Additional Financing
for Third East West Highway Improvement Project

EXECUTIVE SUMMARY
of the Environmental Impact Assessment Report

Introduction

Due to its geographical position Georgia has gained the status of an important transport corridor connecting Europe and Asia and the development of the transport infrastructure has become a national priority. The Government of Georgia requested the World Bank to support modernization of the East-West Transport Corridor. Two projects for the improvement of the E-60 East-West Highway are ongoing with the Bank financing and additional financing for the Third East-West Highway Improvement project is now under preparation. It will cover a section of the Highway between Ruisi and Gomi. Future investments will complete improvement of the Highway from Gomi to the already rehabilitated Rikoti tunnel. A Regional Environmental Assessment (REA) and an Environmental Management Framework (EMF) were developed for the entire corridor Sveneti-Ruisi-Rikoti Tunnel. An Environmental Impact Assessment (EIA) has been carried out for Ruisi-Gomi section of the Highway, including an Environmental Management Plan (EMP). The objective of the EIA for Ruisi-Gomi section was to identify expected environmental impacts and risks of the proposed works, recommend measures for their mitigation, and develop a plan for monitoring environmental compliance during construction and operation of the section of E-60.

Technical and Environmental Standards and Regulations
Technical design of the highway improvement is in compliance with the Trans-European Motorway (TEM) standards. The project will be implemented in compliance with the Georgian legislation and environmental standards, as well as the World Bank’s safeguards policies. According to the Georgian law, the proposed project requires EIA, conduct of the environmental expertise, and issuance of a permit for impacting the environment. The project triggers World Bank OP/BP 4.01 Environmental Assessment, OP/BP 4.11 Physical Cultural Resources, and OP/BP 4.12 Involuntary Resettlement.

Environmental Screening
The proposed works for the improvement of Ruisi-Gomi section of E-60 include widening of the existing carriageway between Ruisi and the town of Agara for converting it from a two-lane into a
four-lane motor road, and construction of a four-lane sections of road on a new alignment between Agara and Gomi. Road works of the described scope and scale determine classification of the Third East-West Highway Improvement project as a Category A for environmental assessment purposes, requiring the conduct of a full scale Environmental Impact Assessment (EIA) and development an Environmental Management Plan (EMP).

Public Participation
The Bank policies and the Georgian legislation require meaningful public participation and involvement in the process of EIA and environmental management planning. The main principles of public consultation include:

- Conduct of at least two public consultation meetings for an environmental Category A project at the EIA inception phase and at the stage of mature draft EIA report;
- Disclosure of the draft EIA report to public through the convenient media in a national language;
- Announcement of the venue and time of stakeholder consultation meetings through central and local means of public communication;
- Invitation for written comments/questions on the draft EIA; and
- Incorporation of public feedback into the EIA report and re-disclosure of the finalized document.

The initial consultations on the environmental implications of the proposed project and the scope of the forthcoming EIA were carried out at the early stage of its preparation. Feedback received during these consultations was fully incorporated into the draft EIA report. The advanced draft report was posted on the web page of the Roads Department (RD) of the Ministry of Regional Development and Infrastructure of Georgia on February 7, 2012. Several hard copies of the document were made available at the office of Kareli local self government (sakrebulo) located within the project implementation area. RD organized public consultation meeting to discuss the draft EIA report on February 15, 2012. It was hosted by Kareli local self government. Present EIA report was finalized with incorporation of the feedback received through this consultation.

Sensitive Environmental Receptors and Potential Impacts
The Ruisi-Gomi section passes mostly through the significantly transformed landscape, away from protected areas and biodiversity hotspots. The main environmental impacts are expected at the construction phase and come from clearing of the right-of-way (RoW); establishment / operation of
work camps and temporary access roads; operations/ servicing of construction machinery; sourcing of construction materials; earth works and works in waterways.

Clearing of the RoW will be required for widening of road in the sections where the highway alignment remains unchanged, and for cleaning a new route for the re-aligned sections. This would imply removal of topsoil, removal of shrubs, and cutting of up to 350 trees. Establishment of construction camps and access roads is associated with generation of solid waste and waste water, compression of soil, and noise disturbance for nearby population. Parking, operating and servicing of construction machinery will carry the risk of operational spills of oils and lubricants and generation of noise, vibration, dust, and emissions. Supply of the highway construction with asphalt, stones, gravel, and sand may carry the risk of landscape degradation, erosion, and disturbance of aquatic life in rivers. Construction works will also have implications for the occupational health and safety of workers/personnel.

