1. **Basic information**

1.1. **Désirée number:** PL01.06.05.01

1.2. **Title:** Road system in the area of the Tunnel in Bialystok.

1.3. **Sector:** ESC

1.4. **Location:** Poland, Podlaskie voivodship, Bialystok.

2. **Objectives**

2.1. **Wider objective:** Strengthening economic and social cohesion of the Podlaskie voivodship through improvement of transport infrastructure

2.2. **Immediate objectives:**

Enhancing investment attractiveness of the area; Improvement of traffic safety; Increase of traffic flow of vehicles; Improvement of environmental conditions.

2.3. **Accession Partnership and NPAA Priority:**

The project responds to the medium term priority identified in the Accession Partnership - developing national policy for economic and social cohesion and preparing for the implementation of regional development programmes as well as Community Initiatives. It corresponds also with the NPAA priority "Regional and cohesion policy".

2.4. **Contribution to Preliminary National Development Plan:**

Transport infrastructure plays a key role in efforts to reduce regional disparities in economic performance. Therefore one of the priorities of PNDP is “Strengthening development potential of regions and counteracting marginalisation of certain areas”. One of the proposed measures under the priority is “Development and modernisation of infrastructure serving to strengthen competitiveness of the regions”. It defines co-financing of regional transport infrastructure as a principal element of building endogenous potential development and regional competitiveness. The project is also in line with the operational programme for the Podlaskie voivodship. It will be implemented under the OP priority “Infrastructural extension which will improve investment attractiveness of the voivodship” and will aim at upgrading the access to areas and locations in the region, enabling the creation of value added within the regional and local economy.

2.5. **Cross Border Impact:** not applicable

3. **Description**

3.1. **Background and justification:**

Bialystok is a town of major significance in north-eastern Poland. It is a road and railway junction, including the main road leading from Central Europe, through Warsaw and Grodno up to St. Petersburg, and the Via Baltica (E 67), leading from south-eastern Europe to the Baltic states. The north-eastern transport corridor (Warsaw – Białystok – Grodno – St. Petersburg) is serviced by two types of transportation means: motor vehicles (national road No 18) and railway (international railway route E 26), both running more or less parallel to each other, with Białystok as their junction. The town centre is intersected by the international railway line from Warsaw in the direction of Grodno and St. Petersburg, as well as the local line branching off to Zubki Białostockie. The Warsaw line is located on a high embankment and in a major part of the town centre it consists of several tracks. It divides the town in two: the densely-built north-western part and the south-eastern part encompassing the administration centre, industrial and service districts, where a considerable portion of the town’s population is employed. Currently, the line can be crossed in three places, one of which, via the northern bypass of Białystok, services transit traffic. Only two of these points service the inner town traffic: one road over a flyover in the vicinity of the town centre, the other through a tunnel in the south-western part of Białystok, with a non-standard gauge. Owing to the existing structure of the town street network (the better developed is the system in the northern part of the town, and underdeveloped in the southern part - much more convenient crossing via the flyover north-east of the railway station than through the tunnel south-west of the station), the traffic concentrates to the north of the town centre and traffic jams appear at the junctions. The construction of a road system around the tunnel should considerably improve this situation. Currently, the transit traffic from Warsaw to Lublin or to the state border (border crossing with Belarus in Bobrowniki) is carried by the town streets which are not adapted to such loads. This situation is hazardous to the inhabitants of the town of Białystok; it prolongs the time needed for crossing the
town, increases fuel consumption and poses a constant danger of traffic accidents. The construction of the road system in the area of the tunnel, together with the construction of the tunnel under the tracks of the Polish State Railways (PKP) and simultaneous modernisation of the streets (Ks. Popieluszki street, Gen. Sikorskiego street, and the Trasa Kopernikowska street) is an element of the transport system which will make it possible to link the north-western part of the town with the town centre and the industrial and service district of the town. The investment shall improve the capacity of national road No 18, which is a part of the planned Via Baltica, national road No 19 to Bielsk Podlaski and Lublin, as well as national road No 66 in the direction of the road border crossing in Bobrowniki (see map). It will also promote the development of business in the field of trade and services (projects of shopping plazas and multiplex cinemas have already appeared) and help create about 1500 new jobs. Moreover, the situation will improve the access to the Customs Office from the west and north, divert the traffic away from the town centre, increasing at the same time the number of cleared TIR trucks by 10 per day.

