace of Culture);
* Complete architectural design of the 7 metro stations;
* Construction of section tunnels between MS 5-II ÷ MS 9-II and MS 10-II ÷ MS 11-II with a length of 4.4 km (incl. the two facilities for changing the train movement direction at the beginning and end of the route) ;
* Rehabilitation of the metro section between MC 9-II and MS 10-II (at the National Palace of Culture) with a length of 1,050 m;
* Railway and contact rail with a length of 6.5 km double track;
* Three dispatch control systems - of the traffic, of the energy supply and of the sanitary technical devices for a section with a length of 6.5 km;
* Radio communication system for 6.5 km route;
* Power supply system, including 7 traction and lowering stations, cable lines for 6.5 km of route and external power supply of the main traction and lowering power substations;
* Systems for traffic automation and speed regulation of trains for a route with a length of 6.5 km;
* Complex audiovisual systems and low-voltage systems for the operation of the metro for a route of 6.5 km.

**Start of the project:** *09 July 2009* **- Grant contract**

The application form for application for funding was approved by decision CCI 2008.BG.161.PR.001 of 22.09.2009 of the European Commission.

* Main contract - DOPT-7/09.07.2009;
* Annex to the contract – DOPT-9/ 04.07.2011

**Physical start of implementation:**  *01 December 2008* – (start of construction)

**End of project:** according to the Grant contract: *29 August 2012*

Permission for use of the construction No OT – 05 - 1076/ 29.08.2012

The section was fully completed and officially opened and put into operation on August 31, 2012.

* 1. **Project implementation**

**Problems encountered during the implementation of the project**

*Technical problems:*

* Malfunction of the tunnel-drilling machine due to unforeseen encounter of buried significant amounts of steel reinforcement from old constructions; Urgent repair of TDM (tunnel-drilling machine) and intensification of the walkway has been undertaken;
* Severe hydrological conditions at MS I-8 (Serdika), which led to additional drainage measures and waterproofing;
* Complex coordination in the execution of works by different builders under separate contracts, including financed from different sources;

*Financial problems:*

* A financial problem arose in 2012 regarding the continuation of the payment of the completed construction and installation works after reaching 90% of the amounts paid under the Grant agreement. The problem was solved by the adoption of Decree by the Council of Ministers No 212/ 13.09.2012, by which the necessary funds for current payments were provided

**Comparison of project effects forecasts and actual achievements**

*Financial implementation*

The project was implemented with the provision of BGN 362 206 777.47 grant support (ERDF and national co-financing) and other sources amounting to BGN 358 123 812.98.

The total eligible costs of the project are intended for:

* Planning and design – ~12 million BGN, 2,5 % of the total eligible costs, 1.7 % of the total costs of the project (incl. ineligible);
* Construction and building – ~341 million BGN, 70,6 % of the total eligible costs, 47,4 % of the total costs of the project (incl. ineligible);
* Machinery and equipment - ~118 million BGN, 24,4 % of the total eligible costs, 16,4 % of the total costs of the project (incl. ineligible);
* Publicity - ~ 31 thousand BGN, 0,01% of the total eligible costs;
* Implementation supervision - ~ BGN 12 million, 2.5% of total eligible costs, 1.7% of total project costs (incl. ineligible).

The ineligible costs are intended to cover VAT, to purchase rolling stock, to purchase land.

The level of financial implementation of the project is very high as the grant costs have been reimbursed 100%, and the ineligible costs are paid by Metropolitan EAD in the amount of just over 90% of the originally foreseen Table **7‑1** Financial performance in terms of investment costs. presents the value of the total project costs, the amount of the awarded grant and the ineligible costs upon approval of the project and after its implementation and final payment.

Table 7‑1 Financial performance in terms of investment costs

|  |  |  |  |
| --- | --- | --- | --- |
|  | Upon execution | After verification of the costs | Level of financial performance |
| eligible costs | BGN 483 374 184,00 | BGN 483 374 184,1 | 100.00% |
| of which grant | BGN 362 206 777,47 | BGN 362 206 777,47 | 100.00% |
| ineligible costs | BGN 258 111 575,55 | BGN 236 950 017,90 | 91.80% |
| Total project size | BGN 741 485 759,55 | BGN 720 324 202,11 | 97.15% |

*Source: Information from the MA, ISUN,* *final report on the implementation of the OPT, final report on the implementation of the project*

All the data in the analysis relates only to Metro Extension, Line 2, Stage І

*Number of trips*

An important parameter in any investment transport project is the number of passengers (passenger traffic) who will benefit from the implementation of the project. Number of the passengers is the starting point for determining almost all the benefits of the project - financial, economic, social and environmental. Therefore, its accurate forecasting has a key role in achieving the values of the project impact indicators. Therefore, this report compares the historical data on number of trips for the analyzed period (2013-2019) after the commissioning of the line, compared with the projected one in the CBA. Data were presented in Table **7‑2** Number of trips on Line 2, stage I.

Table 7‑2 Number of trips on Line 2, stage I

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of trips | | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| FORECAST 2016 | Trips | 14893133 | 16751660 | 16785333 | 15985545 | 15905618 | 15826090 | 15746959 |
| REAL DATA | Trips | 14893133 | 16751660 | 16785333 | 16343954 | 16265903 | 17307787 | 16990734 |

*Source: updated in 2016* *CBA,* *data from Metropolitan EAD*

The data for the period 2013-2015 are the same, as the actual data for these years were used during the updating of the CBA in 2016. For the following years the deviation is small and is in favor of the real passenger traffic, which is increasing compared to the forecast. The increase in real passenger traffic in 2019 compared to 2013 is 14.08% while it was forecasted to be 5.73%.

The graph visually shows the comparison between the forecasted and the actual number of passengers, as well as the percentage difference.

Figure 7‑1 Number of trips, Line 2, stage I

*Source: Updated 2016 CBA, data from Metropolitan EAD*

*Revenues*

This report provides an overview of historical data of the operating incomes and costs resulting from the operation of Metro Extension, Line 2, Stage І and their comparison with those planned for the line in the CBA. The data from the updated in 2016 CBA were used. Data on operating incomes, operating costs and real passenger flow provided by Metropolitan EAD were used for their recalculation.

The revenues generated by Metropolitan EAD after the commissioning of the line are examined and compared to those set in the CBA. They are presented in Table **7‑3** Comparison between recalculated and forecasted revenues due to the operation of Line 2, stage I*.* There are presented both the total revenues from operating activities and the own revenues without additional compensations. These additional compensations Metropolitan receives from Sofia Municipality and the state budget. According to the approach used in the CBA the own revenues include revenues from ticket and card sales, rents, advertisements, etc. In such a way are made the recalculations, which are based on real historical data for the period reviewed. Revenues presented are only those due to the transport of passengers on Line 2 in the sections covered by the project, and not for the entire metro network.

Table 7‑3 Comparison between recalculated and forecasted revenues due to the operation of Line 2, stage I

| TOTAL operating revenues |  | 2013 | 2014 | | | 2015 | | 2016 | | 2017 | | 2018 | | 2019 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| FORECAST 2016 | *€* | 3 051 964 | | 5 589 309 | 6 087 704 | | 5 409 048 | | 5 388 552 | | 5 368 159 | | 5 347 868 | |
| RECALCULATED 2020 | *€* | 3 051 964 | | 5 589 309 | 6 087 704 | | 6 406 229 | | 6 433 956 | | 7 013 178 | | 7 168 799 | |
| Own revenues |  | 2013 | | 2014 | 2015 | | 2016 | | 2017 | | 2018 | | 2019 | |
| FORECAST 2016 | *€* | 3 009 909 | | 3 464 086 | 3 420 414 | | 4 096 468 | | 4 082 535 | | 4 068 672 | | 4 054 879 | |
| RECALCULATED 2020 | *€* | 3 009 909 | | 3 464 086 | 3 420 414 | | 3 662 238 | | 3 978 257 | | 4 067 949 | | 3 631 335 | |

*Source: CBA and own calculations based on data from the Metropolitan*

A clear vision of the ratio between planned and realized revenues is visible from the graphs.

Figure 7‑2 TOTAL operating revenues, €

*Source: CBA and own calculations based on Data from the Metropolitan*

Figure 7‑3 Own revenues without compensations, €

The **high** level of overlap of the estimated revenues relative to the intrinsic revenues generated is evident. The total operating income in absolute terms and at a rate is higher than those forecasted in the CBA, due to increase in the additional compensation that the company receives for the passenger transport activities.

The sum of total operating income (discounted by 5.5%) for the period 2013-2019 according to the CBA amounts to BGN 29 157 752.92 and the sum of the recalculated total operating income for the same period is EUR 33 207 388.11, which makes less than **14** % difference. For the incremental (own) revenues, the difference between forecasted and recalculated on the basis of historical data is even lower – **3,43**%.

*Costs*

The analysis shows again a high level of comparison for costs, comparing historically incurred costs for Line 2, stage I to the forecasted costs*.*

Table 7‑4 Comparison of recalculated and forecasted costs due to the operation of Stage I of Line 2

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Operating costs |  | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| FORECAST 2016 | *€* | 8 511 189 | 8 591 188 | 9 340 789 | 9 353 516 | 9 330 089 | 9 306 779 | 9 283 586 |
| RECALCULATED 2020 | *€* | 8 511 189 | 8 591 188 | 9 340 789 | 8 383 337 | 9 575 349 | 9 373 833 | 10 063 974 |

*Source: CBA and own calculations based on data from the Metropolitan*

The high degree of overlap between the forecasted and the recalculated costs is visible from the graph below.

Figure 7‑4 Operating costs, Line 2, stage I, €

*Source: CBA and own calculations based on data from the Metropolitan*

The sum of total operating expenses (discounted by 5.5%) for the period 2013-2019 according to the CBA amounts to EUR 51 561 662.52 and the sum of the recalculated total operating costs for the same period is EUR 51 551 273.01, which is **an extremely small difference – 0.02%.**

According to the approach adopted in the elaboration of the CBA, as part of the operational costs, an additional 1.2% of the value of the infrastructure and 1.8% of the value of rolling stock as additional line maintenance costs are foreseen each year. This is how the recalculations in the table above were made. In other CBA models, these types of expenditures are foreseen after the 15th or 20th year and their aim is to replace worn-out infrastructure and rolling stock. If in this model they are excluded from the operating costs (at the beginning of exploitation of the line they are not inherent), then a comparison between operating income and expenses for Line 2, Stage I can be made. This is shown in the graph below.

