**Country:** Republic of North Macedonia

**Purchaser:** Ministry of Transport and Communications

**Project:** Western Balkans Trade and Transport Facilitation Project - P162043

**Ref. no.:** WBTTFP-8929-MK-212C-1-South-RFP

# Terms of Reference (TOR)

# Consultancy Services for Supervision of the Deployment (Installation and Integration) of an Intelligent Transport Systems (ITS) on the Highway A1 (Corridor X) - South Part (Interchange Veles South - Border crossing Bogorodica)

June, 2023

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# 1. Background

The A1 Highway of the Pan – European Corridor X extends from the north to the south of North Macedonia, traverses the central areas near cities of Kumanovo, Skopje, Veles, Negotino, Demir Kapija and Gevgelija. It is equipped with the basic traffic equipment, vertical and horizontal traffic signaling, directional poles and guardrails.

On the Corridor X route through North Macedonia a toll system with the following six frontal toll stations has been implemented: “Romanovce“ (16+500km), “Sopot“ (61+580 km, south lane), „Otovica“ (58+500 km, north lane), „Gradsko“ (92+700 km), „Demir Kapija“ (north to the Demir Kapija junction) and „Gevgelija“ (north to the Gevgelija junction).

The A1 Highway passes mainly through a lowland area, at an altitude of approximately 200-300 m. The dominant climate in the region in the north part is the continental climate with hot and dry summers and cold and dump winters with a lot of snowfall. Fog and ice are frequent in winter months. After Demir Kapija Gorge in the south part of Corridor X, the climate is mild-Mediterranean with hot and dry summers and mild winters.

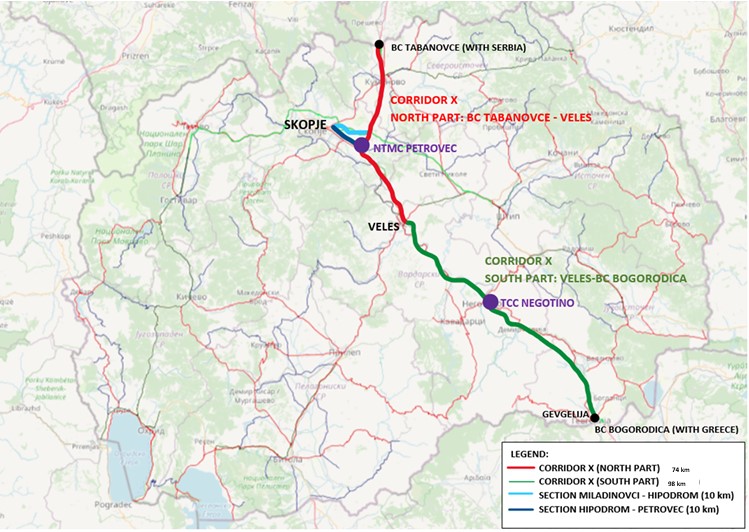
The full Highway profile with two carriageways and median strip was built along Corridor X in North Macedonia. The maximum driving speed along the full Highway profile is limited to 120 km/h.

The A1 Highway is divided into two spatial parts – the North Part and the South Part.

* North Part. The approx. 74 km long North Part begins at the “Tabanovce“ border crossing and runs to the „Veles-South Interchange.
* South Part, this part is approx. 98 km in length and begins after the Veles-South Interchange at chainage km74+950. After Demir Kapija the Highway route crosses Vardar River, runs through the mountainous terrain of the Marijanska mountains and descends towards the lowland part of the Gevgelija valley along Vardar River and ends at the “Bogorodica“ border crossing with Greece.

At the South Part the highway is built in full profile, with two carriageways (2x3.75 m) + stopping lane (2.5 m) in each direction and with the median strip between them, except for the route parts (the RHC from km 79+500 to km 81+600 and the LHC km 78+400 to km 76+600), where the profile has three traffic lanes and no stopping lane (3x3.50 m). The newly constructed section with IPA funds/EBRD/EIB loan, Demir Kapija – Smokvica has two traffic lanes (2x3.5 m) and one stopping lane (2.20 m). It begins with the bridge over Vardar River and the two tubes «T1» tunnel (the right-side tube is 1210m long, the left-side - 1260 m) and also the two tubes „T2“ tunnel (the right-side tube is 1285 m long and the left-side - 1155 m). The width of traffic lanes in tunnels is 2x3.50 m. The maximum driving speed along the route is 120 km/h and in the Tunnels “T1” and “T2” to 80 km/h. Tunnels on this Section are equipped by variable messages signaling, phone call equipment, ventilation system and fire alarm and are connected with the Remote Control and Management System at the Negotino Traffic Control Center (TCC). The other highway parts, as well as structures on this section, are not equipped by devices or equipment for traffic control and management.

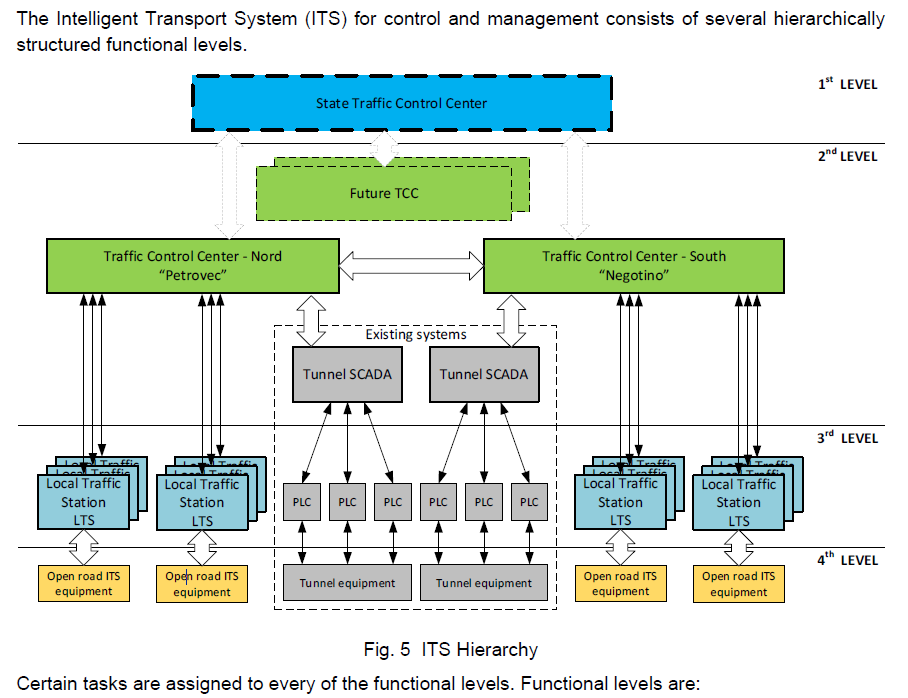
The project map is given below.



