Section 7. Terms of Reference

1.1. Assam has approximately 1980 km of navigable waterways of which the most important for transport purposes are the Brahmaputra and Barak Rivers. The Brahmaputra River with a length of 891 Km between the Bangladesh Border and Sadiya, was declared National Waterway no. 2 by the Government of India in 1988, the development of its navigation infrastructure thereafter being the responsibility of the Inland Waterways Authority of India (IWAI). IWAI is currently aiming to maintain a navigable depth of 2.5m from Bangladesh Border to Neamati (629 Km), 2.0 m from Neamati – Dibrugarh (139 Km) and 1.5m from Dibrugarh – Sadiya. However, while IWAI is responsible for the navigation 'fairway' it does not own the water resources or have responsibility for operating water transport services. Landside activities such as riparian land-use development are regulated by State or local governments.

1.2. The Brahmaputra, running through the heart of the state of Assam, provides a vital link for both urban and rural ferry services which are the single most important transport mode for many section of the population, especially rural households in Assam. These ferry services are provided by the Directorate of Inland Waterway Transport Assam, and by country boat operators – typically small independent and informal private businesses. In addition to the 97 ferry service routes designated by the Directorate of IWT, there are numerous routes licensed by the local (village) and district councils. Other users of the river include the Central Inland Water Corporation Limited (a Government of India Undertaking transporting cargo and operating some terminals on the rivers in the Eastern India & North-Eastern India and on the Indo-Bangladesh protocol routes), border security forces, tourist organizations and private operators. Navigation on the Barak River (152 km), although minimal at present, has been designated as National Waterway 16 under the National Waterways Bill (2015).

1.3. The Directorate of Inland Waterway Transport Assam, established in 1958 and part of the Assam Transport Department, is responsible for developing, maintaining and regulating IWT services in the state. It also operates and maintains many of the passenger transport services, ferry terminals and navigation aids on both Brahmaputra and Barak Rivers. Headquartered in Guwahati, it has three divisional offices in Guwahati, Dibrugarh and Silchar; five sub-divisional offices in Guwahati, Goalpara, Jothat, Dibrugrah and Hailakandi; and three commercial offices at Guwahati, Goalpara and Dibrugarh. It also has a Crew training centre at Guwahati. DIWTA currently has a total of about 4,330 regular staff.

1.4. The ferry industry as a whole is characterised by an aging and poorly equipped fleet. Most demand is now met by the informal sector operating traditional country boats without supporting infrastructure. Terminal facilities and navigational aids are insufficient. Most ferry terminals consist of no more than improvised moorings on the bank of the river, which require relocation with changing river conditions, often over substantial distances. In the absence of bank protection, the main ferry terminals in or close to the urban centres (provided with floating, movable steel pontoons and temporary access roads) also typically require frequent relocation as river conditions change across seasons. The cargo sector is small partly because of market circumstances, partly because of connectivity problems and partly because the navigation standards provided do not permit reliable year round use by large modern vessels that can deliver competitive advantage over other transport modes.

1.5. The Government of Assam wishes to transform the quality of inland water transport services and integrate high quality passenger and vehicle ferry services, and inland water freight transport into Assam's wider transport network system.

2. OBJECTIVE

2.1. The primary objective of the study is ***to prepare an Integrated Strategic Development Plan*** to (a) review, assess the overall transport sector in Assam and prepare transport strategy to help the

Govt. to use it for comprehensive and integrated transport solution in the State and (b) guide the sustainable development of the inland water transport sector in India's Assam State till 2035. This will include a vision for the IWT sector development till 2035 and the physical investments (whether from public or private sources), of which a feasibility study will be prepared for activities to be financed under the scope of the Assam Inland Water Transport Project.

2.2. An internationally recognized Consultant is expected to perform the following tasks:

(i) To provide an assessment of current supply and projected demand covering all transport modes including IWT, passenger and freight (including vehicles) for the base year 2017, and the target year of 2035; and intermediate years 2023, 2030;

(ii) To review and compare the structure and level of transport costs for all transport modes and any other factors that impact modal share;

(iii) To review and assess the current condition of the IWT infrastructure and services in the Assam State territory, including the fleet composition, ports, ferry terminals, last mile connectivity, navigation aids, and the main channel managed by the IWAI;

(iv) To fast track assessment and feasibility study of 10assenger ferry Ghats / landing points pre-identified by the Govt. of Assam for modernization / infrastructure improvement on priority.

(v) To provide an assessment of current and projected demand in ferry traffic including vehicle

ferry services and passenger commuting; transportation of freight to local domestic markets and to regional and export markets; and schemes to develop the modal share of the IWT traffic to the maximum potential.

(vi) To assess the sustainability of current financing arrangements for ferry operations, including the scale and structure of current user/ vehicle ferry/ freight charges, cost recovery, oversight and performance of the funding streams, and capacity for cost-sharing at local levels;

(vii) To present a Vision for the IWT sector development till 2035, consistent with current and projected demand, the expected financing capacity of the State, cost-recovery from charges, and indicating clearly opportunities for private finance;

(viii) To identify and propose the required investments with cost estimates for development of the IWT sector in Assam State, for the short term 2018-2023, for the medium term 20232030,and for the long term between 2030-2035 (indicating sources of funding and cost recovery);

(ix) To prepare a feasibility study for investment, which is the Assam Inland Water Transport Project.

(x) To carry out preliminary social assessment (screening & scoping) including establishment of the ownership of land required to trigger the applicability of Right to Fair Compensation and Transparent Land Acquisition and Rehabilitation Act, 2013 (RFCTLAR&R). It must ensure the incorporation of the findings and recommendations of the Social Impact Assessment (SIA), which will run concurrently with the technical design of proposed investments, in the feasibility study, cost estimates and bid packages of the proposed investments.