Figure 7‑5 Comparison of operating revenues to costs for Line 2, Stage I

*Source: Own calculations based on data from the Metropolitan*

The graph shows the possibility to cover the operating costs with the generated revenues for the period reviewed. The only year in which revenue is less than expenditure is 2013, mainly due to the fact that despite the lower traffic in the first year, all the forecasted costs of operating the line were incurred.

*Economic benefits*

With the realization of Line 2, stage I of the metro extension, is ensured accessibility to the transport system of the city, which leads to the following benefits:

* reduction of vehicles in ground mass urban transport on the basis of falling and reorganized lines and easing traffic with the presence of metro in comparison to the traffic without metro;
* reducing traffic accidents and traffic with the presence of metro, in comparison to the traffic without metro;
* reducing harmful emissions in air;
* travel time is reduced by 16 minutes.

As a result of these benefits, economic benefits from the implementation of the project have been derived from the project's preparation phase. According to the updated in 2016 CBA and the recalculations made on the basis of the actual passenger flow following the model of the approved CBA, the total values of these benefits (discounted by 5.5%) for the period 2013-2019 are as follows:

Table 7‑5 Values of economic benefits derived from commissioning of Line 2, Stage I

|  |  |  |  |
| --- | --- | --- | --- |
| Total value of economic benefits for the period 2013-2019 |  | Forecasted | Recalculated |
| Savings on travel time | € | 106 586 836 | 110 051 192 |
| Decrease of the traffic accidents | € | 52 260 108 | 53 695 267 |
| Decrease of the public transport vehicles | € | 19 009 651 | 19 531 691 |
| Savings on gas expenses of private automobiles | € | 13 659 248 | 14 034 356 |
| Reduction of the public transport output | € | 12 375 956 | 12 715 823 |
| Saving on maintenance expenses of private automobiles | € | 11 694 562 | 12 015 716 |
| Reduction of greenhouse gas and harmful emissions | € | 7 012 732 | 7 205 314 |
| Savings on public travel costs | € | 3 762 043 | 3 865 356 |
| **TOTAL ECONOMIC BENEFITS (COSTS SAVED)** |  | **226 361 137** | **233 114 715** |

*Source: CBA and own calculations*

These data show that the projected benefits have been achieved and there is an excess of about 3%. The comparative analysis of the amount of the value of the most significant economic benefit - the travel time saved for each of the years in the period considered, also shows a good match with the one forecasted. The data on the benefits are presented graphically in the following figure.

|  |
| --- |
| Figure 7‑6 Value of economic benefits for the period 2013-2019, € |

*Source: CBA and own calculations based on data from the Metropolitan*

The contribution of the benefits is maintained in almost the same ratio, with the time saved for travel is with greatest contribution again. This is shown graphically in the following figure.

|  |
| --- |
| Figure 7‑7 Travel time savings, € |
|  |

*Source: CBA and own calculations based on data from the Metropolitan*

Figure 7‑8 Comparison between forecasted and recalculated benefits

|  |  |
| --- | --- |
|  |  |

*Source: CBA and own calculations based on data from the Metropolitan*

In addition to the economic benefits achieved, the following should be noted for the implementation of the project and its benefits:

* The schedule for development and implementation of the project has been respected;
* The main indicators for the final result have been achieved – constructed 6.5 km of metro with 7 metro stations;
* The works, which are not funded under OP "Transport" 2007-2013, namely:
* To limit the access of cars in the city central parts, buffer parking’s on MS 6-II (for 150 cars) and MS 11-II (for 480 cars) were built, outside the project;
* To ensure the normal operation of the section, 6 pcs. trains with a capacity of 1100 passengers were commissioned.
* Access is provided for disadvantaged people;
* Conditions for new 90.6 thousand metro trips per day on average have been created or 26 455 200 metro trips per year on the sections of this line.
* The additional population, which will be served by improved urban transport with the construction of this section of the metro alone, is over 200 thousand.
* The sustainability of the investment is ensured by:
* Maintenance of the infrastructure created by Metropolitan EAD. With the commissioning of the Line 2, I stage, additional new 364 permanent jobs were created. The operating services created at Metropolitan EAD are specialized in accordance with the specificity of the activities to be implemented. Activities for the preparation and qualification of the personnel were carried out, in order to assure the necessary key specialists in the separate operating services, emergency groups and repair and maintenance of the facilities brigades.
  + Tariff policy update (in 2016) taking into account the price levels that can be borne by customers and providing additional financial resources in the form of compensation from Sofia Municipality and the State Budget.
  1. **Conclusions**
* The schedule for development and implementation of the project has been observed, there are no significant deviations in the amount of investments in the project and its level of financial implementation is high;
* 100% of the eligible costs incurred have been verified. No financial corrections were imposed on the project;
* The main problems of the project, which are in the stage of its implementation, were of a technical nature and corrective measures were taken;
* At the end of the project, the beneficiary has experienced difficulty securing the last 10% of the investment, but with Council of Minister Decree deciding to secure the funding, the problem is resolved;
* The assumptions of the preliminary financial analysis of the project from CBA were examined in the operational phase through an updated financial analysis in 2016. The calculations performed shows again the need of support from EU. The financial sustainability is provided by own revenues and compensation from the State Budget and from the budget of Sofia Municipality;
* The comparison of the data from the CBA updated in 2016 and the recalculated basic parameters show a high degree of matching in terms of both passenger traffic and operating income and expenditure;
* The estimated economic benefits have been achieved and exceeded by around 3 % on the basis of calculations based on actual historical data;
* The travel time saved had the highest share (over 47%) of all benefits, followed by the benefits related to reduced traffic accidents and incidents.

# ***Project B0161P0004-3.0.01-0005 “Project for extension of Sofia Metro Stage III, Lot 1 “Tsarigradsko Shose - Sofia Airport” and Lot 2 Mladost 1 - Business Park in Mladost 4”***

* 1. **Project summary**

Short name: **Metro Extension, Line 1, Stage IIІ**

|  |  |
| --- | --- |
| **Project B0161P0004-3.0.01-0005 “Project for extension of Sofia Metro Stage III, Lot 1 “Tsarigradsko Shose - Sofia Airport” and Lot 2 Mladost 1 - Business Park in Mladost 4”**  http://www2.metropolitan.bg/data/uploads/fck/%D0%93%D0%B5%D0%BD%D0%B5%D1%80%D0%B0%D0%BB%D0%BD%D0%B0%20%D1%81%D1%85%D0%B5%D0%BC%D0%B0%2022-06-2012-Model.jpg | |
| Priority axis | Priority axis 3 |
| Category – large/small | Major project |
| Beneficiary | "Metropolitan" EAD |
| Budget | Budget:  Total budget:  BGN 385 054 780,43  Eligible costs:  BGN 213 042 364,8  Grant contract:  BGN 199 197 229,16  EU funding  BGN 169 317 644,79 |
| Implementation period | 15.11.2012 – 08.05.2015 |

*Source: Final Project Report and UMIS*

*\*The budget of the project includes the verified eligible costs of the project, including grant and co-financing by the beneficiary*

According to the Technical and Economic Report on the Metro adopted by the Council of Ministers of the Republic of Bulgaria and the General Development Plan of the Capital, the General Development Scheme for metro lines must be of three diameters with branches on the periphery, with a total length of 62 km and 63 metro stations, with the possibility of prospective development of up to 80 km, and in the final stage of realization it will carry over 1.2 million passengers per day.

The first diameter "Obelya - Lyulin - Center - Mladost 1 - Druzhba - Airport and Mladost 1 – Business Park in Mladost 4" will have a length of 29 km and 27 stations. The second diameter "Lozenets - Center - Iliyanci" will have a length of 17 km and 17 stations. The third diameter "Ovcha Kupel - Center – Levski” will have a length of 16 km and 18 metro stations. The diameters intersect in a triangle in the central city area, thus with one change of lines can be reached to any part of the subway track.

Stage III of the metro extension project includes two separate branches of metro diameter 1 from Mladost 1. The total length of the extension is 7 588 m, double line (with track gauge 1 435 mm):

* **Lot 1** includes the construction of 4 968 m extension of metro diameter 1 between metro stations MС19 ("Tsarigradsko Shose" bul.) and MS23 (Sofia Airport). The project includes the construction of 4 new metro stations (MS20 to MS23);
* **Lot 2 includes the construction of 2 620 m fork of metro diameter 1 south of Mladost** 1 (MS13). The project includes construction of 3 metro stations (MC14 to MC16) in Mladost 2 and 3 and will serve Sofia Business Park in Mladost 4.

The investment project for Stage III includes:

* design and construction of the structures of the 7 metro stations (with an appropriate connection of MS 21 at the Druzhba railway station from Lot 1);
* construction of the railway station "Druzhba" – 1 pcs.;
* construction of steel trestle – 625 m.;
* construction of tunnel sections between metro stations – 5.32 km.
* rail track – 7.47 km;
* construction and the architectural and artistic layout of metro stations;
* transport power systems, insurance installations, communications, sanitary control systems, radio communication, traffic automation and speed regulation, audiovisual monitoring, etc.;
* traffic management dispatch systems – 6 pcs.;
* 2 pcs. Radio communication system for a section of 4.85 km and for a section of 2.62 km;
* realignment and reconstruction of the underground and above-ground engineering infrastructure affected by the construction along the metro route.

**Start of the project:** 15.11.2012 **– grant contract:**

* Annex № 1 of the contract - DOPT -16/ 25.04.2013 – reduction of the total value of eligible costs in connection with the completed tendering procedures;
* Annex № 2 of the contract - DOPT - 18/ 29.06.2015 – change in the duration of the contract;
* Annex № 3 of the contract – DOPT - 36/30.11.2015 - change in the total value and grant value in relation to additional projects included.

**Physical start of the implementation:**

* Lot 1 "Tsarigradsko Shose Blvd. /MS-19/ - Druzhba – Sofia Airport /MS-23/"- 05.11.2012;
* Lot 2 "Mladost I – Business Park in Mladost IV" - 08.04.2013

**End of project:**

* Lot 1: "Tsarigradsko Shose Blvd. /MS-19/ - Druzhba – Sofia Airport /MS-23/" - 30.03.2015;
* Lot 2: "Mladost I – Business Park in Mladost IV" - 08.05.2015

**Commissioning:**

* Lot 1: Permission to use № CT-05-421/ 30.03.2015;
* Lot 2: Permission to use № CT-05-624/ 08.05.2015
  1. **Project implementation**

**Problems encountered during the implementation of the project**

*Technical problems:*

* Additional amounts of work (construction work). The costs are at the expense of the contingency costs;
* Collapse of an embankment along the route. Recovered and fortified at the expense of the Beneficiary;
* Crossing the route with highway pipeline of "District Heating". Adjustments and reinforcements have been required.

