

Terms of Reference (ToR) for Selection of Project Consultant for Development of a Manual for the Planning, Design and Implementation of Bus Depots for City Bus Operations

Project Consultancy – 4 (PC 4)

1. Background:

City Bus operations in India have been impacted by two important factors — the **Motor Vehicle Act, 1988** and the **Bus Funding Scheme** under the **National Urban Renewal Mission (NURM)**. The Motor Vehicle Act, 1988 governs all road transport in the country. It endows State Governments with the responsibility for bus transport including city buses.

The Bus Funding Scheme under the NURM provided 141 cities with financial assistance to initiate or strengthen city bus services. Before the Bus Funding Scheme, city bus operations in India were largely managed either by private operators or State Road Transport Corporations (SRTCs). These organisations had limited public funding support and therefore could not fully meet the growing demands for public transport.

Operators of intermediate public transport modes (such as auto-rickshaws, jeeps, taxi, cabs, stage cars, etc.) increased their services in response to the commercial opportunities of growing travel demand. However, the intermediate modes were unable to meet the increased travel demand created by rapid increases in urban population and urban development.

This supplier situation led to severe crowding and congestion. People resorted to private modes of travel in absence of regulated, reliable, safe and comfortable public transport services. The rapid increase in personal motorised vehicles also led to high levels of air pollution which significantly reduced the quality of the living environment.

The Government of India (GoI) concerned about the negative effects of the rapid increase in personal motorised vehicles and started programs to promote public transport in cities. Under the second stimulus package in 2009, GoI announced that it would provide states with financial assistance under NURM for the purchase of buses for their urban transport systems. The objectives for the funding were to:

- Provide new, cleaner, more user-friendly buses to help cities offer a higher level of service and convenience for passengers; and
- Support the implementation of public transport institutional and service reforms, including setting up Special Purpose Vehicles (SPV) for managing and operating NURM-financed buses.

GoI launched a second phase of the Bus Funding Scheme in 2013. Under this program, GoI provided funding for the purchase of buses to a total of 141 cities across the country. This led to the operation of new public transport (PT) systems in cities which never had any formal PT system previously. New PT agencies were formed either to directly operate the buses or to contract with private operators to provide new PT services. The new PT systems are managed in a variety of ways – SRTCs, Special Purpose Vehicles (SPVs) or by the Municipal Authorities/ Government department's bus companies.

In many cases, however, the new agencies lack the physical facilities and the technical and human resource capacity to operate and maintain the buses received under the Bus Funding Scheme. Often, the new agencies did not have bus depots with the physical capacity to maintain

the buses. The new agencies could not maintain the buses as per accepted international standards for bus inspections, preventative maintenance and component repairs. The result has been that the new buses have prematurely aged and will not be operational over their expected useful service lives.

The inadequate storage facilities also adversely impacted operations. Buses were often parked in city streets because of inadequate parking capacity within the depots. This poor situation hampered efficient daily operations because it added time to the daily pull-out, pull-in and servicing of buses. It also made it difficult to provide adequate security when the buses were parked overnight.

Some cities have begun to consider upgrading the existing or building new depots. However, full-time staff and bus operations expertise are critical problems. The absence of in-house capacity has made it very challenging for cities to plan and design bus depots that are efficient operationally and meet the maintenance challenges of increasingly-complex buses.

The Ministry of Urban Development (MoUD) intends to address this capacity need by hiring a competent consultancy to develop a bus depot planning, design and implementation manual. The manual will address the key issues that PT agencies should address when designing a bus depot that provides the capacity to maintain buses as per the accepted standards and is operationally efficient. The manual also addresses the importance of developing a detailed implementation schedule for the construction and commissioning of the depot. The MoUD intends to fund this technical effort under Component 1 of the **Efficient and Sustainable City Bus Services (ESCBS)** project.

2. GEF- 5 Project on Efficient and Sustainable City Bus Services (ESCBS)

The objective of the ESCBS project is to promote bus based public transportation in the country. ESCBS is a step forward in the initiatives taken by the GoI through NURM and the Sustainable Urban Transport Project (SUTP) and is funded under GEF-5,

The ESCBS project is consistent with the GEF-5 focal area of Climate Change Mitigation. It aligns well with objective to “Promote Energy Efficient, Low- Carbon Transport and Urban Systems”.