(xi) To carry out environmental screening and alternatives analysis of all proposed investments, develop an IWT Sustainability Plan including proposed investments to enhance environmental sustainability at the sector level, and ensure full incorporation of Environmental Assessment (EA)

findings and recommendations (to be separately commissioned) into the feasibility studies, designs, cost estimates, and bid packages (as applicable) of proposed investments.

The Consultant undertaking the Integrated Strategy Development Plan would:

1. Coordinate with the Consultant undertaking the Institutional Strengthening and Business Planning, to ensure alignment of the development plan, business plan, demand and supply forecasts, investment plan etc.

2. Coordinate with the Consultants undertaking the Environmental Assessment (EA) studies, the Social Impact Assessment (SIA) and Gender and Trade studies for proposed investments, to ensure their analysis and recommendations are fully incorporated into planning and design of investments.

3. Deliver (a) Assam Transport Strategy (2018-2035) and (b) Investment Strategy and Feasibility studies for Assam IWT sector with focus on passenger and passenger related ferries (including freight transport), as harmonized but separate modules.

2.3. A detailed description of the individual tasks to be carried out by the Consultant is given in the following section

3. SCOPE OF THE STUDY

The scope of study consists of three main modules undertaken through the following main tasks and sub-tasks:

MODULE 1: Assam Transport Strategy 2018-2035 *(The module is to be undertaken primarily as Meta-Analysis drawing on credible existing / secondary research)*

A. Detailed Review and Analysis of Supply of Assam's Transport Sector

This task requires the consultant to collect data and information from the various actors in the entire Assam transport sector, including freight transport data from producers and traders of goods, on the respective transport modes.

Task A.1 - Review of existing documentation and information on Assam's Transport

Sector. The consultant will gather and review existing data and prior analytical work related to trade, transport, logistics and customs / approval agencies in Assam State. The consultant shall verify if additional work has been done, and include that in the review. The consultant will collect, review, analyze and present all existing data and information on transport infrastructure and transport services and operators and the customs transit systems in Assam. The consultant will fill potential data gaps through own data gathering efforts.

Task A.2 - Review of Current Transport Network, Costs and other Factors Affecting

Modal Share. The Consultant will be expected to undertake a detailed review of the current transport network, and comparison of the current level of transport costs (both passenger and freight, domestic and international) for all relevant transport modes in Assam. Other factors affecting modal share should also be reviewed. The Consultant is expected to identify origin – destination pairs for current passenger movement, the mode choice behavior, average lead, travel time / cost etc. Similarly for cargo, the Consultant will map origin - destinations pairs, freight flow patterns, volumes/ commodities transported, modes of transport used, nodes along the chain, such as warehousing, terminals, transshipment points, approval processes etc. up to the final consumption destination. For each link in the chain, the Consultant is expected to collect information on freight tariffs charged by different operators and forwarding agents, and examine the cost of operation for domestic and international

operators (if any) including sea freight charges, port charges, rail and road transport charges, storage charges, financial cost of tied capital, handling cost, taxes etc.

B. The Preparation of Demand Forecasts for the Assam Transport Sector

This task involves a review of current demand in the transport sector in Assam, covering all transport modes including IWT, passenger and freight, and the preparation of robust demand projections for a defined base year 2017, and the target year of 2035; and intermediate years 2023 and 2030. Conditional traffic forecasts should be produced for (1) the current transport network and for (2) a transport network that includes probable new multimodal links.

Task B.1 - Collect and update household, land use, and transport data: The first sub-task will involve the collection and collation of the necessary data to prepare and analyse present and historic traffic volumes (for 5 years) for each mode, separately for freight and passenger traffic. These would include both historical and spatial data. Particular attention will also be given to a separate analysis of origin and destination of international trade and transit flows, separately by mode of transport and by border crossing point.

Task B.2 - Baseline data collection: The Consultant will make maximum use of available data from existing secondary sources, including technical studies, documents, traffic counts and existing OD matrices (if any). The Consultant will be expected to review this information, validate against aggregate trade data, and disaggregate traffic volumes, supplementing as necessary to ensure that the data employed in the study indicates accurately the baseline conditions for traffic volumes in the region, and provide a sufficiently robust base for the economic and financial analysis in the later Task. The Consultant will collect additional baseline data as necessary after reviewing available data collected through previous studies (if any). The purpose of this task is to develop a database for the purpose of strategic transport planning. The study area will need to be subdivided into a number of traffic zone systems. The zonal system should be flexible enough to accommodate future land use subdivisions– and here consultation with concerned agency will be necessary.

At a minimum the Consultant should try to collect data on the following categories:

- Population and land use data collected on the basis of traffic zones;
- Road network inventory including attributes of physical infrastructure;
- Railway network inventory, schedules, operating and financial data;
- Historical traffic count data for all transport modes;
- Inland waterway fleet and network; and
- Motor vehicle fleet (historical data).

Task B.3 - Screen line Traffic Counts: The Consultant will review the data collected from the previous and on-going studies and should identify the data gaps in consultation with relevant agencies, and collect additional data required for the purpose of calibration and validation of the model through field surveys and secondary sources.