*Access issues*

* Need to shorten the route by 120.5 m in Sofia airport area for flight safety purposes. The technical project of the route has been amended and the relevant construction works has been implemented;
* Disagreements with National Company "Railway Infrastructure" (NRIC) at the intersection of the railway line and the connection with the railway stop in Druzhba;
* Complaints of citizens and intervention of the municipal authorities in connection with the temporary traffic organization and in particular – under Lot 2 following a new traffic organization developed.

*Financial problems*

* Problem with securing the final 10% of the budget until the completion of the project. Instructions of the Ministry of Finance - ДДС №6/2011 have been applied.
* Imposed 100% financial correction on a contract awarded under Article 90 of the Public procurement law (revision before 2016). It was withdrawn from OPT co-financing and payments under the contract remained at the expense of the Beneficiary.

**Comparison of project effects** **forecasts** and **achievements**

*Financial implementation*

The project has been implemented with the financial help of a grant of BGN 199 197 229.16. (ERDF and national co-financing) and other sources amounting to BGN 185 857 551.27.

The total eligible costs of the project are intended for

* Design and preparation – ~6,8 million BGN, 3,2% of the total eligible costs, 1.7% of the total project costs (incl. ineligible);
* Construction and building – ~135 million BGN, 63% of the total eligible costs, 34.8% of the total costs of the project (incl. ineligible);
* Machinery and equipment - ~67 million BGN, 31% of the total eligible costs, 17% of the total cost of the project (incl. ineligible);
* Contingency costs – ~BGN 3.9 million, 1.8% of total eligible costs, 1% of total project costs (including ineligible);
* Publicity - ~ 154 thousand BGN, 0,07% of the total eligible costs, 0,04% of the total cost of the project (incl. ineligible);
* Performance supervision - ~ BGN 1 million, 0.5% of total eligible costs, 0.3% of total project costs (including ineligible costs).

The ineligible costs are intended to cover VAT, rolling stock purchasing, land purchasing.

The level of financial implementation of the project is very high and the grant costs are reimbursed 99.79%. The ineligible costs are paid by Metropolitan EAD in amount of just over 99.53% of the originally foreseen. Table 8‑1presents the value of the total project costs, the amount of the awarded grant and the ineligible costs upon approval of the project and after its implementation and final payment.

Table 8‑1Financial performance in terms of investment costs

|  |  |  |  |
| --- | --- | --- | --- |
|  | Project implementation | Costs verification | Financial implementation level |
| eligible costs | BGN 213 499 042,89 | BGN 213 042 364,80 | 99.79% |
| of which Grant | BGN 199 641 725,86 | BGN 199 197 229,16 | 99.78% |
| ineligible costs | BGN 172 829 134,58 | BGN 172 012 415,63 | 99.53% |
| Total project amount | BGN 386 328 177,47 | BGN 385 054 780,43 | 99.67% |

*Source: Information from the MA, UMIS,* *final implementation report of OPT, final report of the implementation of the project*

All data in the analysis relate only to the two lots of the Metro Extension, Line 1, Stage III.

*Number of trips*

An important parameter in each investment road project is the number of passengers (passenger traffic) which will benefit from the implementation of the project. It is the starting point for determining almost all the benefits of the project - financial, economic, social and environmental. Therefore, its accurate forecasting has a key role in achieving the values of the project impact indicators. Therefore, this report compares the historical data on number of trips for the analyzed period after the commissioning of the line, namely 2015-2019, compared with the forecasted one in the CBA. They are presented in Table 8‑2*.*

Table 8‑2 Number of trips, Line 1, stage III

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Total number of trips |  | 2015 | 2016 | 2017 | 2018 | 2019 |
| FORECAST 2012 | Trips | 14 860 272 | 15 512 638 | 16 136 246 | 16 739 742 | 17 337 350 |
| REAL DATA | Trips | 8 500 087 | 7 572 620 | 7 963 273 | 8 196 201 | 8 290 177 |

*Source: CBA,* *data from Metropolitan EAD*

There is a deviation from the forecasted number of trips in two directions - on one hand in absolute terms the number of passengers is almost twice less than the forecasted for each of the years. On the other hand, the CBA envisages a growth rate over the years, which is not observed according to historical data.

*Revenue*

This report reviews the operating costs and revenues based on historical data resulting from the operation the operation of Metro extension, Line 1, stage III and their comparison with those planned for the line in the CBA. Operating revenues, operating expenses and real passenger trips provided by Metropolitan EAD were used for recalculating.

The revenues realized by Metropolitan EAD after the commissioning of the line are reviewed and compared to the forecasted ones in CBA in Table 8‑3. There are presented both the total revenues from operating activities and incremental revenues without additional compensation, which Metropolitan receives from Sofia Municipality and the state budget. In the incremental revenues according to the approach of CBA are included revenues from ticket and card sales, rents, advertisements, etc. Thus, recalculations were made, which are based on real historical data for the period reviewed. The revenues presented are only those due to the transport of passengers of Line 1, stage III in the sections covered by the project, and not for the entire metro network.

Table 8‑3 Comparison between recalculated and forecasted revenues due to the operation of Line 1, stage III

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| TOTAL operating income |  | Total for the period | 2016 | 2017 | 2018 | 2019 |
| FORECAST 2012 | *€* | 20 769 657 | 5 655 445 | 5 847 187 | 6 032 745 | 6 216 493 |
| RECALCULATED 2020 | *€* | 18 099 530 | 4 821 038 | 4 867 339 | 5 392 713 | 5 654 298 |
| incremental revenue without additional compensation | |  | 2016 | 2017 | 2018 | 2019 |
| FORECAST 2012 | *€* | 18 124 898 | 4 941 338 | 5 104 372 | 5 262 149 | 5 418 386 |
| RECALCULATED 2020 | *€* | 7 928 562 | 2 077 047 | 2 411 640 | 2 447 483 | 2 116 834 |

*Source: CBA and own calculations based on Data from the Metropolitan*

The ratio of the forecasted revenues to the recalculated revenues based on real data shows that although the passenger flow under the CBA is about twice as much as the actual one, the total revenues of Metropolitan EAD due to the commissioning of Line 1, stage III are close to those forecasted. Thus, their total sum for the period 2016-2019. (discounted by 5.5%) gives a difference in the amount of -**12.86%.** This approximation of real with forecasted revenues is due to the fact that in addition to revenues from ticket and card sales and revenues from compensation that depend on passenger trips, there are revenues from compensation that do not depend on number of passengers, but are determined on the basis of investment value. In addition, revenues from compensations increased during the considered period, due to which total revenues also increased by approx. 17%, while the growth of incremental revenues is just under 2%. Visually, the data is presented in the graphs below:

|  |  |
| --- | --- |
| Figure 8‑1 Total revenue for Line 1, Stage III, € | Figure 8‑2 Incremental revenue for Line 1, Stage III, € |

*Source: CBA and own calculations based on data from the Metropolitan*

*Costs*

Regarding costs, the analysis shows high degree of overlap of the forecasted costs with the actually incurred for the considered sections of Line 1, stage III. The reason is that the main variable costs for the operation of the line, which account for about 85% of the total costs, are to a very large extent a function of the train kilometers traveled and to a lesser extent of the number of passenger trips. Therefore, the difference in the number of passengers between forecasted and the actual does not play a significant role in the cost part of the analysis.

The table below presents the amount of operating cost for the period 2016-2019 and the forecasted in CBA.

Table 8‑4 Comparison between recalculated and forecasted costs due to the operation of Line 1, stage III

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operating expenses |  | common for the period | 2016 | 2017 | 2018 | 2019 |
| FORECAST 2012 | *€* | 17 120 626 | 4 884 420 | 4 884 420 | 4 884 420 | 4 884 420 |
| RECALCULATED 2020 | *€* | 16 076 650 | 3 962 480 | 4 770 062 | 4 618 584 | 5 081 439 |

*Source: CBA and own calculations based on data from the Metropolitan*

From the graph below is seen the high degree of overlap of the forecasted with the recalculated costs.

Figure 8‑3 Costs, Line 1, Stage III, €

*Source CBA and own calculations based on data from the Metropolitan*

The amount of total operating expenses (discounted by 5.5%) for the period 2016-2019 according to CBA amounts to EUR 17 120 626 and the sum of the recalculated total operating revenue for the same period is EUR 16 076 650, which makes a small **difference of -6,10%.** The CBA model did not take into account an increase in operating costs, while the data shows an increase in recalculated costs over the years, mainly due to an increase in external services costs and payroll costs in Metropolitan EAD.

The comparison of operating income to the costs of operating Metro extension, Line 1, Stage III, shows the possibility to cover the operating costs from the generated revenues for the considered period for sections subject of the project, i.e. the financial stability of the project is ensured.

Figure 8‑4 Real revenues/costs comparison for Line 1, Stage III

*Source: Own calculations based on data from the Metropolitan*

*Economic benefits*

The Sofia metro is planned as a backbone of public transport and aims to ensure the efficient transport of large passenger flows in the city, in which to achieve significant traffic relief and reduction of air pollution. The project is related to the construction of environmentally sustainable transport networks in the urban environment. With the realization of Line 1, stage III of the metro extension, accessibility to the city's transport system is ensured, resulting in the following benefits:

* Reduction of traffic of ground urban transport, which will lead to a decrease in the number of cars used, a decrease in road accidents;
* Reduction of harmful air emissions;
* Shortened duration of the trips along the route of the sections covered by the project – just over 4 minutes for Lot 2 and approx. 15 minutes for Lot 1.

As a result of these benefits, economic benefits from the project implementation are derived in the stage of project preparation. According to the CBA and the recalculations made on the basis of the real passenger trips following the model of the approved CBA, the total (discounted by 5.5%) values of these benefits for the period 2013-2019 are as follows:

Table 8‑5 Value of the economic benefits from the commissioning of Line 1, stage 3 of Sofia Metro

|  |  |  |  |
| --- | --- | --- | --- |
| Total value of economic benefits for the period 2016-2019 |  | Forecasted | Recalculated |
| Vehicle operation and maintenance costs | € | 16 313 913 | 8 237 185 |
| Value of time | € | 34 317 938 | 17 274 226 |
| Accidents | € | 6 182 376 | 3 113 160 |
| Benefits from decreased emissions | € | 1 018 969 | 513 029 |
| TOTAL ECONOMIC BENEFITS (COSTS SAVED) |  | 57 833 196 | 29 137 600 |

*Source: CBA and own calculations*

These data show that the recalculated benefits are 50.39% from those forecasted in the CBA. The reason for this is that the projected benefits are linearly dependent on the number of passenger trips, and as explained at the beginning of the analysis during the preparation of the project is forecasted number of passengers, which is about twice the actual number of passengers measured by the Metropolitan for the period reviewed.