**Fig. 1** Project location

# 2. Project Description

The Consultant shall supervise the supply, installation, integration, testing and commissioning of the ITS Systems Implementation for the South Part of the A1 Highway. The ITS Systems Architecture will be the following:



* 1st level. The National Traffic Management Center (NTMC) shall be the central point of the Highways and National (state) Roads events data collection, as the central system component for several Traffic Control Centers, in case that there are more than the one in Negotino TCC, and/or central point for all Local Traffic Stations LTS. NTMC will not be implemented and it is not the subject of this Project (it will be implemented with separate tender);
* 2nd level. It is the Traffic Control Center's (TCC) functional level as the system's component for collection, recording and management of the A1 Highway South part. This Project includes “Negotino” TCC that will be connected to the local stations and equipment on the highway A1, South Part;
* 3rd level. It is the functional level of the Local Traffic (control and management) Station (LTS) on the South Part of Highway A1. It receives control orders from Negotino TCC and submits orders to the end equipment and collects data from them;
* 4th level. It is the functional level of the roadside equipment on the A1 Highway route, of variable light signaling messages (VMS, DMS), of sensor units (non-intrusive sensors, video recordings, roadway probes, aero probes etc.).

The brief description of deployment requirements for ITS on Corridor X, South Part is:

Provision, Installation, Testing and Commissioning of hardware, software and road monitoring device, as well as training on ITS systems (for the operators staff). The following facilities will be deployed on approx. 98 km highway length:

• Road traffic light signaling on the route (Variable Message Signals (VMS), Dynamic Message Display (DMS), Variable Lane Signals (VLS);

• Weather stations on the route (Automatic Weather Station (GMS));

• Video-data equipment on the route (Video camera, Distribution system, Video detection system – (AID), Video Management System – (VMS));

• Control and management devices on the route and the local communication network (Local Traffic Station (LTSs) should be based on open protocols that refers to one whose definition is freely accessible to both companies and users);

• Information and communication functional network;

• Supporting structures (Steel load structures for Variable Message Signs and Displays, Cameras and Weather stations);

• Construction projects on the planned equipment installation on the route (Tranches and cable channels for energy and communication cables);

• Traffic Control Center (Negotino) – operational center, hardware and software equipment.

Delivery period of the ITS deployment for the Contractor is 56 weeks from Effective Date of the Contract, while Contract duration is planned to be 60 weeks.

# 3. Objectives of the Assignment

The objectives of consulting service are to assist the Client in successful supervision of the implementation (deployment) of the ITS Systems for the South Part of A1 Highway, as follows:

1. To ensure high standards of quality assurance in the execution of works and completion of works within stipulated time period and budget.
2. Comprehensive supervision of project implementation activities carried out by the Contractor to ensure complete compliance with the drawings, technical specifications and various stipulations contained in the Contractor’s Contract Documents.
3. Efficient supervision by personnel who are experienced in modern methods of ITS Delivery supervision and contract management.
4. Act independently and on behalf of the Client to review all activities associated with the installation and integration to ensure compliance of requirements of the Contractor’s Contract Agreement in order to have a sound Project.
5. Report to the Client on the supply, installation, technical, environmental and social aspects of the project.
6. Assist the Client in arriving at an amicable settlement of dispute, and if not reached, to regular disputes.

The consulting services to be provided by the Supervising Consultant (“the Services”) include the supervision of the supply, installation, integration, testing and commissioning of the Intelligent Transport Systems (ITS) Implementation for the South Part of the A1 Highway (Corridor X).

The objective of the Services is to act as “Engineer” as defined in respective WB General Conditions of Contract for Supply and Installation and to ensure that: (i) equipment, materials, works, and workmanship are in compliance with the required standards, (ii) deployment are planned in an orderly manner and completed in due time, (iii) the recommendations of the Environment and Social Management Plan (ESMPs) are properly followed during the implementation of ITS, (iv) the whole activities for deployment of ITS should be performed in accordance with safety procedures and the health and safety of all participants in the Project, as well as of third parties is raised to the highest possible level.

The applicable Laws of the Republic of North Macedonia and the WB policies shall be in force for this assignment and for deployment of ITS. Accordingly, within provision of the Services, besides the specifications and requirements provided in the Contract for deployment of ITS, the Consultant shall use national laws, rulebooks and standards, as well as the best experiences from the worldwide practices. Knowledge of national legislation, technical regulations and standards represents a precondition for successful implementation of the Services. Consultant is separately obliged to use the legislation of the Republic of North Macedonia in respect to health, safety and protection at work.

# 4. Scope of the Consultancy Services and Task Description

I. Project Management

In order to successfully coordinate project implementation, the Project Steering Committee (PSC) will be created to manage project, approve all reports and make decisions on all important project implementation aspects.

**Project Steering Committee (SC)** shall be established with overall responsibility to review regularly the supervision of the project implementation, The Project Steering Committee will be chaired by the representatives from Ministry of Transport and Communications. Members of the Project Steering Committee, as voting members, are representatives from the Ministry of Transport and Communications and representatives from the following institutions:

* Public Enterprise for State Roads;
* Ministry of Interior – Sector for Border Affairs & Migration/ Sector for traffic affairs;
* Authorized representative of the Consultant;
* Other relevant institutions/organizations;

The role and main functions of the Project Steering Committee will include:

– To assess project progress and monitor all activities of the project, as agreed in the contract for the delivery of technical assistance for supervision;

– To assess the performance of the Consultant, consider the Consultant’s Reports, make recommendations as appropriate and finally will approve these reports;

– To ensure close co-operation between the relevant institutions, social partner organizations, local authorities and other relevant actors, taking into account the complexity of the project and ensuring transparency.

With regard to the constitution of the SC, at the first meeting the Rules of procedures (RoP) should be adopted by the Project Steering Committee.

The Project Steering Committee will have regular meetings according to the Rules of procedure. The Consultant will ensure proper functioning of the Project Steering Committee, organizing the meetings, preparing and circulating the agenda, writing and distributing the minutes, and follow-up/implementing the committee decisions. The date of the SC meetings, the agenda and the necessary documents shall be set and circulated among the interested parties tentatively with a reasonable time in advance (i.e. approximately 15 days in advance) according to the RoP. The Consultant has to keep them in a file as project documentation. These tasks will be performed in co-ordination with the Ministry of Transport and Communications and the PIU.

II. The Scope of the Consulting services includes, but is not limited to, the following activities:

1. The Supervision Consultant will be responsible for the supervision of all ITS System installation, communication network and power infrastructures implementation, integration, testing and commissioning work for the South Part of A1 Highway.
2. The Supervision Consultant will administer the ITS Implementation Contract and ensure that the contractual provisions, with respect to both quality and quantity of work are respected and the works are implemented in accordance with the best international practices in ITS.
3. The Supervision Consultant will make all necessary measurements and control the quality of works.
4. The Supervision Consultant shall review, approve or suggest modifications on all engineering decisions made by the Contractor to ensure the successful and timely implementation of the ITS implementation Contracts in consultation with the Client and the end beneficiary - Public Enterprise of State Roads (PESR).
5. The Supervision Consultant shall undertake a review of the ITS Implementation Contract for the purpose of identifying any omissions and/or deficiencies, which compromise the completeness or consistency of the design. This review shall be carried out immediately after the services commence. Upon completion of the review, the Supervision consultant shall prepare a report no more than 1 month on this review which sets out all findings and recommendations for making good any omissions identified. Notwithstanding the above, the Supervision Consultant shall immediately inform the Client of any omission and/or deficiencies which may have a substantial impact on the Project at the time the omission and/or deficiencies is detected.