Task B.4 - Demand Forecasts: This sub-task involves a review of the current demand in the transport sector in Assam, covering all modes of transport (passenger and freight), and the preparation of robust demand forecast for a defined base year (2017), and the target year of 2035; and intermediate years 2023 and 2030. The employed model should be defined using commercially produced software, and the procurement of necessary licenses for the Transport Dept. to take over the model should be included in the proposal of the Consultant. Conditional traffic forecasts should be based on a series of simple, but reasonable traffic demand analyses and assumptions for each traffic type and transport mode, and produced for (1) the current transport network and for (2) a transport network that includes the most probable new links (or a network agreed with the sponsors). The model should be able to accommodate existing transport networks and transport usage patterns, as well as changes to be made in the future. For example, the model should be able to accommodate new

transport systems, speeds, frequency, fares, etc. The model should be able to disaggregate the travel pattern of different income groups, and test outcomes of various policy and infrastructure interventions. The projections should include normal, pessimistic and optimistic scenarios, as agreed with AIWTDS. One of the objectives of this task is to identify pinch points, where volume to capacity ratios indicate investments in higher capacity or policy changes would be warranted.

Task B.5 - Data Processing and Analysis: The Consultant shall computerize the data using a suitable package and in the format agreed in consultation with AIWTDS. The data should be coded and analyzed using a standard statistical package and presented in graphical form and tables with verbal descriptions. The processed data pro forma and the software package used for data entry and analysis should be handed over to AIWTDS along with manuals /proper documentation. Data should also be provided on CDs and in hard copy on completion of the study. The data should be broadly categorized as under, and be provided at zonal, subregion and region levels, to be agreed with the client.

Task B.6 - Sector Administration and Governance: The Consultant shall undertake a detailed assessment of the current institutional setup for delivery of transport infrastructure and services in Assam. This would involve secondary research as well as engaging with the key govt. private agencies involved in the overall transport network. The sector institutional structure would have to be evaluated against the ideal scenario that assumes separate and distinct roles for policy making, regulation and operations; operations should typically encourage and provide level playing field for private participation. The Consultant is advised to co-ordinate with the Consultants conducting ISBP study to ensure alignment of the observations made for this task.

Task B.7 - Assam Transport Strategy: The substantive body of data, demand and supply, assimilated and analyzed, and insights gained into the functioning of the transport sector in the State will be used by the Consultant to draw up a strategic transport road map for the state of Assam from 2017 through 2035. This should be underpinned with strong and clear recommendations for strategic transport infrastructure projects and policies, indicative investments for the State Govt. to help take decisions towards developing an integrated / multimodal transport strategy for Assam. The Consultant should also propose required policies, such as traffic congestion pricing, parking pricing, etc. The Consultant shall analyse the implications and benefits of the various investment and policy proposals on the Assam transport network, with high-level cost estimates. The Assam Transport Strategy will be delivered to the Govt. as separate Module.

MODULE 2: Investment Strategy for Assam IWT sector ***(****The module 2 will involve extensive*
Primary survey, supplemented by credible secondary inputs wherever feasible and agreed by the Client/World Bank. This Module focused on the Inland Water Transport in Assam will be harmonized with the overall Assam Transport Strategy)

A. Detailed Review and Analysis of Assam IWT Sector

The Consultant will be expected to undertake a detailed review of the current condition / capacity of the IWT infrastructure assets and services, and compliance with applicable international technical standards and norms.

Task A.1 - Review of Current Condition of IWT Infrastructure and Services. The review is expected to include a detailed description of the existing IWT infrastructure at all levels to ascertain current condition, performance, suitability and needs. The review is expected to cover the fleet composition, service routings, ports, ferry terminals, channels to the ports and ferry terminals, last mile connectivity, navigation aids, and the main channels and routes currently managed by the DIWTA, IWAI and local governments.

Task A.2 – Review of Accessibility to IWT Infrastructure and Services. This task is expected to review and evaluate the level of Accessibility of urban / rural settlements, chars, islands in Assam (suitably divided into zones across the north and south bank) to IWT. Among others, the task should be able to - reveal the extant gaps in access to IWT for these areas; travel time / cost / mode available for these areas to reach basic facilities such as health, education, employment, markets etc. To highlight the poverty alleviation aspects, the consultant is required to use existing information on the demand for transport facilities to access basic services that has impact on health including child birth, maternal health etc., and educational institutions. A requirement for the Vision document.

Task A.3 - Review of the current pricing and financing management of the IWT sector:
This sub-task will involve an assessment of the current financing management in the sector, including the scale and structure of current user/ vehicle ferry/ freight charges, public sector sources at the State and panchayat levels, the current levels of public support, the levels of cost recovery from both public and private modes, oversight and performance of the funding streams, and capacity for cost-sharing at local levels. The consultant will collect and collate trend data on expenditure, split by capital and recurrent and source and identify the level and source of financing within the sector currently, and ascertain any shortfall to the financing (capex or opex) necessary to sustain the sector. Particular attention will be paid to the cross river Ferry operations, including the assessment of the cost of operations, which is the main focus of the Assam Inland Water Transport Project.

Task A.4 – Review the current volume and cost of transportation of commodities and other types of cargo by small and marginal farmers: To highlight the poverty alleviation aspects, the consultant is expected to carry out detailed assessment and use data and information from other ongoing studies on transportation of surplus commodities to the markets and cost of transportation. A requirement for the Vision document.

Task A.5 - Demand forecast for IWT sector: This task involves assessment of baseline demand (passenger and freight) for IWT ascertained through primary research and the preparation of robust demand forecast for a defined base year (2017), and the target year of 2035; and intermediate years 2023 and 2030. The employed model should be defined using commercially produced software, and the procurement of necessary licenses for the Transport Dept. to take over the model should be included in the proposal of the Consultant. Conditional traffic forecasts should be based on a series of simple, but reasonable traffic demand analyses and assumptions for each traffic type and transport mode. The model should be able to accommodate existing IWT system and usage patterns, as well as changes to be made in the future. For example, the model should be able to accommodate new IWT terminals / services, speeds, frequency, fares, etc. The model should be able to disaggregate the travel pattern of different income groups, and test outcomes of various policy and infrastructure interventions. The projections should include normal, pessimistic and optimistic scenarios, as agreed with AIWTDS.

