TERMS OF REFERENCE FOR ROAD SAFETY CONSULTANT (FIRM)

A. BACKGROUND

1. The Government of India has applied for a loan from the Asian Development Bank (ADB), and intends to utilize part of this loan towards the cost of the contract for consulting services related to Road Safety to be taken up under the proposed project of improving major district roads in the state of Uttar Pradesh, details of which are elaborated in subsequent sections. A project implementation unit (PIU) under the Uttar Pradesh Public Works Department (UPPWD) is designated as the Implementing Agency (IA) for the project. The government of Uttar Pradesh (GOUP), acting through the UPPWD will be the executing agency (EA) for the project.

2. The state of Uttar Pradesh has a road network of approximately 300,000km, out of which 209,000 km is under UPPWD. The roads under UPPWD comprise 7,550 km of National Highways (NHs), 7,530 km of State Highways (SHs), 7,255 km of Major District Roads (MDRs), 42,362 km of Other District Roads (ODRs) and 152,000 km of Village Roads. Only about 85% of SHs are double lane. In the entire state 54% of MDRs and 83% of ODRs have widths less than 7 m.

3. In view of the emerging traffic trends, it is clear that there is an urgent need for further improving the road network of the state and redefining the core road network from time to time. Keeping this in mind, a study to prepare a road network master plan of the state has been done, wherein consultants appointed by UPPWD have identified an updated Core Road Network (CRN) duly approved by GoUP in April, 2014, for the state comprising:

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Highway</td>
<td>7,550 km</td>
</tr>
<tr>
<td>State Highways</td>
<td>7,530 km</td>
</tr>
<tr>
<td>Major District Roads</td>
<td>5,761 km</td>
</tr>
<tr>
<td>Other District Roads</td>
<td>3,254 km</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24,095 km</strong></td>
</tr>
</tbody>
</table>

4. The Government of Uttar Pradesh has a long-term program to improve the CRN and, as part of this program, has applied for a financial assistance from ADB for the Uttar Pradesh Major District Roads Improvement Project (UPMDRIP) – hereinafter referred as “the Project.” The project will focus on MDRs forming part of the CRN. The estimated Project cost is $428 million.

5. The UPMDRIP will have two main components:

   i. **Civil Works Component.** The scope of this component shall include upgrading/reconstruction/widening of selected major districts roads from the CRN, based on the available budget.

   ii. **Road Safety Component.** A comprehensive and coordinated package of road safety sub-components.
B. SCOPE OF THE ROAD SAFETY COMPONENT

6. **Aim** is TO ADDRESS CURRENT REQUIREMENTS OF THE STATE AND THE REQUIREMENTS SET BY EXTERNAL FINANCING AGENCIES. THE TOR SHALL ALSO ENCOMPASS THE NEED ARISING OUT OF FUTURE DEVELOPMENTS - THE BILL. The TOR will look to establish a GIS based TRAFFIC MANAGEMENT AND ROAD SAFETY MANAGEMENT SYSTEM, geared to tackle Road Safety issues comprehensively. The scope will endeavor to address State’s Road Safety Policy on the whole and specifically points iv and vii, which are as follows:

“Government of Uttar Pradesh, Transport Section-3 No-1575/30-3-2014-32M/201T.C., Lucknow : Dated 16 June 2014, State Road Safety Policy

(iv) **Ensure Safe Road Infrastructure:**

The Government will take steps to promote conscious planning for safe design of roads. Government would ensure that best practices should be incorporated in designing the roads. Government will adopt the accident reduction strategy for existing roads through black spots improvement programs.

(vii) **Safety of Vulnerable Road Users**

The design and construction of all road (rural and urban) will take into account the needs of non-motorized transport and physically challenged person in an appropriate manner. “

The vii) Policy statement would emphasize on Recognition of vulnerable road users (VRU) as equally important elements as the motorized vehicle in the planning, designing, construction and operation of roads and to provide for their special needs.