III. The Consultant’s duties and authorities are:

A. The Consultant shall perform the duties and authorities of the “Engineer” as specified in the Contract for Supervision services.

B. The Consultant shall ensure that the Contractor for deployment of ITS have secured all relevant permits necessary to start ITS implementation, or specific works process, and that the Contractor comply with all relevant Health and Safety and Environmental and Social regulations during the works.

C. The Consultant shall exercise all reasonable care to protect the interests of the Client, where this does not conflict with the duties of the “Engineer”, to ensure the timely supervision and control of the ITS implementation.

# 4.1. Phase I - Inception

A. Project Inception

The Consultant’s Project Inception shall include, but not limited to, the following:

1. At this stage, the Consultant shall conduct a preliminary review of the ITS Implementation contract documents, drawings, specifications, materials reports and status of the work for the current contract to obtain understanding of the scope and complexities of the assignment.
2. The Consultant will also have discussions with the key personnel at PESR to understand implementation status, project issues, specific concerns of PESR (if any) and any coordination that are required between the Contractor of ITS Implementation and other stakeholders.
3. The Consultant will conduct project site visit to understand and asses the field conditions and the magnitude of the work.
4. The Consultant will review and approve the Contractor’s Environmental and Social Management Plan - CESMP (including all relevant sub-plans thereof, e.g., Waste Management Plan, O&H Plan, Grievance Mechanism Plan).
5. After the initial study, discussions and field visit, the Supervision Consultant will prepare and submit a Project Inception Report. The Inception report would include but not limited to items like:
   * Meeting discussions and field visit findings,
   * Detailed methodology for the execution of the ITS System implementation supervision, including the integration and testing and commissioning of the system,
   * Overall supervision team deployment schedule (manning schedule).
   * Regular coordination meeting schedule,
   * Meeting schedule with the Contractor, PESR, MoTC and other relevant stakeholders, on as needed basis,

B. Quality Control/Quality Assurance

The Consultant’s Quality Assurance Plan shall include, but not limited to, the following:

1. Evolve a system of Quality Assurance of system installation and integration, including, but not limited to, establishing testing frequencies and acceptance criteria for all installation activities
2. Testing frequencies that should be in accordance with the Contractor’s Contract Document and how they will be supervised and control the quality assurance.
3. Type of tests, stage, frequency, standards to be complied, guidance on judging from test results
4. Reporting formats to include schedule of reporting and verification of compliance to observations.

# 4.2. Phase II – Supply and Installation

The Supervision Consultant services shall include, but not limited to, the following:

1. Administer the implementation contract, approve materials, issue orders to the Contractor in consultation with PESR and ensure that the quality of the ITS System deployment is in accordance with contractual specifications and provisions.
2. Review, approve or suggest modifications in the Contractor’s implementation plan (work program), purchased equipment and sources, hardware and software etc. in consultation with the Client and the end beneficiary PESR.

Review, approve or suggest modifications on the Contractor’s test schedules, witness system tests on behalf of PESR, and provide reports of tests to PESR including review of the Contractor’s test results in consultation with the Client and the end beneficiary PESR.

1. Monitor progress of the installation, identify causes, or potential causes, of any delay and advise the Client of suitable corrective actions in a timely manner.
2. Review and approve the Contractor’s proposed personnel.
3. Provide assistance to the Client in respect of contract implementation.
4. Advise and assist the Client with respect to the dispute or arbitration or litigation relating to the system deployment (installation and integration).
5. Provide other specialist services relevant to the Project as may be agreed to during negotiations or ordered by the Client.
6. Ensure that the deployment methods as proposed by the Contractor for carrying out the works are satisfactory.
7. Prepare and issue the following reports, the format and content for each report is to be acceptable to the Client:
8. A monthly progress reports shall be submitted,
9. A detailed quarterly report shall be submitted. Quarterly reports should include description of project activities illustrated by progress/completion photographs, status of any delays and contractual claims and details of all latest financial projections,
10. Approve Contractor’s proposed designs/drawings for temporary works in consultation with the Client.
11. Inspect at regular intervals the Contractor’s plant and facilities, for both production work and workers accommodation, to ensure that they conform with both the conditions of contract and all government and World Bank regulations.
12. Assist the Client in coordination work with different agencies and hold meetings for proper and timely implementation of the Project.
13. Liaise and coordinate along with the client to remove all obstacles that may occur and encumbrances from the project site.
14. Inspect all equipment and sources that will be purchased by the Contractor and approve in consultation with the Client.
15. Issue orders to the Contractor to remove or make good any work which is found to be:
16. Not in accordance with the drawings,
17. Not in accordance with the specifications in terms of either work method or materials specification and
18. Covering work which has not been inspected for acceptance or reflected as unacceptable.
19. The execution of inspection will be in accordance with the approach and methodology agreed in the Inception Report and in accordance with the Inspection/Supervision Plan. In general, the purpose of quality audit exercise is to ensure that the works are:
20. Executed according to the designs, drawings and specifications as specified in the Bidding Documents/applicable standards, and that good engineering practices are followed in the installation of the hardware and software and
21. Executed following the relevant laws/statutes and practices/guidelines related to workers welfare, safety at worksite, insurances, etc.
22. The quality inspection at installation sites shall include, but not be limited to, the following:
23. Assess independently the quality of the installation vis-à-vis the standards specified in the Bidding Documents and good engineering practices,
24. Review the degree of quality control exercised during the installation by the Contractor maintaining adequate arrangements/practices (tests, numbers, frequency, approach and timing etc.)/documentation (QC registers, test reports, observations of supervisory staff, compliances etc.).
25. Through the agreed implementation supervision strategy and series of test procedures:
26. Review that the materials have been procured stored and used in accordance with the quality standard requirements.
27. Review that the workmanship of the work confirms to specified standards.
28. Approval and/or review the test reports (prepared by the Contractor) of the materials/workmanship that were performed and tested according to the requirements set in the Supply and installation contract are satisfactory.
29. Review the action taken on the earlier reported non-compliances and re-certify including following up with the Client for action on earlier reported non-compliances and non-conformities.
30. Assist the Client in resolving the issues related to non-compliances.
31. Create photographic documentation of quality related issues including its compliances with date and geo tags.
32. Subject to quality of works covered under every bill submitted, countersign the Quality certificate as applicable.
33. Check Contractor’s software and hardware ordering schedule.

# 4.3. Phase III – Commissioning

The Supervision Consultant services shall include, but not limited to, the following:

1. Monitor and check the workshop and field tests carried out by the Contractor and request for additional testing if necessary, and approve as required.
2. Maintain records of all testing work, including cross referencing to items of work to which each test refers and location of the device.
3. Review that the test reports of the materials/workmanship that were tested by the Contract as required in the individual Contract Document are satisfactory.
4. To the extent possible field testing shall be done in the presence of Supervision Consultant’s and Contractor’s representatives and the process should be photo documented with geo tagging.
5. Upon field inspection and tests the Consultant, where required and in critical cases shall arrange to issue ‘stop work’ notice in consultation with the Client, to the Contractor and assist in remedying the defects. This shall be done only in exceptional cases where continuance of works may jeopardize the ultimate quality and safety of workers and of third parties etc.
6. The Supervision Consultant shall review, comment and approve the System Integrator’s Test Plans and Procedures in consultation with the client.
7. The Supervision Consultant shall monitor and check each testing activities that include Final System Acceptance Test and approve if the results of the testing and commissioning are satisfactory.

