



**L3063-GEO: Sustainable Urban Transport Investment Program  
ENGINEERING, PROCUREMENT, CONSTRUCTION MANAGEMENT  
AND SUPERVISION OF THE MODERNIZATION OF TBILISI-RUSTAVI  
SECTION (SECTION 2) OF THE TBILISI-RED BRIDGE (AZERBAIJANI BORDER) ROAD**

## **UPDDATED IEE FOR SECTION 2**

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### **Executive Summary**

December 14, 2015

## **Background**

The Government of Georgia signed a loan agreement of USD 60 million with the Asian Development Bank (ADB) under a MFF to implement Tbilisi~Rustavi Urban road link(Section 2). The modernization of road section-2 of 6.8 km from Phonichala to Rustavi forms a part of Tbilisi-Rustavi Highway with a total length of 17.4 km is one of the components /sub-projects (Tbilisi~Rustavi Urban road link(Section 2) and Anaklia Coastal Improvement (Phase 2) identified for construction. The Municipal Development Fund of Georgia (MDFG) is the project executing, implementing and disbursing agency. The objective of the Project is to develop an efficient, affordable, and environmentally sustainable transportation system that forms a part of the south-east route of the country. The project will focus on the improvement of the existing transport services linking Rustavi to Tbilisi. The Project targeted measures and specific facilities such as provision of interchanges, underpass, bridge road widening, bus stops, retaining wall, footbridge included to ensure a quick, safe and reliable bus services and guarantee proper physical connection with Tbilisi and Rustavi at the entrance of the city. The Program was developed as the Government's response to the transportation problems in urban areas, which include large traffic volumes between Tbilisi and Rustavi route causing increasing delays.

**The national consulting firm WEG has been engaged by DOHWA Engineering Ltd/Transproject Ltd to prepare and deliver the IEE for Tbilisi-Phonichala Project to MDF.**

## **Scope of Report**

The IEE demonstrates and describes the need for this Project. The IEE details the Project concept design, proposed method of delivery and proposed location of the Project. This IEE considers the technical constraints of the Project and by doing so presents the potential positive and negative social and environmental impacts that may result from its implementation.

This IEE presents the following:

- Introduction and assessment methodology;
- Project Description
- Legal requirements;
- Description of existing environment:
- Socioeconomic condition
- Considered Project alternatives;
- An assessment of potential impacts as a result of the Project:
- Proposed mitigation and environmental management plan;
- Environmental Monitoring Program
- Public consultation;
- Grievance Redress Mechanism

- Conclusions and recommendations

## **Objectives**

This Initial Environmental Examination (IEE) has been prepared for Section-2, as part of the ADB supports (ADB Loan 3063-GEO) in undertaking the Detailed design of the Engineering, Procurement, Construction Management and Supervision of the Tbilisi~Rustavi Urban link (Section 2) of 6.8 km. The objective of the study is to help the Government prepare and implement an efficient, safe and sustainable transport network, in accordance with international environmental safeguards.

In addition, the IEE aims to identify the likely impacts, both positive and negative, and assess the impacts on the environment of the proposed intervention undertaken by the MDF. The basic objective is to ensure that nobody is made worse off as a result of such development. The overall aim is to ensure that the proposed project is environmentally sound and sustainable following the international requirements laid out in United Nations Framework Convention on Climate Change to which Georgia is a signatory (Ref: Short List of the Ratified Conventions in Section 1.2.4 of Volume-II).

## **Project Description**

The proposed Project is an Investment Program under MDF for the SUTIP-3. The interventions considered under this Tranche include creation of New road on the Mtkvari river side, road widening for development of 4 or 6 lanes from existing 2 lanes, pavement strengthening, drainage improvement, construction of new bridges and underpasses, retaining walls, interchanges, overpass for easy crossing of the local people. The length of 17.4 km is divided into 2 Packages. As such, Package-I which had completed is Section-1 (Sta. 0+000~4+000) and Section-3 (Sta. 10+800~ 17+400) and Package-II is Section-2 (Sta. 4+000~10+800). This IEE is developed for 6.8km length Section-2 from Phonichala to Rustavi.