**A. ASSESSMENT OF ROAD SAFETY SCENARIO IN THE STATE, ANALYSING THE SITUATION AND PROPOSING SOLUTIONS AND BASED ON AGREED APPROACH TO ADDRESSING ROAD SAFETY ISSUES IN CONSULTATION WITH STATE AUTHORITIES.**

Road Safety, as per the Ministry of Road Transport and Highways (MORTH) report of 2015, the country’s road safety record is not very good. Amongst the states in India, Uttar Pradesh has a poor record of road accidents, and ranks seventh highest in the country in terms of number of accidents of registered vehicles. However, it has the highest proportion of fatal accidents in the country, with over 12.8% in 2015, as per NCRB data. It is in this context that Uttar Pradesh became one of the first states in the country to establish a “Road Safety Policy” in 2014, as per Annexure-1. The Road Safety Policy, established in partnership with the World Bank and the Government of New Zealand, covers the following areas: (i) building awareness of road safety, (ii) strengthening institutional arrangements, (iii) establishing a road safety database, (iv) ensuring safer road infrastructure, (v) promoting safer vehicles, (vi) training drivers for safety, (vii) enforcement of traffic laws, and (viii) emergency medical assistance to accident victims. The present projects of the World Bank and ADB will facilitate...
UPPWD’s actions to improve road safety.

- Establish a System for accident data archiving subsequent to reporting by Police/Transportation and analysis system (using computerized methods/Relational Database Management System). The focus of this aspect should be to develop a reliable and complete system for accident data reporting and analysis so that it can identify, categories and quantify accident problems – graphically or by conflict type, road users involved etc. This should also include procedures for post accident actions.

- Identification of procedures for black spots identification. The focus of this aspect should be to evolve a system to identify accident-prone spots or sections and suggest remedial measures.

- The ultimate goal of the study is to make Uttar Pradesh roads safer for all users. Establish a sustainable institutional framework for efforts to improve road safety. This includes legal, financial and organisational aspects as well as co-operation between different authorities

RSC will be the key resource team on Road Safety Management at the Road Safety Division and Road Safety Cell. The Team Leader/Road Safety Expert will be responsible for enabling the Road Safety Units of the State to effectively carrying out their responsibilities. The Consultant's specific additional responsibilities shall include, but will not be limited to, the following tasks:

- Undertake the preparation of TOR and RFP in line with the best practices for procurement of a Road Safety Consulting firm, which will be responsible for the development and management of implementation of a Model Road Safety Corridor. The Consultants will also provide/assist the hiring of a Road Safety Auditors and overseeing his/her work (extra hired staff for RSA on reimbursable basis).

- Undertake Institutional analysis of PWD on Safety management awareness, readiness and capability and suggests improvement measures there upon.

- Provide support to Road Safety Division for undertaking a comprehensive review of documents to improve the contractual framework for safety management, including contract bid documents, RFPs and TOR for construction supervision/independent/specialized road safety consultancies including works of PMC in charge of Externally aided projects.

i. Developing a web based Road Safety GIS enabled application for implementing, managing, monitoring and evaluating Road Safety measures and Decision Support System for managing Black spots, Road Safety Audit and other issues of interfacing with other Stakeholders.

ii. Targeted thematic implementation and guidelines for safety and traffic management infrastructure, including --

   a) Segregation of mixed traffic including motorcycle lane, bicycle lane, and Footpath;
   b) Pedestrian crossings;
c) Intersections & interchanges;
d) Active Traffic calming & speed control measures;
e) Roadside hazards;
f) Traffic signals, signs and lane marking;
g) Intelligent transport systems;
h) Parking zones on-street / off street;
i) Speed limits / weight limits;
j) Zoning and congestion pricing;
k) Traffic restrictions for different vehicles; and
l) Temporary road closures and car-free programs.
m) Liaise all stakeholders with Road Safety Division / PWD.

iii. To examine and recommend measures for Black spot rectification and prepare estimates. To conduct periodic review of sample/selected civil works zone on the PWD ongoing projects and submit Report to the Road Safety Division. These reviews will include both Traffic Safety for all users and protection of construction and maintenance workers on site. Coordinate with the Police Department in their effort to establish road accident database management system. To reconcile historical road accident data and do crash analyses and Black Spot identification. Provide support to PWD in development of an appropriate interface to the accident data collection system being developed by Traffic Police for capturing accident data on highways.

