

Terms of Reference for Consulting Firm:

Consultancy Services for Feasibility Study and Conceptual Design I) to construct Multimodal Transport Hub at Dhaka Airport Station (DABB) & II) to facilitate construction of Multimodal Transport Hub at Dhaka Kamalapur Station

- (I) Consultancy Services for Feasibility Study and Conceptual Design to construct Multimodal Transport Hub (MmTH) at Dhaka Airport Station (DABB)

Introduction

The World Bank has received a request from the GoB to finance improvements to strategic rail facilities in Bangladesh, including the redevelopment of the existing railway station building, yard and railway facilities at Dhaka Biman Bandar (DABB) airport railway station to create a multimodal transportation hub. This term of reference is for (i) preparing a plan for the redevelopment of the existing railway station building, and other railway facilities at DABB airport railway station; (ii) aligning the plan with TOD development of the area around the station; (iii) developing a station master plan and conceptual design; and (iv) preparing a bankable feasibility study for the investments in new station building, yard and railway facilities improvements.

Key Project Requirements

1. To provide an efficient interchange between the different transport modes for passengers and cargo
2. To establish the physical infrastructure of station building, yard facilities and other associated transit-oriented development (TOD) facilities to meet the functional requirements of the station and yard operations. This will include (not exhaustive):
 - a) Review and development of station platforms facilities to accommodate BR intercity passenger and freight trains. Review possibility of separate through tracks for non-stop intercity and freight trains, and for urban, intercity and freight trains that will stop at the station. There will be additional siding lines for stabling trains, which could be located outside DABB airport railway station MmTH
 - b) The station master plan will enable to receive and dispatch the current and forecast growth of passengers and cargo
 - c) Development of station infrastructure for the multi-modal transfer of passengers between the different transport modes, including commercial, retail and hotel facilities

Background

Bangladesh Railway (BR) is an agency of the Government of Bangladesh (GoB) that provides railway infrastructure, passenger services and freight services in Bangladesh. The railway is vertically integrated and does not currently allow private operators. BR is headed by a

Director General, supported by functionally organized Additional Directors General (for rolling stock, infrastructure, finance, marketing and planning, and operations). Operations are organized geographically between East and West and subdivided into geographical divisions. Ministry of Railways oversees BR and formulates rail policy. Railway prices require approval by the Cabinet of Ministers.

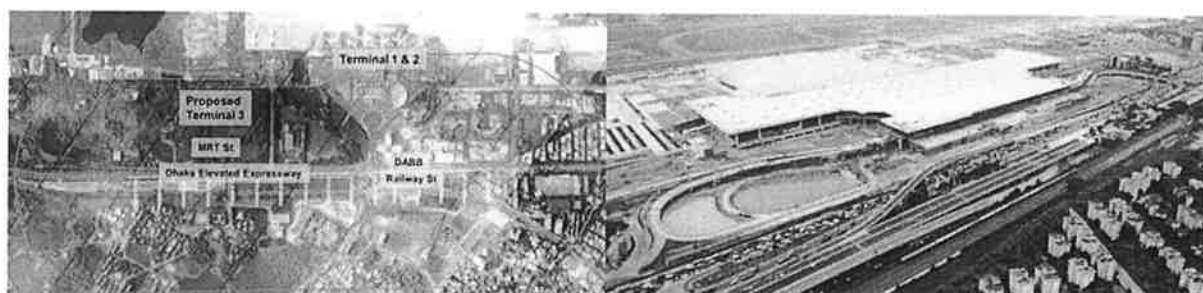
BR operates a network of just over 3000 route-km. The network was originally broad gauge (1676 mm) in the Western half and meter gauge (1000 mm) on the Eastern half. BR has significant investment projects underway or in study to expand its network and operations

Bangladesh railway is primarily a passenger railway—it carried 63 to 93 million passengers per year in the last ten years and 3 to 4 million tons of freight per year. Use of infrastructure (measured by train-km) is about 90 percent passenger and 10 percent freight³. The Government provides BR a small formal Public Service Obligation (PSO) and welfare grant and covers the balance of BR costs through budget allocations.

The capital city of Bangladesh, Dhaka is connected with Northern, Southern, Eastern and Western region of the country by the Dhaka-Tongi railway section, where the proposed station is located, and which is the busiest corridor of the Bangladesh Railway network. It is a mixed traffic section of route with passenger and freight traffic. At present 106 passenger trains run to and from Dhaka Station in the Dhaka-Tongi railway corridor. All passenger trains have to stop at the DABB airport station. About 60,000 passengers commute in those trains daily using the existing facility of DABB Station. BR is executing several infrastructure development and rolling stock procurement projects, with a view to increase the rail share in national transport from 4% to 10% both in passenger and goods. After implementation of these projects, sectional capacity of Dhaka-Tongi section is expected to be increased about 2.5 times of the present capacity.

The DABB airport station MmTH will be connected with ongoing BRT Line 3: Airport to Gazipur to be extended up to Purbachal; Hazrat Shahjalal Airport Terminal-3; First Dhaka Elevated Expressway; Dhaka-Ashulia Elevated Expressway; Underpass between Hazi Camp, DABB and Terminals of Airport; and MRT Line 1: Airport to Kamalapur. The DABB airport station MmTH project has been conceived with a view to providing an integrated multi-modal transportation facility at this location to handle passengers and cargo.

The Project Location



³ Figures are taken from BR financial reports. FY 2019/2020 FY was used because BR indicates that its difficulties in converting to a computerized accounting system has rendered the more current reports unreliable.

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Dhaka Biman Bandor (DABB) Railway Station Dhaka Biman Bandor (DABB) Railway Station /
/ Dhaka Airport Dhaka Airport

Source: BR & World Bank meeting 19 Oct, Source: Star Digital Report Oct 7, 2023
2021

In the general vicinity of the DABB Airport railway station, a new five-star hotel and shopping mall are under construction on the opposite side of the Airport Road. Pedestrian accessibility between the DABB railway station and these commercial facilities is not yet available, however, a new pedestrian bridge crossing over the Airport Road is now under construction.

Although the existing DABB Airport railway station is located only 600 m from the entrance to the existing terminal building at HSIA, there are no pedestrian facilities connecting the DABB Airport railway station and rail passenger access to the Airport Terminal Building and rail passenger is very difficult. The new third terminal of Hazrat Shahjalal International Airport (partially opened Oct 2023, planned completion late 2024) is located several hundred metres further away than the existing DABB railway station. See Annex 1 for additional information on the location of the station.

Objective

The objective of this assignment is to prepare a conceptual design and bankable feasibility study, covering the technical, social, environmental (includes computing carbon emission inventory), and economic and financial viability for the investments for the DABB MmTH airport railway station and prepare tender documents for procurement of them.