In addition, the project's special focus will also be given to the improvement of the express bus services linking Rustavi to Tbilisi, with specific facilities such as bus stops, road marking, footbridge or underpass will be developed to ensure a quick, safe and reliable bus services and guarantee proper physical connection with metro network at the entrance of the city.

## **Government Policies and Legislation, ADB SPS**

The Annex 1, presents detail description of the environmental legal framework and administrative structure in Georgia including environmental regulations, measures required and indicates the institutions at the local and national levels responsible for issuing permits, licenses, and enforcing compliance with environmental standards. Chapter 3 of the IEE describes ADB

Safeguard requirements; screening and categorization of projects. This Section also provides public consultation procedures; procedure for official submission of EIA/IEE, Rules for construction projects by Government Ministries etc. In addition, information on relevant agencies such as, Road Department, Ministry of Environmental protection, and Ministry of Economy and Sustainable Development are assembled as well.

### **Methodology for IEE**

This IEE follows the methodology outlined in the ADB Guidelines; ADB Safeguard Policy Statement, June 2009 (SPS 2009) and environmental Laws of the Government of Georgia. The experiences of other studies in preparing IEE documentation for transport sector have also been reviewed. This IEE is prepared based on review of detailed design, collection of primary, secondary data and information, field visit, discussions with the MDF and Environment Department, and stakeholder consultations.

This report covers the description of existing environmental conditions, assessment of environmental impacts of proposed road project, recommended management and mitigation measures and monitoring of selected parameters. The environmental impact was considered for activities during pre-construction, construction and operation phases of the Project. The scope of the IEE covers the natural and human environment, their interaction and any induced change brought about by the road construction/reconstruction activities.

Further, various environmental activities were carried out at the project feasibility and planning stages. Sector experts conducted both office studies and field investigations and on-site assessment of the environmental condition. A full set of the required environmental and social information has been collected. In 2013 the National Environmental Agency took samples of surface water, soil and ambient air and analyzed them. The baseline values of dust, CO, NO<sub>2</sub> and SO<sub>2</sub> have been recorded. The design team checked the background noise and radiation along the entire alignment for the proposed route. Emission impacts of the traffic were analyzed using licensed software “Ecolog–Magistral”.

Further, in 2015 the noise and vibration modelling was executed by Nord Est Progetti S.r.l. Engineering Consulting team. The results of studies are summarized in a report **“Investigation of Structural Integrity of, and Impact of Vibration and Noise on Buildings at a Segment of Tbilisi-Rustavi Road – Consolidated Report”** (Annex 10). Project Modelling of construction and design traffic related noise and vibration impacts have been conducted for the residential areas most sensitive for impact: these are the sites with apartment buildings located along the new alignment of the design road section, which is remote from the existing road. At present these residential areas are imposed to much less traffic related noise and vibration, than the sites along the existing road, which are already under the impact of current traffic. Thus, the project will impose noise and vibration impacts at the sites, which are currently perceived to be in favorable environmental conditions. Besides that, the mentioned areas are sensitive, because they are located close to the embankment construction site. Construction of embankment requires

supply of large amounts of construction materials and its compaction. Both of these activities are expected to generate significant noise and vibration. This was the reason for modeling traffic and construction related noise and vibration. In 2015 the additional baseline studies and modeling of noise, vibration and air pollution (dust, NO<sub>2</sub>, Zn, Cd, Pb, Ni, Co) has been also conducted for the areas close to the pharmaceutical company GMP and adjacent apartment buildings. The mentioned studies supplement the baseline studies earlier conducted by the Environmental Protection Agency. The studies conducted for particular sensitive areas are important to record the baseline and projected conditions (compared to the standards) to address the concerns raised during the public consultation process. Based on the noise and vibration modeling the recommendations on mitigation measures have been provided. The methodology of the noise and vibration studies is described in details in the reports “Investigation of Structural Integrity of, and Impact of Vibration and Noise on Buildings at a Segment of Tbilisi-Rustavi Road Project (Section 2, km 5,2-6,9)” and its Addendums prepared by the Nord East Progetti S.r.l. (Italy) in 2015 .