iv. Undertake the preparation of TOR and RFP in line with the best practice for procurement of a Road Safety Audit Consulting firm, for Road Safety Audits on CRN and other State Roads. Else Consultants may themselves conduct Road Safety Audit on reimbursable basis.

v. To assist Road Safety Division in developing and conducting Indian Road Assessment Programme (I-RAP) surveys including preparation of bidding documents to engage consultant for the same.

vi. In close coordination with the consulting firm managing the model corridor, undertake the preparation of Road Safety Action Plan for the State to implement the strategy including the formulation of a staffing plan, operational budget and the mechanism for implementation, monitoring and dissemination to road users / public.

vii. Undertake the work of development of a Road Traffic and work zone safety manual of road infrastructure safety principles and good practice incorporating safe system principles. For Work Zone Safety, develop an application to help implement, manage, monitor and evaluate Safety measures.

viii. Review current measures being adopted by PWD to improve work zone safety management by addressing technical, contractual and institutional dimensions related to safety during road construction including the implementation and enforcement mechanism for safety management during the construction stage.

ix. Make recommendations and arrange for training needs to PWD staff, Contractors & concessionaires, and support Road Safety Division in organizing the training curriculum. Identify suitable training opportunities for staff training and capacity building of PWD.
including national and International courses and Study Tours as a training curriculum for PWD and assist in organizing workshops/seminars/Lectures as required.

x. Make recommendation for and assists in developing for organizational capacity of PWD for safety management through all phases of Highways development.

The Road Safety Experts/consultants have to model all of the work in accordance with ROAD TRANSPORT AND SAFETY BILL 2015 (likely to be implemented), therefore consultant is expected to familiarize themselves with existing system and the changes required as per new legislation. As per new legislation responsibilities and accountability are emphasized. Failure to discharge duties/responsibilities will attract punishment and severe consequences. Therefore Consultants will be charged with responsibility to devise system of management of Road Safety issues from conception of a project to finalization and subsequently for operational period.

The Consultant is expected to familiarize himself/herself thoroughly with the Banks’ Operational Policies that would help in aligning the delivery of services under this assignment.

B. GATHERING FEEDBACK FOR EFFECTIVENESS OF WORKS UNDERTAKEN. COMPARING WITH BASELINE DATA FOR IMPACT ASSESSMENT. UNDERTAKING ANY COURSE CORRECTION REQUIRED. ESTABLISHING TRAFFIC MANAGEMENT AND ROAD SAFETY MANAGEMENT SYSTEM. HANDHOLDING FOR COMPLETE DURATION OF PROJECT, EXTENDABLE ON CLIENTS REQUEST.

7. Besides the above works, specifically under the UPMDRIP, the selected Road Safety Consultant (RSC) will (i) conduct a detailed safety audit of the MDRs under the CRN (5761 km), and including all eight roads taken up under the UPMDRIP; (ii) propose designs and drawings for improving identified accident prone locations (black spots); and (iii) supervise the contractor(s) implementing such improvement measures.

C. SCOPE OF SERVICES

8. UPPWD now wishes to engage a team of multi-disciplinary expertise, hereinafter called the RSC, to carry out the broad scope of work mentioned in 6&7 above. The overarching objective of these Services is to provide quality technical support to assess, design, and supervise defined road safety features on the MDRs in the CRN. In achieving these objectives, the RSC is required to provide all required assistance and support to the UPPWD in complying with the ADB’s requirements for project design and implementation. The RSC is encouraged to refer to these policies available on ADB’s website (https://www.adb.org/documents/handbook-project-implementation) before submitting the proposal and during delivery of these services. The works contract for road safety components will be based on Asian Development Bank standard bidding document for works in India, as amended from time to time for National Competitive Bid procured contracts.