Scope of Work

The consultant shall undertake the following tasks. Throughout this assignment consultant shall work closely and collaboratively with staff from BR, so that their analysis is well understood and concerns of BR have been addressed.

Inception

Task 1: Literature Review, Initial Interviews, Site Visit, and Inception Report

The consultant shall develop a contextual understanding of the construction of the construction of DABB MmTH airport railway station through the following activities.

a) Review existing studies and reports related to the proposed project investments. These would include:

- The Government of the People's Republic of Bangladesh / World Bank: The Strategic Plan Transport for Dhaka – 2005; By: The Louis Berger Group Inc / Bangladesh Consultants Ltd
- Dhaka Transport Coordination Board / Ministry of Communications / The Government of the People's Republic of Bangladesh / JICA: Preparatory Survey Report Dhaka Urban Transport Network Development Study - final report March 2010; by Katahira& Engineers International / Oriental Consultants Co., Ltd. / Mitsubishi Research Institute, Inc.

- Dhaka Transport Coordination Board / Ministry of Communications / The Government of the People's Republic of Bangladesh / JICA: Preparatory Survey Report Dhaka Urban Transport Network Development Study Phase 2 - summary October 2011; By Katahira & Engineers International / Oriental Consultants Co., Ltd. / METRO Development Co., Ltd.
- The Government of the People's Republic of Bangladesh: Roads Division / Ministry of Communication: The National Integrated Multimodal Transport Policy - Unofficial English Version; August 2013
- Dhaka Transport Coordination Authority (DTCA) / JICA: The Project on The Revision and Updating of the Strategic Transport Plan for Dhaka (RSTP) Urban Transport Policy – November 2015; by: Almec Corporation / Oriental Consultants Global / Katahira & Engineers International
- Dhaka Transport Coordination Authority (DTCA) / JICA: The Project on the Revision and Updating of the Strategic Transport Plan for Dhaka – draft final report November 2015; by: Almec Corporation / Oriental Consultants Global / Katahira & Engineers International
- Dhaka Transport Coordination Authority (DTCA) / JICA: The Project on the Revision and Updating of the Strategic Transport Plan for Dhaka – final report / summary November 2016; by: Almec Corporation / Oriental Consultants Global / Katahira & Engineers International
- BEZA (Bangladesh Economic Zones Authority): Prefeasibility Report Dhaka SEZ (Special Economic Zone) -30 November, 2016; by: IIFC
- Civil Aviation Authority, Bangladesh / Ministry of Civil Aviation and Tourism / The Government of the People's Republic of Bangladesh / JICA: Preparatory Survey for Dhaka International Airport Expansion Project – final report March 2017; by: Nippon Koei Co., Ltd.
- JICA: The Preparatory Study on the Dhaka Mass Rapid Transit Development Project (Line 1) in Bangladesh – final report (summary) December 2018; By: Almec Corporation / Oriental Consultants Global / Nippon Koei Co., Ltd. / Katahira & Engineers International
- JICA: The preparatory study on the Dhaka Mass Transit Development Project (TOD) in Bangladesh Final Report December 2018; By Almec Corporation / Oriental Consultants Global / Nippon Koei Co., Ltd. / Katahira & Engineers International
- Salat Serge and Ollivier Gerald, Transforming the Urban Space through Transit-Oriented Development: The 3V Approach, World Bank, Washington, DC
- Bird, Julia, Yue Li, Hossain Zillur Rahman, Martin Rama, and Anthony J. Venables. 2018. Toward Great Dhaka: A New Urban Development Paradigm Eastward. World Bank, Washington, DC
- Herrera Dappe, Matias, Charles Kunaka, Mathilde Lebr and, and Nora Weisskopf. 2020. Moving Forward: Connectivity and Logistics to Sustain Bangladesh's Success. Washington, DC: World Bank.

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- World Bank 2023. Unleashing Rail Station Potential through Station Redevelopment. Washington, DC
- The Government of the People's Republic of Bangladesh / WTO Cell / Ministry of Commerce: Policy Review/Policy Study/Policy Paper Preparation on National Integrated Multimodal Transport Policy, 2013 February 2023; By: South Asian Network on Economic Modeling (SANEM)
- Current BR plans, designs and enabling works for the DABB MmTH Airport railway station

b) Review the arrangements and plans for TOD development around DABB airport station
Review of the relevant documents related to the TOD development around the project.] Meet with representatives of [BR to please provide the name of any entities working on TOD around the DABB station] to understand the state of their planning and the interfaces between the station and the TOD developments around the station. See Annex 2 for more information on TOD plans.

c) Conduct initial interviews with BR staff concerned with investment requirements and operations

BR will provide names/positions of staff to be interviewed.

d) Visit the transport and rail facilities in the DABB airport railway station area and other related urban transport facilities

This would include Hazrat Shahjalal International Airport (Dhaka Airport), MRT Lines 1; BRT Line 3; the Elevated Expressway, and the proposed tunnel underpass connections between Hazi Camp, DABB MmTH airport station and Hazrat Shahjalal Airport Terminals.

e) Review existing BR designs and construction works proposed for the DABB Airport station yards area

This would include the Dhaka Tongi Joydebpur Railway Expansion Project, currently schedule for completion in 2027. The project will increase capacity from current 112 trains (actual 144) to 250 trains on the Dhaka-Tongi section and 90 trains (current 44) on the Tongi-Joydebpur section. A Computer Based Interlocking (CBI) signalling system along with telecommunications will be installed at seven stations on the route, along with a signal warning system installed at 37-level crossing gates.

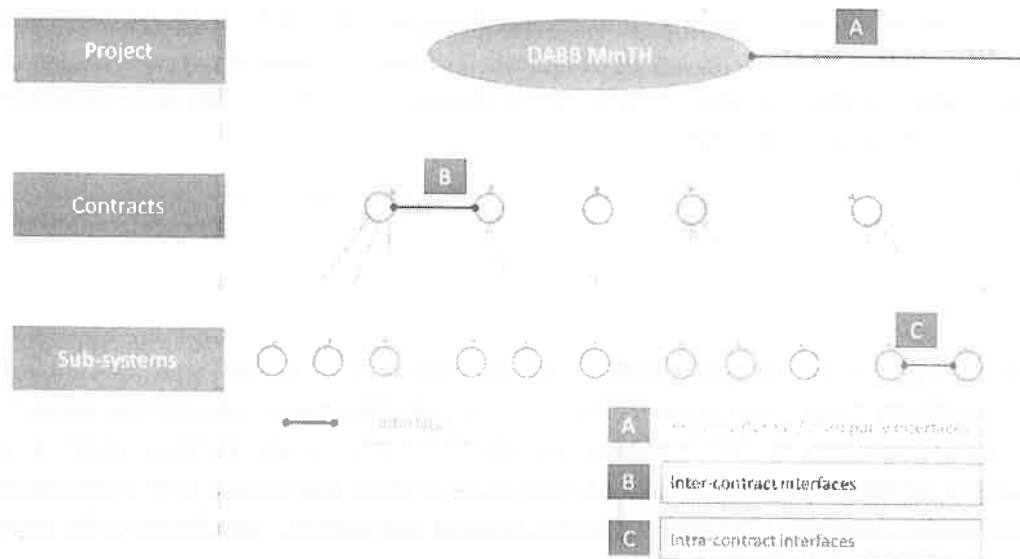
Based on this initial review, the consultant shall prepare an **Inception Report**, outlining its findings and confirming or proposing changes to its workplan.