The contribution of the benefits remains almost the same, with largest share (nearly 60%) of the saved travel time, followed by the benefits of reduced maintenance costs for other vehicles. The distribution of the share of each of the economic benefits is shown graphically in the following figure.

|  |  |
| --- | --- |
| Figure 8‑5 Distribution of economic benefits by CBA | Figure 8‑6 Distribution of recalculated benefits |

*Source: CBA and own calculations based on data from the Metropolitan*

In addition to the economic benefits achieved, the following should be noted for the implementation of the project and its benefits:

* The schedule for development and implementation of the project has been observed;
* The main result indicators were achieved – built 7.47 km of metro lines with 7 metro stations;
* Works that are not funded under OPT have been carried out, namely the necessary rolling stock has been delivered;
* Access is provided for disadvantaged people;
* The trestles are filled with tracks with specially placed noise absorbing rubber stripes, the track is filled with elastic fasteners and the metro area is covered with polycarbonate coating to reduce the noise level of passing trains in the area of the trestles;
* Construction of intermodal connection - Sofia Airport – Sofia Central Railway Station
* Conditions have been created to make new 53,750 thousand trips on average per day or 19,618,750 trips per year by metro on the sections of this line.
* The additional population that will be served by improved public transport with the construction of these sections of the metro is about 150 thousand.
* The sustainability of the investment is ensured by:
  + Maintenance of the infrastructure built by Metropolitan EAD. 325 new permanent jobs will be created in the company with the commissioning of this section of Line 1, Stage III. The established operational services of Metropolitan are specialized according to the specifics of the individual activities. Constant work on the training and qualification of the personnel is carried out in order to provide the necessary key specialists in the separate operational services, emergency groups and brigades for repair and maintenance of the facilities. The company has implemented a training system according to which, when new personnel starts in the units, the relevant trainings are conducted, and regular exams are held;
  + Tariff policy update (in 2016) taking into account the price levels that can be borne by customers and providing additional financial resources in the form of compensation from Sofia Municipality and the State Budget.
  1. **Conclusions**
* The schedule for development and implementation of the project has been observed, there are no significant deviations in the amount of investments in the project and its level of financial implementation is high;
* 100% of the eligible costs have been verified;
* The main problems of the project, which are in the stage of its implementation, were technical and corrective measures have been taken;
* At the end of the project, the beneficiary had difficulty securing the last 10% of the investment, but with the Council of Ministers Decree the problem was resolved. In addition, a financial correction was imposed for incorrect selection of a contractor. The financial correction amounted to 5% of the grant.
* The assumptions of the preliminary financial analysis of the project by the CBA were examined in the operational phase through an updated financial analysis in 2016. The calculations performed prove again the need of EU support. Financial sustainability is ensured by own revenues and compensations from the state budget and from the budget of Sofia Municipality;
* The value of the economic benefits for the period 2016-2019 is about 50% lower than forecasted, which is due to the smaller number of passenger trips compared to the forecasted one. However, the project also generates significant benefits, given the upward trend of passenger trips for the period (nearly 10%), the value of these benefits is expected to increase during the projected 30-year project period;
* The travel time saved has the largest share (nearly 60%) of all benefits, followed by the benefits of reduced maintenance costs for other vehicles.

# ***В0161Р0004-3.0.01-0008 “Rehabilitation of railway station complexes on TEN-T network – rehabilitation of railway station complex Central Railway Station Sofia“, “Rehabilitation of railway station complex Railway Station Burgas, Passengers”, “Reconstruction and renovation of passenger terminal in Railway Station Pazardzhik - Stage 2”***

## **Project summary**

|  |  |
| --- | --- |
| **В0161Р0004-3.0.01-0008 “Rehabilitation of railway station complexes on TEN-T network – rehabilitation of railway station complex Central Railway Station Sofia“, “Rehabilitation of railway station complex Railway Station Burgas, Passengers”, “Reconstruction and renovation of passenger terminal in Railway Station Pazardzhik - Stage 2”** | |
| Priority axis | *Priority Axis 3* |
| Category | Small project |
| Beneficiary | *National Railway Infrastructure Company* |
| Budget | BGN 56 542 345,51 |
| Implementation period | 23.08.3013 – 18.11.2016 |

*Source: Final Report of OPT*

The project includes the rehabilitation of railway complexes Central Railway Station Sofia, Burgas railway station for passengers and railway station Pazardzhik. It was included as additional project in the second modification of. The main objective of the project is to modernize the reception buildings of the three stations and their adjacent territories, which are managed and maintained by NRIC. Since the buildings and terrains are located along the railway infrastructure under reconstruction and modernization, they were classified as priority projects and fall within the scope of the Trans-European railway network. The project aims to improve the overall service concept in the station complexes to meet the development of railway transport, market requirements, public and social needs.

As positive effects of the project include improved passenger service by renting areas to tenants providing different types of services, optimized communication solutions for connecting stations with the surrounding area, landscaping, etc.

The following construction activities were carried out within the scope of the project:

* rehabilitation of the reception buildings of the three railway complexes
* renewal of all communications
* façade works (renewal of joinery and thermal insulation)
* improving accessibility in station complexes by installing new elevators and escalators
* rehabilitation of indoor and outdoor car parks
* rehabilitation of underground transitions
* provision of accessibility facilities for people with reduced mobility.

The project beneficiary is NRIC – a national company established in 2002 as a state enterprise and the sole manager of the railway infrastructure in Bulgaria. The Company organizes, implements and is responsible for the fulfillment of obligations under a long-term contract concluded with the state, and plans the overall development of the railway infrastructure in accordance with this contract. The company develops and maintains the railway infrastructure on the basis of long-term 10-year railway infrastructure development programs and annual business plans. For the implementation period of OPT 2007-2013 and in the five-year period after the end of the programme by 2020, currently the NRIC continues to perform its functions.

## **Project preparation**

The project was implemented within the period between August 2013 and November 2016 and includes interventions on the following sites:

* ***Site 1*** *"R*ehabilitation of railway station complex Central Railway Station Sofia

All rehabilitation activities of the reception building, underpass, platforms, platform coverings and adjacent parking lot have been completed. The space in the building was functionally redistributed, the surrounding area was shaped and landscaped. The scope of implementation also includes the rehabilitation of the contact network within the platform coverings, which led to delays in the completion of the project due to unforeseen works on the contact network.

* ***Site 2*** *"* Rehabilitation of railway station complex Railway Station Burgas, Passengers*"*

All rehabilitation activities of the building and platforms have been carried out. The building was structurally fortified, the roof has been replaced, functional redistribution and restoration have been completed, while the façade, architectural and interior elements of the building, which is an architectural monument, have been preserved. The buildings of Auxiliary Post and Post 1 have been sanitized, rehabilitation and construction of a new retaining wall has been implemented. General works and landscaping were carried out.

* ***Site 3*** *"Reconstruction and renovation of passenger terminal in Railway Station Pazardzhik - Stage 2"*

All rehabilitation activities of the station building have been completed and the functional distribution has been partially amended. The magasia building has been renovated and rehabilitation of the underpass has been carried out, including the placement of new sheds above the staircases and installation of elevators.

## **Project implementation**

The grant contract from 2013 initially envisages project completion till 31.12.2015. Three annexes were signed to the contract, which include changes to adjust investment costs on the basis of values from concluded public procurement contracts, refinement of indicators, reflection of financial corrections and extension of deadline for implementation until 31 January 2016. Under the first annex the grant aid was increased, and the own contribution was decreased.

The following table shows the change in the investment costs of the project, including EU contribution, national co-financing and own co-financing, as well as ineligible costs /VAT, financial corrections, etc. The financial implementation is about 8% below the planned budget and the share and value of the grant has been increased, according to the first annex to the grant contract. Ineligible costs include VAT, financial corrections, expenditures made outside the eligibility period of OPT.

Table 9‑1 Changes in the project budget

|  |  |  |
| --- | --- | --- |
| Budget by source of funding | Initial budget | Financial implementation |
| Total | 96 951 164,00 | 89 608 698,75 |
| CF | 38 788 370,45 | 43 375 680,03 |
| National co-financing | 6 845 006,55 | 7 654 531,73 |
| Other /loans, own funds, etc./ | 7 876 217,61 | 5 512 133,75 |
| Total eligible costs | 45 633 377,00 | 56 542 345,51 |
| Total ineligible costs | 43 441 569,39 | 33 066 353,24 |

*Source: Final Project Report*

Figure 9‑1 Changes in the project budget

*Source: Final Project Report*

As a result of the project implementation, a development of the management structure has been achieved, providing a complex concept for servicing the station complexes and changing through reconstructions of the purpose of the premises to meet the development of railway transport, the market, public and social needs. The services to passengers were improved by creating a comfortable environment, providing access for people with disabilities, provision of different types of services and implementing communication solutions for connecting stations with the surrounding area – transport and pedestrian, and landscaping in the context of environmental development. From a social point of view, the project contributes to making railway transport more attractive, and this will lead to positive environmental consequences, as this mode of transport is less polluting for the environment. The project achieves complete architectural renovation of the host buildings and gas complexes using high quality energy-efficient modern materials and technologies.

The indicators for project implementation were refined in the annexes to the initial grant contract, when also the detailed design projects were available, and the targets have been fully implemented, as shown in the following table.

Table 9‑2 Project implementation indicators

| Indicator | Measure ed. | Target value\* | Current Value |
| --- | --- | --- | --- |
| (1) | (2) | (3) | (4) |
| I. General project indicators | | | |
| Rehabilitated reception buildings of three garrison complexes | m 2 | 41 992 | 41 992 |
| Replaced plumbing and sewerage systems | m 2 | 41 992 | 41 992 |
| Replaced high and low voltage networks (high voltage and low voltage electrical installations) | m 2 | 96 333 | 96 333 |
| Replacement heating and ventilation systems | m 2 | 41 992 | 41 992 |
| Façade works (replacement of with joinery and thermal insulation) | m 2 | 15 367 | 15 367 |
| Installation of lifts | Number | 12 | 12 |
| Installation of escalators | Number | 9 | 9 |
| Rehabilitation of indoor and outdoor car parks | m 2 | 4 115 | 4 115 |
| Rehabilitation of underground trekking (pedestrian underpasses) | m 2 | 1 910 | 1 910 |

*Source: Final Report of OPT*

Positive effects of the project implementation are time savings in stay and movement at stations, improved conditions for integrated operation of urban transport systems, reduction of operating and maintenance and operation costs of buildings due to energy efficiency measures in place.

