**TERMS OF REFERENCE**

**FEASIBILITY STUDY FOR - ROAD REHABILITATION AND STREET LIGHTING MODERISATON IN ANI DISTRICT OF CITY OF GYUMRI**

**1. INTRODUCTION**

The City of Gyumri (“Gyumri” or the “City”) is the capital of the Shirak Province and is the second largest city in Armenia with a population of 146,000. Economic activity in the City comprises mainly of tourism, production of building materials, textile manufacturing and food processing industries. Armenia’s capital, Yerevan, is located around 125 km south of Gyumri. The international border with Turkey is also located some 10 km to the west of Gyumri, but this border is presently closed.

In 1988, Gyumri suffered from a major earthquake. The earthquake left the City in ruins destroying everything homes, schools, churches and hospitals. The 6.9 magnitude earthquake destroyed the infrastructure of the City, took lives of over 25,000 people, injured over 19,000 and left over 500,000 people homeless. The earthquake caused a collapse in city infrastructure, and since then minor rehabilitation works have been implemented in the city by the means of municipal budget.

The European Bank for Reconstruction and Development (“EBRD”) funded the facility comprising of a loan of up to EUR 14.6 million to the Republic of Armenia (“RA”, the “Borrower”) for the benefit of the City of Gyumri (the “City”). The loan is co-financed by the capital grant from the EBRD Shareholder Special Fund (“SSF”) in EUR 5.3 million and EUR 2.0 million Eastern Europe Energy Efficiency and Environment Partnership (“E5P”).

The proceeds are used for the rehabilitation of main roads and modernisation of public lighting in the City, comprising: (i) renewal of asphalt and pavements including upgrade of water drainage infrastructure; (ii) building new pedestrian areas; and (iii) modernidsation of the street lighting infrastructure

Originally the Loan and grant consist of three Tranches as follows;

* Tranche A: EBRD loan- EUR 5.3 million, SSF grant - EUR 2.65 million, for the road rehabilitation;
* Tranche B: EBRD loan- EUR 5.3 million, SSF grant - EUR 2.65 million, for the road rehabilitation;
* Tranche C: EBRD loan- EUR 4.0 million, E5P grant - EUR 2.0 million, for the modernisation of street lighting infrastructure.

The road rehabilitation works in the scope of Tranche A are completed. The activities under Tranche B are ongoing, will be completed in 2022.

Originally the funds of Tranche C are provided for the street lighting modernisation of the primary roads of whole the city. However, the City authorities, after witnessing the successful implementation of road rehabilitation and the effective impacts of the implemented works decided to reallocate funds for the road rehabilitation and improvements of street lighting infrastructure in one of the districts of the City. With this comprehensive approach the City will fully rehabilitate all the road infrastructure including the street lighting system of the district. The Feasibility Study is required to justify proposed new objectives compared with the originally defined ones.

**2. OBJECTIVES**

The objectives of the Feasibility Study assignment are:

1. to identify the scope of road rehabilitation and street lighting modernisation works in Anidistrict (“District”) of the City, having an overall cost of EUR 6 million (exclusive of VAT) that would be eligible for a change of scope of Tranche C component of the project;
2. to prepare cost estimates for the road rehabilitation and street lighting modernisation and improvement works in the District;

1. to carry out an economic appraisal of the proposed road and street lighting works to demonstrate economic viability of the proposed works;
2. To carry out comparison of environmental benefits of the proposed changes including CO2 emissions;
3. to carry out an environmental and social impact assessment of the proposed road and street lighting works;
4. Assess the needs of any acquisition of land and property for the proposed road improvement works.
5. Tranche C component was designed in a way that a comprehensive solution was provided for the whole street lighting system of the city. Comparative analyses is required between the original scope and the new proposal for the environmental benefits.

The selected consultant (the “Consultant”) shall liaise and co-ordinate with the respective department of Gyumri Municipality and in case required with the representatives of EBRD.