# 4.4. Phase IV – Operational

The Supervision Consultant services shall include, but not limited to, the following:

1. Make measurements and keep records of each furnished and installed ITS System hardware and software of the South Part of Highway A1 and TCC Negotino.
2. TCC that include power and communication infrastructure to be in accordance with the provisions of the Contract Documents that detail major elements, components and system.
3. Certify completion of the supply, installation, testing and commissioning of whole the South Part of Highway A1 and TCC Negotino.
4. Issue Interim Payment Certificates to the contractor as per the schedule. Make sure the payment is made as per the Contractor’s Contract Document payment schedule. The payment will include all labor, equipment, tools, materials, and all incidentals necessary to complete the implementation.
5. Prepare quarterly cash flow projections for the Client in a format acceptable to the Client. Cash flows should identify budget estimates for all outstanding works.
6. Maintain records of all software/hardware, labor and materials used in the system installation.
7. Analyze any contractual claims submitted by the Contractor and prepare a report for the Client addressing the contractual basis, in terms of both technical and financial issues, for the claims and upon getting Client’s prior approval notify the Contractor the response for the claim.
8. The Supervision Consultant shall prepare reports, including technical appraisals, additional contract documentation and/or reviewing and commenting on Contractor’s proposals for the successful completion of the Project.
9. Maintain records, working/as-built drawings, test data, details of various correspondence and diaries in the formats approved by the Client.

At the completion of the Contract verify the complete set As Built Documents and Drawings drafted by the Contractor as true record of the ITS System of South Part and TCC Negotino as installed, integrated and deployed and tested.

# 5. Duration of the Services

**The duration of the Services will be 26 months from the Contract signing date.**

The Services provided by the Consultant are expected to start in October 2023, shall cover a period of about 14 months duration of the implementation works and additional 12 months for Defects Liability Period (DLP).

The Implementation Works contract should be implemented almost simultaneously. Therefore, the Consultant should plan its activities and provide capacities in accordance with the said facts in each phase of the Project implementation.

Table 5.1: Duration of Phases

|  |  |  |
| --- | --- | --- |
| **Phase** | **Phase** | **Duration**  **(Month)** |
| I | Pre-Construction | 1 |
| II | Supply and Installation | 11.5 |
| III | Commissioning | 1 |
| IV | Operational | 0.5 |
| V | DLP | 12 |
| **Total** | | **26** |

# 

# 6. Reporting Requirements and Time Schedule for Deliverables

All Deliverables/Reports should be delivered to the Client (MoTC and Project Implementation Unit - PIU) and Project Steering Committee, as draft reports for review comments and approval.

The key Deliverables/Reports for the assignment along with respective timelines are as follows:

|  |  |  |
| --- | --- | --- |
| **No.** | **Reports/Deliverables Description** | **Deadline for submission** |
| 1 | Inception Report including Consultant Review of the Implementation Contract | 1 month from commencement date |
| 2 | Detailed Design Review Report and Quality Assurance Plan and Reporting Formats | 1 month from commencement |
| 3 | Monthly Progress that includes Supervision and Inspection Report | 10 working days after the end of the month |
| 4 | Quarterly Progress Report | 14th day of the 1st month of the next quarter |
| 5 | Quarterly Environmental and Social Report | 10th day of the 1st month of the next quarter |
| 6 | Final report upon Operational acceptance | 14 days from Operational acceptance |
| 7 | Other reports (non-compliance event report/ critical issues report, claims report, ad-hock report, accident report) | When needed, during implementation and DLP period |
| 8 | Defect Liability Period (DLP) Report | Within 5 days after completion of each mission during DLP. |
| 9 | Final Report after completion of DLP | Within 15 days after the DLP period |
| 10 | Presentation to the PESR on the findings of Project and next step suggestions | At the end of implementation and at the of DLP period |

**Reporting requirements (Deliverables/Reports Description):**

1. Inception Report – the report preparation to include but not limited to Part 4.1, Sub-part A, Project Inception activities and documentation.

The Client shall comment upon the draft Inception Report within 14 days from submission, following which the Consultant shall submit the final Inception Report within 7 days.

The final version of the Inception Report shall be submitted in Macedonian and English language in 3 hard and 3 electronic copies (CDs). The Inception Report shall be deemed accepted if approved by the Client in writing.

1. Detailed Design Review Report and Quality Assurance Plan and Reporting Formats
2. Detailed Design Review Report – Report with the result of all the design activities between Systems Integrator and Consultant till Design Approval.

The Client shall comment upon the draft Detailed Design Review Report within 14 days from submission, following which the Consultant shall submit the final Detailed Design Review Report within 7 days.

The final version of the Detailed Design Review Report shall be submitted in Macedonian and English language in 1 hard and 3 electronic copies (CDs). The Quality Assurance Plan and Reporting Formats shall be deemed accepted if approved by the Client in writing.

1. Quality Assurance Plan and Reporting Formats – the plan preparation to include but not limited to Part 4.1, Sub-part C, Quality Control/Quality Assurance activities.

The Client shall comment upon the draft Quality Assurance Plan and Reporting Formats within 14 days from submission, following which the Consultant shall submit the final Quality Assurance Plan and Reporting Formats within 7 days.

The final version of the Quality Assurance Plan and Reporting Formats shall be submitted in Macedonian and English language in 3 hard and 3 electronic copies (CDs). The Quality Assurance Plan and Reporting Formats shall be deemed accepted if approved by the Client in writing.

1. Monthly Progress that includes Supervision and Inspection Report – The field visits which shall be an ongoing activity shall be undertaken as per the finalized Inspection and inspection/supervision plan and strategy. Monthly progress reports would be prepared as per site visits and the reports shall highlight for each contract package, status and progress of work, inspection opinion, status of compliance to earlier observations, critical issues, and follow-up actions. The report would compile the findings in the site reports, summary inspection opinion, corrective actions, progress of works and issues etc.