*The following problems have been reported during implementation, for which the relevant corrective measures have been taken:*

* *Extension of the rehabilitation period of the Central Railway Complex Sofia due to the emergence of additional construction and installation works on part "Constructive" and "Rehabilitation of contact network",* which led to delays and implementation of activities outside the eligibility period OPT, as well as the need to provide additional financial resources by the Beneficiary. As a corrective measure, the object was divided into two stages, and for the implementation of Stage 1 on 20.04.2016 a permit for use of the has been issued, and for the implementation of Stage 2 (including only the additional works on the rehabilitation of the contact network) an additional contract for implementation has been concluded and the beneficiary has provided a financial resource for the additional activities.
* *Delay of the start of the contracts for implementation of Burgas station by eight months due to long appealing procedures for in the procurement process*.
* Financial corrections *have been* imposed in the course of implementation, which reduce the value of grant and required an increase in co-financing budget by the beneficiary.

## **Operational phase**

In 2017 an ex-post financial analysis has been prepared as per Art. 55 of Regulation 1083/2006 and in accordance with the Guidelines on the closure of operational programmes adopted for support from the ERDF, ESF and CF for the period 2007 - 2013. The updated analysis confirms that the project needs a grant. The value of net income was compared to the initial calculations of the financial deficit and the value of the net income actually generated at the date of the updated financial analysis, the latter representing 52.3 % of the originally calculated and the amount of the recalculated financial shortfall being higher than initially calculated. It was therefore concluded that there is need for revision of eligible costs paid.

Since the project is not a major project within the meaning of Art. (39) Of Regulation (EC) No 1083/2006, no cost-benefit analysis has been prepared for it, appraising the economic benefits and performance.

In the operational phase, the beneficiary submits annual sustainability reports in accordance with paragraph 16.1.3. Management and implementation Guidance of OPT within the five-year period following the completion of the project. For the completed sites of the project tender procedures under the State Property Act were carried out and parts of the buildings were rented mainly for commercial purposes – kiosks and catering establishments. NRIC provides the maintenance of the station complexes through specialized units and provides detailed information about the activities carried out for maintenance of the sites and the means of maintenance and operation in the sustainability reports.

## **Conclusions**

* The preparation of the project has taken place without significant problems and the project was included in the second programme modification;
* There have been delays in the implementation of some of the activities – design and construction of Burgas station (8 months due to public procurement appeals) and rehabilitation of Sofia Central Station (11 months). Corrective actions have been taken to split the activities for Sofia Central Station into two stages, the second stage was completed at the end of 2016 and the site was put into operation.
* Despite deviations from the original schedule, the project was successfully completed in the programming period 2007-2013 and the planned positive effects of its implementation were achieved.
* In 2017, an ex-post financial analysis was prepared, which confirmed that the project continues to need a grant and there is no justification for revision of the grant paid under.
* The project is being monitored by submitting sustainability reports to the MA, which include the maintenance and exploitation measures taken and the actions carried out to maintain the results.

# **PROJECT LEVEL STUDY -** **PRIORITY AXIS 4**

# ***Project BG161PO004-4.0.01-0003 "Establishment of a river information system in the Bulgarian part of the Danube – BULRIS"***

## **Project summary**

|  |  |
| --- | --- |
| **Project BG161PO004-4.0.01-0003 "Establishment of a River information system in the Bulgarian part of the Danube – BULRIS"**  C:\Users\AGinov\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\N2IAXZK2\za_SITE_sas (003).jpg | |
| Priority axis | Priority axis 4 |
| Category | Small project |
| Beneficiary | *State enterprise "Port Infrastructure"* |
| Budget | BGN 28 288 282,06 |
| Implementation period | 04.10.2011 – 31.12.2015 |

*Source: OPT Implementation Final Report*

The project is designed to provide the necessary organizational and technical structure for the provision of harmonized river information services and is the Bulgarian part of the Common European System for ensuring efficient and safe navigation on inland waters. This is the first project under the OPT TPP to be carried out in the field of water transport.

The overall objective of the project is to harmonize information services to maintain traffic and transport management on inland waters, in accordance with the implementation of Directive 2005/44/EU.

The specific objectives can be defined as follows:

* Construction of the telecommunications infrastructure of the river information system in the Bulgarian part of the Danube – BULRIS, which carries out full and continuous transmission of all data and "voice" from Florentin station to Silistra station and to RIS- center in. Ruse;
* Creating conditions for ensuring interaction with the other information systems serving the other modes of transport;
* Construction of a modern building of RIS center for coordination in the Republic of Bulgaria.

The implementation of the project was scheduled to take place in three phases:

* Phase 1 (2007-2012) "*Establishment of a River information system*";
* Phase 2 (2010-2012) "*Extension of the scope of the system and services;*
* Phase 3 (2012-2013) "*Implementation of new technologies in accordance with the newly adopted EU regulations".*

**The project is not revenue-generating and does not include** **State aid.**

## **Project preparation**

The primary beneficiary of the project is the Executive Agency Maritime Administration and it was changed following some detailed requirement under the European legislation. The change of beneficiary is positive in view of the specifics of the project and it subsequent operation. The project focuses on meeting a legislative obligation of the Republic of Bulgaria, tender procedures started before an application form drafting and project approval. This is so because the beneficiary lacked capacity for SCF project development and management as well as structured project management unit. The application form as well as the tender technical specifications were prepared by a beneficiary’s team. This imposed additional delays in the project implementation according to the originally planned schedule for project individual phases.

## **Project implementation**

**Time implementation**

The project started with the grant contract signing - DOPT-14/04.10.2011.

By letter No 11-08-78/22.07.2013 the beneficiary sent to the MA a request for updating and reducing the budget and extending the deadline for the implementation of grant contract No SUPT-14/04.10.2011. After discussion and correspondence between the beneficiary and the MA of OPT, Annex No 1 was signed, with Reg. No DOPT – 40/10.12.2013.

**Financial implementation**

Annex 1 also made amendments to the project budget due to a decrease in the values of contracts with contractors as a result of the tender procedures carried out.

Table 10‑1 Project budget amendments

|  |  |  |
| --- | --- | --- |
| Categories of expenditure | Initial project budget | Final budget |
| Sources of funding | Value in BGN | Value in BGN |
| Total project value | 42 318 622,36 | 37 427 697,90 |
| Eligible costs | 35 378 913,72 | 31 304 189,92 |
| CF/ERDF | 30 072 076,66 | 26 608 561,43 |
| National co-financing | 5 306 837,06 | 4 695 628,49 |
| *Total eligible costs* | 35 378 913,72 | 31 304 189,92 |
| Total ineligible costs | 6 939 708,64 | 6 123 507,98 |

*Source: Final Project Implementation Report*

Figure 10‑1 budget Amendments

*Source: Final Project Implementation Report*

The physical start of the project implementation was on March 27, 2009, as the beneficiary and the company "MG-ARCH" EC s signed a contract: " Drafting a partial amendment of the current *PPA with scope UPI No 1 of sq.133 with cad.No277 according to the plan of the town of Varna. As part* of Activity 1 "Preparatory activities *of* Phase 1 (*Feasibility/ pre-investment studies)*.

Under Activity 2 "*Implementation activities*" of Phase 1, the necessary infrastructure of 16 communication points located along the Danube river and one booking center in the town of Varna was built. Through the construction of the telecommunications infrastructure of the river information system in the Bulgarian part of the Danube – BULRIS was provided carry out full and continuous transmission of all data and voice from Florentin station to Silistra station; The implementation of the activity was awarded under Contract No 48/15.05.2010. Within the scope of Contract No 48/15.05.2010 are: design, which covers the process of preparation of investment projects and their compliance with the required documentation, according to the SPA; Construction and installation works /construction works/; Services related to the conduct of staff training, installation and integration of RIS.

Activity 4 "*Implementation activities*" of Phase 2, Lot 1 – in Ruse a RIS center was built.

In the RIS center were delivered the facilities of the system and equipment for the staff for the implementation of river information services. The RIS center is equipped with servers, workstations and other control-measuring equipment. The following services are provided in accessible electronic format: fairway information; traffic information on the river; traffic management information; emergency assistance information; transport logistics information; information on current regulations; statistical information; information on port and other taxes collected by ships.

Activity 6"*Implementation activities*" Phase 2, Lot 2 with subject: " Establishment of a river information system in the Bulgarian part of the Danube – *BULRIS PHASE* 2, Lot 2 – Expanding the scope of services and the system", through the introduction of new sensors, television and thermal imaging cameras, automatic measurement of river levels and implementation of new functions and services provided by the information system, information about the weather situation, provision of wireless access to the services of the System, water level information based on mathematical models, disaster response services, crises and catastrophes (calamity abatement services) etc.

Activity 7 Phase 2 Lot 3,*"Implementation activities"* with subject "Implementation of a system for monitoring *the state of the riverbed".* Under the contract, a motor ship was delivered, fully equipped for simultaneous hydrographic (based on multi-beam echolot) inspection of port facilities and control of dredging works.

**Phase 3**: Not implemented during the expenditure eligibility period of OPT 2007-2013 due to delays in the publication of regulations for certain specific river information services, such as Regulation (EU) No 164/2010. In the meantime, Commission Implementing Regulation (EC) No 689/2012 amending Regulation (EC) No 415/2007 on technical specifications for vessel interception and tracking systems has also been issued.

**End of the project:** On 15.08.2015 the implementation of a contract "Establishment of a River information system in the Bulgarian part of the Danube –*BULRIS PHASE 2, Lot 2 – expansion of* the scope of services and the system" was completed.

**Information about putting into operation:**

* **Phase 1**: On January 3, 2014 a Final Reception Protocol for the adoption of a River Information System in the Bulgarian part of the Danube River – BULRIS was signed.
* **Phase 2:**

2.1. **Lot 1**: A.RIS – Centre: Use permit of 05 December 2014 (NoST-05-1807); B. Photovoltaic plant on the roof of RIS Center Ruse and Railway Level crossing (NoS-05-1807);

C. Pier Wall: Use permit of December 5, 2014. (No ST-05-1806) for the site Reconstruction of an existing pier wall.

2.2. **Lot 2**: On 14.08.2015 a final acceptance protocol was signed.