The ESCBS project is designed to complement the baseline project of Bus Funding Scheme under the NURM through additional activities that would help realize its full potential. The proposed project will fund the incremental costs of activities aimed to enhance sustainability, energy efficiency, quality of city bus services and thereby increasing the potential for GHG emissions reductions from the baseline project.

The ESCBS project has three major program activities:

- **National Capacity Building:** Development of 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;
- **Regulatory, Institutional & Fiscal Analysis:** 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;

- **City Demonstrations:** Targeted city level modernization interventions to showcase low cost high impact initiatives in bus operations and user responsive initiatives.

The ESCBS project is being implemented through the following three main components:

Component 1:- National Capacity Building for Urban Bus Sector

Primary objective of this component is to build capacities in the field of urban bus service operations. The main activities identified under component include:

- (i) **Developing policy recommendations** to assist nodal government departments at the National and State level to address identified issues; and
- (ii) **Capacity building** of the urban bus sector through development of knowledge materials (training toolkits), training activities, knowledge sharing and cross learning events, dissemination of best practices, etc. in cutting edge areas aimed at development of the overall urban bus sector in the country.

This project component is being implemented by the MoUD.

Component 2A: City Demonstration Projects – Physical Improvements

This component supports physical improvements targeted at modernizing the city bus services in demonstration cities including:

- (i) **Modern depot equipment** for improved maintenance and life of buses
- (ii) **Modern ITS** for vehicle-tracking, passenger information systems and automatic fare collection to make the services more user friendly,
- (iii) **Modern MIS** for improved management information systems, inventory management systems, vehicle dispatch and crew scheduling, maintenance management, improved collection management, analysis, reporting and use of data for more scientific planning to enable optimal use of facilities.

This project component is being implemented by the respective project cities.

Component 2-B: City Demonstration Projects – Technical Assistance and Capacity Building

The capacity building and technical assistance component is targeted at supporting the modernization efforts of the selected four demonstration cities. This involves assistance to improve their quality of service through technical assistance in focus areas such as service planning and route rationalization, greater private participation including mainstreaming informal sector, improved branding and overall financial sustainability, vehicle and driver performance management with a view to improving fuel efficiency, overall financial sustainability and reform implementation. It also includes assistance in capacity building through conducting workshops and training events.

This project component is being implemented by the respective project cities.

The MoUD intends to fund the development of the bus depot design and implementation manual under the National Capacity Building program area of the ESCBS project.

3. Objective of the Consultancy Services and Broad Scope of Work:

The objective of the assignment is to develop a **bus depot planning, design and implementation manual** that can be used by PT agencies that are involved in the planning, design, construction, commissioning and operation of bus depots. These agencies either directly operate the bus services using their own employees or contract with private companies to operate the bus services. Since many professionals at these agencies have limited expertise in bus operations, the manual shall be written in a simple style that assumes no prior knowledge of bus operations, planning or design.

The manual should address the entire process of bus depot planning, design and implementation. It should address, but not be limited to, the following technical topics:

- **Identification of system bus maintenance and storage needs.** The analysis should start by examining the needs of the current bus fleet plus the anticipated growth in bus fleet over the next ten years. These needs should include daily bus servicing, night parking, scheduled maintenance inspections, scheduled preventive maintenance, routine ongoing repairs, and, if appropriate, refurbishment/ rebuilding of major bus components such as engines and gearboxes. An assessment methodology should be developed that guides PT agencies perform this analysis.
- **Preparation of a system bus depot plan.** Guidance should be provided on how PT agencies should prepare a bus depot plan for the next ten years that best meets the system needs. The guidance should examine potential actions such as building new bus depots and rehabilitating and expanding existing bus depots. Potential centralisation of functions such as body repairs and refurbishment/rebuilding of major bus components should be considered. A location analysis methodology should be suggested to examine ongoing operations costs related to the daily deadheading costs (i.e., dead kilometres and dead driver work hours) among potential bus depot locations. A guidance should outline a costing methodology helps identify most cost-effective plan that considers both the capital costs and ongoing operations and maintenance costs of the system plan.
- **Functional space requirements.** Guidance should be provided on the space requirements for the different functions that will be performed at a specific bus depot. These should include servicing, bus repair, bus and employee parking, parts storage, administrative offices, training rooms, employee rooms, and bus circulation etc. The space requirements should be related to measures of operational scale such as annual kilometres, number of vehicles operated, maintenance staff per shift, bus operators per shift, and management staff.
- **Concept of operations.** A strong emphasis of the guidance should be on defining a concept of operations that guides the physical layout of the depot. Three key components of a concept of operations are bus movements, employee work flow, and data entry and retrieval. The bus movements should be for driver pull-outs to start service operations, driver pull-ins at the end of service operations, serving activities (e.g., fuelling, cleaning, parking), and travel between maintenance and parking areas should be considered to minimize daily travel and safety conflicts. Employee work flow includes mechanic travel between work areas and parts rooms, management visual oversight of work activities, and physical separation of driver (operations) and mechanic (maintenance) activities. Data entry and retrieval is important for the recording of maintenance activities and parts usage and analysing trends and performance problems. The guidance should emphasise

the importance of having the concept of operations drive the physical design of the bus depot and not having the design of bus depot dictate the operations plan.

- **Construction and implementation schedule.** The guidance in the manual should outline a complete set of activities that must be considered in the development of a construction and implementation schedule. This schedule should cover all activities from the beginning of site preparation to full operations of the depot. It should include not only construction activities, but also other actions such as installation of maintenance and support equipment, obtaining government permits and approvals, training of maintenance staff, bus purchasing and delivery, and training of drivers and supervisors. The guidance should stress developing a critical path of activities from this schedule as an approach for determining a realistic timeframe and for managing important activities.

The consultancy services are expected to be carried out in four general stages:

- **Review of Existing Bus Depot Planning, Design and Implementation Guidance.** The Consultant will identify and review existing and documented guidance on bus depot planning, design, and implementation. The Consultant shall identify existing guidance written for Indian operations and international guidance that could be applied to Indian bus operations. The Consultant shall convene an advisory panel of Indian industry experts and solicit the panel's assistance in identifying relevant materials.
- **Drafting of a Detailed Outline of Manual Contents.** The Consultant shall prepare a detailed outline of the manual contents based on its review of existing guidance and its assessment of the need to develop new materials in areas where guidance is lacking. The outline will be sufficiently detailed so that potential analysis approaches can be understood and evaluated. The Consultant shall solicit comments on the outline from the MoUD and the advisory panel of Indian industry experts.
- **Preparation of Bus Depot Planning, Design and Implementation Manual.** The Consultant will prepare the manual based on the work conducted in the first two phases. The manual will be written in a simple style that assumes no prior knowledge of bus operations, planning, or design. The Consultant shall solicit comments on the draft manual from the MoUD and the advisory panel of Indian industry experts and incorporate the responses in the final manual.
- **Develop and Demonstrate Training Course on Use of Manual.** The Consultant will prepare a two-day training course on the use of the planning, design, and implementation manual. The primary training media will be PowerPoint slides. The Consultant shall prepare case study exercises to reinforce the concepts presented in the manual. The Consultant shall conduct the two-day course in Delhi.

4. Detailed Scope of Work: The scope of work is divided into following six work tasks:

Task 1: Organise Industry Expert Review Panel

The Consultant shall identify seven experienced managers from the bus industry in India to serve on an industry review panel for this project. The purpose of the panel is to provide input at critical points of the work program and to provide review comments on draft work products. The seven managers should represent a reasonable cross section of PT agencies involved in providing public transport including managers representing: 1) SRTCs, 2) PT agencies directly

operating bus services using their own employees or 3) PT agencies contracting with private companies to operate bus services.

The Consultant will submit a proposed list of potential panel members to MoUD for review and comment. Based on the comments received, the Consultant will invite the potential members to participate on the panel.

The Consultant will be responsible for convening the panel in Delhi twice during the project — once at the outset of the project and a second time to review the draft manual. The Consultant shall be responsible for paying all expenses for the panel members including travel, boarding-lodging and honorarium.