Delivery

The feasibility study and conceptual design for the redevelopment of the existing station building, yard and railway facilities at DABB airport railway station multimodal transport hub is a complex project. As illustrated in Figure 1, the project has a large number of stakeholders and interfaces (project external / third party interfaces; Inter-contract interfaces; and Intra-contract interfaces).

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Figure 1: Project Interfaces



The DABB airport station multimodal transportation hub development offers an opportunity to demonstrate effective partnership working between the joint Clients, namely the interfacing BRT / MRT / Elevated Express Project and Hazrat Shahjalal International Airport.

The success of this project will rest upon open and transparent communication between all Clients and BR supported by a clear and responsive governance framework.

The Consultant shall effectively deliver the project with specific consideration of Stakeholder identification and consultation. The project shall be delivered with consideration of safety and risk management; systems engineering and integration management.

The Consultant shall maintain regular communication, briefing meetings and reporting with BR and World Bank on the progress of the work. Initial and developing technical findings shall be presented and any areas of concern addressed.

Task 2: Stakeholder Management

Stakeholder Management is defined herein as "the systematic identification, analysis and planning of actions to identify, communicate with, negotiate with and influence stakeholders".

Stakeholders are defined as "all those who have an interest or role in the environment, performance and/or outcome of the project or are impacted by the project, whether internal or external to BR".

The objectives of the Stakeholder Consultation process are to achieve:

- Ensuring relevant stakeholder requirements become project deliverables
- Creating acceptance of project deliverables to all
- Communicating of project benefits to all
- Building support for change

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- Demonstrating clear communication and accountability

A significant part of the project communications with external stakeholders will be carried out by BR. The Consultant shall work closely with BR and support BR in responding to the relevant stakeholders.

International experience with multi-modal station development highlights the need for close coordination and cooperation of the various stakeholders of the different modes of transport and the effective integration of the station building, yard and railway facilities into a single station complex system.

The Consultant shall undertake effective stakeholder identification and consultation process to understand stakeholders' interests and concerns about the station and to reflect their needs in the design of the station. Key stakeholders include (not exhaustive):

- a) Dhaka Metropolitan Police (DMP)
- b) Dhaka Metropolitan Transport Authority (DMTA)
- c) Dhaka BRT
- d) Hazrat Shahjalal International Airport
- e) Dhaka Mass Transit Company Limited (DMTCL)
- f) Directorate of Road Transport Maintenance (DRTM)
- g) Dhaka Transport Coordination Authority (DTCA)
- h) Dhaka Transport Coordination Board (DTCB)
- i) Government Inspector of the Bangladesh Railways (GIBR)
- j) Ministry of Communication (MOC)
- k) Ministry of Housing and Public Works (MOHPW)
- l) Ministry of Railways (MOR)
- m) Public Private Partnership Office (PPPO)
- n) Rajdhani Unnayan Kartripakkha (RAJUK)
- o) Road and Highway Department (RHD)
- p) Regional Transport Committee (RTC)
- q) Bangladesh Fire Service & Civil Defence (FSCD)
- r) Operators of all the connecting infrastructure (BRT / MRT / Airport)
- s) Japan International Cooperation Agency (JICA)
- t) World Bank (WB)

The consultant shall survey current and potential users of the station to understand their needs. This survey shall specifically include women, whose travel needs are typically different than men's needs, people with disabilities and other disadvantaged groups.



The results of this analysis will be summarised and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 3: Safety Management Planning

Safety consideration and effective management is paramount during both the initial development stages through to the construction and operation of a railway station building and operating railway yard system.

A safety management plan shall be developed which will describe how the project shall comply with all relevant statutory provisions. The safety management plan should be updated as the project develops.

A Cyber Security Network and Information Systems (NIS) strategic response plan shall be developed in line with Bangladesh legislation.

The results of this analysis will be summarised and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 4 Risk Management

The consultant shall conduct a comprehensive assessment of the hazards and risks inherent in the redevelopment of the DABB airport railway station to identify and set up a process for managing hazards and risks throughout the development of the station building, yard and railway facilities. See Annex 4 on Risk Management.

The Consultant shall prepare and maintain a risk management plan to confirm the objectives, roles and responsibilities, definitions, hazard and risk management process, risk mitigation measures, including the consideration of optimism bias for the development of the -DABB station MmTH.

The results of this analysis will be summarised and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 5: Systems Engineering and Integration Management

Railways are first and foremost a system. Railways must be designed, constructed, operated and maintained holistically, but also take account of the importance of interfaces between its constituent parts, some of which are safety critical and upon which the integrity of the railway system depends. See Annex 5 for more information on systems engineering and integration.

The Consultant shall apply effective System Engineering and Integration Management for the project work.

A systems engineering management plan (SEMP) shall be prepared by the Consultant and updated as a live document as the project develops.



A systems integration and interface management plan (SIIMP) shall be developed prepared by the Consultant and updated as a live document as the project develops. An interface matrix (IM) shall be developed by the Consultant. The IM shall be updated as the project develops.

The results of this analysis will be summarised and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Conceptual Development of DABB Airport Railway Station Building, Yard and Facilities

Task 6: Demand Analysis

The consultant shall prepare a forecast of the passenger and freight usage of the new DABB airport railway station through 2050. This forecast should consider the flow of passengers between each mode connecting at the station (between commuter rail, intercity rail, metro, BRT, local bus, taxi, auto & motorbike, bicycle, pedestrian) and the peak period flows between modes that would need to be accommodated in the station.

The demand analysis should include the following activities.

- a) Collect and analyze traffic survey data of the connecting urban transport projects (e.g., BRT, MRTs, FDEE)
- b) Conduct and analyze traffic survey data in the DABB airport railway station and nearby stations
- c) Analyze BR traffic data by origin and destinations and survey passengers using DABB railway station and other connected stations
- d) Analyze traffic surveys, forecasts and studies of other modes of transport in the adjacent area (e.g., road traffic, rickshaws, bus, coaches)
- e) Analyze BR traffic data by origin and destinations and survey passengers using Kamalapur railway station and other connected stations Narayanganj to Kamalapur and Kamalapur to Joydebpur
- f) Analyze the TOD development plans for the DABB station area to understand the impact the TOD development will have on the generation of passengers .