2.3. **Lot 3**: On 22.01.2015 a commission has been appointed to conduct final tests of the system for monitoring the state of the riverbed – motor cutter housing, equipment, instruments and measuring equipment.

Table 10‑2 Indicators taking into account the project's contribution to the fulfilment of priority axis objective

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Type | Indicator | Unit of measure | Target value | Value achieved | Percentage of implementation (in %) |
|  | (1) | (2) | (3) | (4) | (5) = (4/3) \* (100) |
| Impact | Percentage of river roads along the Danube covered by a safety system | % | 100 % | 100% | 100% |
| Score | Observed river lengths | Km | 471,5 | 471,5 | 100% |
| Achievement | River Information System | Number | 1 | 1 | 100% |

*Source: OPT Implementation Final Report*

**Implementation of project indicators**

* Built telecommunications infrastructure of the river information system in the Bulgarian part of the Danube – BULRIS with 16 communication points covering a total of 471.5 km;
* Built infrastructure, supplied equipment and 16 sites put into operation;
* Conditions are provided for the provision of services in the section from the Timok River to Silistra, along 470 km. Quantitative parameter - percentage of coverage from the entire section (470 km – 100%);
* Constructed building of RIS Center Ruse with built-up area 245 m2, built-up area 805 m2 and area of the plot 901 m2. According to the Design Visa, the building is on 3 levels;
* Built checkpoint and installation of a security barrier at the railway level crossing to port street;
* Reconstruction of an existing pier wall at the entrance to Ruse-West port terminal – from the territory up to 22 meters behind the edge of the pier and equipment: 3 pieces of electricity; lighting poles; 2 fire hydrants; 9 pieces of bollards; a number of stationary transient pontoon, etc.;
* Implemented up-to-date technical standards for RIS (software and/or hardware update/upgrade);
* Wireless access to river information services for shippers is provided;
* Established system for providing water level information based on mathematical models;
* Established system for automatic collection and provision of meteorological information;
* The possibility of broadcasting additional safety-related communications through the AIS subsystem was created;
* Added and integrated new sensors in the system, built national Hull Database and Reference Database, Position Information Service, etc. and their integration with European databases (European Hull Database, European Reference Data Management System, European Position Information Service, etc.), as well as integration with the available river information services;
* Data exchange (including European databases) for crisis prevention and management by connecting the system and exchanging data with GIS (e.g. at Bulgarian ports along the Danube) and providing river information services through a national RIS portal;
* Built 1 pc. mobile (based on motor cutter and multi-beam echlot) system for monitoring the condition of the riverbed and 1 pc. post-treatment center to final results.

**Despite the fact that Phase 3 was not implemented, all project indicators had been met.**

The project implementation:

* Improved the safety of inland navigation. The RIS provided information on traffic safety at tactical and strategic level;
* Increased the efficiency of inland navigation. The RIS contributed to the optimization of the resource of the water transport system through a continuous exchange of information between member states' competent authorities as well as between inland navigation actors, better use of inland waterways by providing diverse information;
* Provided information for assistance in disaster situations, thus protecting the environment.

**Problems in the implementation of the project and measures taken to address them:**

**1. Phase 1. Activity 2 "Implementation activities":** In connection with the implementation of the RIS an expropriation procedure in the village of Vabel was imposed, planned for the deployment of the telecommunications facility – a major repeater of the System, was required. The beneficiary required through the Minister of Transport, Information Technology and Communications from the Minister of Agriculture and Food, the provision of land from the state land fund in the village of Vabel (part of a farm yard in the village of Vabel, Nikopol Municipality) for its construction, and radio relay profiles were established. The expropriation procedure took about 1 calendar year, which subsequently delayed the implementation of contract No 48/15.05.2010.

*Corrective actions: In*  accordance with Section IV, Art. 8, para 6 of Contract No 48/15.05.2010 with the contractor and on the basis of the revised deadlines in the submitted revised schedule plan, the beneficiary, in its capacity of contracting entity, in order to protect its interests suspended the contract following Art. 8. para. 1, according to the hypothesis of Art. 8, para. 4, until all obstacles to its continuation had been removed. On 01.02.2012 between the beneficiary and the contractor, parties to contract No 48/15.05.2010, a statement of findings was signed, by which they agreed to suspend the term for the implementation of the contract. The implementation of the contract was resumed by a statement of findings and the contract was successfully executed.

**2, 2014 in New Year Phase 2 activity 4 "Implementation activities", Lot 1:** In connection to the envisaged implementation of the construction works of the DZZD "BUL RIS 2", from PHASE 2, Lot 2 of the project on the construction of RIS - Center Ruse, it is considered that the implementation of these construction works by another builder after putting the building into operation will lead to a change in the agreed terms and the cancellation of the warranty liability by the contractor for the construction of the RIS-Center.

*Corrective actions:* The beneficiary, in its capacity as Assignor, made a decision that it was possible for the contractor under Phase 2,Lo t 2 DPZ BULRIS 2 to carry out the planned construction works and deliveries before the completion of the phase 2 finishing works, Lot 1 in order not to carry out subsequent construction works on the construction of the RIS Center in Ruse and in order to prevent the loss of the warranty liability of the contractor Consortium "Danube". The parties agreed that the term in Art. 5, para 1 for the implementation of Contract No IED-18/17.12.2012 was changed, extending it by 200 (two hundred) days from the date of the additional agreement.

**3. Phase 2, Activity 7:** According to the signed contract No IED-4/28.04.2014 between the beneficiary and consortium "NAG - HYDROSYSTEMS", the deadline for implementation is 8 (eight) months – until 28.12.2014. By letter No 11-08-125 of 18.12.2014. the contractor submitted a request for suspension of the term of contract No IED-4/28.04.2014 from 24.12.2014 to 28.12.2014 and from 3 1.12.2014 to 06.01.2015.

*Corrective actions:* The delivery of the motor cutter to the Republic of Bulgaria couldn’t take place for reasons outside of both parties to contract No IED-4/28.04.2014. On 23.12.2014 a Statement of Findings has been signed, according to which, pursuant to Article 7 para 3, the term of Contract No IED-4/28.04.2014 was suspended from 24.12.2014 to 28.12.2014 and from 31.12.2014 to 06.01.2015.

## **Operation** **phase**

BRIC provides telecommunications services ship-to-coast and coast-to ship; traffic management and information services for ships and river traffic information services; hydro meteorological information.

For the effective functioning of the BULRIS system, SEPI established a specialized department " Ship Traffic Management- Danube River", located in the city of Ruse, which performs functions for providing river information services in the Bulgarian part of the Danube River:

* collection, processing, storage and provision of information acquired through the reporting system in the inland waterways of the Republic of Bulgaria to other Bulgarian and foreign competent authorities and interested persons;
* collection, processing, storage and provision of information on transport logistics;
* collection and storage of electronic information about the hydrometeorological situation in the Bulgarian section of the Danube River;
* collecting, processing and storing information on the condition and depth of the channels and shipping sites;
* providing information related to the safety of navigation and the organization of traffic using the traffic visualization system;
* interaction with organizations external to the system related to navigation on the Danube;
* providing information to the public authorities, organizations and persons concerned within the framework of the established rules;
* collection, storage, processing and provision of information obtained through the river traffic system in the interests of the safety of human life, navigation on the Danube and environmental protection.

According to the legal basis in the country, the newly created river information system is managed and maintained by the SEPI. All costs of operation, maintenance, remuneration of operators and depreciation costs are covered by the budget of the beneficiary and no problem in this respect is reported.

The sustainability reports submitted by the SEPI to the MA for 2016 and 2017 did not report any change in the results achieved, as well as on the function, purpose and ownership of the acquired equipment and fixed assets.

## **Conclusions**

On the basis of the project information examined in the preparation, implementation and operation phase, the following conclusions can be defined:

* The actual implementation of the project has begun before the development and approval of the AF with financial resources of the beneficiary;
* There was a delay in implementation and the contract was annexed in order to extend the implementation period;
* The budget was amended once due to a reduction in the values of contracts with contractors as a result of the tender procedures carried out, but the budget structure remained unchanged;
* Phase 3 of the project was cancelled due to specific legislative changes at EU level;
* Nevertheless, all project indicators were achieved;
* There were no difficulties in providing funds for the maintenance of the system.

# ***BG161PO004-4.0.01-0005 “Vessel Traffic Management Information System (VTMIS) – Phase 3”***

## **Project summary**

|  |  |
| --- | --- |
| **BG161PO004-4.0.01-0005 “Vessel Traffic Management Information System (VTMIS) – Phase 3”**  http://scortel.com/upload/vtmis-4.jpg | |
| Priority axis | Priority Axis 4 |
| Category – major/small | Small |
| Beneficiary | Bulgarian Ports Infrastructure Company |
| Budget | BGN 29 867 650,90 |
| Implementation period | 26.06.2012 – 31.12.2015 |

*Source: Final Report of OPT*

The project achieved increased safety, security and efficiency of maritime transport, as well as reducing the environmental consequences of pollution caused by ships in the Community's maritime spaces by setting up and maintaining the Vessels Traffic Management and Information Services System (VTMIS) as part of the Community System of vessel traffic monitoring and information service (SafeSeaNet)), as well as harmonizing the VTMIS system for implementation of Directive 2002/59/EC and Directive 2010/65/EU.

## **Project preparation**

Within the period 2000 and 2008 one pilot project (Varna Initial System) and two projects for the establishment of the Vessels Traffic Management and Maritime Transport Information Services System (VTMIS), phase 1 and phase 2, respectively, have been successfully implemented with the financial support of the PHARE programme and the Dutch Government. With the implementation of phases 1 and 2 of the VTMIS project, the requirements of Directive 2002/59/EC in the VTMIS part were partially met, covering only Burgas and Varna Bays and Inland Waters. The implementation of the VTMIS Phase 3 project contributes to fully compliance to the requirements of Directive 2002/59/EC, as amended by Directive 2009/17/EC on the maritime spaces of the Republic of Bulgaria.

The project "Vessel Traffic Management and Information Services (VTMIS) - Phase 3" envisages extension and completion of the system to cover the entire coastline and integrating all subsystems into a single national maritime information system, in line with the current requirements of European and international documents. It was also envisaged to establish a "National Electronic Document Turnover Centre for Maritime Transport (one-stop shop") in accordance with Directive 2010/65/EU.

