Проектна програма

TECHNICAL ASSISTANCE PREPARATION OF CLIMATE RESILIENCE DESIGN GUIDELINES FOR THE PUBLIC ENTERPRISE FOR STATE ROADS IN MACEDONIA

Terms of Reference

March, 2018

A. BACKGROUND

Intense precipitation over short periods has increased the incidence of landslides and flooding of roads in Macedonia. The country's mountainous terrain aggravates the impact of floods in low-lying areas. These floods often result the erosion of roads, community isolation, cutting the main and many landslides on the network. They disrupt serious economic activity and generate large direct and indirect losses.

The road infrastructure is particularly vulnerable to landslide risk and there have been increasing examples of unstable slopes resulting in road damage, which in turn leads to detours and thus increase the cost of transportation.

The Public Enterprise for State Roads (PESR), which is in charge of managing the main road network is interested to obtain a guideline to incorporate climate resilient infrastructure principles into routine construction and maintenance, and thus to improve the sustainability of the road network.

B. OBJECTIVES OF TECHNICAL ASSISTANCE

The objective of the technical assistance is to develop guidelines on managing climate resilience of road and bridge infrastructure in Macedonia for PESR and provide initial capacity building on incorporating climate resilience measures in PESR’s operations.

C. SCOPE OF WORK

This Consultancy includes three main activities. The first one primarily focuses on developing a climate resilience design guidelines customized for PESR in Macedonia, the second activity is to review the current legislative requirements for PESR to work on landslide reconstruction and propose necessary changes, and the third activity is to provide hands-on capacity building and training to PESR staff and engineers on how to practically apply such guidelines in their daily operations, as well as finalize the guidelines incorporating feedbacks from PESR and the field trips.

Activity 1: Develop climate resilience design guidelines

The climate resilience design guidelines should help PESR understand the steps needed to make investment projects resilient to climate variability and changes. These Guidelines should detail the steps that can be undertaken to integrate climate resilience measures within a project lifecycle appraisal practiced by PESR. It should start with thorough climate inspection in Macedonia. It is

expected that road transport planning and policy decisions would be informed by the developed guidelines. The guidelines should include the following aspects, but not limited to:

- The guidelines should be prepared while considering the vulnerability of the road network and possible climate scenarios for the country. The consultant is expected to understand what are the most significant and common climate resilience challenges for the road network in Macedonia. The guideline should include design standard options, non-engineering options, and maintenance options. This could include a discussion on changes necessary to the current maintenance practices and the Road Asset Management Systems (RAMS).
- The guidelines should include i) preventative measures to ensure new infrastructure is built to last and survive the severe foreseeable climate events; ii) maintenance measures to ensure existing infrastructure to survive severe climate events to the maximum extent possible.
- The guidelines should include project planning/screening and vulnerability assessment for climate proofing road investment decision making.
- The guidelines should provide an analysis of the policy and cost implications and also propose short and long-term measures. The guidelines should include recommendations for revisions to PESR's maintenance practices and design standards on the short and long term.
- The guidelines should include detailed recommendations about methods to improve maintenance practices (e.g. scour protection of bridges, landslides and etc.).
- The guidelines should include a climate resilience checklist which PESR engineers can use to confirm that all designs for rehabilitation, reconstruction and construction have considered sufficient climate resilience measures for foreseeable near future climate changes.
- The Guidelines should include method of defining the vulnerability of road sections, due to hydraulic and geotechnical risks; method of hierarchization of repair works and/or strengthening concerning the hydraulic or geotechnical phenomenon, and the good practices for the designing of works.
- The Guidelines should include recommendations on institutional setup to ensure sustainability and proper incorporation and adaption in the long run.

Activity 2: Review legislative requirements related to landslide reconstruction

This activity aims to simplify the procedures for PESR to work on landslide related reconstructions. This activity will be led by Macedonian legal experts and carried out in collaboration with PESR, Ministry of Transport and Communications, Cadaster Office and Ministry of Environment. The following tasks will be carried out:

- Review the current legislative process and requirements (in particular bottlenecks) for PESR to work on landslide reconstructions, such as required design approvals, processes for environmental permits, land acquisition procedures and etc.