9. The assignment has three distinct and overlapping parts: (i) studies, conceptual framework, and prioritization; (ii) design and detailing of proposed measures; and (iii)
supervision of contractors implementing these measures. In support of the overarching objective, the key tasks of the services, shall include, but not be limited to, the following:

**Road Safety Audit**

i. The RSC will carry out a safety audit as per IRC: SP: 88-2010 Manual on Road Safety Audit of all MDRs in the CRN including all 8 roads taken up under UPMDRIP (including the junctions with other state roads, national highways). The audit will, inter-alia, examine and determine accident statistics (fatal, grievous, others), map them by approximate location, identify causative factors, and prioritize spots for corrective measures.¹

**Design and Detailing**

ii. Based on this prioritization of accident spots where engineering interventions can help, the RSC will prepare designs and drawings for addressing them in an optimal cost way. Typical measures will include signage, dividers, junction traffic management installations (passive and active), S-curve improvements, and so on. All improvements will be done within existing available land, and no acquisition is envisaged. The project cost for Road Safety consultancy and implementation is estimated to be about $10 million and the priorities and actions will need to be limited to about this amount.

iii. UPPWD will procure a contractor(s) for carrying out these safety enhancement features. The RSC will be responsible for all construction supervision activities for such road safety works to ensure that works are carried out as per required quality and specifications with due regards to environment, social, and safety aspects in compliance with the contract conditions, environmental management plan, and international best practices for road construction. Minimum requirements for supervision activities are presented in Annexure 2.

**Supervision of Implementation**

iv. The RSC should note that there may be a period of about 6 months, during which the procurement of contractors is ongoing, and the staffing plan of the RSC should take the likely lower deployment and change in nature of services from study and detailing into supervision and oversight into account.

v. The RSC shall assume delegated powers, duties and responsibilities assigned to the “Engineer” under the civil works contracts by the Employer. The construction period for such contract(s) depends on the scope of works, but is expected to be about 24 months. The RSC will prepare an overall plan and schedule for the project in sufficient detail to ensure all important activities are identified, clearly show linkages between activities, allow monitoring of progress, provide early indications of potential problems, and enable interventions by the UPPWD, other consultants and contractors to maintain the project schedule. This plan will require updating at regular, frequent intervals.

vi. The RSC will prepare overall project implementation program including pre-construction activities, DPR, Bid documents, fund flows and financing, and submit to UPPWD for approval.

vii. The RSC will monitor actual physical progress and costs against plans and budgets and prepare detailed Monthly Progress Reports on activities, progress and costs of all

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¹ In a majority of cases, the cause is indicated as ‘driver error.’ This is a catchall phrase that covers various contributions such as engineering related (poor curves, junctions, sight distances, road conditions), awareness related (pedestrians running across), and so on. Data should be properly assessed and marked.
The report will be a summary of progress reports prepared by contractors, consultants and other agencies in components of the project related to Road Safety. The contents and formats of the report will be agreed with the UPPWD.

viii. The RSC will review compliance with the documentation, including securing of all statutory clearances and permits or handing over of site, and advise on issuing the notice to set the Commencement Date;  
ix. Assess the achievement of project development objectives through monitoring of result framework indicators agreed between UPPWD and ADB (outcomes and outputs in the design and monitoring framework – DMF).  
x. Prepare environmental and social safeguards reports in the formats prescribed by ADB. Support the UPPWD in matters relating to safeguards, including updating the Resettlement Plan, monitoring the implementation of the resettlement plan and providing expert advice in all matters relating to acquisition and resettlement  
xi. Advise the UPPWD on safeguard compliance issues and if necessary a corrective action plan will be prepared to address such issues.  
xii. Monitor Project costs and provide an updated forecast of costs at completion in the Quarterly Progress Reports. Alert the UPPWD and Asian Development Bank of unexpected major cost overruns at the earliest possible time.  
xiii. Participate in various discussions/meetings/missions as may be called upon by PWD and ADB and provide required information/documents.

D. DATA AND RESOURCES TO BE PROVIDED BY UPPWD

10. The following data and resources will be provided by UPPWD:
   i. Available base maps, existing road inventories, including data on pavement history and condition, traffic statistics and geographical maps of all districts including category of road thereon as per IRC: 1981-2001 Road Development Plan relevant to the consultancy. PWD will assist RSC in collecting Data related to road crash fatality and serious injury statistics from Transport / Police Departments  
   ii. Assist RSC in preparation of detailed project reports, design/drawings of bridges, and roads including sub-soil investigation reports for implementation of work related to Road Safety, with data available with the field units. Other required data will be collected by RSC.  
   iii. Limited office space in UPPWD office, RSC will make necessary support staff, equipment, communication and IT facilities etc.; including internet access points as bandwidth in UPPWD office is limited. The RSC will need to make all other office, accommodation, and equipment arrangements.