**3. SCOPE OF WORK**

**3.1 Project Identification Stage**

*3.1.1 Identification of Scope of Road Improvement and Rehabilitation Works*

(i) Prepare a list of road improvement works, and road rehabilitation works with cost estimates, that will reduce traffic congestion, make significant improvements in road safety and environmental conditions and restore roads to a serviceable condition. Road improvement works shall focus on cost-efficient traffic management works, which benefit both road traffic and pedestrians. Road rehabilitation works shall seek to minimise road user costs and restore the roads to a condition where they can be maintained in a normal cost-effective manner.

*3.1.2 Identification of Scope of Street Lighting Improvement Works*

(ii) Prepare details of the scope and cost of works necessary to modernise the street lighting system to achieve significant savings in energy costs and eliminate environmental hazards resulting from the disposal of toxic and harmful materials in the existing system. Options for the modernisation of the street lighting installation shall include replacement of existing mercury-based luminaires with LED type luminaires and should provide an overview of those parts of the street-lighting and traffic lights modernisation project that can be repaid within the term of the loan from pure energy and operation and maintenance savings. While estimating the street lighting modernisation works, consider the available feasibility study prepared for the original scope of the Tranche C of project.

**3.3 Economic Appraisal**

*3.3.1 Economic Analysis of Road Improvement and Rehabilitation Works*

(i) Review any records of traffic flows held by the Traffic Department and carry out classified traffic counts on the roads selected for improvement and rehabilitated works as well as other key roads in the network where traffic might be influenced by the project. The duration and timing of the classified traffic counts shall be selected to ensure variations in daily traffic are determined so that a realistic determination of base year Annual Average Daily Traffic (“AADT”) can be made.

(ii) Prepare annual traffic growth rates for passenger and freight vehicles that reflect forecasts of national and regional economic growth, population growth, vehicle ownership growth and tourism growth etc.

(iii) Prepare forecasts of AADT for different types of traffic (cars, buses and trucks) on the road that includes a realistic assessment of any diverted traffic and generated traffic resulting from the project. These forecasts should cover a minimum period of 20 years from the expected opening year of the rehabilitation works;

(iv) Prepare an economic appraisal of the individual road improvement and road rehabilitated components selected for the loan funded project. This economic appraisal shall be based on a cost–benefit analysis of each component over a minimum 20 year operating period (starting at the opening year of the works) that considers:

* 1. the investment cost of each component;
  2. changes in routine and periodic road maintenance costs between the do-minimum and do-something scenarios;
  3. savings in vehicle operating costs and travel time costs between the do-minimum and do-something scenarios;
  4. savings in accident costs if specific accident savings can be realistically determined for each component.

The economic internal rate of return (“EIRR”) and net present value (“NPV”) of each road improvement and road rehabilitation component shall be determined. The cost streams for the individual components shall then be combined to determine the EIRR and NPV of all components together.

*3.3.2 Economic Appraisal of Street Lighting Works*

(i) Review any available records held by the Housing and Communal Department to determine average annual maintenance costs and energy costs for the existing street lighting installation;

(ii) An economic appraisal of the selected street lighting modernisation works shall be prepared using a cost-benefit analysis that considers:

(a) the investment cost of the street lighting modernisation works;

(b) changes in routine maintenance costs and periodic lamp replacement costs between the do-minimum and do-something scenarios;

(c) savings in energy costs between the do-minimum and do-something scenarios;

(d) the scope of street-lighting and traffic management (e.g. LED-based traffic lights with intellectual controls) system modernisation and (where necessary) new street-lighting infrastructure construction that can be repaid from energy and maintenance savings within the term of the loan or the service life of the equipment in question.

*3.3.3 Economic Appraisal of Project*

The cost streams for the road works and the street lighting works shall be combined to determine overall EIRR and NPV values for the proposed loan funded project.

*3.3.4 Sensitivity Tests*

Carry out sensitivity analyses to determine variations in the EIRR and NPV values for the Project when critical input parameters are varied. The sensitivity tests should include the following separate tests:

1. variations of plus and minus 20% in investment cost;
2. variations of plus and minus 20% in base year traffic flows;
3. variations of plus and minus 20% in traffic growth rates;
4. variations of plus and minus 20% in vehicle operating costs;
5. variations of plus and minus 20% in time values;
6. variations of plus and minus 20% in the street lighting maintenance and energy costs;
7. delays in the project opening year.

