Ref: BTN/IC/2015-01

Terms of Reference for International Consultant

Intelligent Transport Systems (ITS) feasibility study and preparation of a comprehensive ITS Action Plan for Thimphu City
I. BACKGROUND

Bhutan has a population of 741,822 and Thimphu, the capital city accounts for 15% of the total population. Urban population has been growing at a rate of 13% which is higher than the total population growth rate in the country and this is solely due to rural-urban migration, with the perception of better employment opportunities and economic prospects. The increasing population has created several environmental issues, and has had a direct impact on human health, economic hindrances, traffic congestion, and pollution. Road transport is the only mode of transport in the country apart from air travel. The 2000 National Green House Gas (GHG) inventory identifies the energy sector as the second highest contributor of GHG emissions after agriculture. The transport sub-sector accounts for about 44% of all energy-related GHG emissions.

Thimphu city has a road length of over 200 km. Around 30% of Thimphu population owns personal vehicles, of which 65% are cars. Growth in the use of vehicles continues to be very high with an average household vehicle ownership of 1.40. According to the data maintained by Road Safety and Transport Authority (RSTA), about 70% of all vehicles are privately owned cars and two wheelers, including 8% taxis in 2014. In Thimphu, at least 80% of traffic consists of private vehicles and taxis. Two wheelers represent only about 3% of total traffic. The growth of vehicles in Bhutan in general and Thimphu in particular has been quite alarming especially during the last decade, with the majority of vehicles being concentrated in the west. The vehicle population has grown from mere 5,000 in the 1990s to over 69,126 as of 31st October 2014.

On the other hand, the growth of vehicles has not been matched by the supply of road space, parking space or alternate transportation options to reduce traffic congestion and vehicle emission. The Bhutan Transport 2040: Integrated Strategic Vision for Bhutan is to provide the entire population with a safe, reliable, affordable, convenient, cost-effective, and environment-friendly transport system in support of strategies for socioeconomic development. In line with this vision there is an urgent need for well-planned and engineered transport system which is currently lacking. Further the coordination of transport is scattered amongst various stakeholders which needs to be streamlined.

In 2011-2012, a study on Bhutan Urban Transport was conducted and after thorough observation and assessment, the study recommended the feasibility of operating a pre-Bus Rapid Transit system (BRT) with gradual up-gradation to a full BRT system. However, work has not been initiated due to lack of funds.

Currently, the city has one main city bus operator, Bhutan Postal Corporation which runs a fleet of 32 buses around 9 bus routes. There are also two private bus operators (Lama and Bumpa Transport) which operate a fleet of 5 buses on local routes that go beyond the city boundary. As per records of the Bhutan Postal Corporation, the city buses carry around 6,000 passengers per day as compared to 36,000 passengers using taxi services.
At the current rate of increase of cars and significant increase of import of fossil fuels there is a significant threat that Bhutan’s commitment to remain carbon neutral will be challenged. In an effort to address the issue, the Ministry of Information and Communication (MOIC) along with key stakeholders feel there is need for a more intelligent transport system (ITS) for Thimphu city to reform the transport sector into a more environmentally friendly system as demonstrated in many cities around the world. An ITS Feasibility Study is needed to assess design options, system requirements, and identify solutions to address the city’s growing traffic problems and improve the quality of transport services. This Terms of Reference is associated with the UNDP-implemented Low Emission Capacity Building (LECB) Project for Bhutan, which is funded by the European Commission and the governments of Germany and Australia (www.lowemissiondevelopment.org).

II. GOALS

The goal of the ITS Feasibility Study is to develop a desirable intelligent transport system for Thimphu city which is practical and cost-effective for an efficient and effective transport management system in Thimphu city. An ITS Action Plan will also be developed for Thimphu City with support from this consultancy.

III. SCOPE OF WORK

The assignment aims to carry out activities which would be used as inputs and basis for Thimphu city to finalize ITS Strategic plan. The activities include:

1) Assessment of ITS service needs based on the current and future transport challenges and identifying key priorities for ITS service for Thimphu city.
2) Assessment of operating environment with respect to legal and institutional arrangements and technical capacity.
3) Recommendations for technological and financing options for the ITS.
4) Stakeholder workshop for consultation on the feasibility study and action plan and awareness raising, including capacity building.
5) Provide technical support to key stakeholders in planning proposed activities, which would ultimately include development of an ITS architecture, an action plan, and recommended assignments of roles and responsibility with a timeline.

