

Draft Terms of Reference (TOR) for Consultant to Implement Intelligent Transport System (ITS) at Chandigarh Transport Undertaking

1. INTRODUCTION

Efficient and Sustainable City Bus Services (ESCBS) Project is a step forward in the initiative taken by the Government of India (GoI) under Jawaharlal Nehru Urban Renewal Mission (JnNURM) and Sustainable Urban Transport Project (SUTP), under GEF 5, to promote bus based public transportation in the country.

The Government of India through Ministry of Urban Development (MoUD) with assistance from the Global Environment Facility (GEF) and the World Bank has initiated the project on ESCBS with focus on improvement of Bus Transport infrastructure, fleet management, Intelligent Transport System (ITS) and improvement in fuel efficiency. This project underlines the goals of the National Urban Transport Policy formulated by GoI.

The ESCBS project is designed to complement the baseline project, Bus Funding Scheme of the Government of India under the JnNURM, through additional activities that would help realize its full potential. The Project is designed to specifically focus on (i) Review of the legal, regulatory, institutional and fiscal constraints to operation of sustainable city bus services, identification of areas for reform and development of policy notes for initiating deliberations at the national, state and city levels for addressing these issues; (ii) A comprehensive capacity building program for the nascent urban bus sector including training programs, knowledge and exchange events for sharing of best practices and experiences among public and private stakeholders; and (iii) Targeted city level modernization interventions to showcase low cost high impact initiatives in bus operations and user responsive initiatives.

Four cities have been selected by MoUD for the purposes of demonstration on modern and sustainable city bus service. The four cities are Bhopal, Chandigarh, Jaipur and Mira Bhayandar. One of the bus service improvements involves demonstrating the application of ITS/ MIS for service improvements.

The Chandigarh Transport Undertaking (CTU) under the project intends to apply a part of the GEF grant proceeds towards hiring the services of a qualified agency to provide consultancy support to implement ITS / MIS for its city bus services.

CTU was established in the year 1966 with a fleet of around 30 buses. It now provides bus services to the public covering the city, suburbs and the neighbouring states. CTU is also a member of Association for State Road Transport Undertaking (ASRTU).

CTU has a total fleet of about 517 buses which include both long-distance regional buses and also city & suburban buses. There are currently around 471 buses that are being operated after condemning the old buses which are operating from four depots of CTU. Out of the 471 buses, 276 buses were running as city bus service which serve the Tri-City Area. There are 60 suburban buses to the nearby areas like Zirakpur, Kharar, etc. The fleet includes standard size buses, semi low floor non-A/C buses, A/C buses, Low Floor A/C buses, Low floor non-A/C Buses, and mini A/C buses. 135 buses are running on long routes.

CTU has recently been sanctioned 400 BSIV-compliant buses with pre-conditions such as formation of a Special Purpose Vehicle (SPV) and installation of Intelligent Transport System (ITS). These new buses would be used only for the city bus services.

As part of the GEF-V Project, initiated by Ministry of Urban Development (MoUD) and World Bank, CTU has developed a City Bus Modernization Plan (CBMP). One of the components of the plan is the introduction of Intelligent Transport Systems (ITS) into the city's bus operations.

The City Bus Modernization Plan (CBMP) identified technology intervention, namely, Intelligent Transport Systems for enhancing customer experience and improvement in bus operations & management. The DPR for the implementation of ITS in CTU has been prepared by IBI Consultancy India Private Limited (Agency engaged by CTU to prepare CBMP, ITS DPR and Draft RFP for System Integrator).

2. OBJECTIVES OF THIS CONSULTANCY ASSIGNMENT:

The objective of the assignment is to hire a qualified consulting agency to provide expertise in

- (i) Reviewing, updating and finalizing the design, specification, implementation strategy and bid evaluation criteria documented in the draft RFP for selection of System Integrator (SI) to implement ITS in CTU, prepared by IBI;
- (ii) Conducting Bid Process Management for hiring the System Integrator (SI), which includes updating the draft RFP, finalizing the deliverables, incorporating any amendments post pre-bid meeting, evaluating bids & managing contract process for SI including stakeholder consultation and seeking approval at every stage;
- (iii) Monitoring the performance of the System Integrator;
- (iv) Helping the CTU to build capacity and enable knowledge transfer from System integrator; and
- (v) Preparing impact assessment report.