**3.4 Environmental and Social Impact Assessment**

(i) Carry out an environmental screening of the associated project preparation activities and the project in compliance with national law, the EU EIA Directive and EU Guidances on Screening, Scoping and EIA reports (2017)[[1]](#footnote-1) and the EBRD Environmental and Social Policy (2019). Identify potentially affected communities and other interested stakeholders.

(ii) Carry out an Environmental and Social Impact Assessment (ESIA) of the project which complies with the national laws, the EIA Directive, EBRD’s Environmental and Social Policy (2019) and its relevant Performance Requirements (PR’s). The ESIA should:

(a) identify and address all potentially significant adverse environmental impacts, including (but not limited to):

* + impacts of sourcing and supply of aggregate and other road construction materials;
  + induced impacts;
  + impacts to soil and water resources;
  + air quality impacts;
  + noise impacts;
  + visual impacts and loss of amenity;
  + disposal and management of waste;
  + risks of unexploded ordinance (UXO’s), etc.

(b) identify and address all potentially significant social impacts including (but not limited to):

* + socio-economic impacts;
  + impacts on businesses and employment;
  + impacts to existing infrastructure and public services;
  + local traffic and access impacts;
  + contractor management, including the management of worker camps;
  + community impacts (including health, safety and security issues);
  + land acquisition and resettlement;
  + public road safety and compliance with EU safety guidelines;
  + labour and working conditions (including occupational health and safety);
  + cultural heritage;
  + community development programmes.

Positive and negative impacts should be considered.

(c) Describe the avoidance, minimisation, mitigation, compensation and monitoring measures aimed at improving the Project and avoiding and reducing its E&S impacts in an Environmental and Social Management Plan (ESMP). The ESMP shall include:

* + the mitigation measures to be included in the construction contract document as obligations for the contractor to comply with to mitigate or minimise construction related impacts.
  + monitoring plans for the construction and operational phases of the project
  + actions required to achieve compliance with national regulations, EU standards and EBRD’s Environmental and Social Policy and Performance Requirements.

(d) include a Stakeholder Engagement Plan that complies with EBRD’s Performance Requirement 10: Information Disclosure and Stakeholder Engagement[[2]](#footnote-2) and includes a grievance mechanism to be used in the project. The stakeholder engagement plans and activities should take into account the public participation requirements of Armenia, the EU EIA Directive and the Aarhus Convention.

* 1. Develop a comprehensive Environmental and Social Action Plan (“ESAP”) to address issues identified during the ESIA preparation. The ESAP will focus on those issues that are required to bring the operations into compliance with the EBRD’s requirements and will be presented and sequenced by PRs. Actions identified must be numbered, clearly defined, indicate a time frame for completion (with specific reference to those actions that must be completed before financial close if appropriate) and a responsible party specified (the Client, the Contractor, etc.). Further, each item must contain a description of the factors that will be used to determine when the identified action is closed/completed. The Consultant will also inform the Client about any material budget implications of ESAP items.

(iii) Prepare a Resettlement Action Plan (“RAP”) and Livelihood Restoration Framework (“LRF”), if appropriate, that meets EBRD’s Performance Requirement 5 on Land Acquisition, Involuntary Resettlement and Economic Displacement[[3]](#footnote-3). (The RAP/LRF can be included within the ESIA or can be a stand alone document).

**3.5 Environmental GHG related due diligence**

The Consultant shall perform environmental analysis of the Project related to the expected reduction in GHG and toxic air (NOx, particle matter, SO2) emissions as a result of the introduction of the project implementation. Specifically, the consultant should prepare the following calculations:

* Annual reduction in tonnes of CO2 and toxic emissions (NOx, SO2, particle matter, CO..), if any for improved street lighting modernization and if applicable road rehabilitation,
* Assessment shall be based on comparison of ‘original scope’ situation with ‘new scope’ situation.