3.2. Linked activities:

The project of modernising the road system in the area of the tunnel in Bialystok is closely connected with the construction of the tunnel under the Polish State Railways tracks, which has been qualified as a project co-financed from the Phare ESC 2000 Programme. The realisation of the two projects will make it possible to connect national roads Nos 18 and 19 with national road No 66 Bialystok - Bobrowniki (state border), also modernised with the support of Phare funds.

3.3. Results:

Reduction of journey time by 10 minutes; Improved access to investment areas (5 ha); Creation 500 new jobs; Increase in the safety of traffic by 10%; Increase of the investment attractiveness of the areas laying in neighbourhood of the street.

3.4. Outputs:

One road with three 10-metres lanes, 1244m long; Two reserve lanes for public transport vehicles; Two pavements each 6.0 m wide; Provision/reconstruction of the underground infrastructure.

3.5. Inputs:

Financial input is 3.6 million EURO.

4. Institutional framework

The beneficiary of the project is the Municipal Council of Bialystok. The Municipal Council of Bialystok, acting as Employer will select the Supervisory Engineer. Under the realization and the completion of the project procedures will be in line with the “Practical Guide to Phare, Ispa and Sapard contract procedures”. After the completion of the project, the owner of resources will be the Municipal Council of Bialystok.

5. Detailed Budget

<table>
<thead>
<tr>
<th>Phare Support</th>
<th>Investment Support</th>
<th>Institution Building</th>
<th>Total Phare</th>
<th>National Cofinancing</th>
<th>IFI</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
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<td>-</td>
<td>2 700 000</td>
<td>900 000</td>
<td>-</td>
<td>3 600 000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2 700 000</td>
<td>-</td>
<td>2 700 000</td>
<td>900 000</td>
<td>-</td>
<td>3 600 000</td>
</tr>
</tbody>
</table>

Engineer will be financed out of gmina resources under the budget of the project –approximately 180 000 Euro. Co-financing funds will be available.

6. Implementation Arrangements:

6.1. Implementing Agency:

PAO: Vice - Minister in the Ministry of Regional Development and Construction
Wspolna 4 St., 00-926 Warsaw, phone: + 48 22 661 91 19, fax: + 48 22 661 91 45
Implementing Agency: Polish Agency for Regional Development, Zurawia 4a St., 00-503 Warsaw,
Phone: +48 22 629 28 88, Fax: + 48 22 627 22 46

6.2. Twinning: not applicable

6.3. Non standard aspects:

All procedures will by in line with regulations of the “Practical Guide to Phare, Ispa and Sapard contract procedures”.

6.4. Contracts:

The total value of the project is 3 600 000 Euro. The project will be implemented under works contract, expected value of the works contract is 3 420 000 EURO, including PHARE resources 2 700 000 EURO.
Additionally the contract with Engineer which total value is 180 000 EUR financed by Polish side will be signed.

7. Implementation Schedule
7.3. Project completion: 3rd quarter 2004

8. Equal opportunity
The participation of men and women in the employment will be based on the standards followed in the EU regarding the Equal Opportunity of Employment, which shall be ensured by placing a formal announcement in the press when recruiting the staff.

9. Environment
The feasibility study of the investment project “The Construction of the Tunnel and the Road System of the Town of Bialystok”, developed by the BCEOM company as part of the Framework Contract in the sector of transport between Phare and the Consortium of LOWI, WS ATKINS, BCEOM, GOPA and SECOFISA, includes an environmental assessment, available at the beneficiary’s office. The assessment indicates that the planned investment project shall not impair the state of any of the components of the natural environment. Its realisation will help improve the quality of atmospheric air by eliminating the burdensome traffic jams in the region of the existing intersections of access roads to the tunnel and the quality of the waters of the Bazantarka stream as a result of its pre-treatment along the entire flow. Generally speaking, the modernisation of the road system in the region of the tunnel should be treated as an environmentally-friendly investment. The filtering facilities such as “overflow wells” for the purifying of storm-water and the water of the Bazantarka envisaged in the project, are considered appropriate and effective.

10. Rates of return
The feasibility study was updated in December 2000 and is available at the beneficiary’s office. IRR = 25,2%. NPV for 12% = 99 474 PLN.