The Consultant shall review and update the BR traffic and revenue forecasts for the rail traffic for the Dhaka-Tongi railway section (which is busiest corridor of the Bangladesh Railway network). This should take into consideration recent economic trends, development in the type and volume of railway section traffic, changes in regional trade relationships, competition from alternative transport modes, and other market developments. Based on this review consultant shall prepare a robust traffic and revenue forecast for the station to 2050.

The Consultant shall identify the main factors that affect usage of the station and use them to conduct sensitivity analysis. The Consultant shall prepare three traffic scenarios—low, most likely, high—that show the impact of varying the key demand drivers.

The results of this analysis will be summarized and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.



Task 7: Physical, Utility and Land Use Surveys

The consultant shall conduct the following surveys to establish the physical conditions, climate risks, and land use in the DABB airport railway station area.

Topographical Survey

1. The Consultant shall review existing maps and GIS data collection (including Measure Map app software such as Measure Map Pro and Agro Measure Map Pro for google maps)
2. The Consultant shall conduct a "Plane Survey" to establish:
 - a) Exact boundaries and coordinates of the BR Land
 - b) Consistency with cadastral information
 - c) Exact location and size of facilities located in the BR land
 - d) Ortho-image of the BR land and surroundings
 - e) 3D images of the topography and buildings
3. The Consultant shall conduct a survey of Railway Track and crossings, signaling and telecommunications engineering to establish survey data necessary to establish for the railway yard remodeling purpose covering (not exclusive):
 - a) position, shape and grade of the formation, ballast bed, tracks, and switches within the station survey boundary of circa 2.5 km
 - b) communication cables, ducting connection pits, signaling devices, and track crossing barriers and signs
4. The Consultant shall conduct a Cross-section Survey of the station yard and railway facilities area

Note: All railway survey work shall be undertaken fully in accordance Bangladesh Railway standards and requirements for railway infrastructure. Survey data collected shall be in digital format and suitable for computer software design tools (BIM (Building Information Modeling) / Bentley OpenRail Designer Rail Network Design Software / Autodesk Civil 3D Rail Design software etc.)

Land Use Survey

1. General
 - a) Land history
 - b) Confirmation of land boundaries in terms of "ownership" and "users" [+ existence of agreements between neighboring landowners]
 - c) Use of Lands (e.g., residential, commercial, roads, parks)
 - d) Location, configuration and size of buildings/structures and land fixtures
2. Survey of BR owned lands (present)
 - a) Confirmation of boundary for each land use and current status
 - b) Current status of each housing unit and residents
 - c) Key information on non-residential buildings/structures and facilities
 - d) Survey on non-BR occupants
 - e) Car ownership ratio, parking locations



3. Survey of adjacent lands to BR owned land
 - a) Status of adjacent land boundaries in terms of "ownership" and "users"
 - b) Special issues to be considered regarding land use pattern and requirement base change of land use
 - c) Issues, requests, and/or challenges for an improvement

Infrastructure and Utilities

The Consultant shall undertake an infrastructure and utilities survey. This identify and locate existing facilities and easements including for the following utilities:

- a) Water
- b) Sewerage
- c) Gas
- d) Electricity
- e) Telecommunications
- f) Others

Climate Risks

The Consultant shall review meteorological surveys and data and other information on climate risk to identify the climate risks (e.g., heat, flooding) that must be addressed in the conceptual design of the station.

The results of this analysis will be summarized and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 8: Infrastructure Assessment

The Consultant shall assess the physical condition of the existing DABB airport railway station, including: yard and track infrastructure; station platforms and building; station electrical, mechanical, plant, road access and parking; utilities; and any other relevant facilities. Such assessment would include (not exhaustive):

- a) a geotechnical assessment of the subgrade and surrounding areas
- b) review of drainage structures
- c) assessment of the station building structure
- d) assessment of the station electrical, mechanical and plant equipment
- e) assessment of Building Services including HVAC equipment
- f) assessment of ventilation and firefighting equipment
- g) assessment of toilet and welfare facilities, including water supply
- h) analysis of bridges (road and pedestrian) and other structures
- i) assessment of track condition
- j) assessment of the station yard area including current and proposed remodeling works

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- k) assessment of the station / station yard loading and unloading facilities (parcels, baggage)
- l) assessment of railway station access roads and connections
- m) assessment of level crossings

The Consultant shall carry out a climate and disaster risk screening for the project site and build into the analysis the need for resilience measures such as improved drainage to address key risks.

The Consultant shall assess the train control systems in operation / new works in progress on the Dhaka-Tongi railway section. The consultant shall recommend the train control system standard to be used in the DABB station area, considering functionality and compatibility with BR systems overall.

Based on this assessment, the Consultant shall specify the proposed infrastructure investments and estimate their cost. These costs should be benchmarked against unit costs with similar projects in the East and South Asia sub-region.

The results of this analysis will be summarized and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 9: Operational Assessment

The Consultant shall review BR passenger and freight operations to/from the Dhaka-Tongi railway section including operations from the interconnected BRT, MRTs, DEET to understand the demands that passenger and freight operations will put on the station and yard facilities.

The Consultant shall review how that operation would evolve to handle the forecast traffic volumes, particularly following the completion of the Dhaka Tongi-Joydebpur Railway Expansion Project (4-tracking Dhaka-Tongi, 2-tracking Tongi-Joydebpur); 2-tracking Dhaka Kamalapur- Narayanganj; and freight traffic growth with traffic from Bhanga via the Padma bridge joining the Narayanganj to Dhaka Kamalapur section at Gandaria, and continuing through Kamalapur onto Tongi / Dhirasram ICD

The Consultant shall review the feasible alternatives and discuss with BR any potentially superior alternatives to the infrastructure investments proposed.

The results of this analysis, and the consultant's confirmation of the suitability of the agreed technical solutions will be summarized and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 10: Preparation of a DABB airport railway station TOD Plan

In close collaboration with the relevant stakeholders, including inter alia BR, the Civil Aviation Authority of Bangladesh, the Dhaka MRT, municipal authorities and land use authorities, the consultant shall support BR to create a TOD plan for the DABB multimodal station area. The consultant shall:

- a) Delineate the catchment area of 3km around the station as the planning area. The consultant shall provide the population and socio-economic characteristics of the



delineated area, travel demands, patterns and forecasts, current and projected land uses, current and projected building densities, and real estate dynamics.