Monthly progress report shall include, but not be limited to:

­ Overview of the physical and financial progress of the executed activities compared with the outstanding activities and time elapsed (text and graphics);

­ Encountered problems during the past month and proposed measures for their overcoming;

­ List of pending problems from previous period and status of implementation of the agreed measures for their overcoming;

­ Status with the Contractor’s updated work plan and achievement;

­ Contractor’s equipment, workers and personnel on the site;

­ Road safety and traffic design issues;

­ Environmental issues and status of their implementation, as per the approved CESMP and relevant sub-plans (as per the Annex 7 of the ESMF published for the project - https://wbprojects-mtc.mk/en/wbttf/);

­ Social issues and status of their implementation, as per the approved CESMP and relevant sub-plans, and approved Grievance Redress Mechanism (as per the Annex 7 of the ESMF published for the project - https://wbprojects-mtc.mk/en/wbttf/);

­ Expropriation issues, if any and status of their implementation (please refer to the approved Resettlement Policy Framework (RPF));

­ Report on health and safety (accidents if any and status);

­ Change proposals by the Contractor needing Client’s approval accompanied with Consultant’s assessment and rationale;

­ Overview of the issued Change proposals and status of their approval;

­ List of Claim notices or claims and status;

­ Report on the compliance with the relevant Quality Assurance Plans, any quality control testing undertaken by the Supervision Consultant and remedies taken to rectify works that did not meet the requirements;

­ Status of payment of all contractors’ monthly certificates, of all claims for cost or time extensions, and of actions required of the Client to permit unconstrained works implementation;

­ Consultant’s staff engaged for the period of reporting;

­ Schedule of the Consultant’s staff engagement for the next period;

­ Replacement of Consultant’s staff, if any, in accordance with the Consultant’s Contract and the Contractor’s work plan;

­ Copy of the log file and measurement book for the reporting period signed by authorized representatives (Annex);

­ List of correspondence from the Contractor to Consultant/Client/Final Beneficiary and vice versa (Annex);

­ Filled checklists for monthly field environmental and social monitoring should be attached to the report (Annex).

The Consultant will, no later than the 7th day of each month, prepare a brief progress report, in the form described and agreed in the Inception Report, summarizing the work accomplished by each of the supervision teams for the preceding month, including problems encountered and recommended solutions. The Consultant shall report on the estimated project progress, Contractor’s activities and Consultant’s activities.

Monthly progress report shall be submitted along with the Consultant’s Time Sheets submitted in original to the Client for approval. Monthly progress report shall be in Macedonian and English language in 3 hard and 3 electronic copies (CDs). In case of having comments and suggestions, the Client shall submit them to the Consultant not later than 7 days after receiving. The Consultant is obliged to incorporate the Client’s comments/suggestions in the final version of the report within 7 days from receipt of such comments/suggestions. The Client approves the Consultant’s Time Sheet and the Monthly Progress Report. Approved documents are a prerequisite for submission and payment of the respective Interim Payment Certificate / Invoice by the Consultant.

1. Quarterly Progress Report – the report shall include description of project activities illustrated by progress/completion photographs, status of any delays and contractual claims and details of all latest financial projections. The cash flows should identify budget estimates for all outstanding works.

Quarterly report shall include, but not be limited to:

- Overview of the works executed during the past quarter;

- Identification of unsolved problems as well as proposal of measures for their solution;

- Works realization degree and estimate of the works completion date;

- Summary of the relevant measured data;

- Personnel substitution according to the Consultant’s request, if any, in accordance with the Consultant’s Contract and the Contractor’s work plan;

- All events of importance for works progress and funds expenditures during the previous quarter;

- Data on inspection supervision, as well as on requests and/or decisions of other government bodies, i.e., requests of other entities relating to the execution and progress of works;

- Overview of the issued change proposals;

- Budget estimate in case of significant changes;

- The Consultant will provide presentation of the main achievements, risks, and next steps during the quarter as well as corrective actions at the premises of PESR or MoTC.

Quarterly Progress Report is submitted not later than 14 days after the expiry of stated period. The Quarterly Progress Report shall be submitted in Macedonian and English language in 3 hard and 3 electronic copies (CDs). The Quarterly Progress Report shall be deemed accepted if approved by the Client in writing.

1. Quarterly Environmental and Social Report (QESR)

The Consultant is obliged to review and approve the Quarterly Environmental and Social Reports, prepared by the Contractor in the template for IFI (World Bank financed projects) agreed with the Client (PIU).

The environmental and social findings of the regular (monthly) ES monitoring activities and ad-hoc monitoring (e.g., accidents), carried by the Contractor will be included in the QES Reports prepared by the Contractor and approved by the Consultant.

As part of the obligation related to monitoring of social impacts during the Project implementation, the Client prepared Resettlement Policy Framework (RPF), which includes mitigation measures and ESMP for the deployment of ITS, which includes social mitigation measures and implementation of Grievance mechanism. Obligation of implementation of those measures is stated in the ITS Contract for the Contractor. Continuous monitoring of appliance of the mitigation measures on behalf of the Contractor as well as implementation of all other activities stated by the RPF/ESMP shall represent the Consultant’s duty and to be approved in the CESMP.

The ESMP is part of the ITS Contract signed with the Contractor. The Contractor would be in charge of implementation of CESMP during implementation activities.

The Supervising Engineer would be in charge of monitoring the status of implementation of those measures on site, providing additional guidance to protect the human health, environment and social on and near by the project location along Corridor X (South Part). In particular, the Occupational Health and Safety Specialist and the Environmental and Social Specialist (as a members of Supervising Engineer Company Team), would have the main following tasks:

* Reviewing all environmental and social planning documents required and prescribed in the approved CESMP and relevant sub-plans (e.g., OH&S Plan including Labor management procedures, Community safety Plan, Waste Management Plan or Traffic Management Plan, Code of Conduct, etc.), prior the start of project activities;
* Provide her/his remarks on the submitted documents in order to identify if any additional measures need to be included taking into account the site circumstances;
* Supervise Contractors’ compliance with E&S measures proposed in the site-specific CESMP during the supervisor regular site visits (at minimum 1 visit/week in the first two months of the project duration and 1 visit/month in the rest period of project duration. If it is needed, the number of visits should be increased based on situation on site in communication with PIU staff and ESS Specialist within PIU Team);
* Preparation of the Environmental and Social Supervisor Monitoring Report after each site visit identifying any non-compliances on implementation of E&S measures, taking care about OH&S issues and guidance on workers protection proposed in the CESMP and sub-plans, community safety aspects, if any grievances occurred by any stakeholder, how the Contractor implement the measures to overcome and solve any grievance, waste management issues, noise levels, etc.); The template for E&S Immediate Monitoring Report provided in the ESMF (Annex VII) could be used as a template and it could be adapt on Supervisor reporting system; E&S monitoring reports should be part of the regular Monthly Reports, as an Annex and later summarized in the QESRs;
* Participation on the project monthly meetings in order to present the status of implementation of E&S preventive/mitigation measures and if any non-compliances occurred in the progress period and type of activities implemented to solve the non-compliances;
* Communication with the ESS Specialist in PIU team/WB ES Team and other member of PIU and/or representatives from the PESR in order to organize common site visits in order to avoid any non-compliances or in urgent case, to report any possible damage and to find solution.

However, in case of any kind of accidents or endangerment of protected environments, reporting to the Client (PIU) and the Bank will be immediate.

The approved QESR by the Consultant is submitted to the Client not later than 14 days after the expiry of stated period. The QESR shall be submitted in Macedonian and English language in 3 hard and 3 electronic copies (CDs).

1. Final report upon Operational acceptance

The Final report upon Operational acceptance must be submitted summarizing the methods of ITS deployment, the ITS deployment supervision performed, and recommendations for future projects by the Client. The Report represents analyses and synthesis of the ITS implementation works, good practices and lessons learnt with regard to quality systems and summary of the achieved technical, financial, traffic safety and ecological results under the Project both from the aspect of the executed deployment works and from aspect of the provided services, subject to this ToR.

The Final Report shall contain all relevant details of provided consultancy services, including description of service, all relevant information on implementation, presentation of staff engaged, as well as the cash flow on the Consultant’s contract.