11. Investment criteria
11.1. The catalytic effect:
Phare support will be conductive to achieving economic and social cohesion goals in the Podlaskie Voivodship, which otherwise could be attained only after a much more extended period of time and on a more modest and less efficient scale.
11.2. Co-financing:
The project is co-financed by the Polish partners.
11.3. Additionality:
The activities included in the project supplement other undertakings of the Polish authorities aimed at counteracting marginalisation and supporting the economic development.
11.4. Project readiness and size:
In order to ensure the proper implementation of the project, the Białystok Municipal Council shall undertake preparatory efforts, mainly relating to the organisation of the project, as well as the tender documentation.
The following documents have been prepared: technical documentation, agreements required by the Construction Law, Environmental Impact Assessment. Feasibility Study with financial analysis was updated in December 2000.
11.5. Sustainability:
The project will contribute to the long term sustainable development of the region, as described in the Podlaskie Voivodship Operational Programme. The investment is sustainable and does not demand further expenditure, apart from the ongoing technical maintenance financed from local resources.
11.6. Compliance with state aids provisions:
All aspects of the project will be developed with respect to the state aids provisions of the Europe Agreement
The project is in line with the Preliminary National Development Plan and as such will contribute to increase of economic and social cohesion of the country and region.

12. **Conditionality and sequencing:**

Co-funding of specific activities will be conditional on:

- co-financing of project by the beneficiary;
- maintaining timetable set in the programme;
- appropriate environmental impact assessments and feasibility studies conducted and accepted by the start of project implementation;
- completion of land acquisition before the start of tendering;
- obtaining building permission before the start of tendering;
- all tendering, contracting, reporting and monitoring conditions met;
- selecting contractor enable for proper realisation of works.

**Benchmarks:**

- Financing memorandum signed by end of 2001
- Construction designs prepared by 4th quarter of 2001
- Feasibility Study and Environmental Impact Assessment ready by the end of 2000
- Preparation of tender documentation by 3rd quarter of 2001
- Resources earmarked for Phare co-financing of programme reach National Fund in January 2002
- Beneficiary contracts project activities by 1st quarter of 2002
### Annex 1: LogFrame planning matrix for project

**Date of drafting:** August 2000  
**Planning period:** 2002-2004

<table>
<thead>
<tr>
<th>Project number</th>
<th>Project title</th>
<th>Road system in the area of the Tunnel in Bialystok</th>
<th>Total Budget 3.6 MEURO Including PHARE 2.7 MEURO</th>
</tr>
</thead>
<tbody>
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<td></td>
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</table>

#### Wider objective

<table>
<thead>
<tr>
<th>Indicators of achievement</th>
<th>Sources of information</th>
<th>Assumptions and risks</th>
</tr>
</thead>
</table>
| Strengthening economic and social cohesion of the Podlaskie voivodship through improvement of transport infrastructure | Increase of regional GDP per capita  
Decrease of unemployment rate | Main Statistical Office  
Experts’ reports | Fast track growth of Polish economy  
Implementation of active forms of combating unemployment  
Continued process of EU integration |

#### Immediate objective

<table>
<thead>
<tr>
<th>Indicators of achievement</th>
<th>Sources of information</th>
<th>Assumptions and risks</th>
</tr>
</thead>
</table>
| Enhancing investment attractiveness of the area  
Improvement of traffic safety  
Increase of traffic flow of vehicles  
Improvement of environmental conditions | 13 new companies (including 3 foreign) in the investment area accessed in the result of the project realization after 2 years from the realization of the project  
1500 net jobs created after 2 years in the investment areas accessed from the realization of project  
Value of the investments – 420 mn PLN after 2 years from the realization of the project  
Decrease of accidents by 10% after 1 year (from 33 to 33)  
Increase of vehicles by 40% after 1 year (from 25000 to 35000 per twenty-four hours)  
Decrease of noise by 4.8% after 1 year (from 75.6 dB(A) to 72 dB(A)) | Beneficiary data  
Gmina data  
Voivodship Statistical Office  
Expert reports  
Evaluator reports  
Police data | Co-financing the project by the beneficiary |

#### Results / Outputs

<table>
<thead>
<tr>
<th>Indicators of achievement</th>
<th>Sources of information</th>
<th>Assumptions and risks</th>
</tr>
</thead>
</table>
| Construction of the road system in the tunnel area  
Provision/reconstruction of the underground infrastructure  
Reduction of journey time  
Improved access to investment areas  
Creation of new jobs | Construction 1244m of new road with load capacity of 115 kN/axle  
Construction of two pavements each 6.0 m wide  
Reduction of journey time by 10 minutes (increase of ESS from 28,75 to 46)  
5 ha of investment areas accessed  
50 new jobs created after the realization of the project | Expert reports  
Beneficiary data | High level of services offered by the contractors  
Effective co-operation between the institutions involved in the implementation |