Impacts of the improvement of the Ruisi-Gomi section during its operation phase are much less significant and diverse. Three environmental aspects of the highway operation will be air pollution from automobile emissions, noise, and pollution of soil and surface water with litter and drainage from the highway. Acceptable noise levels will not be exceeded in the short to medium term perspective and are likely only in case of traffic increase projected in a long term. Finally, traffic safety will be an important issue with health, social, and environmental implications.

**Project Alternatives**

Various alignments of the highway carry different levels of environmental risks, which has been critical in environmental analysis of project alternatives.

No “showstoppers” have been identified during EIA and the anticipated impacts can be managed by application of adequate construction standards and good environmental practices. Nonetheless, a “do nothing” option was considered as one of the project alternatives. While it has no environmental and social impacts resulting from construction works, operating the highway in its current poor condition has negative environmental impacts from traffic jams, noise, low speed, and high emission. Under the “do nothing” scenario local communities would lose opportunity of benefiting from all positive effects associated with the highway improvement, including profits resulting from increased cargo turnover and tourism. Therefore, as the potential positive impacts of the project surpass its possible negative impacts, the “do nothing” option was discarded.
Out of the five considered alternative alignments three were discarded at an earlier stage due to the anticipated significant negative impacts, including alteration of land use patterns, major resettlement needs, risk of road flooding, and likely damage to an identified archaeological site. Two preferred alternatives were analysed in depth: one being widening of the road within its present alignment, and the second option - with partial re-alignment of the road to bypass settlements of Agara and Gomi. The latter was selected for implementation due to the least scope of required resettlement, minimal loss of productive agricultural land, best perspective for traffic safety, no damage to the known physical cultural resources, and the least risk of road flooding.

**Project Description**

The length of Ruisi-Gomi section of the E-60 Highway is 19 km. It is a part of a larger program for reconstruction of the Tbilisi-Leselidze motor road. The project will support expansion of the existing two-lane road into a four-lane road, as well as construction of four-lane sections on a new alignment where re-routing is necessary. Widening of the road within the present right of way will occur mostly to the south of the existing carriageway. Re-alignment will allow bypassing densely inhabited settlements. At km 105 a rest area will be arranged. The project includes building of five junctions and four new bridges over the Prone and Ptsa rivers, as well as over the railway and a rural road.

A central reservation will separate two pairs of highway lanes. Paved shoulders will be provided for breakdown and emergency use. Surface water drains, safety barriers, lighting and signage will be arranged for safe operation of the upgraded section of the highway. Following the TEM Standard, each width of each lane will be 3.75 m; shoulders - 3.75 m; paved berm - 3.00 m; unpaved berm - 0.75 m; and the central reservation - 5.00 m (including safety barriers). The total width of the road will make 27.50 m. For highway sections to be upgraded without re-alignment, the existing carriageway will be repaired, and a new two-lane carriageway will be built alongside.

Based on experience gained from other similar road projects it can be assumed that construction may involve a total workforce of about 200. Out of these 60% to 70% may be local workforce, which could be hired as semi-skilled or unskilled workers during the construction period.

**Environmental Impact Assessment Methodology**

The EIA of Ruisi-Gomi section of the highway is comprised of (i) determination of the scope of the work; (ii) collection of the detailed baseline data; (iii) assessment of expected impacts; (iv) outlining of mitigation measures; and (v) development of environmental management and monitoring plans.
The EIA process was a combination of desk work and field work, comprising of literature review, data collection from various agencies, visual observation and fact finding along the RoW, and analysis of all collected information. Impacts of the project activities to be implemented outside the RoW - such as construction camps, temporary access roads, etc. - have been fully considered as well. On initial stage of the EIA, spatial boundaries of the study area were defined to allow identification and assessment of the expected impacts and to enable comparative assessment of project alternatives in a given environment.

**Environmental and Social Baseline**

The EIA report presents information about the physical, biological, and socio-economic characteristics of the environment alongside the project alignment. The purpose of this description is to establish environmental baseline, to identify potential sensitivities, and to suggest adequate response through measures that are appropriate to avoid, minimize, or mitigate potential adverse impacts.

The 19 km section of the highway to be upgraded under the proposed project passes through rural areas, where environmental pollution is insignificant. No polluting or noise-intensive industries exist in the region nowadays. Physical environment around the subject section of the highway is pretty diverse, but not rich in its biodiversity. Landscape around it is mostly altered and land is either cultivated or degraded. There are no designated protected areas in the vicinity of the project site. No protected plant species were registered during field surveys, except several specimens of planted walnut trees. Neither occurrence of rare or endangered mammals was registered. Rivers and adjacent floodplains are the only types of sensitive habitats of fish and reptiles, which fall under potential direct impact zone of the project during the construction phase.