- b) The Consultant shall analyze the station's strategic comparative advantage and prescribe recommendations for enhancing the potential of the station area as a transit node. The consultant shall propose uses of the station land and surrounding area that best expands ridership while creating a pedestrian-friendly, livable community.
- c) The Consultant shall assess the current and projected infrastructure carrying capacities along the TOD catchment area, including assessments on population growth trends, pedestrian and bicycle infrastructure and traffic and level of service benchmarks, utility connection such as water, power, sanitation, drainage etc., and transit indicators as service coverage and ridership.
- d) The Consultant shall assess the regulatory and planning instruments available that enhance ToD, at county, municipal, city and national levels, identifying gaps and providing recommendations for improvement.
- e) The Consultant shall prepare and deliver training on international experience with TOD for BR and a group of identified stakeholders
- f) The Consultant shall recommend a structure for bringing together and harmonizing the interests of the disparate parties critical to making a TOD project around the DABB station viable.
- g) The Consultant shall analyse options for structuring a Public-Private Partnership or partnerships to implement TOD surrounding the DABB station. It shall recommend options to BR and other interested parties and explain their pros and cons in terms of simplicity/complexity, livability of developed spaces, and the potential for Land Value Capture accruing to support the station's development and provision of rail services at the station.

Task 11 Options Analysis & Plan for New Yard Layout and Operational Facilities in DABB airport railway station

The Consultant shall consider and develop an options analysis and plan for the existing yard layout and operational facilities in DABB airport railway station.

The Consultant shall consider the current plans for TOD development at DABB airport railway station, including Task 10 analysis, and the nearby stations on the Kamalapur to Tongi section of route.

New Yard Layout and Facilities required: (not exhaustive):

- Review and development of station platforms to accommodate BR intercity passenger and freight trains. Review possibility of separate though tracks for non-stop intercity and freight trains, and for intercity and freight trains that

Description of Existing Facilities (not exhaustive):

- Existing station building to be removed after construction of the new station building
- Access Road to be dismantled and reconstructed

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- will stop at the station. There will be additional siding lines for stabling trains
- Requirement to receive and dispatch the current and forecast growth of passengers and cargo
- Development of station infrastructure for the multi-modal transfer of passengers between the different transport modes, including commercial, retail and hotel facilities
- RNB & GRP Barrack to be dismantled and reconstructed
- Substation, pump house and water supply system to be dismantled and reconstructed
- Yard Layout to be reviewed and modified if required

The Consultant shall work closely with BR operations staff to determine what railway facilities must be retained in the DABB yard area and which functions / facilities can be handled outside the station yard area, which is prime real estate area of Dhaka in close proximity to the international airport station, and could be made available for commercial development.

The Consultant shall consider the change in commuter traffic from Narayanganj terminating at Dhaka Kamalapur, now being able to continue as through traffic onto Tongi, and from Tongi continuing to Narayanganj. Also, freight traffic from Bhanga via the Padma bridge joining the Narayanganj to Dhaka Kamalapur section at Gandaria, and continuing through Kamalapur onto Tongi / Dhirasram ICD.

Light commuter train facilities considered a requirement to be retained at DABB airport railway station may now be considered for provision at both Narayanganj and Tongi, with BR land at DABB airport railway station utilised for a redesigned yard with provision for future growth for a significant number of intercity, commuter and freight train operations.

From this baseline footprint, the Consultant shall design the new DABB yard layout options and estimate the cost.

The results of this analysis will be summarized and presented in the Plan for developing a new yard layout and operational facilities in DABB airport station report.

Task 12: Master Plan for DABB Airport Railway Station Aligned with TOD

The Consultant shall prepare a Master Plan for the DABB airport station and yard that aligns with the transit-oriented development plans for the area surrounding the station, including the Task 10 analysis and provides for efficient interconnections with other modes of transport. The Master Plan to be prepared by the Consultant will not require detailed design of any Project components but will necessarily contain the preliminary designs and sufficient details to judge the viability, constructability, and feasibility of various layouts as well as the estimated cost related to such development.

The DABB airport station MmTH Master Plan shall provide a framework that sets out opportunities for change within and around the station, with the dual aims of improving the operations, interchange, and passenger experience of the station itself, and of making the station a catalyst for good growth that impacts positively on the surrounding community.

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A comprehensive understanding of the station, its issues and requirements, shall be developed and analysed by the Consultant for their relationship to and impact on the wider context and provide a well-functioning station in terms of:

- a) Accessibility, legibility and connectivity
- b) Safety and security
- c) Operational capacity issues and safeguarding opportunities
- d) Interchange and intermodal provision

Sustainability shall be embedded in the masterplan which shall set out clear strategy setting out sustainability aims and ambitions from the start. The sustainability strategy should be fully integrated with all the aspects of the masterplan; it could touch upon social inequalities and community benefits, sustainable mobility and active transport modes, green space and biodiversity, whole life carbon assessment, and energy efficient development.

The Master Plan shall be developed around the future yard plans/operational infrastructure made available by the Railways for the Project Station. The same shall be reviewed by the Consultant and may recommend improvements / adjustments while developing the Master Plan.

The Master Plan for Dhaka Airport Railway station shall cover as a minimum:

- The history of the station
- The urban context
- Developments and public-private partnership
- The condition of the station
- Capacity issues and forecasts
- Existing and planned interchange (BR, HSR, MRT, Bus, Subway)
- Accessibility issues and wayfinding
- Ticketing – sales and gates
- Rolling stock and platforms
- Future transport projects and expansion
- Retail and commercial opportunities
- Station servicing (deliveries and refuse collection)

The Master Plan, with supporting drawings and reports prepared as part of the Master Plan development, shall meet the requirements of this TOR.

The results of this analysis will be summarized and presented in the **Master Plan for DABB airport Station Report**.



Task 13: Concept Design

The Consultant shall prepare a concept design for the redevelopment of the DABB airport railway station building, yard and facilities. The Concept Design to be prepared by the Consultant will not require detailed design of any Project components, but will necessarily contain the preliminary designs and sufficient details to judge the viability, constructability and feasibility of various layouts as well as the estimated cost related to such development.

The Concept design documentation shall be developed fully in accordance with Bangladesh Railways Standards, Manuals and Specifications. See Annex 6 Specifications Relationship Diagram

The concept design should include the following work packages (not exhaustive):

a) Options for the new DABB airport railway station yard design

The consultant shall develop in close consultation with BR, new station yard layout options, based on work in Task 10: Options Analysis & Plan for Relocating Operational Facilities in Kamalapur Station.

The Consultant shall consider a baseline option based on the existing yard baseline footprint, with the light maintenance and cleaning facilities for passenger traffic remaining at DABB. The existing functional requirements including turnout speeds shall be retained.