The Final report upon Operational acceptance shall be prepared and shall include summary of the activities completed, but not be limited to:

­ Summary of the completed deployment works and contract implementation;

­ Summary of the approved by the Consultant technical documentation for the deployment works completed, including all modifications in the design made during the implementation (as build design/drawings);

­ Overview of all important events on the Site;

­ Overview and description of applied new technologies for deployment works with recommendations to the Client relating to their further use;

­ Summary of the engaged Consultant’s personnel;

­ Summary of completed tests and acceptances of materials and works as well as completed control testing;

- Summary of commissioning activities during the System Acceptance Test;

­ Summary of delivered materials, with data on manufacturer and quality with schematic presentation of locations of the build in materials;

­ Summary of road safety and traffic design;

­ Summary of environmental and social management carried out (mitigation measures implemented) during the deployment works contract implementation (this shall be summary of all QESRs presented as Final (or Annual Environmental and Social Report);

­ Summary of expropriation issues, if any and their implementation;

­ Summary on health and safety (accidents if any and status);

­ Complete financial status/summary of the contract;

­ Summary of Changes orders;

­ Summary of Claims;

­ Summary of Contractor’s equipment, engaged labor and personnel on the site completing the works;

­ Summary of Consultant’s staff engaged and replacement of Consultant’s staff, if any;

­ Copy of the complete documentation prepared during the supply and installation period (Annex);

­ Copy of the complete correspondence between the Contractor / Consultant / Client / Final Beneficiary and vice versa (Annex).

Draft Final Report shall be submitted to the Client within 14 days following the Operational acceptance date. The Client shall review the report within 7 days from the date of submission of draft Report. In case of having comments and suggestions, the Client shall submit them to the Consultant in the stated time. The Consultant is obliged to incorporate the Client’s comments/suggestions in the final version of the Final Report within 7 days from receipt of such comments/suggestions.

The final version of the Final Report shall be submitted in Macedonian and English language in 3 hard and 3 electronic copies (CDs). The Final Report shall be deemed accepted if approved by the Client in writing.

1. Other reports (as part of Final report upon Operational acceptance and Final report after completion of DLP):

- *A non-compliance event report/Critical Issues report*

Inform the Client identifying non-compliances and suggests necessary improvements and compliance methodologies. Any critical issues needing stoppage of work need to be reported immediately to the Client in writing.

*- Claims Report*

In the event of receipt of a notice of claim from the Contractor, immediately thereafter, the Consultant shall notify and provide copy of the Contractor’s notice to the Client. The Consultant shall require the Contractor to copy to the Client all details with regard to the Contractor’s claim.

Promptly after the Consultant’s inspection, the Consultant shall provide the Client with an assessment of the Contractor’s claim supported with records, and the Consultant’s preliminary conclusions with regard to the potential outcome of the claim. The Consultant shall provide the Client with all necessary particulars to enable the Client to establish his position with regard to the Contractor’s claim. The Consultant shall also consult with the Client any instruction, which have been (or to be issued) to the Contractor with regard to any further related records that the contractor may have.

Prior to certification of any payment to the Contractor in relation to the Contractor’s claim, the Consultant has to obtain Client’s approval.

The report should be submitted in both languages English and Macedonian in 3 hard copy and 3 electronic copies (CDs).

*- Ad-hock Report*

The Consultant is obliged to prepare Ad-hock Reports on a request of the Client. The Consultant is obliged to submit the Ad-hock Reports according to the deadlines, subjects and formats requested by the Client.

*- Accidents Report*

In case of accidents or urgency from the aspect of environmental protection, social safeguards issues and traffic safety, the Consultant is obliged to submit immediately the Report on such event.

1. Defect Liability Period (DLP) Report

The Consultant shall prepare a report from inspection visit after each mission detailing:

­ Outstanding and remedial works completed by the Contractor during the period;

- Location, nature, extent and analysis of the causes of defects identified, if any;

- Recommended method to correct identified defects together with cost estimates;

- In consultation with the Client and Contractor the liability for correcting the defects identified.

Number of inspections to the site during DLP shall be based on the Consultant’s assessment, but in any case, should not be less than 3 inspections per works contract out of which the last inspection should be no later than 90 days before the end of DLP.

The DLP Report shall be submitted to the Client within one week (7 days) after completion of each inspection in both languages Macedonian and English in 3 hard and 3 electronic copies (CDs).

1. Final Report (after completion of DLP) represents analyses and synthesis of the implementation and summary of the achieved technical, financial, traffic safety and ecological results under the Project both from the aspect of the executed activities and from aspect of the provided services subject to this ToR. Apart from the conclusion, the report shall include recommendation for improvement of efficiency on prospective projects.

Concluding report shall contain all relevant details of provided consultancy services, including description of service, all relevant information on implementation, presentation of staff engaged, per every work contract and summary, as well as the cash flow on the consultant’s contract.

The Final Report shall also contain a summary of the Final Statement for all activities and services done in accordance with the Contract. The report shall also include a complete financial statement for the activities undertaken, a signed and completed asset register of the purchase and hand-over of all assets purchased under the contract and proposals for future actions. Also, the Final Report shall include details of all remedial activities carried out by the Works Contractor to rectify any defects found and make recommendations with regard to the Beneficiary’s operation and maintenance practices. The Concluding (Final) Report shall include all previously approved reports and other relevant documents on one CD. The executive summary should be translated into the language of the Partner country. The Final Report should include all previously approved project results (see article 2.3.) on hard copy and on the CDs.

The Final Report must be accompanied by the invoice and an expenditure verification report confirming the final certified value of the contract. The Final Payment shall be subject to the approval of the Final Report and the acceptance of the expenditure verification report.

Draft Completion Report shall be submitted to the Client within 14 days before the expiration of DLP. The Client shall review the report within 7 days from the date of submission of draft Report. In case of having comments and suggestions, the Client shall submit them to the Consultant in the stated time. The Consultant is obliged to incorporate the Client’s comments/suggestions in the final version of the Final Report within 7 days from receipt of such comments/suggestions.

1. Presentation to the PESR on the findings of Project and next step suggestions. The Consultant may be required to make presentations on field supervision findings at the designated forums as and when required by the Client.
2. General provisions related to the reporting requirements

The Consultant shall submit to the Client all the reports as specified under the Section 6: Reporting requirements.

The Consultant is obliged to provide and submit hard copies and electronic copies of all records on works, as well as on technical, financial and other material collected during the implementation of the works and services.

All documents prepared during the contracts implementation, all drawings, working notes, and other printed and electronic material related to the works shall be submitted to the Client and shall be regarded as Client’s intellectual property The Client shall keep all the intellectual property rights over the working notes, collected and processed data, technical materials prepared during the contracts implementation, draft and final documents and other materials related to the works and services. Use of data from the Project for purposes not related to the works, and especially in case of the public presentation, shall not be permitted to the Consultant without previous written consent of the Client.