The baseline studies included the following components:

- Climate and meteorology;
- Geology, geomorphology;
- Hydrology, hydrogeology;
- Soils, landscape and land use;
- Air quality;
- Noise;
- Seismic conditions and hazardous processes
- Flora and fauna; and
- Historical, archaeological sites and human environment.
According to the environmental baseline data, the highest environmental sensitivity of the proposed project is proximity of a part of the designed re-alignment to the river. Associated risks of the construction phase include possible deterioration of water quality and disturbance of aquatic life, while risks of the operation phase are water damage to the road embankment and flooding due to artificial limits imposed on the water stream by placement of the embankment. These risks were carefully examined from engineering and environmental viewpoints and were found moderate. Construction phase impacts may be mitigated by applying conventional good practice of works in waterways as described below. Structural damage to the embankment in the observable future is excluded through a proper design solution tailored to the physical structure of soil and the landscape of the site, while detrimental changes of the water flow parameters are unlikely because the road embankment is to be placed only along a small stretch of one bank of the river.

Research of the social baseline revealed a single most sensitive human aspect of the project implementation, which is the required land take. Livelihoods of the majority of affected households considerably depend on the land plots and small businesses the ownership and use of which will be altered in the course of the project implementation. This finding emphasizes the importance of diligent planning and timely provision of adequate compensation and restoration of livelihoods to be conducted under the frames of the Resettlement Policy Framework developed for the project.

Expected Impacts and Mitigation
The results of the EIA show that majority of the potential environmental impacts of the project are associated with the construction phase and are temporary in nature. The main approach of the EIA was to provide adequate recommendations for the prevention or mitigation of negative environmental impacts of the project. These recommendations are applicable during road design, construction, and operation phases. Taking into account the location and sensitivity of human settlements and environmental receptors, the following mitigation measures were developed for mitigating the main risks associated with the project implementation:

- **Impact on vegetative cover**: Clearing of the right of way, especially in the re-aligned parts of the highway, will imply removal of vegetation, including cutting of trees. Loss of vegetation will be kept at the possible minimum. The trees removed from the State owned areas will be compensated through re-planting along the right of way at a ratio of 1:3, and those cleared from private land plots will be compensated in accordance with the Resettlement Action Plan. Selection of species for planting will be based on the natural composition of local flora. Greening of the construction sites along the right of way, as well as maintenance of the
re-planted areas for a year will be included in the assignment of a works contractor. RD will be responsible for further maintenance of plantations.

- **Disturbance of local communities:** Movement of construction machinery, location of the temporary work camps, and temporary storage of construction materials and waste will be planned to avoid or minimize barriers for free movement of the local population. Deterioration of the air quality near populated areas will be controlled through oversight on the technical condition of construction machinery. Operation of engines in idle regime will be discouraged. In the event of existence of especially sensitive receptors, operation of construction machinery will be limited to the regular working hours.

- **Operation of work camps and access roads:** Work camps and temporary access roads will be located preferably in the already transformed areas to minimize landscape and ecosystem degradation. The camps will be organized to have designated areas for storage of materials and waste, and will be equipped with septic tanks. Areas designated for fuelling/servicing of machinery and for storing of hazardous substances will be provided with ground lining and barriers preventing release of spillage.

- **Air pollution:** Air pollution can appear during earthworks, gravel crushing, concrete mixing, and transportation in case of improper maintenance and operation of equipment, inadequate storage of fine-grained materials, and movement of vehicles on unpaved or dusty surfaces. To reduce generation of dust and reduce emissions, construction equipment will be maintained in good working condition and mixing equipment will be sealed. Concrete mixing plants will be installed at least 300 m away from settlements windward. Speed limits will be set for construction vehicles and all loose material will be covered with tarpaulins when transported off-site with trucks. A wheel-washing facility will be provided and ensured that it is used by all vehicles before leaving all sites. All unpaved roads and significant areas of uncovered soil will be sprinkled during working hours in dry weather conditions.

- **Operation of construction machinery:** The technical condition of the construction machinery will be checked on regular basis to minimize air pollution from exhausts oil and soil/water pollution from leakage of fuel. The risk of operational and emergency spills of fuel and lubricants will be mitigated by designation of special parking and servicing sites, to be located away from waterways and other sensitive environmental receptors.

- **Earth works:** Prior to excavation, top soil will be removed and stored separately for later reinstatement of the area. Landscape restoration will be carried out to ensure stabilization of slopes. This would include seeding of grass and planting trees.