The project was included in PA 4 in the initial version of the programme with a significantly lower budget – EUR 3 850 000, with its scope being revised in the second programme modification and the indicative budget was increased to EUR 20 million. Until 05.09.2008 Executive Agency "Maritime Administration" was envisaged as project beneficiary, but due to the implemented structural changes and differentiation of the functions under the Law on Amendment and Supplementation of the Commercial maritime codex, BPIS was designated as a beneficiary, on the basis of its functions to build and maintain a system for traffic management and information services of shipping and exchange information with other systems.

The project implementation contributed to increased safety, security and efficiency of maritime transport, as well as reduced environmental consequences of pollution caused by ships in the maritime areas of the Community.

The application form was submitted to the MA in 2011 and grant contract was concluded in 2012 with the following main activities:

* Expanding the coverage area of the system in the maritime space of the Republic of Bulgaria;
* Establishment of national center of e-documents in the maritime transport of the Republic of Bulgaria
* Upgrading the telecommunications infrastructure that ensures full and continuous transmission of all data and voice
* Building of coastal centers for vessel traffic management and information services in Burgas and Varna;

The scope of the services under the system includes: monitoring of the maritime spaces of the Republic of Bulgaria, management of ship traffic, provision of navigation and weather information, as well as traffic information, assistance in limiting emergency cases and communication provision in case of disaster and in case of accidents, servicing of ships arriving or leaving the ports of the Republic of Bulgaria on the formalities for giving information through a single center for electronic document turnover and information services of maritime transport – Varna and Burgas.

## **Project implementation**

The project was implemented in the period 26.06.2012 – 31.12.2015 with the following main activities:

* *Activity 1: Expanding the scope and functions of the system VTS*
* *Activity 2: Establishing of National center of e-documents in maritime transport (one-stop-shop)*
* *Activity 3: Upgrade and expansion of transmission media (RRS) and technological improvement of radio communication system GMDSS*

For the implementation of Activities 1, 2 and 3, a contract was concluded with the subject "Supply and installation of equipment and implementation of construction works for the project "Information system for traffic management of vessels (VTMIS– Information system for management of maritime traffic) – Phase3". The contract was concluded with some delay due to an appeal against the public procurement procedure.

* *Activity 4: Construction of center for vessel traffic management and Information services to shipping in Burgas*
* *Activity 5: Construction of center for vessel traffic management and information services to shipping in Varna*

A contract was signed for activities “Design and construction (engineering) and furnishing of buildings for coastal centers for management and information services of navigation Burgas and Varna"

* *Activity 6:* Construction supervision under activities 1, 3, 4, 5;
* *Activity 7:* Technical assistance.

The grant contract was signed on 26.06.2012 with a planned deadline for implementation 30.06.2015 /36 months/ which was subsequently extended until 31.12.2015. /by 6 months/ with an annex. The reasons for the extension were delays in the procedures for coordination of the designs with coastal centers in Varna and Burgas and the need for additional time to correct implemented construction works.

The investment costs show a decrease of about 8% in the amounts paid compared to the planned expenditure. A financial analysis has been prepared for the project, but since the project is not revenue-generating, the financial deficit is 100% and does not include co-financing by the beneficiary, so ineligible costs include only VAT costs.

Table 11‑1 Changes in the project budget

|  |  |  |
| --- | --- | --- |
|  | Initial budget BGN | Financial implementation |
| Total | 39 145 117,96 | 36 224 743,14 |
| CF | 27 815 666,79 | 25 387 503,26 |
| National co-financing | 4 908 647,08 | 4 480 147,64 |
| Total ineligible costs /VAT/ | 6 420 804,09 | 6 357 092,24 |

*Source: Final Report of OPT*

Figure 11‑1 Change in investment costs

*Source: Final Report of OPT*

The target values of the project indicators have been fully implemented as follows:

Table 11‑2 Project indicators

| Indicator | Unit of measure | Value achieved |
| --- | --- | --- |
| Supplied and installed new metal towers with a height of 20 m | Number | 3 |
| Supplied and installed new metal towers with a height of 25 m | Number | 1 |
| Supplied and installed new metal towers with a height of 40 m | Number | 3 |
| Delivered and installed metal tower with a height of 50 meters. | Number | 1 |
| Built, furnished and equipped building for coastal management and information services center of Burgas (site 16) | Number | 1 |
| Built, furnished and equipped building for coastal management and information services center in Varna (site 17) | Number | 1 |
| Supplied and installed radar stations (radar) per number Objects | Number | 5 |
| Stations supplied and installed by the automatic identification system (AIS) per number Objects | Number | 4 |
| Supplied and installed video cameras and thermal imaging cameras on pcs. Objects | Number | 7 |
| Supplied and installed stations for the monitoring of objects | Number | 10 |
| Created software performing the functions of "one-stop" and functioning international data exchange. | Number | 1 |
| Installed software performing the functions of "one-stop" and functioning international data exchange of objects in two server centers. | Number | 4 |
| Delivery and installation of new IT, communication and office equipment for CEDMT in sites Nos 5 and 16 | Number | 2 |
| Supplied and installed radio relay stations per number Objects | Number | 14 |
| Supplied and installed equipment for technological renewal of the radio communication system (GMDSS) per number Objects | Number | 6 |
| Supplied and installed radar stations (radar) per number sites*)* | Number | 1 |
| Supplied and installed radio relay stations per number Objects | Number | 1 |
| Stations supplied and installed by the automatic identification system (AIS) per pc. Objects | Number | 1 |
| Supplied and installed video cameras and thermal imaging cameras on number Objects | Number | 1 |
| Supplied, installed equipment and put into operation VTS Operations Center - Burgas | Number | 1 |
| Supplied and installed radar stations (radar) per number Objects | Number | 1 |
| Supplied and installed radio relay stations per number Objects | Number | 1 |
| Stations supplied and installed by the automatic identification system (AIS) of objects | Number | 1 |
| Supplied, installed equipment and put into operation - GMDSS Operating Room | Number | 1 |
| Supplied and installed video cameras and thermal imaging cameras of objects | Number | 1 |
| Supplied, installed equipment and put into operation VTS Operations Center - Varna | **Number** | 1 |

*Source: OPT Implementation Final Report*

**The project results include:**

* Expanded coverage area of the system in the maritime space of the Republic of Bulgaria and the integration of all subsystems into single national maritime information system related to pan-European structures, in accordance with the current requirements of the European and international documents, through the implementation of the works under Activity 1 of the Project.
* Upgrade of the telecommunications infrastructure that ensures full and continuous transmission of all data and voice
* Provision of interaction with other information systems of government and department structures serving maritime transport
* Establishment of national center of e-documents in the maritime transport of the Republic of Bulgaria center through the execution of the works provided under Activity 2.
* Building of coastal centers for vessel traffic management and information services in Burgas and Varna.

**Problems identified and corrective actions:**

* Appeal of the public procurement for the supply and installation of equipment and execution of construction works, which delayed implementation by about 6 months;
* There was an instability of the land base in the construction of a coastal center in the town of Burgas, which required additional design and completion of the building permit;
* Inability to implement a pilot foundation, which required a change during the construction under Art. 154 of the Special Development Act;
* Suspension of production of part of the proposed equipment, which required replacement in relation to the equipment originally proposed. The replacement was carried out in compliance with the requirements of the Public Procurement Act due to the fact that the new equipment met the technical specifications and is of the same or higher compared to the initial equipment;
* Temporary suspension in the performance of contract No IED-21/13.12.2013 until the issuance of an authorization for exploitation of the coastal centers. Until the issuance of an authorization for exploitation of the coastal management and information services of navigation in the town of Varna and Burgas Varna, the contractor for supply and installation of equipment and construction works, did not have the technological opportunity to carry out its activities and obligations under the contract. In view of the interdependence between the contracts, the possibility of temporary suspension was used until the relevant authorization documents have been issued by the competent authorities. The activities under the contract have been completed within the deadlines.

## **Operational phase**

The management of the built infrastructure is carried out by the Bulgarian Port Infrastructure Company. The obligations are clearly laid down in Article 115 of the Law on Maritime Spaces, Inland Waterways and Ports of the Republic of Bulgaria (LMSIWP). The Directorate "Management of Ship Traffic - Black Sea" of the BPIC is responsible for the obligations of the enterprise under the LMSIWP and CMS for management of infrastructure t built under the project, including management of ship traffic; provision of navigation and data information; as well as traffic information and assistance in limiting emergencies; providing advice and recommendations to ships relating to the safety of navigation, assisting decision-making on board the ship in a complex meteorological and navigational environment, movement of ships in order to prevent accidents and incidents at sea; communication provision through the Bulgarian part of the World Maritime Disaster and Safety System (GMDSS) in zones A1, A2 and NAVTEX in the event of disasters and in search and rescue, as well as in fixed-term cases such as weather and navigational warnings and in the case of safety announcements, including the dissemination of maritime safety information and in tests of GMDSS equipment on ships, as well as in accidents; maintain services to facilitate reporting formalities for ships arriving in and/or leaving the ports of the Republic of Bulgaria.

The Directorate shall implement the technical operation of the ship traffic services facilities, apparatus, systems and subsystems, including the main and ancillary facilities of VTS, VTMIS, GMDSS, SSN in carrying out the safety, security and navigation management tasks, by maintaining the necessary personnel to provide 24/7 service provision and system maintenance.

All operating, maintenance, remuneration and depreciation costs covered by the BPIC budget. The sustainability in the management of the structure after the implementation of the project is based on the institutional basis provided by the LMSIWP and CMS. The lessons learned during the period of operation of the first and second phases of the project are essential to ensure sustainability after the third phase, as well as during the exploitation.

Within a 5-year period after the completion of the project, the BPIC submits annual sustainability reports to the MA in accordance with point 16.1.3. Management and Implementation Guidance of the OPT. The reports include a description of the measures and actions taken to maintain the results achieved.

## **Conclusions**

* The project is one of the successfully implemented projects under OPT, which was been set as a priority project in the initial version of the programme and builds on the results of the two phases of the Vessels Traffic Management and Information Services System (VTMIS) in the period 2000-2008;
* The implementation period exceeds the planned period by 6 months, but this has not jeopardized the achievement of the results. The project has been implemented in its full scope within the eligibility period for expenditures under OPT;
* A total saving of about 8% was reported compared to the investment costs initially envisaged;
* In the course of project implementation, timely and adequate corrective measures have been taken on the identified problems;
* The sustainability of results is ensured through the institutional and legislative framework regulating the activities and functions of the BPIC.