The Consultant shall develop the new options for the DABB yard layout to increase capacity allowing more trains and more transfers; The new yard options shall consider (not exhaustive):

- the main traffic flows are physically separated from each other (as far as possible within the given space) and have their own dedicated tracks
- The layout of the existing tracks are optimised for speed and headways (this is a key functional requirement of the station)
- the provision of an optimum number of switch and crossings for traffic growth projections providing higher reliability (less failures due to a reduction in switches, less crossing movements)
- Shorter travel times. The station entry and exit speed for freight and passenger trains is increased from 15 km/h to 40 to 80 km/h
- a simplified traffic control

The Consultant shall rank new DABB station yard options based on a multi-criteria evaluation which shall include a qualified cost benefit analysis (considering financial and operational aspects, such as delay minutes). Only options with a positive result shall be taken forward for further analysis

b) Passive provision for future railway electrification

The Consultant shall consider the passive provision for future railway electrification of the railway. This will principally involve the electrification system physical dimension requirements above track level; and suitable overhead electrical safety clearances required for a 2x25 kV ac / 25 kV ac system

(41)

c) Options for commercial/residential development of the space above the station

The Consultant shall consider in the Concept design, options for commercial/residential development of the space above the station and the air rights over the railway yard and platforms identified in the Master Plan work. This would include:

- Legal review confirming whether BR has the right to develop these spaces
- Technical analysis demonstrating how such developments would work physically with other development in the station and surrounding area
- Financial analysis showing the additional costs and benefits of developing these spaces
- Analysis of options for involving the private sector in development of the spaces, including analysis of risks and stakeholders

Reference should be made to the Task 10 Analysis. Also, the JICA Preparatory Study on The Dhaka Mass Rapid Transit Development Project (TOD) Final Report December 2018, the JICA Study Team prepared a TOD Concept Plan around Kamalapur Station (see Annex 2).

d) Climate and disaster risk analysis

The Consultant shall carry out a climate and disaster risk screening for the project site and build into the analysis the need for resilience measures such as improved drainage design to address key risks

e) Station Architecture, user analysis and planning

The Consultant shall consult with BR regards applicable BR Station Planning Guidelines. The station design shall consider the architectural significance of the DABB airport railway station and its heritage

The Station should be developed in a way which provides a pleasing environment, value for money and a high-quality experience to the user. The station design shall facilitate the safe and efficient flow of passengers to ensure passenger satisfaction

Station design shall consider the impact on both the natural environment and neighbors, and to consider how this can be minimised. Steps should be taken to minimise energy usage and embodied energy. Preference should be given at station for cycling and other methods of public transport. Design should consider the future and changes to the climate

f) Network and train operations planning

The Consultant shall consider Network and Train operations planning requirements in the development of the station

g) Station security analysis

Station security analysis will be needed to advise the design team of the degree of physical security provision and passive security through security awareness in design.

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It should be determined if space will be required to provide body and luggage scanning facilities at the station and the staffing required to support this facility. This will have an impact on the station passenger capacity. The avoidance of conventional glass structures and the introduction of blast-resistant glazing and windows (such as ETFE light weight glazing solutions) need to be at the forefront of secure design. Public space kept free from obstruction and easily monitored from centrally placed control room facilities must and must form part of the integrated brief for the designers

h) Station control centre

The Consultant shall develop the optimum station control centre layout and location, where all the required equipment dedicated to monitoring passenger services within the station are located (CCTV monitors, public address console, fire alarm console, telephone with BR Operations Control Centre. Etc.)

i) Commercial Retail Facilities Provision

The Consultant shall consider the opportunity for commercial retail facilities provision within DABB airport railway station

j) Ticketing and Revenue Protection (gating or non-gating of interchange)

The Consultant shall consider the requirement for Ticketing and Revenue Protection (gating or non-gating of interchange), and its impact on station capacity

k) Passenger flow modelling analysis

The Consultant shall undertake passenger flow modelling analysis to determine passenger interchange capacity (Primary movements arrival departure and segregation from the different transport modes BR / BRT / MRT / Expressways / Road users)

The use of pedestrian flow modelling shall be developed to facilitate the establishment of station footprints that will ensure adequate provision for passengers and facilities is provided without the risk of future passenger congestion. The modelling shall identify the areas with the highest footfall past possible retail frontages and the locations that can exploit the commercial opportunity without impeding passenger movements

l) Ensuring Accessibility for All

The Consultant shall develop the design to ensure accessibility for all. Accessibility considerations are key to ensuring that railways provide a safe and welcoming environment for all customers. Poor design limits access for people with disabilities, the elderly, and many other groups, including foreigners, to employment, education, training, health, or social services (Snider and Takeda, 2008). Universal design is defined as "the design of products and environments to be usable by all people, to the greatest extent possible, without need for adaptation or specialized design. While the concept emerged primarily regarding disability issues, universal design strives to be a broad-spectrum solution that helps everyone, including elderly people, people with strollers, pregnant women, and children, in addition to people with disabilities. Its goal is to remove physical barriers and create a more inclusive environment" (Snider and Takeda, 2008). Vertical Access Provision (lifts, escalators, stairs)

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The Consultant shall develop the optimum solution for vertical access to ensure the safe flow of passengers does not exceed design capacity with a provision for future growth. Particular consideration shall be made for people with mobility and other disabilities

m) Vertical Access Provision (lifts, escalators, stairs)

The Consultant shall develop the optimum solution for vertical access location and provision of lifts, escalators and stairs, to ensure the safe flow of passengers does not exceed design capacity with a provision for future growth. Particular consideration shall be made for people with mobility and other disabilities

n) Civil Engineering

The Consultant shall develop the civil engineer design required covering site drainage, access roads, parking etc.

o) Infrastructures and Utilities (Water, Sewerage, Gas, Electricity, Telecommunication)

The Consultant shall develop the required designs for infrastructure and utilities covering waste, sewerage, gas, electricity and telecommunications

p) Structural Engineering

The Consultant shall develop the required structural engineering designs for the station building, yard and railway facilities

q) Electrical, Mechanical and Plant Engineering

The Consultant shall develop the design for Electrical, Mechanical and Plant Engineering for the station

r) Building Services

The Consultant shall develop the design for the station building services, including HVAC

s) Ventilation and fire Engineering

The Consultant shall develop the ventilation and fire engineering infrastructure necessary for the station. This shall include liaison and agreement with Bangladesh Fire Service & Civil Defense (FSCD)

t) Lighting, CCTV security, digital display and passenger information systems

The Consultant shall develop the design for the station Lighting, CCTV security, digital display and passenger information systems

u) Energy efficiency and climate resilience

The Consultant shall review the proposed investments for opportunities to green their use through wastewater treatment, ballast cleaning, use of renewable energies (rooftop solar), energy efficient electrical plant & equipment, intelligent controls and other such measures.