Task A.6 - Improved Safety in IWT: The consultant is expected to study in detail the current state of safety / accident response mechanism at the existing IWT terminals and vessels in Assam. The Consultant should also review the report on Medartari Ferry accident that highlighted severe gaps in safety and also made recommendations for improvement. The Consultant would assess the need and recommend measures / equipment to improve IWT safety at the terminals and on the vessels including aids to navigation, accident response protocols.

Task A.7: Environmental sustainability of IWT sector: The consultant shall study, assemble (from secondary sources, high level field review and through stakeholder interviews and discussions) and review information on: (a) sensitive environmental features within the state which could be affected by IWT development, and potential major environmental constraints, impacts or critical issues as well as opportunities (including to enhance low-carbon potential of the sector) with respect to IWT sector development; and (b) the existing environmental practices and conditions of the IWT sector, including assembling a baseline GHG emissions inventory for the sector. Based on these, the

consultant shall analyse the potential for improving the environmental sustainability (both in terms of reduced pollution as well as enhanced low carbon potential) of the sector. As tackling emission reductions and effective environmental management is a multi-sectoral challenge, this activity will also identify cross-sector institutional and regulatory barriers for effective implementation of the strategy, focusing on responsibilities, expertise, regulatory and enforcement powers, and capacity among relevant stakeholders. Based on this analysis, the consultant shall develop a sustainable IWT sector-wide strategy (detailed under task C4 below).

B. A Detailed Review of the Institutional Framework for Private Finance
This task focuses on the institutional framework for involving private finance in the IWT sector.

Task B.1 - Review of the current policy framework: This sub-task will consist of a review of the current policy framework guiding the introduction of private finance in the financing, constructing, operating and maintaining the transport fleet, service routings, terminals, and support services in the IWT sector development, highlighting any policies that deviate from international best practice. The consultant is asked to evaluate the constraints to the existing frameworks' abilities to (a) enhance public sector financing capacity, and (b) attract private sector participation according to defined policy objectives.

Task B.2 - Review of the current legal and regulatory framework: This sub-task will involve a review of the legal and regulatory framework in respect of introducing private finance in the financing, constructing, operating and maintaining in the IWT sector development. The consultant is asked to evaluate the constraints to the existing frameworks' abilities and propose solutions to (a) enhance public sector financing capacity, and (b) attract private sector participation according to policy objectives.

Task B.3 - Review of the existing institutions and their respective responsibilities: This sub-task will furnish an overview of the capacity of the existing institutions that either are/or would be involved in PPPs in the IWT sector, and a review of their roles, functions and responsibilities. The purpose is to provide a concise 'roadmap' for improving the functioning, and suggestions for improving the screening, appraisal, prioritization, and estimation of contingent liabilities of potential projects. Other modes of increasing private finance and investment, besides PPP, which are successful internationally, could also be suggested. The outcome is to increase private investment in terminals, fleet, service routings and other IWT related infrastructure and services. Co-ordination with consultants undertaking ISBP study is required to ensure alignment of findings in this section.

C. The IWT Sector Capacity and Vision

Task C.1 - Review of Development Plans for River Ports and Inland Waterway
Transport: The Consultant is expected to review the development plans of the inland waterway sector in Assam in light of the demand forecasts produced in Task A.5 identify major issues and proposed strategies to improve functioning and performance. The review should cover the main characteristics of water transport, including river/ inland port infrastructure, the length of the inland waterway network, the inland waterway transport operations and extent of service coverage, traffic levels and ridership, cargo levels, service levels by type of service (passenger/freight), port and terminal condition and performance levels at each port / terminal, safety, security and social and environmental issues, and other pertinent information. Financial and fiscal issues, subsidies, user charges, etc. will also be reviewed. Particular attention to the cross-river ferry operations shall be made by the consultant in a separate chapter.

Beyond infrastructure, policy proposals on how to increase passenger and freight traffic on the IWT system, should be recommended. The challenges for achieving the potential of passenger and freight on the IWT corridor should be analyzed, and solutions to mitigate the challenges be proposed. This could include issues of increasing service connectivity and

reliability, terminal-hinterland connectivity, cargo consolidation, customs/ approval processes, increasing IWT passenger convenience etc.
The review will also include issues related to bilateral and multilateral waterway agreements, especially in case of Brahmaputra river development. In addition, water resources development plan on the river basin shall also be taken into account with regard to the IWT development management. The study shall review the organizational structure of water transport, explaining the role and responsibilities of public authorities, the regulatory framework, and private concessionaires involved in provision of water transport services, and discuss the legal relationship between these entities. The Consultant is advised to co-ordinate with the Consultants conducting ISBP study to ensure alignment of the observations made for this task.

Task C.2 - Vision for IWT Sector Development: Utilizing all relevant information, the demand projections and the institutional framework for private finance, the Consultant will propose Vision to improve quality, efficiency, and adequacy of water transport services and port performance in a draft Integrated Strategy Development Plan (ISDP) for discussion with stakeholders. The focus of the ISDP is to enlist the recommendations on various infrastructure and policy interventions required to establish an economically viable network with a framework of potential growth and expansion of the transport system, and incentives to facilitate modal shift to waterways. This ISDP is expected to cover *inter alia* improvements in IWT management and operations, improved regulatory and funding regime efficiency and a sustainable business environment. The recommendations should be developed with a view to encourage investment in the industry and should be in compliance with international waterways agreements. The recommendations should also cover the requirements for construction of IWT fleet, establishing higher fleet standards and cleaner technologies, together with high levels of operational performance and enhanced environmental management. This section should include options in all necessary areas, benchmarking international good practices, including options to enhance infrastructure, policy, transport services, to encourage passenger and freight movement by the IWT network.