- Recommend legislative changes to simplify the current process for carry out landslide related reconstructions, considering Macedonia local contexts while also incorporating best international practices, in particular those in the European Union. The recommendations should be consulted with Ministry of Transport and Communications, Cadaster Office and Ministry of Environment before finalizing.
- Incorporate the recommendations in the proper sections of the guidelines prepared in Activity 1

Activity 3: Capacity building for PESR staff, design consultants and supervision engineers

This activity aims to raise awareness of climate resilience and transfer the methodology and knowledge generated to PESR, Ministry of Transportation and Communications (MOTC) and the engineering community, and strengthen clients' climate resilience analysis capacity during the planning and programming stage (before roads were selected for upgrading/maintenance). For this activity, the Consultant is expected to present the draft guidelines and discuss the draft before finalization, and present good practice for design and maintenance activities.

The following tasks are expected from this activity:

- A workshop with stakeholders discussing in detail the new guidelines and ensuring thorough understanding by the engineering community in Macedonia. This workshop should also include discussions with PESR on the institutional arrangements to ensure adaption of the guideline in their road design and maintenance practices.
- Conduct field trips (at least 3) to demonstrate hands-on experience with PESR engineers on climate resilience analysis during project planning and programming stage. The field trips should select specific sites with typical climate vulnerabilities. The Consultant is expected to demonstrate how to apply the guidelines developed in Activity 1, including how to conduct visual inspections of climate resilience on road infrastructure, and explain in details to PESR engineers on how to identify and mitigate the problems, including design details.
- Finalize the guidelines based on comments received from PESR and World Bank team as well as experiences from field trips.

D. EXPERTISE AND CAPACITY REQUIREMENTS

The Consultant shall be a firm that has the following experience and skills:

- Proven experience in the field of road design, adaptation of road design and maintenance to climate change, and measures to improve the resilience of roads to extreme climate.
- Experience in the interpretation of climate forecasts to determine their effects on roads.
- Robust policy analysis capacity, proven knowledge of institutions and regulations that support effective adaptation to climate resilient roads.

The Consultant shall provide a statement of qualifications and experience of key personnel that will undertake the technical assistance. The minimum composition (essential personnel) of the Consultant team will be:

- an experienced geotechnical engineer (minimum of 15 years relevant experience);

- an engineer specializing in hydrology / hydraulics and design of structures (minimum of 15 years relevant experience);
- an environmental economist (minimum of 10 years relevant experience);
- a Macedonian legal expert to address legal issues in the guideline on obtaining related government permits with land acquisition and etc. that might be encountered when prepare climate mitigation measures (minimum of 10 years relevant experience);
- professional experiences of work with similar nature in the European Union is preferred.

The duration of the technical assistance is estimated at 7 months. The start of the assistance is expected in April 2018, and completed by November 2018.

E. REPORTING AND PAYMENT

The Consultant will report to PESR and the World Bank team. The Consultant is expected to prepare guidelines in English to be submitted to PESR and the World Bank team for review and approval. The final text should be provided in Macedonian and English.

Deliverables correspond to the following payment schedule.

Activities	**Deliverables**	**Delivery Schedule**	**Payment**
1	Draft climate resilience design guidelines prepared	4 months after signing of contract	45%
2	Review current legislative requirements for landslide reconstructions and recommend changes to simplify the process	4 months after signing of contract (in parallel with activity 1)	15%
3	• Workshop conducted • Field trips for different climate resilience design scenarios concluded • Final guidelines and implementation roadmap approved by both PESR and World Bank team	• Workshop to complete 1 month after finishing activity 2 • Field trips to complete 1 month after workshop • Finalized guidelines to complete 1 month after field trips	40%
Total			100%