v) Station Signaling and Train Control System

The Consultant shall develop the signaling and train control design for the DABB airport railway station and yard area resignalling. This shall include consideration of

the signaling and train control system required in the DABB airport railway station area, regards functionality and interoperable compatibility with existing BR systems, including existing signaling and train control systems in operation. The design shall also consider new works planned and in progress on the adjacent sections of DABB to Tongi, DABB to Kamalapur

w) Rolling stock depots, cargo handling facilities and operating plan

The Consultant shall develop the design for the station Rolling stock depots, and cargo (heavy parcels) handling facilities. The Consultant shall prepare an operating plan for this work

x) Station Building, Yard and Facilities including HV power lighting Towers, transformers, switchgear, cables

The Consultant shall develop the design for the station building, yard and facilities

y) Station Operations and Maintenance

The Consultant shall provide a station operations and maintenance plan

z) Implementation schedule

The Consultant shall provide a implementation plan for the development of the station. This shall include enabling and staging works to minimise disruption to operating BR traffic

aa) Concept design Drawings

The Concept Design to be prepared by the Consultant shall be supplemented with complete structural/ architectural/Mechanical/Electrical/Plumbing/Fire Protection (MEPF) drawings for all the components related to development planned. Drawings shall be provided showing options where appropriate. Scale 1:1250 with 1:500 details & cross sections where appropriate with an overall location plan scale 1:1250 / 1:2500 / 1:5000

bb) BIM & Digital Twins

The Consultant shall consider the benefits of the application of Building Information Modelling (BIM) and Digital Twin for the station complex

BIM is the process of creating and managing digital information about the station asset and is a critical tool for designing within a complex environment involving multiple disciplines and constraints. The Digital Twin concept builds on BIM by creating a virtual representation of the station asset which uses smart technology to feed real time data into the digital models, enabling the smart operation of the building

cc) Estimation of the capital, maintenance, and operating costs during the lifetime of the project

The consultant shall prepare an estimate of the capital, maintenance, and operating costs during the lifetime of the project. These costs shall be benchmarked against unit costs with similar projects in the East and South Asia subregions. This shall include phased investments. The level of detail shall enable the evaluation of the technical options and costing of the investment

The level of detail shall enable the Economic and Financial tasks to be undertaken

dd) Land Value Capture (LVC)

Land Value Capture (LVC) is a way to capture the increase in the value of land and development generated by the improved accessibility of transportation. Improved access has value which is reflected in land and property values. The Consultant shall provide an estimate of Land Value Capture (LVC). This estimate shall build on analysis Options for commercial/residential development of the space above the station

ee) Financing Options

The consultant shall provide financing options for the station works. See Task 16 Financial Sustainability Analysis

ff) Packaging and Procurement Options Analysis

The Consultant shall analyze and make recommendations for the packaging and procurement options for the Kamalapur station building, yard remodelling and relocation of railway facilities. The analysis shall also consider operations and maintenance requirements for the works

The analysis shall include consideration of best value practice for works of similar scope. It is expected that the analysis shall include consideration of: PPP (public private partnership) both user-charge PPP and service payment PPP; EPC (engineering, procurement and construction), DBB (Design-bid-build) and DB (Design-Build); and consideration of a packaging mix of different procurement types for the works e.g.: PPP station Building, D&B FIDIC contract for Yard remodelling and relocation of railway facilities

The results of the Concept Design process will be summarized and presented in the **Concept Design Report**.

Feasibility Study

The Consultant shall prepare a bankable feasibility study, covering technical (including climate and disaster resilience), economic, financial, social and environmental feasibility for the investments covered by concept design. This feasibility study will summarize and incorporate the results of:

- a) the traffic forecast prepared in Task 6
- b) the infrastructure and operations analysis carried out in Tasks 8 and 9, together with technical analysis made in developing the Options Analysis & Plan for a new yard layout and Operational Facilities in DABB airport railway station; the Master Plan; and the Concept design; to provide a technical feasibility assessment
- c) Cost estimation carried out in Task 13

It will additionally include the results of tasks 14 – 16.

Task 14: Scoping of Environmental, Social and Gender Impacts

The Consultant shall undertake an assessment of the expected environmental, social and gender impacts of the proposed passenger and freight services, and the defined investments, in a manner consistent with the World Bank Guidelines for Environmental and Social

Framework, including its 10 Environmental and Social Standards (ESSs), as well as Bangladesh environmental Conservation Rules (ECR) 2023, and relevant laws of Bangladesh. It shall consider all relevant direct, indirect, and cumulative environmental and social risks and impacts of the proposed project.

The ES assessment will begin by a preliminary baseline analysis, natural trend in ES ecosystem, scoping for the ES assessment followed by the assessment of the risk and impact of the project activities. The risks and impacts shall take into account:

- a) those defined by the Environmental, Health, and Safety Guidelines (EHSg)
- b) those related to community safety
- c) those related to climate change
- d) any material threat to the protection, conservation, maintenance, and restoration of natural habitats and biodiversity
- e) those related to ecosystem services and the use of living natural resources, such as fisheries and forests
- f) any prejudice or discrimination toward individuals or groups in providing access to development resources and project benefits, particularly in the case of those who may be disadvantaged or vulnerable
- g) negative economic and social impacts relating to the involuntary taking of land or restrictions on land use
- h) impacts on the health, safety, and well-being of workers and project-affected communities
- i) risks to cultural heritage

The Consultant will also consider all relevant Associated Facilities (if any) to determine the extent to which they can be brought in line with the requirements of the ESSs. The assessment should also focus on those aspects that present the most significant risks, taking into account the extent to which implementing specific measures will be technically and financially feasible.

The risk and impact analysis will lead to the development of indicative mitigation measures by the Consultant and to be implemented by the implementing authority. This will include development of TORs for further studies ES Management Framework (ESMF), ES Impact Assessment (ESIA), Resettlement Planning Framework/ Action Plan (RPF/RAP), Labor Management Procedure (LMP), Waste Management Plan, ES issues inclusion in Contractor Bid Document and other document necessary as per the feasibility study.

The results of this analysis will be summarized and presented in the **Feasibility Study Report**.

Task 15: Economic Feasibility Analysis

The Consultant shall carry out an economic analysis for project investments in accordance with the World Bank economic analysis guidelines, demonstrating the economic costs and

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benefits to Bangladesh of the proposed investments. This would include inter alia time savings, reduced road deterioration, accident cost reductions, reduction in transport costs, maintenance costs, increased access to job, education and health facilities and reductions in other environmental and social externalities. It would also include an estimation of the GHG impact of the project, priced at the shadow price of carbon used by the World Bank.