Task C.3 - Possible Modal Share to Boost IWT Demand: Based on the demand forecast (as given in A.5) & development vision, the Consultant is expected to assess and identify the passenger / commodity type and transport links that can be shifted to IWT mode. The challenges for achieving the potential of passenger and freight on the IWT corridor should be analysed, and solutions to mitigate the challenges be proposed. This could include issues of increasing service connectivity and reliability, terminal-hinterland connectivity, cargo consolidation, customs/ approval processes, increasing IWT passenger convenience etc. This would be used as basis for IWT investment at later stage.

Task C.4 - IWT Sustainability Plan: Building on the Vision for IWT Sector Development, and the analysis of environmental sustainability of the sector developed under task A.7, propose a plan to enhance environmental sustainability of the IWT sector in Assam. Specific activities may include, for example: (a) proposed policy reforms, incentive schemes and investments / subsidies for promoting lower carbon transport modes and routes in a multimodal context; (b) adoption of greener / more efficient technologies for vessels (including cleaner fuels like CNG, sewage treatment systems, solar lighting, waste compressors, energy efficiency design improvements, etc); (c) measures to increase the carbon efficiency of existing IWT users, such as by reducing empty miles through consolidation platforms; (d) measures to improve waste/effluent management and introduce green technologies at ports and terminals; environmental awareness campaigns and training programs; etc. The strategy should also outline recommendations to address capacity gaps and regulatory/institutional barriers (including on institutional coordination) for effective implementation of the proposed actions. Provide initial cost estimates and potential funding streams. Conduct a detailed environmental feasibility assessment of the highest priority activities, including a calculation of potential GHG emissions reduction benefits.

D. Development of Final Action Plan and Investment Options

Task D.1 - Action Plan: The draft ISDP, after discussion with representatives of the AIWTDS and the World Bank, will be developed into a detailed Action Plan, setting out timetables, responsibilities and mechanisms. The Action Plan should ensure continued performance of functions while the current institutional framework is gradually improved. The Consultant will also identify necessary legal changes to affect the reforms. This Action Plan should include all infrastructure and policy actions required, as well as any engagements with the private sector to increase private investments.

Task D.2 - Investment Plan and Financing: As part of the Action Plan, the Consultant will also prepare a detailed investment plan, highlighting the priority investment projects for the short term 2018-2023, which should be taken up under the proposed Assam Inland Water Transport Project, for the medium term 2023-2030, and for the long term between 2030-2035. The investment plan will set out timetables, responsibilities and mechanisms, based on the demand forecasts and an assessment of financing options.

MODULE 3: Feasibility Assessment for Assam IWT Project *(This module would involve assessing the feasibility of the project investments recommended out of module 2 above and develop list of potential investments to be made under the project)*

A. Feasibility Studies for the Assam IWT Project

The Consultant will discuss and agree with the AIWTDS and the World Bank, on the priority list of investment (for the amount of about US$150 million) to be financed under the Assam IWT Project from the list of available investment options. To this end, the consultant will undertake a Feasibility Analysis, including an assessment of the economic, financial, technical, social including gender and trade and environmental implications for the selected project.
The Task will include the following activities:

A1.Carry out additional data collection and engineering surveys (if necessary from other previous tasks);

A2. Engineering studies and preliminary engineering design, drawing and cost estimation of alternative improvement options;

A3. Environmental health and safety (EHS) screening, alternatives analysis, and reflection of EHS measures into engineering designs / cost estimations. This shall include the following:
(*Note: these tasks will require coordination with a separate, independent EIA consultancy tobe contracted in parallel, to be facilitated by AIWTDS. If analysis and conclusions about major environmental issues, potential costs/benefits, and details of mitigation measures to reflect in designs and cost estimates differ across the two firms, AIWTDS may instruct the Consultant to reflect the findings of the independent firm.)*

a. Carry out initial screening and assemble and review information on sensitive environmental features which could be affected, and potential major environmental constraints, impacts, health and safety risks, or other related critical issues as well as opportunities (including to enhance low-carbon potential) with respect to the proposed investments.

b. Analyse alternatives to individual potential investments, including the “no project” / no investment alternative, from an EHS perspective. Identify potential alternative designs, locations, technologies or approaches to meeting the objectives of the ISDP and Action Plan, and contrast them in terms of their relative potential environmental impacts and benefits. Identify major required mitigation measures, and develop initial cost estimates for environmental, health and safety mitigation and management, as

well as potential cost savings associated with adoption of environmental enhancement measures (including sustainability measures recommended in the IWT Sustainability Plan) and factor them into the economic feasibility and financing assessments for specific proposed investments. The final Investment Plan and feasibility study shall reflect this analysis in its recommendations for investment scope and design under the Project, and provide justification if the environmentally preferred option is not adopted.

c. Ensure that final engineering studies, including preliminary designs, drawings and cost estimates, reflect EHS mitigation and enhancement measures as required as per World Bank Safeguard Policies as well as all national and state environmental, health and safety legislation.