Sensitive environmental and social receptors were analyzed in the project area and the results of the analysis were considered in design and planning of mitigation measures. In November 2014, the additional detailed studies of flora and fauna have been carried out in Krtsanisi Forest Park, which is the only ecologically sensitive area affected by the project. The land acquisition and resettlement issues are submitted as a separate document – Resettlement Action Plan. Mitigation measures were integrated within the Environmental Management and Monitoring Plan

The IEE document is structured as main text and annexes. The main body of the text provides concise and logical description of the environmental condition, sensitive receptors, potential environmental impacts and relevant mitigation measures, integrated in the Environmental Management Plan (EMP). The annexes provide more detailed information regarding particular issues, like: the report of the he National Environmental Agency on the environmental pollution (water, soil and ambient air), the results of traffic pollution modelling, , additional ecological studies of the Krtsanisi Forest Park. The additional studies of the noise, vibration and emission impacts are presented in separate set of documents “Investigation of Structural Integrity of, and Impact of Vibration and Noise on Buildings at a Segment of Tbilisi-Rustavi Road Project (Section 2, km 5,2-6,9)” and its Addendums prepared by the Nord East Progetti S.r.l. (Italy) in 2015.

In general, the data from the following disciplines were also reviewed and incorporated in to the IEE study.

- Engineering
- Hydrology
- Ground water
- Public Health
- Land Acquisition and Resettlement

## **Summary of Findings**

### **Selection of alignment for section 2**

With the objective of rendering effective accomplishment to the Project in the process of being arranged and avoiding the public complaint of residents living in section2, MDF divided the project area into 3 sections. As a result of this, economic analysis for section 2 had been carried out by the consultant with 3 alternative alignments. According to economic analysis and MDF's direction, MDF decided that the Alternative-3 was selected for Section 2 as a result of comparison of economic analysis of the three alternative option of Tbilisi~Rustavi Highway project Section II dated April 11, 2013.

On comprehensively judging with construction cost, resettlement issues and environment issues, the result of economic analysis, Alternative-3 is applicable as optimum alignment of the Section 2. The construction cost of Alternative-3 is a little expensive than other alternatives, but it will be reduced through comparison of construction method about retaining wall, underpass and etc. In case of Alternative-1 & 2, Resettlement problem to be caused by crossing residential area (the first section and second section of Ponichala) will make progress of the Project impossible, and will also cause significant delay of Resettlement action plan and implementation.

### **Impact Analysis**

This IEE study has identified that there is the potential for both positive and negative environmental and social impacts to occur as a result of the Project. The IEE has determined that comprehensive and effective management and mitigation measures are feasible to be implemented through all delivery phases of the Project. Such measures could feasibly mitigate potentially negative impacts and enhance the identified potential positive benefits. Key potential negative impacts identified in this IEE if unmitigated include:

- Impact of construction and traffic noise on the residents of apartment buildings adjacent to the new road section. Noise barriers of 682m length and 3-8 m height should be installed near the apartment buildings and 265m length and 3m height barrier in front of GMP pharmaceutical plant.



Fig.2.1 Alternatives for section 2 alignment

- Impact of the project on a bordering strip of the Krtsanisi National Park. About 401 trees are subject to cutting and among them 68 are red data species - 39 wych elms (*Ulmus minor* Mill) and 29 walnut trees (*Juglans regia* L). Tree planting and landscaping plan should be developed and implemented
- Impacts to environments are possible from the accidental spillage, leakage or improper management of hazardous substances such as fuels or oils; Wastes generated by the accommodation of personnel living and working on site could pollute nearby environments if improperly managed;
- dust and emissions from project construction activities may affect local people or nearby fauna
- Disposal of asbestos containing roofing plates (special project should be prepared by MDF or by Contractor (depending on contract details).
- Prevention of spillage related pollution during dismantling, transportation and storage of gas filling station equipment (4 gas filling stations)

The design project envisages cutting of trees. **In total the project will affect 7,758 trees including 401 trees within the Krstanisi Park, 851 trees on municipal land and 6506 trees grown on private land plots.** The vegetation mainly comprises a green belt along the highway, trees in orchards and riparian vegetation. Detailed botanical studies showed that no sensitive floodplain forests, wetland habitats or red data species growing in natural habitats are under the impact. Among the affected trees there are artificially grown red list species of trees – walnut and wych elm trees presented in Krstanisi Park and in greenery zones along the existing road.