- **Construction of bridges:** Works in the waterways will be planned to avoid construction during fish spawning periods. River banks will be checked for stability in the course of works and reinforced as necessary to minimize erosion. Barriers of inert materials will be used to
avoid sedimentation from terraced sides of river beds. Working time will be minimized during filling the bridge footings with concrete. If temporary re-direction of river stream becomes necessary, piping, channels, and fish-passes will be arranged to allow alternative water flow and fish movement. Technical condition of machinery operated in and near waterways will be checked on daily basis to avoid leakage and operational spills of fuel and lubricants. No stockpiling of construction materials and waste will be allowed in or nearby the waterways.

- **Accumulation of construction waste:** Temporary storage of waste will be organized by separating construction debris, household solid waste, and hazardous waste. The latter, comprising of used filters, tires, and lubricants from machinery, will be kept in a closed and isolated storage. Out transportation of waste from the construction sites will follow a time-bound schedule. Formal instructions will be obtained from local authorities for the final disposal of waste in the existing landfills. Access material, such as soil and rock, may be disposed outside municipal landfills if authorised by local authorities, as permitted by national legislation, and in compliance with conventional good environmental practice. Volumes of disposable waste will be minimized to the extent possible through re-cycling and back-filling of material as feasible.

- **Operation of quarries and borrow pits:** Purchase of inert construction materials will be allowed only from the licensed legal and/or physical bodies. Extraction of these materials will also be allowed on the grounds of a special license. Opening of new borrow pits will be avoided if those already in operation can be used instead. Operation of quarries and borrow pits, as well as extraction of gravel from river terraces, will be carried out strictly in accordance with the conditions of a license issued by the State authority and enforced by the Ministry of Energy and Natural Resources.

- **Historical, cultural, and archaeological sites:** All known historical and cultural monuments along the right of way were identified and mapped during the EIA. The Highway alignment will not cause physical damage to these monuments. There is a high likelihood of chance finds during earth works, though. If an artefact is encountered by a works contractor, physical activities on site shall be immediately suspended and the RD be promptly notified. RD then contacts the Ministry of Culture and Monuments Protection. The latter defines and manages further steps and actions aimed at proper handling of the encountered cultural property. Works may resume if and once cleared by the Ministry of Culture and Monument Protection.

- **Occupational health and safety:** Work camps will be established and operated to ensure the maintenance of adequate hygiene and sanitation. Workers and other personnel involved in the project will be provided with personal protection equipment and gear. They will receive
training on the safety rules and course of action in case of emergencies. Special safety regulations will be provided and conformed during works in waterways.

Environmental Management Plan
This EIA report contains the EMP with a full set of the proposed mitigation measures, as summarized above, and monitoring indicators. It also describes the role of RD in overseeing adherence of construction works with the recommended mitigation measures and identifies the needs for RD’s technical and institutional capacity building for ensuring full environmental compliance of the project. A supervision consultant will be hired by RD to provide technical control and quality assurance of civil works. Environmental monitoring will be an integral part of the consultant’s assignment and information on the compliance with EMP will be included into the supervisor’s regular reporting to the RD. RD will have an overall responsibility for applying due environmental diligence. This will include ensuring quality of the supervision consultant’s performance, site inspections, timely response to any issues identified by the consultant or by RD inspectors, and record keeping on all environmental aspects of the project implementation.

Before commencement of works the selected works contractor will be asked to develop and agree with the RD a plan of traffic management for the period of works. The works contractor will also develop and agree with the client a plan of greening and landscape reinstatement at a relevant stage of contract implementation.

Operation of the Highway
The improvement of the E-60 highway aims at minimizing the need of interventions during its operation and maintenance. Ensuring safe and good environmental performance will be a high priority at the operations stage and will comply with the requirements of the national legislation and the best international practices. RD, through an outsourcing arrangement, will permanently maintain and, in a longer term, improve greening along the right of way to be provided by the construction contractor for landscape reinstatement and as a compensation for trees removed during works. Regular collection of solid waste will be organized along highway. The State technical control of the highway through regular oversight and inspection will be provided. Operation of the upgraded Ruisi-Gomi section of the highway is unlikely to cause increase of noise levels beyond the established acceptable levels in short to medium term perspective, and therefore no mitigation measures are required at present. In case the noise level limits are exceeded in future due to increase of traffic volumes forecasted in a long term perspective, RD will install noise barriers and consider additional greening along the rights of way as required following the barrier design principles provided in the EIA report.