3. SCOPE OF WORK:

The tasks to be undertaken by the agency to be hired have been outlined in three stages, namely:

- (i) Pre-implementation stage,
- (ii) Implementation stage and
- (iii) Post-implementation stage

The details of tasks, expected outputs and schedules have been discussed in paragraphs below. The Consultant must review DPR and draft RFP document prepared by IBI and all available project related document & prepare an implementation schedule for each phase of the work in conformity with the overall project implementation schedule of the project.

(i) Pre-Implementation Stage:

The Consultant is required to provide expertise in terms of Information Technology experience, understanding of bus operations, procurement and subject matter expertise in ITS operations to further augment initiative of providing best in class transit services to commuters and a relevant action and delivery oriented Management Information System (MIS).

The scope of the Consultant would include end-to-end Project Management broadly including the tasks mentioned below and allied activities.

The Consultant shall

- a. Develop proper understanding of the project objective after studying the DPR and draft RFP document prepared by IBI and all available project related document. Special emphasis on the following from the perspective of implementation should be given:
 - Design, framework, specifications and report generation
 - Implementation strategy and sequencing of activities
 - Bill of Quantities (BOQ)
 - SI Contract
- b. Modify RFP based on the changes suggested during bid process management.
- c. Coordinate and take feedback from all concerned stakeholders. Post approval from all stakeholders, incorporate the amendments

During the pre implementation phase the following tasks need to be accomplished by the Consultant:

Task 1: Solution Design Assessment & Project Management Planning for ITS implementation (including MIS) (2 Months)

- 1.1 Assessment of design for ITS (including MIS) in a way that it meets the requirements of the Project and finalize the same in consultation with the stakeholders.
- 1.2 Review and sign-off the detailed design document with clearly defined ITS solutions, processes and infrastructure envisaged for the project.
- 1.3 Review functional requirements of the proposed solution, change management process including development, staging and production environment detailed by DPR Consultant.
- 1.4 Review or prepare report(s) on the following:
 - a. Architecture design specification
 - b. Solution specification
 - c. Component description
 - d. Deployment plan (taking into account available equipment resources)
 - e. Training plan
 - f. Acceptance test plan
 - g. Service Level Agreement (including service level parameters for measuring the effectiveness of MIS in the ITS environment)
 - h. MIS and Business Critical Dashboards to aid efficient operations environment.
 - i. Prepare Operations SOP's to ensure management and delivery on predictable levels
 - j. Risk assessment for the proposed ITS and Risk Mitigation Strategy.

Deliverables of Task 1:

1. Report should include, but not limited to, following:
 - a. Architecture design specification
 - b. Solution specification
 - c. Component description
 - d. Deployment plan (taking into account available equipment resources)
 - e. Dashboard capabilities
 - f. Training plan
 - g. Acceptance test plan
 - h. Service Level Agreement while implementing the ITS in CTU including the key service level parameters for measuring the effectiveness of MIS in ITS environment.
 - i. MIS and Business Critical Dashboards to aid efficient operations environment.
 - j. Standard Operating Procedures; evaluation and process reengineering wherever required.
 - k. Risk assessment
2. Preparation of updated RFP document for proposed ITS after discussion with all the stakeholders

Task-2: Bid Process Management and support required during selection of System Integrator. (6 Months)

- 2.1 Assist CTU in various stages of tendering process i.e, conducting pre bid conference, reply to queries during the pre bid meeting, issue corrigendum,

preparing evaluation matrix, evaluating proposals received, preparing evaluation report and selection of the System Integrator.

2.2 To ensure that the technical solution proposed by the selected bidder meets all the requirements and objectives defined in the RFP documents.

2.3 Assist CTU to prepare the Contract along with Service Level Agreement (SLA) to be signed with the successful bidder. The Consultant will prepare this in consultation with all the stakeholders.