IV. TASKS

The consultancy will commence from 1st February 2015 to 30 June 2015. The consultant is expected to make minimum 3 visits to Bhutan to ensure smooth facilitation and development of the feasibility study and action plan. An inception report including a clear plan and
methodology with a timeline should be submitted 2 weeks after contract signing. Contract tasks will include:

- Consultation with stakeholders to become familiar with current transport service and issues and identify ITS needs for Thimphu city. The consultant is expected to carry out a desk review of existing documents and reports related to transport, including the Thimphu structure plan (key documents will be provided to consultancy).
- ITS service needs should be recommended through short, medium and long term plans. The Plans should identify different components of ITS relevant to Thimphu city. The Plans should include qualitative and quantitative data and the ITS study should also address environmental, social and co-benefits in terms of addressing climate change mitigation and meeting development needs in Bhutan.
- Review existing policy and legal documents related to transport and identify opportunities and barriers to plan implementation.
- Visit relevant agencies to study institutional arrangements and functions to identify opportunities and constraints faced in efficient and effective implementation of ITS.
- Recommend solutions based on international best practices and developments and recommend ITS architecture and technology options, including cost estimates with context to Bhutan.
- The consultant should conduct face-to-face consultations and raise awareness of benefits of ITS to stakeholders. The consultant will take stock of stakeholder perceptions, findings and recommendations and make recommendations on roles and responsibilities each agency could play in ITS implementation.
- Provide necessary support in drawing a strategic action plan. The consultant will also assist in drafting necessary TORs for immediate ITS implementation by preparing detailed tender-ready specifications for ITS components that are recommended for immediate (up to 5 years) deployment within the identified locations within the City.

V. EXPECTED DELIVERABLES: PLAN DEVELOPMENT

- Develop a systematic and comprehensive plan for Traffic Management System. This will include: (i) establishment of a 24/7 operation control center and its management set up; (ii) plans for installation of CCTV cameras, speed monitoring cameras, traffic lights at identified junctions, parking guidance systems and other ITS equipment along the city roads, junctions, highway connections and major junctions as per requirement; and (iii) an ITS Blue Print for the City. (Note: The plan for CCTV should complement the already existing plan on installation of CCTVs by the Royal Bhutan Police and must specifically address monitoring traffic flow and surveillance at bus terminals.
• Develop a plan for setting up Traveler Information Systems at the city bus terminals/bus stops and the inter-city bus terminals in Thimphu and Traveler Information system in in the inter-city bus terminal in Phuentsholing

• Design user training curriculum and schedules, and suggest training institutes for training of officials on installation, maintenance and management of the Control Centre and the entire ITS system.

• Prepare detailed tender-ready specifications for ITS components that are recommended for immediate (up to 5 years) deployment within the identified locations within the City.

• The Feasibility Study must, to an adequate degree of detail, address the following individual ITS components.
  i) Weigh in motion, virtual weigh stations, and automated vehicle identification systems
  ii) Video incident detection systems
  iii) Road and weather information systems including real time emission recorder/data collectors
  iv) Speed monitoring devices and systems

The consultant should explore opportunities for integrating these components and leveraging their capability to achieve practical and cost effective solutions. The recommended technology should be based on its effectiveness, maintenance, serviceability, durability, and conformance with the international ITS architecture standards.

Other technologies may be identified and included as per relevance, cost, and time constraints, and may include over-height warning/detection, traffic classification/counting, data collectors (detector loops, detector cameras, CCTV's), parking guidance signs, forewarning variable message signs, off-street parking collection equipment, bus priority/lanes signs and signals, bus departure and arrival information systems, GPS systems, etc.

• Develop and present to the steering committee a draft final report detailing the results and recommendations of the above tasks.

• Make a presentation on findings to the steering committee and MoIC.
- Finalize the report by incorporating the feedbacks from the steering committee and the project force team

**VI. DATA COLLECTION & ASSESSMENT**

- Gather basic background such as existing and projected collision and traffic statistics (all available data would be shared with the consultants).
- Review all existing relevant reports including the structure plan of Thimphu, Bhutan Transport 2040: Integrated Strategic Study and Bhutan Urban Transport Systems Study Report for Thimphu.
- Consult and interview relevant officials of the MoIC, Road Safety and Transport Authority (RSTA), Traffic Police, Thimphu Thromde, Department of Human Settlement, Department of Roads, and Bhutan Postal Corporation and relevant stakeholders
- Identify relevant technologies that can be realistically implemented under the current technology regime and the agencies budget positions for the immediate and long term.
- Identify international best practices based on similar traffic, road conditions, natural topography, weather characteristics, social and cultural values/systems, etc.
- Estimate life-cycle costs and benefits of potential ITS applications. Costs include initial capital and ongoing maintenance and operating costs.
- Prepare and submit a Needs Assessment Report summarizing the findings of the above tasks and identifying the ITS requirements for the identified roads, junctions, locations on and the major highway junctions/connections.