**4. IMPLEMENATION ARRANGEMENT AND DELIVERABLES**

**4.1 Reporting**

The Consultant will report to the City’s relevant department.

**4.2 Provision of Support Facilities**

The City shall provide a suitable office for the Consultant during the implementation of the assignment. The Consultant shall provide all equipment, accommodation, international travel and local transport facilities required for carrying out the assignment.

**4.3 Time Schedule**

Draft copies of the Feasibility Study Report, Environmental and Social Impact Assessment, Environmental and Social Action Plan are to be provided within 4 months of the start of the assignment. The duration of the overall assignment will be 5 months.

**4.4 Deliverables**

| **Deliverable** | **Number of Copies required** | **Submission of Draft** | **Time for receipt of comments from EA** | **Time for Incorporation of Comments** |
| --- | --- | --- | --- | --- |
| Inception Report | Electronic versions in Armenian and English languages | One month after commencement of assignment | Two weeks | Two weeks |
| Feasibility Study Report | Electronic versions in Armenian and English languages | Four months after commencement of assignment | Four weeks | Four weeks |
| Environmental and Social Impact Assessment Report | Electronic versions in Armenian and English languages | Four months after commencement of assignment | Four weeks | Four weeks |
| Environmental and Social Action Plan | Electronic versions in Armenian and English languages | Four months after commencement of assignment | Four weeks | Four weeks |
| Stakeholder Engagement Plan (“SEP”) | Electronic versions in Armenian and English languages | Four months after commencement of assignment | Four weeks | Four weeks |
| Resettlement Action Plan (“RAP”) and/or Livelihood Restoration Framework (“LRF”) | Electronic versions in Armenian and English languages | Four months after commencement of assignment | Four weeks | Four weeks |
| Non-Technical Summary (“NTS”) | Electronic versions in Armenian and English languages | Four months after commencement of assignment | Four weeks | Four weeks |

**5. THE CONSULTANT PROFILE**

The Consultant’s team shall include the following key staff:

(i) Highway Engineer with more than eight years experience of carrying out feasibility and preliminary design studies for road projects. At least four years’ experience is required of the planning and design of urban road improvements. The Highway Engineer shall have a Bachelor’s degree and should be a chartered engineer or be licensed to practise as a qualified engineer;

(ii) Transport Planner / Transport Economist with more than eight years’ experience of the planning of urban traffic improvements, traffic management measures, traffic forecasting and carrying out economic appraisals of road projects;

(iii) Electrical Engineer with more than five years’ experience of the inspection of both existing street lighting installations and legacy traffic lights, as well as the design and operation of modern street lighting and traffic lights installations. The Electrical Engineer shall have a Bachelor’s degree and should be a charted engineer or be licenced to practise as a qualified engineer;

(iv) Environmental Specialist with more than five years experience of: (a) carrying out environmental impact studies of road projects. The Environmental Specialist should also have more than 5 years experience of carrying out environmental impact assessments in accordance with the environmental policy, guidelines and requirements of the EU and major international financial institutions (IFIs);

(v) Social Impact and Resettlement Specialist with more than 5 years experience of carrying out social impact assessments of transport infrastructure projects and preparing associated Resettlement Plans in accordance with the policy, guidelines and requirements of major IFIs.

The Team Leader nominated for the assignment should be either of the Highway Engineer or the Transport Planner / Transport Economist and should have a proven track record of paricipation in projects (e.g. concession agreements or long-term operation and maintenance contracts) where performance-based approach or life-cycle costing was employed.

Other technical and administrative support staff shall be provided by the Consultant as necessary.

1. Ref. <http://ec.europa.eu/environment/eia/eia-support.htm> [↑](#footnote-ref-1)
2. Re. the EBRD Environmental and Social Policy (2019) [↑](#footnote-ref-2)
3. Re. the EBRD Environmental and Social Policy (2019) [↑](#footnote-ref-3)