A4. Preliminary Social Assessment (Screening and Scoping): In case it is established that RFCTLAR&R, Act 2013 is not applicable to the sub-project, the consultant will carry out detailed social screening, data on hotspots, include, realistic estimates on impact of government land to be transferred, any informal settlements, estimate cost for resettlement and transfer of government land. If the RFCTLAR&R Act is applicable, then it must incorporate findings from the SIA studies carried out concurrently and incorporate in the feasibility study. In addition, it will incorporate recommendation from Gender and trade study on accessibility and suggested intervention to enhance trade at terminals.

Preliminary Social Assessment for each ferry infrastructure facility i.e. terminals, landing ghats, access, and findings to be integrated in the feasibility, preliminary design and detailed design for each alternate site. Preliminary Social Assessment will cover demographic, social and economic profile of likely adversely impacted, land holding including estimate of land to be acquired and enumerate structures and typology, estimate of affected household, estimate of displaced household, estimate fisher-folk households that may be adversely affected by increase in passenger ferries, consultation, institutional capacity, resettlement and rehabilitation, legal and policy framework and budget. It should be conclude application of Right To Fair and Transparent Land Acquisition and Rehabilitation and Resettlement Act, 2013 (Henceforth called the Act) and compliance with World Bank Social Safeguard Operational Policies 4.10 and 4.12. Data will be collected on application, which will be geo-referenced including the consultations, assets etc. for which a workflow will be prepared to develop application as part of the Inception report. Analyse the secondary data on health and educational services and impact of lack of services i.e. infant mortality, maternal health, death rate at child birth, school dropout rate, etc. on inhabitants of islands and in upper Assam. In case it is established that RFCTLAR&R Act is applicable then similar information needs to be collected from the SIA consultant. The outcome of the feasibility study with the various options identified, master plan and preliminary design options, comparison of options in terms of technical, social, environmental and economic aspects shall be presented to the client. Output will be Preliminary Social Assessment (screening & scoping report) which will establish applicability of the Act 2013 and comply with OP/BP 4.10 and 4.12 and broad action plans. It should also reflect the findings from the Gender and trade study.

A5. Feasibility analysis of the studied alternatives. The analysis should establish an acceptable NPV, IRR and EIRR, to for the economic and financial feasibility of the studied alternatives. It should also be indicated whether these alternatives are appropriate for (i) private sector financing; (ii) public-private sector financing; or (iii) public sector financing, and consistent with the current and projected financing capacity of the State. In case of financially unviable projects, the amount of Viability Gap Funding (VGF) required to make the project financially viable to be stated. The priority list of investment specified above would include terminal feasibility study of select 10 terminals /ghats / landing points as specified in Module 4 Task A. The feasibility study report would form key inputs for the terminal design consultants.

MODULE 4: Feasibility assessment for pre-identified IWT infrastructure *(This Module 3 focuses on the preparatory works for projects that can be undertaken for immediate development. It will involve location assessment studies, cost estimation of certain project identified by the Client.)*

A. Feasibility Study of select 10 existing Ghats / landing points identified by Client

The task is focused on the development and modernisation / improvement of 10 landing points already identified by DIWTA/AIWTDS where ferry services are currently being undertaken, but with inadequately planned IWT infrastructure. The task will therefore involve technical surveys, feasibility assessment to identify ghats/landing points to be taken up for the development works, with a view of improving operational efficiency and enhanced user comfort / experience, while also ensuring environmental sustainability. The Consultant shall undertake all surveys, investigations and works necessary to determine the feasible locations for undertaking development works. This would include traffic and transport planning analysis and forecasting to ensure the study corresponds to future (through 2035) transport demand.

The feasible ghats from the above study should be included in the list of viable projects identified in Module 2 Task E.
The list of identified Ghats / landing points, their location and the Area are given below.

No.	Ghats/ Landing points (Division)
1.	Guwahati – North Guwahati
2.	Guwahati – Rajaduar
3.	Doukuchi – Bhokradia – Rangeswari – Pijupara
4.	Nagarbera – Alopatty – Majorchar
5.	Neamati – Kamalabari
6.	Gandhighat
7.	Sonabari
8.	Beranga
9.	Choto – Dudhpatil
10	Badri

An index map showing the location of these passenger ferry Ghats / landing points on the Brahmaputra and the broad design basis is given at Annex-A

Task A.1 – Surveys and Feasibility

i) Review and assess site conditions at all the identified Ghats / landing point locations for their feasibility to be developed as modern and fixed / floating passenger ferry terminal. This shall include an assessment of conditions at the vessel / shore interface, river and landward access conditions, the condition of existing infrastructure and utility provision at each location. The Govt. (DIWTA/AIWTDS) on its part will extend all possible support in making the existing data available to the Consultant.

a. Undertake a review and analysis of bathymetric surveys carried out by DIWTA / IWAI at the terminal location and in adjacent approach areas.

b. Carry-out geotechnical surveys for the investigation of sub-surface conditions, including exploratory drilling, sampling and in-situ testing necessary to obtain: passive earth resistance, pile driving conditions, bearing capacity, dredging characteristics and overall soil stability

c. Carry out topographic surveys of all DIWTA owned and adjacent land at the terminal location to capture all natural terrain features, buildings, roads, fences and all other features necessary for land-use and river modeling;

d. Undertake a review and analysis of historic data available at DIWTA/IWAI or other departments or agencies for each site, including but not limited to:

- Surface river level variation;
- Tidal and current conditions;
- River flow characteristics;
- Wave conditions;
- Sedimentation data;
- Water quality including salinity and turbidity.
- Patterns of erosion and accretion;
- All other hydro-morphological conditions that may influence detailed design work; Environmental data relevant to the site.