E. DURATION OF RSC TEAM

11. The estimated duration of services will be 36 months.  
12. Proposed Key Professionals and indicative person-months are indicated in the table below:

<table>
<thead>
<tr>
<th>Key Professionals</th>
<th>No. of persons</th>
<th>Person-months</th>
<th>Total Person-months</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Team Leader (Road Safety Expert)</td>
<td>1</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>
### National

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Position</th>
<th>No. of persons</th>
<th>Man-months</th>
<th>Person-months</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Deputy Team Leader (Road Safety Expert/Traffic and Transport Engineer)</td>
<td>1</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>3.</td>
<td>Highway Engineer</td>
<td>1</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>4.</td>
<td>Database and System Specialist</td>
<td>1</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>5.</td>
<td>Road Safety Auditors</td>
<td>2</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>6.</td>
<td>Senior Material- cum- Quality Control Engineer</td>
<td>1</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>7.</td>
<td>Resident Engineers (2 in numbers)</td>
<td>2</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>8.</td>
<td>Senior Surveyor (2)</td>
<td>2</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>9.</td>
<td>Senior CAD Expert</td>
<td>1</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>10.</td>
<td>Environmental Specialist</td>
<td>1</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>11.</td>
<td>Social Development Specialist</td>
<td>1</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>12.</td>
<td>Contract Administration Specialist</td>
<td>1</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Total (1-12)</td>
<td></td>
<td>16</td>
<td>204</td>
<td></td>
</tr>
</tbody>
</table>

### 13. Notes:

i. Key professionals at positions 1-3 in the above table must be from the Lead/Principal Firm in case of association, failing which the proposal shall be nonresponsive in the Technical Evaluation.

ii. The RSC team will have to work and be located both its main offices in Lucknow, and in a suitable number of field offices, including, and not limited to, offices in Meerut, Kanpur and Varanasi.

iv. The above Key Professionals are minimum requirements. The RSC has to propose additional non-key technical support staff and administrative staff, as required, to best meet the objectives of the assignment. The INDICATIVE list of Non-key Professionals is given in the following table, but is for guidance only. However, the numbers and person-months for such staff shall be included in the technical proposal and the costs in respect of these personnel are to be included in the financial proposal, and will be deemed to have been so included. CVs shall be provided at the time that the post is to be filled. Candidates shall meet the requirements for responsiveness of that position, as per good engineering practice.

<table>
<thead>
<tr>
<th>SI No.</th>
<th>[INDICATIVE] Non-Key Professionals</th>
<th>No. of persons</th>
<th>Man-months</th>
<th>[INDICATIVE] Person-months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Quantity surveyors</td>
<td>2</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td>2.</td>
<td>Field Engineers</td>
<td>4</td>
<td>24</td>
<td>96</td>
</tr>
<tr>
<td>3.</td>
<td>Surveyors</td>
<td>4</td>
<td>24</td>
<td>96</td>
</tr>
<tr>
<td>4.</td>
<td>CAD Draftsmen</td>
<td>2</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>5.</td>
<td>Lab Technician</td>
<td>4</td>
<td>18</td>
<td>72</td>
</tr>
<tr>
<td>6.</td>
<td>Programmer</td>
<td>1</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>7.</td>
<td>Computer Operator</td>
<td>1</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>18</td>
<td></td>
<td>408</td>
</tr>
</tbody>
</table>
v. The RSC shall, if so required by the Client, provide any additional service at rates or on man-month rates as per the contract, or as mutually agreed upon, as a variation order.

vi. Traffic surveys and topographic surveys will be covered under Provisional Sums. However, these have to be assessed, coordinated, executed and analyzed by the professional staff of the RSC at locations decided in consultation with UPPWD.

vii. Training and awareness programs and/or materials will be covered under Provisional Sums. However, these have to be prepared and conducted by the professional staff of the RSC.
F. POSITION BASED QUALIFICATIONS OF KEY STAFF

i. Team Leader (Road Safety Expert) (International)

*Educational Qualifications*
- Minimum - Graduate in Civil/ Highway/ Transportation Engineering.
- Desirable - Post Graduation or equivalent in Civil Engineering/ Highway Engineering/ Transportation Engineering/Road Safety Engineering.