### Activities/Inputs

- Construction of 1244m of road system in the area of tunnel
- Construction of two pavements each 6.0 m wide
- Provision/reconstruction of the underground infrastructure
- Financial input: 3 600 000 EUR, including 2 700 000 from Phare
### Annex 2-4: Cumulative implementation, contracting and disbursement schedule

**Date of drafting**: 24.08.2000  
**Planning period**: 2002 – 2004

**Road system in the area of the Tunnel in Białystok**

<table>
<thead>
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<th>Date</th>
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<th>I'02</th>
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<tbody>
<tr>
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<th>1.90</th>
<th>2.20</th>
<th>2.50</th>
<th>2.70</th>
<th>2.70</th>
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</thead>
</table>

**Legend:**
- **D** = design of sub-project
- **C** = tendering and contracting
- **I** = contract implementation and payment
- *in Euro growing*
Annex 5 - Summary of Feasibility Study

1. Socio-economic Background

Białystok - the principal urban centre of north-east Poland enjoys an important role on the eastern side of the Vistula. It is a significant economic, cultural and scientific centre, participating in the works of the Polish Association of Metropolitan Centres. Białystok is a capital city of the voivodship and the most important town of the whole region. Białystok fills macroregional functions due to its size and location. It is also the biggest (together with Lublin) urban centre of Poland east of the Vistula river, with extended activities in the field of culture, health, services, commerce, science, banking and tourism. There are numerous branches of state and local administration and many co-operatives and corporations. The conurbation of Białystok contains the city proper and the communities of Choroszów, Wasilkow, Suprasl and seven rural communities. Their combined area covers 1379 sq. km and amounts to 345 000 inhabitants. The infrastructure of the City is well integrated with the communities. On the other hand, due to present level of development and land use within the city, the new housing and commercial centres will be located outside the present urban area. The unemployment level in Białystok indicates a decreasing trend and is situated below a mean level of the country. The city intends to limit inflation to 6% within the next couple of years. The major developing sector of the local economy is production and processing of food and food industry. The foreign investment is considered inadequate. Following an anticipated membership of the European Union there is a feeling of incertitude related to a new visa policy, implicating negative changes in trade exchange with East European countries. The City has all ingredients for a further socio-economic development, being conveniently located along the east-west transit routes. According to the actual development forecast, Białystok will become one the fastest growing urban centres in the early XXI century. Taking proper advantages of all the opportunities including human resources, as well as avoiding potential dangers, would decide on the importance of the City and its role nation-wide.

2. Main components of the Study

Road infrastructure

The location and main parameters of the proposed new railway crossing were generally defined in the Master Plan of Białystok in 1994. In the same period, the Municipal Design Office of Białystok prepared a conceptual design elaborating a layout proposed in the Master Plan (near the existing tunnel). The junctions on either side of the exits are in the form of roundabouts (of different diameters). The main road axes, Popieluszki on the northern side and Kopernika and Skladowa on the south, will be dual-carriageway, leaving only Hetmanska street among the four access roads with single carriageway. The detailed (construction) design commissioned in 1997 with the same office has the complex hydrography and geotechnical conditions (insufficient stratification data). High water-table and the fact that the gradeline of northern approach lies partly below water table complicate drainage problems. The type of drainage and the methods of protection against penetration of water affect both, the structural and road design. It is highly recommended to apply concrete diaphragm walls, which could be extended beyond the tunnel to protect approaches. The design of junctions is considered satisfactory from the capacity point of view. The pavement has been designed with a supplementary bearing capacity, which may compensate for difficult geotechnical and hydrological conditions.

Tunnel

The location of tunnel as defined in the Master Plan, takes advantage of the well developed street pattern catering for cross-railway traffic flows. The existing tunnel due to its condition demands growing maintenance funds. On the other hand, the capacity of the tunnel is practically exceeded during the peak hours. Improvement works linked to the eventual upgrading of technical parameters would involve high investments costs and closing for traffic during the works. The proposed solution consists of a new structure of a viaduct type with large opening (total width 41 m) and high clearance (5m). The recommended type of structure (viaduct founded on piles, protected laterally by sheet-piles) is based on traditional technology and involves relatively high construction costs. The proposed solution is visibly dictated by the railway point of view. The weak aspect of this design (apart from the costs of foundation) is drainage and water protection. In the Consultant's opinion two options deserve particular attention: construction of a typical tunnel closed by a floor slab - construction of a deck supported by the deep founded diaphragm walls. Both options, according to the preliminary evaluation would decrease the investment cost (around 15% in more favourable case).