ii) Laws and regulations pertaining to the development of River terminals in Assam, including restrictions, if any, on landward and river side accesses; land reclamation, river boundary conditions, building and other conditions; Conduct passenger and cargo traffic survey at each identified Ghat / Landing point location and provide a forecast through 2035. Applying sound transport planning principles, review and analyse the suitability of identified Ghat / Landing point locations from the perspective of their development as modern passenger ferry Terminals / Landing stations; access conditions (first mile and last mile); providing a suitable ship-shore interface for rural communities at each location; being part of an integrated transport strategy; potential for future expansion; minimising social and environmental impact. Carry out techno-commercial Feasibility of each of the Passenger ferry Ghats / landing points.

iii) Conduct passenger and cargo traffic survey at each identified Ghat / Landing point location and provide a forecast through 2035.

iv) Applying sound transport planning principles, review and analyse the suitability of identified Ghat / Landing point locations from the perspective of their: development as modern passenger ferry Terminals / Landing stations; access conditions (first mile and last mile); providing a suitable ship-shore interface for rural communities at each location; being part of an integrated transport strategy; potential for future expansion; minimising social and environmental impact, and maximizing environmental, health and safety benefits. This shall include environmental, health and safety screening and alternatives analysis in the same manner as outlined under Module 2 task E.3 above.

v) Carry out techno-commercial Feasibility of each of the Passenger ferry Ghats / landing points to establish ghats/ferry locations which can be taken up for further development works

vi) To provide prioritized list of investments, for detailed design/ engineering designs by the Design/ Engineering Consultant

4. **EXPECTED TIMING AND DELIVERABLES FOR THE STUDY**

It is envisaged that the study will be undertaken in accordance with the following timetable and deliverables:

Activities	Date
Inception Report	Contract signing + 4 weeks
Monthly Progress Reports	Every four weeks
Module 1: Assam Transport Strategy 2018-2035 ***Draft Final Report Module 1 & Workshop with stakeholders***	Contract Signing + 16 Weeks
Module 2: Assam IWT Investment Plan ***Draft Final Report Module 2 & Workshop with stakeholders***	Contract Signing + 20 Weeks
Module 3: Project Feasibility Assessment ***Draft Final Report Module 3 & Workshop with stakeholders*** ***(Before feasibility studies are to be undertaken, there should be agreement with the Client and Bank on the investment list.)***	Contract Signing + 24 Weeks
Module 4: Feasibility assessment for pre-identified IWT infrastructure ***Draft Final Report Module 4 & Workshop with stakeholders including handover to Engineering and Design Consultants***	Contract Signing + 16 Weeks
Integrated Draft Report	Contract Signing + 26 Weeks
Draft Report with comments from the Client and the Bank incorporated ***Draft Final Report & Workshop with stakeholders***	Contract Signing + 28 Weeks
FINAL REPORT	Contract Signing + 30 Weeks

2 During the work, the Consultant will prepare brief monthly progress reports on the status of the project, including progress, any problems encountered and identified solutions, and proposed activities for the current month. These reports will be submitted in soft copy both to the AIWTDS and the World Bank by the 5th of each subsequent month.

3 The Consultant is expected to hold a workshop at each stage to discuss the contents of the draft report for each of the module with all key stakeholders in the sector. Comments on the latter will be provided within three weeks of the workshop, after which the Consultant will have two weeks to incorporate the comments into the final version of the Report.

4 The Consultant will prepare all reports in English. The monthly reports are acceptable in soft copy only and should be sent to the AIWTDS. All the reports should be submitted both in hard and soft copy to the AIWTDS and the World Bank (6 hard copies to AIWTDS, 2 hard copies to World Bank office in Delhi).

The Resources Required for the Study

5 The assignment is intended to be undertaken by a very experienced and high quality firm (or a consortia) of consulting engineers, transport planners and PPP experts, familiar with the transport sector internationally, and with considerable experience of the production of national transport strategies in developing countries. Experience and knowledge of transport and logistics issues in in the IWT sector in the South Asia Region would be an advantage.

6 The Consultant should propose an appropriate team composition for the study, but it is likely to require a mix of international and local Consultants with substantial international and developing country experience (South Asian Region is an advantage) in a wide range of transport sector studies, and advanced multi-disciplinary skills in a range of areas. The team should comprise the following:

Title	Qualifications/Experience
Team Leader	• Master's degree in Transport Planning/Transport Engineering • Minimum 15 years' experience in management consultancy operations, delivery and oversight, with broad knowledge of transport issue and specialist knowledge of waterways transport
Transport Economist	• Master's degree in Economics, Business Administration or equivalent • Minimum 10 years' experience in relevant management consultancy assignments in demand modeling, econometric modeling, integrated transportation and land use models, transport demand analysis, vehicle operating costs, total transportation costs and economic evaluation. Experience on project benefit evaluation and monitoring is also important.
Structural Engineer	• Master's degree in Structural Engineering with Graduation in Civil Engineering. • Minimum 10 years' experience in structural engineering, design and supervision of construction of buildings, ports, terminal structures with experience of executing 2 works of similar nature and complexity.
Naval Architect	• Graduate in Naval Architecture • Minimum 8 years' experience in design of similar infrastructure / ports / terminals as project planner/designer with experience of executing 2 works of similar nature and complexity.
Terminal Planner	• Post graduate Civil Engineering/Architecture degree • An expert with minimum of 10 years of experience in river port terminal planning and design with good knowledge of national and international best practices
PPP/ Private Finance Specialist	• MBA (Finance)/CA/Company Secretary • Minimum 10 years' experience in relevant management consultancy assignments with an experience of executing 2 works of similar nature and complexity
Port/Waterways Specialist	• Master's degree or equivalent in IWT Engineering/specialization in Transportation and Logistics • Minimum 10 years' experience in development projects in Inland water transport sector and proven knowledge of IWT sector policy administration, industry regulations and IWT operations.
Environmental specialist	• Master's degree or equivalent in Environmental Sciences and/or Environmental Management • Minimum 8 years' experience in conducting Environmental Impact Assessment of projects in the IWT sector and knowledge of national and World Bank environmental policies, regulations and standards that may apply to IWT investments, as well as environmental sustainability and efficiency good practices for the IWT sector.