*General Experience*
- Minimum total work experience after graduation – 20 years.
- Minimum experience in developed countries – 3 years.

*Relevant Experience*
- As Team Leader for at least one Infrastructure/ Road Projects of similar complexities in a developed country.
- As Team Leader for at least one Infrastructure/ Road Projects of similar size and complexities in a developing country.

*Essential Knowledge and Experience*
- Project Management Experience for Infrastructure development projects from design to delivery.
- Thorough experience in road safety audits, design, construction, supervision and management of road safety related engineering interventions in major highway projects.
- The candidate must demonstrate knowledge and experience of international ‘best practices’ and road safety audit, design, drawings and execution of road safety enhancement features in different countries.
- Administering FIDIC / Internationally Funded Contracts.
- Computer Aided Project Management Tools & Interpretation
- Experience of managing a team of at least 10 multi-disciplinary experts as well as strong people management skills during a project or corporate assignment.

ii. Deputy Team Leader (Road Safety Expert/Traffic and Transport Engineer) (National)

*Educational Qualifications*
- Minimum - Graduate in Civil/ Highway/ Transportation Engineering.
- Desirable - Post Graduation or equivalent in Civil Engineering/Highway Engineering/ Transportation Engineering/Construction Management.

*General Experience*
- Minimum total work experience after graduation – 20 years
- Minimum 3 years of total international work experience.

*Relevant Experience*
- Minimum 10 years of total work experience in road safety audits, design, construction, supervision and management of road safety related engineering interventions in major highway projects.
• Candidate should have worked as Team Leader of at least one road construction supervision project.

**Essential Knowledge and Experience**

• The candidate must have experience in administering FIDIC conditions of Contracts, specifications and Standards for road safety audits, design, construction, supervision and management of road safety related engineering intervention relevant to India and International best practice, Modern Survey & Construction Techniques and Computer Aided Project Management Tools & Interpretation.

• Experience of managing a team of at least 10 multi-disciplinary experts as well as strong people management skills during a project or corporate assignment.

• Should have knowledge of contract law, disputes resolution and arbitration.

### iii. Highway Engineer (National)

**Educational Qualifications**

• Minimum - Graduate in Civil/ Highway/ Transportation Engineering.

• Desirable - Post Graduation or equivalent in Civil engineering/ Highway Engineering/ Transportation Engineering/Construction Management.

• Desirable- Professional/ chartered accreditation with a recognized engineering/management institute.

**General Experience**

• Minimum total work experience after graduation – 15 years

**Relevant Experience**

• Minimum 10 years of total work experience in road safety audits, design, construction, supervision and management of road safety related engineering interventions.

• Candidate should have worked as RE of at least one road construction supervision project of similar size and complexity.

**Essential Knowledge and Experience**

• Candidate must have experience in administering FIDIC conditions of Contracts, specifications and Standards for road safety audits, design, construction, supervision and management of road safety related engineering interventions relevant to India and International best practice, Modern Survey & Construction Techniques and Computer Aided Project Management Tools & Interpretation.

### iv Database and System Specialist

• The qualification is Bachelor's degree in Computers/IT or any other discipline

• 5 years professional experience in information system design, analysis, development, implementation and reporting including data collection, analysis and reporting. He should have experience in information system development, analysis through design, programming, implementation, user training and project management systems including application of Geographical
Information System for management functions. He should have working experience in open source database postgresql and postgis

V Road Safety Auditors

**Educational Qualifications**
- Minimum - Graduate in Civil/Highway/Transportation Engineering.
- Desirable - Post Graduation or equivalent in Civil Engineering/Highway Engineering/Transportation Engineering/Road Safety Engineering.

**General Experience**
- Minimum total work experience after graduation – 10 years.

**Relevant Experience**
- As Road Safety Auditor for at least five Infrastructure/Road Projects, including three in Road Safety Audit including design stage audit of similar size and complexities in a developing country.