Task 2: Identify and Review the Existing Bus Depot Planning, Design and Implementation Guidance

The Consultant shall identify and review the existing and documented guidance on bus depot planning, design and implementation and shall also identify existing guidance written for Indian operations and international guidance that could be applied to Indian bus operations. The guidance shall cover the following technical areas:

- Identification of system bus maintenance and storage needs;
- Preparation of system bus depot plan;
- Functional space requirements;
- Concept of operations; and
- Construction and implementation schedule.

The Consultant shall conduct the review in two ways:

- A **literature review** of available sources including those on the Internet and available for international public transport organisations such as the International Association of Public Transport (UITP), Transport Research Laboratory (TRL) and Transportation Research Board (TRB).
- **Direct interviews** with at least three large SRTCs and two large city/ SPVs in India. The Consultant should identify the guidance used by these agencies to design depots and interview the relevant managers to gain insight on how well the guidance has worked in practice and how the guidance might be enhanced to address technological changes in buses and maintenance practices.

The Consultant shall prepare a draft interim report that summarizes the results of use of the existing guidance documents for bus depot design.

The draft interim report will be submitted to the MoUD for review and comment to the expert review panel. Based on the comments received, the Consultant shall prepare the final interim report.

Task 3: Prepare a Detailed Outline of Manual Contents

The Consultant shall prepare a detailed outline of the manual contents based on its review of existing guidance and its assessment of the need to develop new materials in areas where guidance is lacking. The outline should follow the sequence of activities that a PT agency would follow from the assessment and identification of system maintenance needs through the design, construction and commissioning of a bus depot.

The outline will be sufficiently detailed so that the suggested analysis approaches can be understood and evaluated. As appropriate, the outline may include flow diagrams or other aids that can add clarity to the draft outline. The outline also should provide for a glossary of terms.

The Consultant shall prepare a draft outline of the manual contents and submit for review and comment to the MoUD and to the expert review panel. Based on the comments received, the Consultant will prepare the final outline.

Task 4: Create Bus Depot Planning, Design and Implementation Manual

The Consultant will prepare the manual based on the manual outline prepared and approved by MoUD in the previous task. The Consultant should write the manual in a simple style that assumes no prior knowledge of bus operations, planning or design. As appropriate, the manual should include:

- Examples of how analysis procedures should be applied. Considerations should be given to using one case study example throughout the manual.
- Flow diagrams or other aids that can add clarity to the suggested procedures.
- Pictures of examples of good depot practices in India and, as appropriate, other countries.

As appropriate, the Consultant shall create excel spreadsheets that would support the use of suggested procedures in the manual. Possible technical areas include:

- Location analysis for examining ongoing operations costs related to the daily deadheading costs.
- Costing analysis to determine the least-cost system plan of bus depots.
- Functional space requirements based on operational measures of operational scale such as annual kilometres, number of vehicles operated, maintenance staff per shift, bus operators per shift and management staff.
- Determination of critical path activities in the construction and implementation schedule.

The Consultant shall prepare an initial draft manual and submit to the MoUD and to the expert review panel for review and comment. Based on the comments received, the Consultant will prepare the final manual.

Task 5: Create Training Course on Use of Manual

The Consultant will prepare a two-day training course on the use of the planning, design, and implementation manual. The primary training media will be PowerPoint slides. The Consultant shall prepare case study exercises to reinforce the concepts presented in the manual.

The Consultant shall prepare draft course materials including PowerPoint slides and case study exercises shall submit the draft course materials for review and comment to the MoUD. Based on the comments received, the Consultant will prepare the final course materials.

Task 6: Conduct Training Course on Use of Manual

The Consultant shall conduct two-day training course on the use of the planning, design and implementation manual for urban bus transport agencies/ authorities and State Transport Undertaking in Delhi. The Consultant shall be responsible for the registration of the participants and all meeting expenses such as workshop venue and usual package of Lunch & snacks.

The Consultant will prepare and administer a participant evaluation form and write a brief report documenting the workshops/ training details and outcomes.