Deliverables of Task 2:

1. Bid evaluation matrix
2. Bid evaluation report
3. Contract along with Service level agreement to be signed with the selected System Integrator
4. Signing of contract with SI

(ii) Implementation Stage: (6 Months)

In this stage the Consultant shall supervise and monitor as well as provide guidance to CTU. Key activities shall include:

- a. Providing proactive inputs to CTU as well as to the SI to ensure that results are achieved as per the desired objectives.
- b. Monitor the performance of the SI on defined SLAs.
- c. Ensure schedule and process compliance with effective project planning and monitoring;
- d. Periodic status reporting;
- e. Risk assessment with recommendations to mitigate the identified risks;
- f. Resource utilization and variances;
- g. Validation of solution proposed;
- h. Ensure critical elements of the project are covered in the Proof-of-Concept (PoC) for technology and solution validation.
- i. Facilitate acceptance testing;
- j. Provide suggestions for Business Process Re-engineering wherever required;
- k. Review SI's project methodology, project templates, questionnaires and other toolkits that aid in capturing detailed requirements in developing the solution. Coordinate/arrange workshops and interviews that need to be conducted;
- l. Assist CTU for certification of quality assurance including certification of hardware, software and other related components before commissioning and monitor compliance to service level agreement for the same. Ensure that only open data sharing standards are used.
- m. The Consultant shall give recommendations on training and deployment plans, proposed migration plan and may include phases (alpha, beta, pilot roll out) before a full-scale roll out. Critical reports such as transition plan;

feedback of pilot roll out shall be submitted to CTU. Feedback from stakeholders shall be incorporated into the specifications and provided to the vendor for implementation.

- n. Validate solution architecture to ensure interoperability, scalability and performance.
- o. Ensure that the vendor has addressed the issues of maintenance of the system satisfactorily.
- p. Ensure that the project life cycle activities are conducted as per the project plan finalized with the SI.
- q. Ensure quality of deliverables at each review milestone and advise corrective action as needed.
- r. Evaluate project progress on cost schedule and resource utilization. Advise corrective action for variance in performance against set standards.
- s. Review the working prototype and final delivery of the solution.
- t. The Consultant shall advise the SI on evolving the test plan required to meet the outlined specifications and SLA. The Consultant shall ensure timely and proper fixing of bug and report the same. Critical test reports in areas such as scalability, interoperability and performance shall be submitted.

Deliverables of Implementation Stage:

- 1. Review report of the prototype of all the modules of ITS / MIS
- 2. Detail report on works carried out by system integrator for ITS implementation.
- 3. Periodic project progress report
- 4. Exception report (SLA breach)
- 5. Acceptance testing and quality assurance certification

(iii) Post Implementation Stage

This phase shall include post deployment monitoring, assist CTU to build capacity & enable knowledge transfer from System integrator and prepare evaluation/impact assessment (12 Months)

Post Deployment Monitoring & Knowledge Transfer:

- a. The Consultant shall conduct monthly post deployment reviews to ensure that the objectives of the project agreement and delivery of the services are as per the SLA.
- b. Implement a post deployment assessment activity of the project
- c. Assess effectiveness of the project deliverables
- d. Review the SLA for the SI and bring out the variances and options to mitigate these if necessary.

- e. Monitor the performance of the SI on as per defined SLA
- f. The Consultant shall monitor processes and activities to ensure that project deliverables deliver the intended benefits
- g. Review the various manuals (user manual/maintenance manual/training manual) prepared by the SI and recommend revisions if any.
- h. Supervise the capacity building and change management exercise expected to be provided by the SI to the related staff responsible for implementation of ITS components and also supervise the guidance imparted to the relevant stakeholders to take advantage of MIS for enabling decision.
- i. Knowledge transfer to CTU along with the learning, best practices followed, challenges faced (i.e. managerial, technical and financial) and improvements suggested.
- j. Assessment of capacity building of the staff CTU.
- k. Risk Assessment with recommendations to mitigate the risks.
- l. Ratify SI plan for withdrawal and post withdrawal support.