**Essential Knowledge and Experience**
- Thorough experience in road safety audits, design, construction, supervision and management of road safety related engineering interventions in major highway projects.
- The candidate must demonstrate knowledge and experience of international ‘best practices’ and road safety audit, design, drawings and execution of road safety enhancement features in different countries.
- Computer Aided Project Management Tools & Interpretation

vi. Senior Material-cum-Quality Control Engineer (National)

**Educational Qualifications**
- Minimum - Graduate in Civil/Highway/Transportation Engineering.
- Desirable – Post Graduation or equivalent in any Civil Engineering Discipline.

**General Experience**
- Minimum total work experience after Graduation – 15 years

**Relevant Experience**
- Minimum experience in material testing and quality control of highway design and construction projects – 10 years
- Material Engineer for at least two projects of similar size and complexities.

**Essential Knowledge and Experience**
- A thorough knowledge of Specifications and Standards for Highway Projects in developing countries including India and International best practice.
- A thorough knowledge on modern techniques of materials investigation and laboratory testing is essential including monitoring quality control documentations at Laboratory.
- The candidate must have wide experience on designs using alternative and local materials, in use of materials in pavement structures.
- The candidate should have experience of supervising contractor’s crushers & mixing plants, design of bitumen & concrete mix, preparation of quality assurance/control manual/system.
vii. Resident Engineers (National)

**Educational Qualifications**
- Minimum - Graduate in Civil/ Highway/ Transportation Engineering.
- Desirable - Post Graduation or equivalent in Civil Engineering/ Highway Engineering/ Transportation Engineering/Construction Management.
- Desirable - Professional/ chartered accreditation with a recognized engineering/management institute.

**General Experience**
- Minimum total work experience after graduation – 10 years

**Relevant Experience**
- Minimum 5 years of total work experience in road safety audits, design, construction, supervision and management of road safety related engineering interventions.
- Candidate should have worked as RE of at least one road construction supervision project of similar size and complexity.

**Essential Knowledge and Experience**
- Candidate must have experience in administering FIDIC conditions of Contracts, specifications and Standards for road safety audits, design, construction, supervision and management of road safety related engineering interventions relevant to India and International best practice, Modern Survey & Construction Techniques and Computer Aided Project Management Tools & Interpretation.

viii. Senior Surveyors (National)

**Educational Qualifications**
- Minimum - Graduate in Civil/ Highway/ Transportation Engineering.
- Desirable – Post Graduation or equivalent in any Civil Engineering Discipline.

**General Experience**
- Minimum total work experience after Graduation – 10 years.

**Relevant Experience**
- Minimum 5 years of total work experience in road safety audits, design, construction, supervision and management of road safety related engineering interventions.

**Essential Knowledge and Experience**
- A thorough knowledge of Specifications and Standards for Highway Projects in developing countries including India and International best practice
- A thorough knowledge on modern techniques of survey e.g. total stations, GPS etc.

ix. Senior CAD Expert (National)

**Educational Qualifications**
• Minimum - Graduate in Civil/ Highway/ Transportation Engineering
• Desirable – Additional qualifications in CAD in Civil Engineering

**General Experience**
• Minimum total work experience after Graduation – 10 years

**Relevant Experience**
• Minimum 5 years CAD experience in AutoCAD, MX Road, or similar software, in CAD applications of road projects, including data imports from GPS, Total Station, checking of vertical and horizontal profiles, and structural drawings.

**Essential Knowledge and Experience**
• A thorough knowledge of Specifications and Standards for Highway Projects in developing countries including India and International best practice.

x. **Environmental Specialist (National)**

**Educational Qualifications**
• Minimum – Master’s Degree or equivalent in Environment Sciences, Environmental Engineering or related field.

**General Experience**
• Minimum total work experience after post-graduation – 10 years.

**Relevant Experience**
• Minimum 5 years of total work experience on carrying out environment impact assessments of road development projects.
• Desirable - Environmental Expert in at least two externally funded (World Bank or ADB) projects.

**Essential Knowledge and Experience**
• The candidate must have knowledge of the Asian Development Bank’s or World Bank’s guidelines, procedures and operational policies/directives.
• Candidate should be conversant with all the activities expected to be undertaken for Environmental / Forest / Wild Life clearance procedures and pertinent guidelines of Ministry of Environment & Forests (MoEF), Government of India.
• The candidate must have the experience of preparing environmental management plans and supervising & monitoring implementation of the plans.

xi. **Social Development Specialist (National)**

**Educational Qualifications**
• Minimum – Master’s Degree or equivalent in Social Sciences or related field.

**General Experience**
• Minimum total work experience after post-graduation – 10 years.

**Relevant Experience**
• Minimum Social/ resettlement expert in at least two externally funded (World Bank or ADB) projects of similar size and complexity.