For the purpose of the Services, “Intellectual Property Rights” means any and all copyright, moral rights, trademark, patent, and other intellectual and proprietary rights, title and interests worldwide, whether vested, contingent, or future, including without limitation all economic rights and all exclusive rights to reproduce, fix, adapt, modify, translate, create derivative works from, extract or re-utilize data from, manufacture, introduce into circulation, publish, distribute, sell, license, sublicense, transfer, rent, lease, transmit or provide access electronically, broadcast, display, enter into computer memory, or otherwise use any portion or copy, in whole or in part, in any form, directly or indirectly, or to authorize or assign others to do so.

The critical reports should be submitted in both Macedonian and English as per the requirements stipulated under Section 6. Additionally, the Consultant shall submit electronic copies of these documents in form leaving a possibility of the text editing.

1. Site Supervision Procedures Manual

The Site Supervision Procedures Manual should detail procedures listed above in tasks during the Phase II – Supply and installation. Supervision Manuals should include, but not be limited to:

a) proposed program of works which should include works during the construction phase and during the defect liability period (DLP);

b) proposed Consultant’s organization plan with list of needed resources;

c) parameters to be measured;

d) locations for taking samples or performance of measurements;

e) type of equipment to be used and their detection limits;

f) frequency of measurement;

g) key and other staff to perform the measurements.

The Site Supervision Procedures Manual should be prepared and submitted by the Consultant 7 days after commencement date. Client shall review the report within 7 days from the date of submission of draft Report. In case of having comments and suggestions, the Client shall submit them to the Consultant in the stated time. The Consultant is obliged to incorporate the Client’s comments/suggestions in the final version within 7 days from receipt of such comments/suggestions.

The final version of the Site Supervision Procedures Manual shall be submitted in Macedonian and English language in 3 hard and 3 electronic copies (CDs). The Supervision Plan shall be deemed accepted if approved by the Client in writing.

1. Log File (Construction Diary)

Contractor keeps Log File (Construction Diary) in accordance with the applicable national legislation (the “Rulebook of rulebook on the Form, Content and Method of Keeping Books of Inspections, Log File (Construction Diary), and Measurement” Official Gazette No. 26/2011). Contractor is keeping Log File by entering all requested log data. Accuracy of data entered into a Log File shall be: controlled, verified, and filled in with supplement comment, remark or instruction, by the Consultant.

Keeping of the updated log file on a daily basis, available for the Client’s inspection shall include:

­ Activities to be done and parameters to be measured and locations for taking samples or measurement performance for every particular day;

­ Activities completed and parameters measured and locations where samples were taken or measurements performed for every particular day;

­ Instructions, recommendations and orders given to the contractor and actions taken by the contractor in respond to such requirements;

­ Daily works progress;

­ Data that may have influence on quality and works safety;

­ Inspection of all works, which cannot be inspected after execution of the next works phases;

­ Weather conditions and temperatures;

­ Traffic accidents and other incidents of importance for the contract realization;

­ Discrepancies in relation to the technical documents;

­ Arrival, origin and quality of the material and equipment delivered to the site;

­ Data on site overview completed by inspection authorities and their main findings;

­ Approvals and decisions of the government bodies, other legal or physical entities, which may be of importance for the works execution;

­ Additional or contingency works;

­ Events requiring or which may require urgent measures, such as occurrence of ground water, unstable terrain or similar;

­ Number of employed workers for the works execution, their qualification structure, as well as on number and type of the engaged equipment and mechanization;

­ Delays and termination of the works execution;

­ Orders for modification of the design documents, acceptance of the modification proposal on behalf of the contractor, orders for removal of defects, etc.;

­ All other data requested by the state or provincial regulation in the territory of the works execution.

Data entered in the log file must not be altered or amended. If there is a need for correction, amendment or modification of already entered data, it shall be done by making a new record.

1. Measurement Book

Contractor keeps Measurement Book in accordance with the applicable national legislation (the “Rulebook of rulebook on the Form, Content and Method of Keeping Books of Inspections, Log File (Construction Diary), and Measurement” Official Gazette No. 26/2011) by entering all accurate data on measurements and quantities of executed works, which serves as document for works calculation and payment. Accuracy of data entered into a Measurement Book shall be controlled and verified by the Consultant.

As integral part of the Measurement Book keeping, a Contractor is obliged to prepare adequate measurement drafts (evidencing documents). Consultant’s obligation is to control and verify such calculations and documents. Measurement drafts shall include adequate sketches and data based on which quantity of the executed works has been calculated. If necessary, they can also include relevant references to the log file, as well as data indicating when, why and based on what causes modification has been made.

**7. Company profile and qualification criteria**

For the purpose of the assignment a team of experts with relevant experience and qualifications in their subject area as indicted further below will be engaged. The Consultant firm may associate with other Consultant firm (s) in the form of a joint venture or of a sub-consultancy to complement their respective areas of expertise, strengthen the technical responsiveness of their proposal, and avail themselves to a broader pool of experts.

The Consultant firm will be selected in accordance with QCBS (Quality-and Cost-Based Selection) method set out in the World Bank’s Procurement Regulations for IPF Borrowers (July 2016, revised November 2017 and August 2018 (“Procurement Regulations”).

From the Consultant firms that will submit an Expression of Interest (EoI), the Client will assess the Expressions of Interest to determine the Shortlist of the firms based on selection Criteria stated in REoI/ToR. Qualifications of the Key staff (CVs including their qualifications) will not be evaluated at this Shortlisting stage. Upon determining the Shortlist, the Client shall issue the letter of invitation along with the request for proposals (RFP) to all the Shortlisted firms. For QCBS method the WB Standard RFP will be used.

The qualification requirements of the Consultant firm are summarized as follows. The Consultant shall be a firm or a group of firms with following qualifications:

* Proven experience and verifiable track-record working as a supervisor of ITS projects and/or infrastructure projects in the past 10 (ten) years;
* Proven expertise in supervision of ITS projects, at least two (2) similar project references within last 7 (seven) years (references issued by the Employers should be presented in the EoI);

- The relevance of reference projects that may be considered to verify the track record of the Consultant shall be based on and shall include all of the following:

Implementation of traffic data collection system on highway, Implementation of traffic video surveillance system on highway (CCTV, incident management system, etc.), Implementation of programmable electronic signs with LED technology (VMS/DMS/VLS) on highway, Implementation of meteorological data collection system on highway, Implementation of traffic control center for ITS.

* Knowledge of applicable national legislation, administrative system, government organization and related areas is mandatory.

The credibility of mentioned experience shall be presented with at least two (2) similar project references within last 7 (seven) year with description of services provided (including information on contract value, contracting entity/client, project location/country, duration, assignment budget, percentage carried out by consultant in case of association of firms or subcontracting and main activities) and accompanied by certificates of orderly fulfilment of the contracts verified by other party from such contracts.

**Note to Bidders: According to the national legislation, the awarded Bidder (or JV) should obtain and possess a License A or Confirmation for performance of Supervision services issued by Ministry of transport and communications, prior to Contract Signing. Copies of the required License A or Confirmation should be submitted to Employer prior to Contract signing.**

The Consultant shall have the organizational capacity (it is expected that the Consultant shall have at least below listed/required key experts for performing activities under this assignment) and available appropriate skills among staff. The consulting team assembled to implement the project should be composed of experts with strong knowledge as per the below requirements.