Evaluation/ Impact Assessment:

With the objective of evaluating the effectiveness of the ITS implementation at CTU, the Consultant shall prepare an impact assessment report. The report should consist of the methodology and performance measures for comparing the pre-implementation scenario with the post-implementation scenario. The report shall provide a roadmap for evaluating the project outcomes through collecting, analyzing and documenting relevant performance indicators. The Consultant shall incorporate a review of project outcomes and compare them to the expected outcomes and baseline data in its quarterly report.

Deliverables of Post-Implementation Stage:

- 1. Submission of quarterly post-implementation monitoring report should include, but not limited to, following
 - a. Performance report of SI
 - b. Survey report
 - c. User manual evaluation report
 - d. Capacity building and change management evaluation report
 - e. Exception report (SLA breach)
- 2. Project knowledge transfer document and lessons learned report
- 3. Quarterly project evaluation report including impact assessment report

3 Consultant Team Requirement

Position	Minimum Qualifications	Specific Experience	Nature of Involvement	Onsite Duration
Project Manager	Master Degree in Transportation Engineering Or Equivalent	<p>Atleast 10 years experience as Project Leader in implementing all aspects of the planning, design, implementation, Integration and operations of Intelligent Transportation Systems.</p> <p>In addition to expertise in the transportation operations, the PM should also have experience in Information technology and communication.</p> <p>PMP, PMI, prince2 or similar Certification and training are desired. Should Have demonstrated analytical skills to analyze and interpret data Good communication skills in local language and English and good</p>	Manage timely delivery of Pre-Implementation, Implementation and post-Implementation stages.	26 Months

		written Communication skills in English.		
ITS Specialist	Degree in Engineering Preferably Transportation and good knowledge Of Information Technology	Atleast 8 years Progressive experience in at least 2 similar Intelligent Transportation System (ITS) projects as well as Demonstrated Knowledge and credentials in the ITS industry.	Provide expert inputs on deliverables of Pre-Implementation, Implementation and post-Implementation stages	17 Months (include s only 1 st Quarter of post Impleme Ntation stage)
IT Specialist	Degree in Engineering preferably in Computers / electronics Or Equivalent	Atleast 8 years experience as IT expert in at least two similar projects - ITS design, Implementation technology and Systems integration.	Provide expert inputs on deliverables of Pre-Implementation, Implementation and post-Implementation stages	17 Months (Include s only 1 st Quarter of post Impleme Ntation stage)
Procurement Specialist	Degree in Engineering And Master's Degree in Contract Managemen T Or equivalent	Atleast 10 years experience in preparation of tender documents and in carrying out bid process management. Should have experience in ITS-Related procurement and should be capable of understanding And Communicating the technical specifications of ITS products	Provide expert inputs on deliverables of Pre-Implementation and Implementation stages	14 Months

		(Hardware and software) to the Implementation agency. The expert should have ability to conduct market research, negotiate pricing and establish terms and conditions for services and product maintenance. Experience with World Bank Procurement Guidelines is preferable.		
Field Officer	Degree in Engineering or Diploma In Information Technology Or equivalent	Atleast 8 years experience in Information Technology project management and Transport domain. Conversant with the local language (Punjabi).	Designated to be onsite for entire period of the project. Responsible for all field Related activities and reports to the Project Manager.	26 Months

Note: It is expected the team has experience and expertise available in ITS for Automatic Vehicle Location System (AVLS), Passenger Information Systems (PIS), Automatic Fare Collection System (AFCS) through Electronic Ticketing Machine (ETM) with Smart Travel Card, Automation of Depot activities and Depot Management System (DMS), traffic management, signal synchronization, fare integration mechanisms, Transit Management System and other ITS related modules.

4 Project Schedule

Months	2	6	6	12
Pre Implementation Phase				
Implementation Phase				
Post Implementation Phase				

5 Payment Schedule

S. No.	Milestone	Time Frame	Payment (%)
1.	Signing of contract	T	10%
2.	Approval of all Deliverable of Task 1 of Pre-Implementation Stage	T + 2 Months	10%
3.	Approval of all Deliverable of Task 2 of Pre-Implementation Stage	T + 8 Months	20%
4.	Approval of all Deliverable of Implementation Stage	T+ 14 Months	30 %
5.	Approval of all Deliverables of Post-Implementation Phase (Quarterly)	T + 26 months	30%