The results of the botanical studies conducted prior to the construction need to be verified and detailed figures and descriptions, required for calculation of compensation planting will be added when the RoW is finally rectified. The requirement of detailed cadastral description of the trees to be felled and marking of each tree will be incorporated in a contract with the civil works Contractor. MDF will take responsibility and will ensure that the CW Contractor conducts detailed cadastral description of the trees and agrees the terms of tree felling with the municipal authorities and the MoENRP. Based on the detailed cadastral description, MDF will agree with the municipal authorities and the MoENRP terms and conditions of eco-compensation program. In terms of liabilities, it is important that pre-entry survey and cadastral valuation of the trees is done exactly after the demarcation of the construction corridor and before actual start up of construction activities at these sites. MDF and CW Contractor cannot take liabilities for the uncontrolled tree felling that may occur during the period from the IEE/EIA surveys till the start up of the construction activities. That's why the IEE/EIA survey is focused on the description of habitats and biodiversity, which is necessary for impact analysis, while the numerical estimation and cadastral description of the affected forest and each tree subject to felling, should be conducted immediately before start up of civil works. The expenses on the cadastral survey of the trees to be felled (including red data species), preparation and implementation of the tree felling and compensation plan is the responsibility of the CW Contractor. The MDF will fix this responsibility of the CW Contractor in the CW Contract.



In relation with the affected red list trees (**39 wych elm trees and 46 walnut trees**), the **CW Contractor** will execute following actions:

- Conduct additional pre-entry study and refine the construction corridor to minimize impacts on the red list trees
- Prepare detailed cadastral description of the affected red list species
- Appeal to the MoENRP and Tbilisi City Hall to obtain tree cutting permit and agree terms and procedures. Terms may include replanting program for the affected red list species. IEE recommends to propose planting of 460 walnut trees and 390 **wych elm trees, which provides ration of 1:10 (ten planted new trees instead of 1 felled tree)**.

Pay compensations to the Tbilisi City Hall in accordance with the **Law of Georgia “On special protection of green plantations and state forest fund within the boundaries of Tbilisi and its environs”**.

The identified potential negative impacts are likely to be able to be minimized and managed effectively with the implementation of the measures detailed in the Environmental Management Plan.

Noise modeling and analysis allowed to develop proper design for the noise protection wall. Sound barrier with small absorption capacity (around 20dBA) and thus, not expensive (not made of expensive materials or complex shape), but with special optimal and dimension of shape (determined by the Project Team) to get maximum performance in reflecting sound, making sound walls active also in the upper building stories – is proposed. Recommended location of the noise barrier are provided on the maps. Total length of the wall to be installed near the apartment buildibgs is 682 meters. Recommended height on the wall – height varies depending on location because in some areas, where high story buildings are present, the height of the wall should be higher, while in other areas – lower noise barrier is sufficient. The height of the wall is 3 or 8 meters depending on location. The another noise barrier of 265m length and 3m height should be installed in front of the GMP pharmaceutical plant.

The assessment of the vibration impacts on the apartment buildings conducted by Nord East Progetti S.r.l. (Italy) in 2015 demonstrated that no tangible impacts of the project (construction activities and traffic) on the structural stability of core bodies of the apartment buildings is expected. However, the voluntary additions are considers to be less resistant and there is no guarantee that these structures will not be damaged during the construction period (does not matter due to construction activities or due to other reasons). Accordingly, the study provides recommendations on reinforcing the Voluntary Additions. This recommendation has been addressed in the design and related expenses are included in the bill of quantities.

Potentially positive impacts that could result from the Project include, safe driving conditions for transit motor transport flows and local residents and higher carrying capacity of the road. The design road is also very much important for the socio-economic development of the population of Kvemo Kartli region, particularly for the population and industries in the city of Rustavi and Gardabani region. Many of 120,000 residents of Rustavi work or study in Tbilisi.

In addition, the modernization of Tbilisi-Red Bridge (Azerbaijani border) road will allow transporting the passengers and various goods to Baku, the capital of Azerbaijan through the improved and modern road. This road will also make Tbilisi and Georgian Black Sea resorts and ports more accessible to the population of Azerbaijan.

The community consultation field work resulted in engagement with a large number of stakeholders, across a broad range of socio-economic groups. The main results of this consultation showed that the community is supportive of the proposed Project and perceived benefits of the Project by increasing business and local employment opportunities.