# 8. Team Composition & Qualification Requirements for the Key Experts

The Consultant shall provide competent personnel for the services, who shall be managed by the Project Manager and who will represent the Consultant in performing the services.

All the Consultant’s personnel shall be fluent in the full use (i.e., the writing, reading and speaking) of the contract language, which is English. In addition, all the key staff described herein, shall be fully computer literate regarding word processing and spread sheets, with at least one member of staff fully computer literate in the use of: data bases; total station surveying; computer aided design and drafting (CADD).

**8.1 Key experts**

The Consultant’s Proposal shall include required Key experts and Non-key experts needed for successful performance of the project. The Key experts shall have specific experience in projects of similar scope and complexity. The team shall have knowledge and experience of international tendering and in the administration of contracts for similar types of projects.

Qualifications of the Key staff (CVs including their qualifications) will not be evaluated at this Shortlisting stage. Upon determining the Shortlist, the Client shall issue the letter of invitation along with the request for proposals (RFP) to all the Shortlisted firms.

Curriculum Vitae (CV) for the proposed Key and Non-key Experts will be filled in using the format given in Standard Forms of the Request for proposal (RFP). The shortlisted Consultants are obliged to fulfill the forms and submit it in the RFP together with required Diplomas, CVs and references/proofs for experience.

The required qualifications and experience for Key experts are presented in the table below.

The Consultant may propose Non-key experts needed for successful performance of the project as per by Consultant proposed methodology and work plan. The Consultant also need to consider as required at least following Non-key experts: Communications and Power Specialist (2 positions); Civil Engineer (Structural Engineer); Occupational Health and Safety Specialist; Environmental and Social Specialist and Contract Specialist.

**Note to Bidders: The Key and Non-key Personnel of awarded Bidder (or JV) should obtain and possess required and adequate Authorizations prior to Contract signing. Copies of the required Authorizations should be submitted to Employer prior to Contract signing.**

| **Item No.** | **Key position** | **Relevant academic qualifications** | **Minimum years of relevant professional experience** | **Required Number** |
| --- | --- | --- | --- | --- |
| **Key Experts** | | | |  |
| **1.** | Project Manager | *Qualifications and skills:*  University Degree in Telecommunications or Electronics Engineering or related field  MSc will be considered as an asset  *Language:*  He/she should be fluent in English language. | *General professional experience:*  Minimum fifteen (15) years’ experience in the field of ITS systems.  *Specific professional experience:*  Minimum ten (10) years’ experience as ITS Project Manager or related position in the design, installation or supervision of ITS systems installation, testing and commissioning.  PMP, PRINCE 2 or equivalent certificate is required.  The experience in the field of ITS systems in Europe for more than five (5) years will be considered as asset. | **1** |
| **2.** | Deputy Project Manager and Telecommunication Engineer | *Qualifications and skills:*  University Degree in Telecommunications or Electronics Engineering or related field  MSc will be considered as an asset  *Language:*  He/she should be fluent in English language.  Knowledge of Macedonian language will be considered as an asset. | *General professional experience:*  Minimum ten (10) years’ experience in the field of ITS system.  *Specific professional experience:*  Minimum Ten (10) years’ experience as Project or Deputy Project Manager or related position in the field of ICT and/or ITS systems installation, integration and supervision for traffic or transportation systems.  Minimum Eight (8) years’ experience in the field of Telecommunications design and/or supervision for highways.  The experience in the field of ITS systems in Europe for more than five (5) years will be considered as an asset. | **1** |
| **3.** | Senior ITS System Designer / ITS Engineer | *Qualifications and skills:*  University Degree in Telecommunications  or Electronics or Systems engineering or related field  MSc will be considered as an asset  *Language:*  He/she should be fluent in English language. | *General professional experience:*  Minimum Ten (10) years’ experience in the field of ITS system.  *Specific professional experience:*  Minimum Eight (8) years’ experience on ITS System design, and/or installation, integration and commissioning as Senior ITS System Designer, ITS Expert or related position.  The experience in the field of ITS systems in Europe for more than five (5) years will be considered as an asset. | **1** |
| **4.** | Senior Communication Specialist / Network Engineer | *Qualifications and skills:*  University Degree in Telecommunications or Electrical or Communication Systems Engineering or related field  MSc will be considered as an asset  *Language:*  He/she should be fluent in English language. | *General professional experience:*  Minimum Ten (10) years’ experience in the field of ICT and/or ITS system.  *Specific professional experience:*  Minimum Eight (8) years’ experience on electronics or network design and/or Systems installation, testing, and troubleshooting as Senior Communication Specialist/Network Engineer or related position.  The experience in the field of ITS systems in Europe for more than five (5) years will be considered as asset. | **1** |
| **5.** | Senior Traffic Engineer | *Qualifications and skills:*  University Degree in Traffic or Transportation or Civil Engineering (road traffic sciences)  MSc will be considered as an asset  *Language:*  He/she should be fluent in English language. Knowledge of Macedonian language will be considered as asset. | *General professional experience*  Minimum Ten (10) years’ experience in highways traffic design and/or audit and/or supervision.  *Specific professional experience:*  Minimum Five (5) years’ experience as Traffic Engineer or related position in the field of highways traffic design and/or construction and/or supervision.  He/She should have knowledge of Macedonian traffic regulations. | **1** |

**8.2 Support staff & backstopping**

The Consultant will provide support facilities to their team of experts (back-stopping) during the implementation of the contract.

Backstopping and support staff costs must be included in the fee (remuneration) rates.

**8.3 Office accommodation on site**

Office accommodation on site, of a reasonable standard and of approximately 6 square meters for each expert working on the supervision for the Contract for ITS deployment is to be provided by the Consultant.

Costs for office accommodation on site must be included in the fee (remuneration) rates.

**8.4 Facilities to be provided by the Consultant**

The Consultant shall provide all required office equipment, supplies, services, documentation, logistical support, local travels, etc., necessary for the implementation of the contract. All monthly bills for electricity, water supply, sewerage, solid waste, telephone, internet and cleaning service of the offices shall be paid by the Consultant.

The Consultant shall be responsible to provide and pay for all necessary residential accommodation for their staff, local and international transportation.

The Consultant will also be responsible for all salaries, fees, allowances, insurance, leave pay and taxes for the Consultant’s staff involved in the assignment.

**8.5 Equipment**

No equipment is to be purchased on behalf of the Client as part of this service contract or transferred to the Client at the end of this contract. Any equipment related to this contract that is to be acquired by the Client must be purchased by means of a separate supply tender procedure.

**8.6 Level of Effort**

Estimated Consultant’s total Person-Month Input is presented as follows:

| **Item No.** | **Positions** | **Person-month** |
| --- | --- | --- |
|
| **Key Experts** | | |
| K-1 | Project Manager | 16 |
| K-2 | Deputy Project Manager - Telecommunication Engineer | 16 |
| K-3 | Senior ITS System Designer/ITS Engineer | 10 |
| K-4 | Senior Communication Specialist/Network Engineer | 10 |
| K-5 | Senior Traffic Engineer | 7 |
| **Total estimated Person-month for Key Experts** | | **59** |
| **Non-Key Experts** | | |
| **Total estimated Person-month for Non-Key Experts** | | **33** |