Title	Qualifications/Experience
Social Development specialist	• Master's degree or equivalent in appropriate social discipline (Sociology, Anthropology, Social Work etc.) • Minimum 8 years' experience in Social Impact Assessment of projects in the IWT sector and knowledge of national and World Bank social policies, regulations and standards that may apply to IWT investments, as well as social sustainability good practices for the IWT sector.
Procurement Specialist	• Engineering/commerce graduate (preferably with postgraduate degree/diploma) • Minimum 10 years of experience in procurement of goods, works and consultancy services. Must have direct experience of applying the World Bank's or other donor Procurement policies and guidelines and be able to reference examples of such experience.

The team should also have access to specialists with skills in: (a) gender/social specialist; (b) environment (additional as required); and (c) stakeholder engagement.

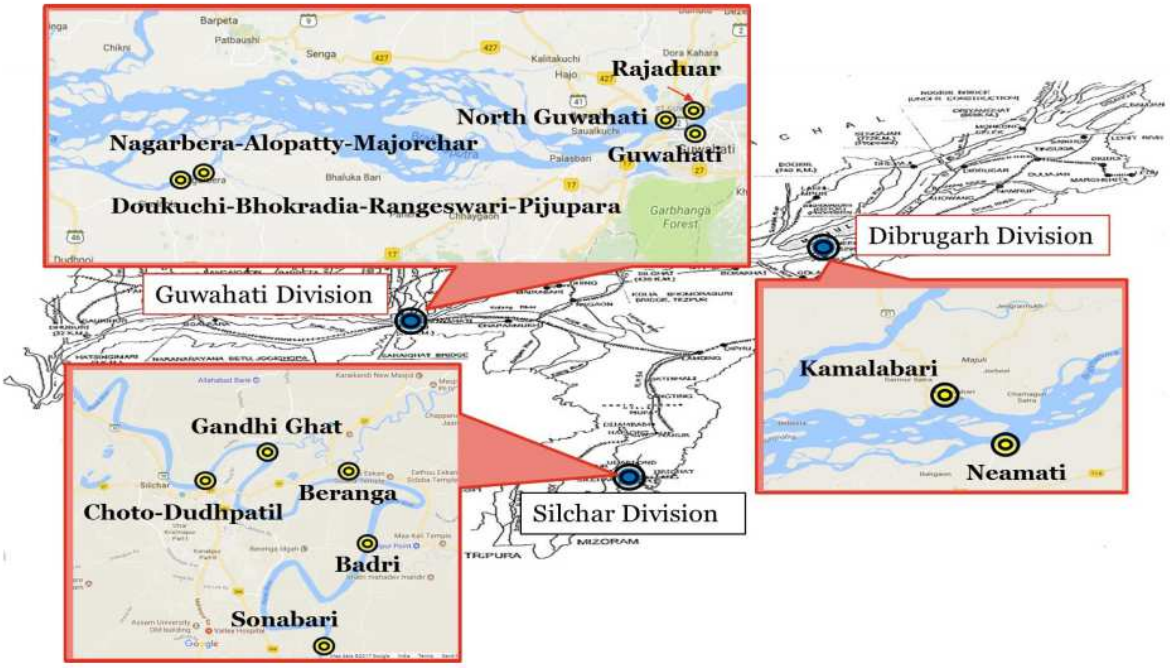
7 **The Obligations of the Consultant.** The Consultant shall make his own arrangements for all living accommodation, transportation, personal equipment such as computer or lap top and stationery. The nominated Team Leader will be expected to spend the majority of the assignment on location in Assam. All reports, minutes of meetings etc. shall be drafted by the Consultant. Circulation thereof shall be done by the AIWTDS.

8 **The Obligations of the AIWTDS**: The AIWTDS will make available to the Consultant all relevant reports and data in its possession and/or collected from IWAI and other agencies (if relevant), but the Consultant shall be fully responsible for the interpretation and use of the material in question as well as for the conversion of available data into a form that can be used in the system he sets up. The AIWTDS will provide an office for use by the Consultant for his assignment, as necessary. The AIWTDS will liaise as necessary with other government offices/authorities as required in order to facilitate the Consultant's work.

11. **The Management of the Study**: The primary point of contact for the Consultant will be Project Director AIWTDS who will represent the project manager within the AIWTDS. He will form part of a steering committee to be established within AIWTDS, comprising representation from relevant Ministries, other relevant local agencies, and suitable public and private stakeholders. The Consultant will be expected to present the content of the monthly reports to the steering committee.

Annex A

An index map showing the location of the identified passenger ferry Ghats / Landing point



Annex A (Continued)

The Design Basis:

a. Terminal Design Life:

- Major Structural Components: 25 years
- Replaceable Components: 10 years

b. Design Standards

In general accordance with – latest editions of Indian standards and codes of practice for designs (or equivalent international standards, as required)

c. Terminal Layout: Single berth floating platform with either guide piles or flexible moorings
and link-bridge to access causeway/shore. The berth to be designed for passenger and passenger cargo.

d. Terminal Facilities: These facilities are to include:

- Separate passenger waiting areas (with ablution and other amenities) for men / women;
- Pedestrian (and disabled) access; and

Other recreational facilities like food stalls, shopping area, parks etc.