According to the completed LARPs, this project will affect as minimum 278 households permanently losing property. Its impact is related to permanent take of 226 private land plots with total area of 205,268sq.m. 92173 sq.m. of the affected land plots are used as agricultural. Vegetables are cultivated on these affected land plots. Acquisition of only 180 land plots is associated with losses of 6506 trees. The main impact is related to the loss of land, structures and businesses. In total 822 structures, owned by 215 AHs, 27 legal entities and 2 unknown owners, will be destroyed. 43 businesses in total are affected. In total, 104 APs will lose their 121 residential structures (i.e. house with ancillary structures), 43 APs will lose their 42 business related structures and will need to relocate. According to the ADB SPS 2009 this sub-project is thus classified as of category A and needs the preparation of a Land Acquisition and Resettlement Plan (LARP).

Results of this IEE suggest that the proposed Project is likely to be able to proceed without resulting in significant impacts to physical, biological, or socio-economic environments occurring, if appropriate management measures are implemented. As such, the Project will have overall beneficial impact as well as some minor negative impacts that will be carefully monitored and adequately mitigated. Therefore, the completion of this IEE fully meets the MoE and ADB requirements and submitted to MoE to obtain Environmental Impact Permit.

### **Environmental Management Plan (EMP) and Cost of its Implementation**

The costs of environmental activities associated with the construction (**5,364,877**) will be included in the contract for civil works Contractor, and 208,600 GEL in contract with the Supervision Company (Engineer). 103000 GEL will be required for MDF capacity building (additional personnel and trainings). In total the planned environmental activities will cost around **5,676,477 GEL**

**Waste Management.** The waste management costs will be substantial in its part related to asbestos containing waste management. For disposal of 9000m<sup>2</sup> of asbestos containing roofing materials preparation engagement of specialized certified company is required. Services of the specialized (certified) company, who will dispose the waste appropriately, could be estimated as follows: according to rough estimations this price (including wrapping, transportation and burying) may cost around **75000** Gel. MDF as an EA will incorporate in Civil Works Contract requirement that Civil Works Contractor hires appropriate certified waste operator who will ensure proper and safe disposal of asbestos waste according to good international practices. Costs for asbestos disposal, should be considered during the

project budgeting during the bidding process. Costs of spoil and rock disposal is not significant, as the substantial part of the spoil generated in cuts will be used for construction of fills (embankments). Costs of spoil transportation are included in the bill of quantities (BoQ) for the CW Contractor.

**Pollution Prevention:** The large companies like Gulf or Socar are responsible for removing their facilities to the new locations or storage sites. The smaller gas filling station that finish their business will receive compensation for facilities and will not remove the remains of facilities, including fuel reservoirs. Construction Contractor has to dismantle the fuel reservoirs, which are not removed by the owners to the new site or storage. Contractor should be equipped by proper spill containment equipment (skimmer, motor-tank, absorbent pads etc.). Contractor should provide spill containment plan. The preferable solution is engagement of the specialized company for supervising processes of dismantling, transportation and storage of oil contaminated reservoirs and other equipment of the 4 gas fueling stations and application of spillage prevention and response measures, if required. The services of the company will cost around 50000 GEL. 2 Kits of absorbent materials will cost 720 GEL. Construction of local fuel spillage containment systems and oil separators for equipment yards – **5000 GEL. Total value of pollution prevention measures – 55,720GEL.**

**Noise and Vibration Abatement.** In order to mitigate traffic noise impacts it is necessary to install noise barriers along the design road (682m of total length and from 3m to 8m height in various sites) near the apartment buildings (section B). Total cost of permanent noise abatement measures is around 2,426,186 GEL. This cost could be optimized by applying concrete basement of walls combined with the transparent polymer screen. Permanent noise barrier (265m length) is required also to protect the GMP pharmaceutical factory. Cost of this part of noise barrier is equal to 369,802 Gel. Noise abatement during construction will require use of about 120m of temporary noise barriers (120m x 2m) that will cost around 168,000 Gel. Reinforcement of the voluntary additions (VA) on buildings will cost around 28,030 GEL. Total cost of noise and vibration abatement equals 2,992,018 GEL.