**VII. WORK SCHEDULE**

The duration of the contract shall be for five months from 1st February 2015 to 30 June 2015.

Parts of the assignment can be home-based with a minimum of three visits for contract signing stakeholder consultation and data collection. The consultant should also make a visit to present the draft report and seek stakeholder’s feedback in finalization of the report. The payments will be made as per the deliverables indicated below.

<table>
<thead>
<tr>
<th>Deliverable/Milestones</th>
<th>Time line (Tentative – Subject to change after discussions with Project manager)</th>
<th>Payment schedule (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract signing</td>
<td>1 February 2015</td>
<td></td>
</tr>
<tr>
<td>Stakeholder consultation, interviews, desk review and field</td>
<td>2-10 February 2015</td>
<td></td>
</tr>
<tr>
<td>visit to Phuentsholing</td>
<td></td>
<td></td>
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</tbody>
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### VIII. QUALIFICATION & REQUIREMENTS

- Master’s degree in transport engineering or related fields
- Ten years of expertise in ITS design, planning and implementation
- Proven track record of work in the area of ITS
- Experience in ITS design and practical project implementation within Asia
- Strong experience in leading ITS projects
- Thorough understanding of ITS Architectures, practical experiences in ITS deployments, and working knowledge of hardware components included in ITS technology.
- Excellent written, communication and presentation skills in English
- Excellent human relations, coordination and planning skills
- The Consultant must be an individual that has no direct or indirect affiliations (financial or otherwise) with an ITS product manufacturer/vendor, and must disclose any associations that may affect the impartiality of the study outcome.

### IX. REPORTING

- Submit an inception report two weeks after contract signing
- Submit three progress reports on the work progress and status to the project manager. The reports should be brief, succinct and provide items requiring attention of the steering committee
- Submit draft report, including all plans and needs assessment.
- Submit final report, including all plans and needs assessment. Include interviews, minutes of meetings, presentations as annexures
The consultant shall provide a copy of the final report along with an electronic copy of text files, drawings and maps.

X. INSTITUTIONAL ARRANGEMENT/ REPORTING RELATIONSHIP

The consultant shall work under the direct supervision of the identified project manager from MOIC, Royal Government of Bhutan and in close consultation with UNDP and other relevant stakeholders. The office of the consultant will be housed in the Road Safety and transport Authority and an official will be designated to provide assistance and necessary support to the consultant. The Project Manager from MOIC will manage the study, oversee the progress, and provide directions for the study.

The consultant will report directly to the project manager on day-to-day activities and submit reports as required in the agreed upon plan and time schedule.

X1. RECOMMENDED PRESENTATION OF OFFER

The following documents need to be submitted:

a) Duly accomplished Letter of Confirmation of Interest and Availability using the template provided by UNDP;

b) Personal CV or P11, indicating all past experience from similar projects, as well as the contact details (email and telephone number) of the Candidate and at least three (3) professional references;

c) Brief description of why the individual considers him/herself as the most suitable for the assignment, and a methodology on how they will approach and complete the assignment.

d) Financial Proposal that indicates the all-inclusive fixed total contract price, supported by a breakdown of costs for professional fee and travel costs to Bhutan. If an Offeror is employed by an organization/company/institution, and he/she expects his/her employer to charge a management fee in the process of releasing him/her to UNDP under Reimbursable Loan Agreement (RLA), the Offeror must indicate at this point, and ensure that all such costs are duly incorporated in the financial proposal submitted to UNDP.

Proposals should be submitted in electronic format by 9th January 2014 to procurement.bt@undp.org.
XII. CRITERIA FOR SELECTION

On advertisement of the procurement notice, qualified consultants are required to submit both the technical and financial proposals. The Combined Scoring Method will be used to evaluate the consultant where technical and financial proposal will be given 70% and 30% weightage respectively. The consultant should obtain at least 70% in technical category to qualify for financial evaluation. The technical evaluation will be based on the following allocation of points:

<table>
<thead>
<tr>
<th>Evaluation category</th>
<th>Maximum Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Education qualification in the related fields</td>
<td>30</td>
</tr>
<tr>
<td>2. Relevant work experience in ITS design, planning and implementation</td>
<td>40</td>
</tr>
<tr>
<td>3. Experience in implementing similar projects within the region in Asia</td>
<td>15</td>
</tr>
<tr>
<td>4. Proposed Methodology</td>
<td>15</td>
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</tbody>
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Contact Persons for the assignment:

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