# ***BG161PO004-4.0.01-0007 “Improvement of the systems for navigation and topo-hydrographic measurements along the Danube River”***

## **12.1 Project summary**

|  |  |
| --- | --- |
| **BG161PO004-4.0.01-0007 “Improvement of the systems for navigation and topo-hydrographic measurements along the Danube River”** | |
| Priority Axis | Priority Axis 4  Improving shipping on maritime and inland waterways |
| Category – major/small | Small project |
| Beneficiary | *IA "Maintenance and exploration of the Danube River"* |
| Budget | Budget\*: BGN 3 316 368.06  Total BFA: BGN 3 316 368.06  *EU*: BGN 2 818 912.85  (EUR 1 441 287.25). |
| Implementation period | 09.10.2013 – 30.09.2015 |

*\*The project budget includes the verified eligible costs of the project, including grant and co-financing by the beneficiary*

*Source: Final Report of OPT*

The project aimed at improving the conditions for navigation in the common Bulgarian-Romanian section of the Danube by improving the navigation, updating and updating systems of monitoring networks and methods for collecting, processing and analyzing data for quantitative and qualitative assessment of the waters of the Danube; restoration and improvement of the underlying infrastructure representing the supporting geodetic network along the Danube River.

The beneficiary of the project is the Executive Agency for Exploration and Maintenance of the Danube River, which is a legal entity based in the city of Ruse within the structure of MTITS. The agency performs functions in accordance with national and international law regarding servicing, research, and maintaining the conditions for navigation in the inland waterways of the Republic of Bulgaria. The activities include ensuring the navigational and road situation in the Bulgarian-Romanian section of the Danube River, studies of the hydro morphological and hydrological regime of the Danube river in the Bulgarian section, collecting and disseminating information about the condition of the shipping road and the hydrometeorological regime of the river, organization of smooth navigation in the area of the Ruse - Giurgevo bridge, etc.

## **Project preparation**

The project was implemented within the period 09.10.2013 – 30.09.2015 and included the following main activities:

* *Construction of a support GPS geodetic network along the Bulgarian bank of the Danube river and its connection with EUREF;*
* *Purchase and installation of automatic hydrometric and meteorological stations;*
* *Purchase of floating and coastal signs;*
* *Purchase of a specialized vessel for hydrographic surveys.*

The grant contract was signed in 013 and was amended twice in 2015 for the following reasons:

* the exclusion of the activity for the supply of a specialized vessel for hydrographic surveys on a proposal from the beneficiary, due to the fact that the period the commercial contract was beyond the period of eligibility of OPT costs and the beneficiary was not in a position to provide its own financial resource for its purchase. In this respect, a phase-out of the project has been proposed, with the delivery of the ship foreseen for the next programming period;
* reduction of grant caused by the removed activity;
* extension of the deadline for implementation of the project by five months (from 31.05.2015 to 30.09.2015), due to an agreed extension of the deadlines for the implementation of two of the main project activities.

The savings in the public procurement and the drop-off of the main supply activity of a specialized vessel resulted in a substantial reduction in the planned investment costs, with the investment decrease about 72% below the value originally planned.

Despite the removed activity, the project achieved the objectives of reaching the international standards for carrying out topographical (geodetic) measurements; restoring and improving the underlying infrastructure, representing the supporting geodetic network along the Danube River; uniformity of quality in the indication of the navigational and road situation in the common Bulgarian-Romanian section of the Danube River; faster provision of information on the status of the waters of the Danube river and the shipping route.

Table 12‑1 Changes in the project budget

|  |  |  |
| --- | --- | --- |
|  | **Initial budget** | **Financial implementation** |
| **Total** | 11 973 999,99 | 3 316 368,06 |
| **CF** | 10 177 899,99 | 2 818 912,85 |
| **National co-financing** | 1 796 100,00 | 497 455,21 |
| **Other /loans, own funds, etc./** | 0,00 | 0,00 |
| **Total eligible costs** | 11 973 999,99 | 3 316 368,06 |
| **Total ineligible costs** | 0,00 | 0,00 |

***Source: Final Project Report***

Figure 12‑1 Change in investment costs

## **12.3 Project implementation**

**Project implementation indicators**

The target values of the project indicators have been fully implemented, as follows:

Table 12‑2 Project implementation indicators

|  |  |  |
| --- | --- | --- |
| Indicator | Unit of measure | Value achieved |
| 1.Construction of GPS geodetic network along the Bulgarian coast of the Danube river and its connection with EUREF |  |  |
| * 1. Built new geodetic points with underground center | Number | 198 |
| * 1. Measured geodetic points and defined in space by GNSS measurements | Number | 267 |
| * 1. Measured geodetic points and determined in height by geometric level IV class | Number | 9 |
| 1.4. Processed and adopted new GPS geodetic network coordinated in European reference systems, providing an output base for geodetic and hydrographic surveys on the Danube | Number | 1 |
| 2. Purchase and installation of automatic hydrometric and meteorological stations |  |  |
| 2.1. Automatic hydrometric stations supplied and installed | Number | 9 |
| 2.2. Automatic weather stations supplied and installed | Number | 9 |
| 2.3. Electronic boards supplied and installed for visual information to shippers and stakeholders | Number | 9 |
| 3. Purchase of floating and coastal navigation signs along the Danube River |  |  |
| 3.1. Coastal navigation signs supplied | Number | 980 |
| 3.2. Coastal navigation headlamps supplied | Number | 20 |
| 3.3. Floating illuminated navigation signs (buoys) supplied | Number | 160 |
| 3.4. System in place for monitoring floating illuminated navigation signs and coastal navigation headlamps | Number | 1 |
| 4.Verification of the implementation of completed geodetic activities for the creation of GPS geodetic network |  |  |
| 4.1. Contract concluded to check the performance of the GPS geodetic network | Number | 1 |
| 4.2. Submitted inspection report on the performance of GPS geodetic network | Number | 1 |

*Source: Final Report of OPT*

The project achieved objectives like reaching international standards for performing topographical (geodetic) measurements; restoring and improving the underlying infrastructure representing the supporting geodetic network along the Danube River; uniformity of quality in indication of the navigational and road situation in the common Bulgarian-Romanian section of the Danube River; faster provision of information on the status of the waters of the Danube river and the shipping route.

*In the implementation phase, the following problems were reported, and relevant corrective measures have been taken:*

* Long appeals of public procurement procedures for the selection of a contractor for supply of a hydrographic ship, which made it impossible for Project Activity 4 to be implemented within the eligibility period of expenditure under OPT 2007-2013. In order to avoid loss of funds, it was decided to phase the project and to implement Activity 4 with funding from OPTTI.

## **Conclusions**

* The preparation of the project was carried out without significant problems and the project was included in the second programme modification;
* In the course of project implementation, a major activity related to the supply of a hydrographic vessel was excluded, due to delays in awarding the contract. The delay shifted the delivery period beyond the eligibility period of OPT costs, so thus activity has been removed from the project and investment costs have been reduced by 72 % compared to the planned values;
* In order not to lose funds, it was decided that the project should be phased and the activity for the supply of a hydrographic ship was planned to be financed under OPTTI;
* Despite deviations from the original schedule, the project was successfully completed in the programming period 2007-2013 and most planned positive effects have been achieved. All targets after project modifications have been fully implemented;
* The project is subject to monitored through sustainability reports presented to the MA, which include the maintenance and exploitation measures taken to preserve the results.

1. 1. *Ex-post evaluation of major projects financed by the ERDF and CF in the 200 programming period0-2013 - Ex post evaluation of major projects supported by the European Regional Development Fund (ERDF) and Cohesion Fund between 2000 and 2013,* [*https://ec.europa.eu/regional\_policy/en/information/publications/reports/2018/ex-post-evaluation-of-major-projects-supported-by-the-european-regional-development-fund-erdf-and-cohesion-fund-between-2000-and-2013*](https://ec.europa.eu/regional_policy/en/information/publications/reports/2018/ex-post-evaluation-of-major-projects-supported-by-the-european-regional-development-fund-erdf-and-cohesion-fund-between-2000-and-2013)*;*

   2. *Ex-post evaluation programmes financed by CF and ERDF for the 2007-2013 programming period Ex post evaluation of Cohesion Policy programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and the Cohesion Fund (CF)*

   [*https://ec.europa.eu/regional\_policy/en/information/publications/evaluations/2014/ex-post-evaluation-of-cohesion-policy-programmes-2007-2013-financed-by-the-erdf-and-the-cohesion-fund-wp1-synthesis-report*](https://ec.europa.eu/regional_policy/en/information/publications/evaluations/2014/ex-post-evaluation-of-cohesion-policy-programmes-2007-2013-financed-by-the-erdf-and-the-cohesion-fund-wp1-synthesis-report) [↑](#footnote-ref-1)
2. [↑](#footnote-ref-2)
3. [*https://ec.europa.eu/regional\_policy/en/information/publications/reports/2018/ex-post-evaluation-of-major-projects-supported-by-the-european-regional-development-fund-erdf-and-cohesion-fund-between-2000-and-2013*](https://ec.europa.eu/regional_policy/en/information/publications/reports/2018/ex-post-evaluation-of-major-projects-supported-by-the-european-regional-development-fund-erdf-and-cohesion-fund-between-2000-and-2013)*;* [↑](#footnote-ref-3)
4. *The budget of the project includes the verified eligible costs of the project, including grant and co-financing by the beneficiary* [↑](#footnote-ref-4)
5. According to data provided by RIA [↑](#footnote-ref-5)
6. the total value of the project is according to the Application Form approved by EC Decision C (2013) 1045/27.02.2013 [↑](#footnote-ref-6)
7. the total value of the project is according to the Application Form approved by EC Decision C (2013) 1045/27.02.2013 [↑](#footnote-ref-7)
8. the eligible costs, in accordance with Annex 2, Reg. 2. No SUPT-15/01.08.14 contract for BFA NoDOPT-18/01.12.2011 are BGN 543 199 754.12. vat, of which BGN 538 031 140,30 costs for BFA and BGN 5 168 613.82 are eligible for VAT. costs that will not be grant funded.

   [↑](#footnote-ref-8)
9. On the basis of information from conducted interview with representatives of the beneficiary, RAI demonstrates satisfaction with the cooperation with Jaspers [↑](#footnote-ref-9)
10. According to data provided by RIA. [↑](#footnote-ref-10)
11. Data from the final project report [↑](#footnote-ref-11)