As appropriate, the Consultant shall revise the training materials based on input received during training course/ workshop.

5. Schedule and Deliverables:

Task	Deliverable	Time Frame (Months from Start of Contract)
1	Inception Report and List of potential members of expert review panel	1.0
2	Review of Existing Bus Depot Planning, Design, and Implementation Guidance Report	3.0
3	Detailed Outline of Manual Contents	4.0
4	Bus Depot Planning, Design, and Implementation Manual	8.0
5	Training Course on Use of Manual	9.5
6	Conduct Training Course/ Workshop on Use of Manual	10.0
7	Training Course/ Workshop Report	10.5
8	Final Version of Training Course on Use of Manual	11.0

6. Suggested Consultant's Team Requirements:

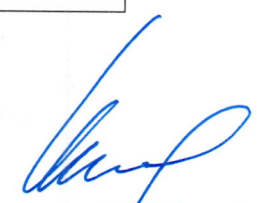
Team Composition (Numbers required)	Minimum Years of Professional Experience	Minimum Qualification/ Area of Experience
Team Leader cum Bus Transportation Specialist (1)	20	Post-graduation or equivalent with minimum 20 years of experience or Bachelor degree in Civil/ Mechanical Engineering with 15 years of experience in Urban Transport planning, research and operations and maintenance management. Experience in planning, operations and maintenance management of bus transport systems is advisable.
Bus Fleet Maintenance and Inventory management specialist (1)	20	Bachelor degree with 20 years of experience in Urban Transport operations, maintenance and Inventory management. Experience about bus technology, bus fleet acquisition, fuel and oil conservation; tyres and re-treading processes; performance assessment, monitoring and control; requirement planning, acquisition, storage and disposal of stores, spares and materials; is essential. Must be conversant with the latest maintenance systems and technologies, tools and equipment; public procurement, inventory management and control techniques and should have good communication and writing skills.
Public Transport infrastructure planning, design and development (1)	10	Graduation in Civil Engineering with 10 years of experience in planning, design and development of Public Transport infrastructure including bus depots and workshops. Sound knowledge of bus parking design, bus fleet maintenance infrastructure design, depot and terminal layout and circulations planning; regulatory, legal standards related aspects; utilities planning and development is essential.
Transportation Planning	15	Post-graduation or equivalent in Transportation planning with minimum 15 years of experience in Urban Transport planning

Team Composition (Numbers required)	Minimum Years of Professional Experience	Minimum Qualification/ Area of Experience
Specialist (1)		and research. Experience in operations and management of transport systems is essential. Must be conversant with the latest analysis and planning tools and should have good communication and writing skills. Experience in Bus operations shall be an advantage
Training Specialist (1)	20	Bachelor's degree. Should also have a minimum of 10 years of training experience in the transportation sector. Must have experience in designing of training programs, designing and development of training support materials and implementing training programs.
Communications Expert (1)	10	Graduation in Management/ Mass Communication or Graduate with advanced diploma in Mass Communication or equivalent. Experience in preparation of contents for training toolkits. Shall have excellent writing, translation and editing skills in English.
Graphic Designer (1)	7	Bachelor's degree in graphic design or related field or equivalent experience. Knowledge of media production, communication, and dissemination techniques and methods. The ideal candidate will have strong visual skills.

9. Payment Schedule:

The following payments shall be subject to the satisfactory completion of the milestones and approval by MoUD.

Task	Milestone	Payment Percentage
1	Inception Report and List of potential members of expert review panel	10%
2	Review of Existing Bus Depot Planning, Design, and Implementation Guidance Report and Prepare a Detailed Outline of Manual Contents	20%
3	Bus Depot Planning, Design, and Implementation Manual	40%
4	Create Training Course on Use of Manual and Conduct Training Course on Use of Manual	15%
5	Training Course Evaluation Report and Submit Final Version of Course Materials	15%


विनय शंकर पान्डेय / V.S. PANDEY
 उप सचिव / Deputy Secretary
 आवासन और शहरी कार्य मंत्रालय
 Ministry of Housing and Urban Affairs
 भारत सरकार, नई दिल्ली
 नए दिल्ली, भारत