**Essential Knowledge and Experience**
The candidate must have knowledge of the Asian Development Bank’s or World Bank’s guidelines, procedures and operational policies/directives.

Experience in preparation of RAP, gender plan, LAP, community consultations and IPDP is required.

Familiarity with project area and local language will be advantageous

Contract Administration Specialist (National)

**Educational Qualifications**

- Minimum - Graduate in Civil/ Highway/ Transportation Engineering/ Law.
- Desirable - Post Graduation or equivalent in Civil engineering/ Highway Engineering/ Transportation Engineering/ Construction Management/ Law.
- Minimum total work experience after graduation – 15 years.

**Relevant Experience**

- Minimum 10 years of construction supervision and/or total Project Management experience in Infrastructure projects
- Must have been on dispute resolution board or arbitration panel of at least two road projects
- Candidate should have worked in a similar role on at least one road construction supervision project.

**Essential Knowledge and Experience**

- The candidate must have experience of administering FIDIC conditions of Contracts, specifications and Standards for Highway Projects relevant to India and International best practice, Modern Survey & Construction Techniques and Computer Aided Project Management Tools & Interpretation
- Should have knowledge of contract law, disputes resolution and arbitration.

G. FACILITIES TO BE PROVIDED BY THE RSC

14. Save the limited facilities mentioned in Para (10) above, the RSC shall be required to provide their own office accommodation, support staff, equipment, communication and IT facilities, transportation, and all resources, amenities, and facilities required to complete the services. Provision will be made in their office for visiting staff from the UPPWD Project Management Unit, including a meeting room with all facilities for 20 participants.

H. REPORTS

15. The RSC’s assignment is driven by performance of the services in the field, and not by reports. However, the RSC shall submit the following reports, in a form and manner to be finalized between UPPWD and the RSC:

i. Inception Report: 30 days after mobilization
ii. Monthly Performance Reports:
iii. **List of Road Safety Capacity Building and Strengthening Reports:**
   1. Work plan for Road Safety Capacity Building and Strengthening Report
2. Report on **Strengthening of the capacity of the Road Safety Division, Public Works Department and plan/procedure for interaction with other Stake holders and RSC.**
4. Report on targeted thematic implementation and guidelines for safety and traffic Management infrastructure, including --
   a) Segregation of mixed traffic including motorcycle lane, bicycle lane, and Footpath;
   b) Pedestrian crossings;
   c) Intersections & interchanges;
   d) Active Traffic calming & speed control measures;
   e) Roadside hazards;
   f) Traffic signals, signs and lane marking;
   g) Intelligent transport systems;
   h) Parking zones on-street / off street;
   i) Speed limits / weight limits;
   j) Zoning and congestion pricing;
   k) Traffic restrictions for different vehicles; and
   l) Temporary road closures and car-free programs.
7. Report on carrying out Road Safety Audits on CRN
8. Report on carrying out Indian Road Assessment Programme(I-RAP) surveys to establish road safety **Star Rating** baselines on high-risk corridors in major State Highways or Major District Roads with high traffic volumes;
11. Report on **Road Safety Capacity Building and Strengthening** of PWD on Safety management awareness, readiness and capability and suggestions for improvement measures there upon.
12. Review of documents to improve the contractual framework for safety management, including contract bid documents, RFPs and **TOR** for construction supervision/independent/specialized road safety consultancies/contracts.
13. Report on recommendation for training needs to PWD staff, Contractors & concessionaires, and support Road Safety Division in organizing the training curriculum.
14. Review and Recommendation on necessary interventions required in PWD for effective implementation of requirements of ROAD TRANSPORT AND SAFETY BILL 2015.
15. Preparation of Road Safety Manual to be followed by PWD personnel in light of ROAD TRANSPORT AND SAFETY BILL 2015. This will be hosted on the web for easy access, dissemination and efficient implementation.

vi. Draft Final Report:
v. Final Report