**Ecology: Compensation for the cutting of trees. In total the project will affect 7,758 trees including 401 trees within the Krstanisi Park, 851 trees on municipal land and 6506 trees grown on private land plots. 828,197 Gel will be paid to Tbilisi City Hall as a compensation for felled trees (330,172 Gel for trees to be cut within the Krstanisi Park and 498,025 Gel for trees to be cut on municipal lands outside the park zone). The compensation paid for the cut trees will be used by Tbilisi City Hall Environmental Services for planting trees and developing recreational zones according to the overall development plans, which are under the discussion, as well as for other environmental needs of the city. The particular sites and number of planted trees will be decided by the City Hall. The execution of compensation payment and obtaining required approvals will be the responsibility of the CW Contractor. The related provisions will be included in the CW Contract and reflected in the bill of quantities. Specialised company (Subcontractor) should be engaged by CW Contractor to implement tree cutting program. After the demarcation of the project areas and construction corridor, the Subcontractor has to prepare cadastral description (inventory) of trees to be felled, agree tree felling plan with the City Hall, execute compensation payments according to the results of inventory and implement tree cutting activities. Total costs for implementing tree cutting procedures are as follows:**

- Compensation Payments - 828,197 Gel
- Cadastral Inventory of trees, preparation and implementation of the tree cutting plan – 20,000 Gel

**Ecology and Landscaping: Replanting of trees.** In general, the environmental damage for tree cutting is compensated in cash and this money to certain extent will be used for tree planting according to the City Hall overall development plans. In addition to cash compensation, some tree planting and landscaping actions should be taken by the project, to improve the ecological situation locally, in the project area. 303 trees will be planted under the program of Construction of Recreational Zone for Urban Road. These trees will be planted in the boulevard areas adjacent to the road. The cost of the entire program, including the tree planting activities is equal to 1,015,549 Gel. Apart from this, we propose to consider planting of 2500 trees to offset the project damage, improve aesthetic and recreational value of the area. These trees could be planted on the territories of Krtsanisi Park and municipal wasteland adjacent to the Park. The proposed tree planting program envisages planting of red list species felled during the project in a proportion 10 new trees instead of 1 felled tree. The common trees will be planted in a proportion of 1.5 new tree to 1 felled. However, in case of common trees, the species composition will be determined in consultation with the City Hall Environmental Services. Tree planting program envisages planting of:

- 390 wych elm tree
- 460 walnuts
- 2050 trees of common species

Planting of 303 trees in boulevard zone and planting of 2500 trees in Park and adjacent areas will be conducted by the CW Contractor. Related provisions will be included in CW Contract and reflected in a bill of quantities. Specialized sub-contractor engaged in these ecological program will be responsible to take care of planted trees during following 2 years.

The details of the tree planting plan should be elaborated by MDF and CW Contractor in collaboration with the City Hall environmental services. Specialised company (Subcontractor) should be engaged for that purpose. This could be the same Subcontractor, which is used for inventory and implementation of the tree cutting program (see p. 719). The ToR of the Subcontractor should cover tree planting and nursing activities. The Seedlings of 2500 trees will cost around 12500 GEL. Services of the landscaping company for tree planting and maintenance works may cost 30000 GEL in addition. **Thus, approximately 42,500 GEL should be considered in budget for tree planting and landscaping.**

Pre-entry Zoological Survey will cost additional 4,000 Gel.

**Topsoil storage.** 13,000m<sup>3</sup> of topsoil will be stripped and stockpiled. Cost of these operations equal 13,000m<sup>3</sup> x 4 Gel = **51,000 GEL**

**Managerial Expenses.** Some not significant expenses are foreseen with respect to the following public consultation on the IEE and EMP and will be borne by the Roads Department. The main expenses are associated with the need to hire environmental and H&S specialists and Cultural Heritage Protection specialist. Costs for hiring local specialists are approximately 100,000 Gel annually for Construction Contractor and 100,000 GEL for Engineer - Construction Supervising Company (SC). SC has to involve also international environmental specialist. The related cost is estimated as 200,000 GEL. Total cost of the devices for permanent monitoring of noise, vibration, dust and air emissions, as well as turbidity of water samples is around 8100 Gel.

Capacity building program for MDF environmental team including training of personnel will cost around 3,000 GEL.