Traffic forecast

Within the scope of his studies the Consultant had undertaken traffic survey focused on two existing railway crossings. The survey consisted of the O-D survey and of a classified count in the morning (7 am...
to 11 am) and afternoon (2 pm to 6 pm) peak. On the basis of the survey results and demographic and growth-factor analyses, a generation and distribution model was produced. For the network study, the new links which are likely to be constructed within a reasonable time frame and which will influence traffic in the adjacent zones, were incorporated into the model. Four-stage forecast was produced, starting from year 2002 (opening of a new tunnel) with 5 year intervals up to year 2017. While analysing the growth factors it has been assumed, that a number of journeys in public transport will stay at constant level, the pedestrian trips will decline and a number of trips by private car will increase. The results confirm adequacy of the tunnel capacity until the end of the study period (2017) when the capacity of three lanes will be gradually exhausted for the direction: city centre - north-west quarters (p.m. peak). It has to be emphasised, that the capacity will be limited by the junctions not by the tunnel itself, and that a likelihood of the third crossing before year 2017 (highly realistic within the development time-frame) which will change travelling pattern and extend the timing of exhausted capacity.

**Environment**

Environmental evaluation showed the positive aspects of the proposed location, taking into account the required mitigation measures. The noise protection becomes a priority task. It is also important to replace the trees. About 130 of them will be cut in the construction zone. The important environmental aspect is protection and cleaning of water courses and surface water (including run-offs). This element seems to be well solved ensuring efficient operation.

**Economic Analysis**

Economic analysis indicated a full economic justification of the proposed investment. Two scenarios were examined, a new investment and do-nothing scenario (i.e. only maintenance works in the old tunnel). Two basic indicators were computed i.e. Net Present Value and Internal Rate of Return. To be economically justified, a public works project should exceed a return rate of 15%. The economic analysis showed the Internal Rate of Return of 33%. It demonstrates the economic viability of the Project. It may be added, that sensitivity analysis reflecting investment cost and time value variations (within the limits +/-25%) indicated still satisfactory rate of return. On the other hand IRR will increase, when reducing construction costs by introducing different structural solution and by eliminating a space reserved for tramway.

**Financial Analysis**

The financial situation of Białystok is characterised by a highly satisfactory financial capacity allowing considerable expenditure. Białystok has the resources for financing investments owing to efficient financial policy and energetic financial administration. There is however, a visible need for investment planning. It would be advantageous to introduce a three-year investment plan, updated yearly. Also the human resources policy should be strengthened to avoid a possibility of losing valuable staff in favour of private sector. The basic issue is not the evolution of the financial capacity, nor the cash-flow problems but identification of investments (also in the private sector) suitable to feed economic growth of the city, based on the well-prepared strategic investment plan. The access to credits in the financial market should be relatively easy in view of the findings of this analysis.

**3. Findings and Conclusions**

1. The proposed investment is indispensable from the city development viewpoint taking into account growth of traffic. The railway creates a permanent physical barrier and there is not only a need for replacement of the present crossing in the western part of the central area, but also a need for a feasibility study of the third crossing which should be constructed before year 2015.
2. Location of the crossing is justified from the road access point of view and traffic flows in this part of the city.
3. The road infrastructure design being prepared by the Municipal Design Office is based on the correct design criteria.
4. The hydrological and geotechnical data create some problems for the designers. They seem to be of insufficient accuracy to finalise a detailed construction design.
5. The structural design in the Consultant's opinion is not the optional solution from the costs point of view (mainly founding). The problem of drainage and protection against water penetration is not solved to the full satisfaction.
6. The proposed cross-section of the tunnel is too generous. There is no justification for reserving two lanes for the rail public transport, unlikely to be introduced in the foreseeable future. Also the width of the sidewalks seems to be excessive (2 * 6m). The economies of scale could be achieved with reducing the width of passage.
7. The Project ensures in principle all environmental requirements.
8. The Project indicates a proper economic viability, as a result of the economic analysis carried out in accordance with the practice of the international funding institutions. Economic justification of this investment is fully satisfactory.
9. The financial situation of Białystok is sound, and securing the funds for the proposed investment should not be difficult for the City authorities. The form of financing (grant, subsidy, external credits, etc.) should be decided by the Treasury, upon approval by the City Council. Availability of external credits from the financial market should be relatively easy, owing to the financial situation of the City.
10. The proposed investment fulfils the technical criteria (with a room for improvement) as well as the environmental, economic and financial requirements.
11. In Consultant's opinion, the outcome of the Study fully justifies a need for the proposed investment.