The analysis shall include:

- a) Estimation of the economic internal rate of return (EIRR) and the net present value (NPV) for all identified alternatives, compared to a defined "do-minimum" alternative using a standard benefit/cost methodology and a defined appraisal period. Costs and benefits should be expressed in constant economic prices (defined base year)
- b) All economic costs and benefits should be shadow-priced, as appropriate, to reflect local conditions, e.g. labour costs, value of freight time, vehicle costs, fuel subsidy, taxes and levies, etc. Growth in the real value of time and value of life should be included in the analysis
- c) The economic appraisal should include, where appropriate, the costs associated with any necessary expropriation of land and property
- d) Economic analysis should include the Greenhouse Gas Accounting and Shadow Price of Carbon as per the World Bank Guidance note which will be provided to the Consultant, using the WB range on price of carbon
- e) The Consultant is expected to undertake sensitivity and formal risk analyses (explaining clearly the analysis for an educated non-technical audience) on the parameters that are estimated with the greatest uncertainty, e.g. traffic and travel time forecasts, cost estimate etc. The Consultant is also expected to calculate the switching values of critical parameters⁴

The results of this analysis will be summarized and presented in the **Feasibility Study Report**.

Task 16: Financial Sustainability Analysis

The consultant shall analyze the financial sustainability of the investment in the DABB airport railway station MmTH. This analysis shall include:

- a) Investment costs for constructing the station, including options with greater or lesser development of air rights and other spaces over the station
- b) Sources of financing and funding for construction of the station. This may include, *inter alia*, grants or loans arranged through the national government, support from the municipal government directly or through the Dhaka Mass Transit Development Project, support from the TOD development around the station, sale or leasing of land development rights held by BR at the station and yard or by other interested parties. The earlier stakeholder consultant will have provided insights into parties that have

⁴Consistent with the approach outlined in Pedro Belli et al. (2001) *Economic analysis of investment operations analytical tools and practical applications*, World Bank Institute

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an interest in development of the multimodal station and the resources they may be able to contribute to the investment in the station

- c) Operations and maintenance cost of the station. This will identify which parties may be responsible for operation and maintenance of certain parts of the station. For example, BR may be responsible for operating and maintaining the rail part of the station, while the metro could be responsible for operating the metro station
- d) Sources of funding for operation and maintenance of the station. This may include, *inter alia*, support from BR and the other transport modes connecting to the station, parking revenues, commercial revenues from leasing of retail space in the station, advertising in the station, and rental of office or residential space above the station and yard

Consultant shall prepare a financial model for the station that allows analysis of various financing and funding options. Consultant shall use this model to develop a funding and financing plan for the station. Such analysis and plan may inform the structuring of a public private partnership for construction, operation, and maintenance of the station.

The results of this analysis will be summarized and presented in the Feasibility Study Report.

Task 17 Land Acquisition Plan, Resettlement Plan, IPP

Land Acquisition Plan (LAP)

- 4. Land acquisition may be required for Construction of Multimodal Hub in Dhaka Airport Station. In that case, Consultant shall prepare LAP & other associated documents for these components. .
- 5. Consultant shall do the following but not limited to:
 - Collect Land Acquisition Plan of existing BR land; certified latest Khatians; latest approved Mauza Map, Gazettes and other records from DC offices and consult BR's estate office records for identify the ownership of lands within the finalized Construction Right of Way (CROW). In case of anomaly DC's offices record are to be followed. Based on these documents, establish the land ownership in the finalized CROW. Within total land uses for the CROW, identify BR owned land, private land to be newly acquired and land to be required from Government khas/other Government agencies (if any).
 - Carry out 100% census and prepare detailed data base of all Project Affected People (PAPs), their affected assets, inventory of losses, identify categories for impact and eligibility of affected people for the loss of structure, trees, crops etc as per Government laws and regulations of Bangladesh related to Land Acquisition.
 - Prepare district wise Land Acquisition Plan (LAP) based on latest gazette Mauza Maps with estimated cost and detailed plot schedule. The latest gazette Mauza maps are to be digitalized showing the proposed alignment including acquisition and requisition boundaries, plot number, labels of mauza, upazila and districts homesteads, angle at change of direction of alignment, and other physical features with appropriate legends for incorporation in the study report. The mauza map will constitute a basis for



calculation of land acquisition and requisition areas of the affected plots at the pre-project condition. The Plot schedule will contain the following information:

Upazila:

Mauza:

JL No.:

SN	Plot No.	Khatian No.	Total Area of Plot Acre	Type of Land (as per record)	Area to be Acquired (Acre)	Full/Partial (of plot to be acquired)	Remarks
Total:							

- Prepare complete Land Acquisition Proposals for land acquisition of private land and land requisition of Government khas/other Government agencies' land. Land Acquisition Proposals are to be ready to be submitted to the approving authority as per "Acquisition and Requisition of Immovable Property Ordinance 1982" and "Immovable Property Acquisition Manual 1997" or latest manuals, laws and regulations of Bangladesh related to Land Acquisition (if required).
- Keep liaison with respective agencies for obtaining necessary clearance towards acquisition of land. Assist arranging meeting of different statutory committee as well as other committee formed by GOB from time to time in the matter of land acquisition.
- Assist Project Director in Land Acquisition process especially during feasibility of DC office, issuing of notice under section 3, Joint verification and handing over land to BR (if required).
- Perform other tasks as given from time to time by the client in the matter of Land Acquisition. Assist Project Director in Land Acquisition process specially during feasibility of DC office, issuing of notice under section 3 of Land Acquisition Act of GOB, Joint verification and handing over land to BR (if required).
- Perform other tasks as given from time to time by the client in the matter of Land Acquisition.

c. Resettlement Plan (RP)

6. Consultant shall do the following but not limited to:

- Based on ROW fixed by topographical survey and Land Acquisition Plan, conduct 100% census to define categories for impact and eligibility of affected people for compensation and number of titled and non-titled Entitled Persons (EPs).

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- Prepare a matrix of entitlements covering compensation and other assistance for all types of impacts to fully replace lost assets, income, and livelihood in compliance with the ADB's Safeguard Policy Statement (2009) or other latest publishing.
 - Carryout detailed land market survey. Assess the replacement value for lands, all types of structure, other assets, crops, and trees and discuss in detail the valuation methodology used. Identify additional top-up compensation for land, structure etc are to be paid to the Titled EPs as per replacement Value. Specific measures are to be taken for severely affected poor people, ethnic minorities, Women headed families or other vulnerable households.
 - Prepare a detailed database covering EP based detailed information such as family members, their earnings & expenditure, type wise detailed inventory of assets and loss, replacement value of loss, entitlement of EP for compensations, willingness to participate in income restoration program and interested training etc. as per entitlement Matrix.
 - Prepare detailed cost estimate for implementation of Resettlement Plan where cost involving Land Acquisition is to be paid by DC office; entitlement wise cost estimate for implementation of Resettlement Plan, cost estimate for implementation of Income restoration Program and cost estimate of NGOs/Agencies are to be mentioned separately.
 - Prepare a Resettlement Plan (RP) based on 100% census in accordance with WB's Policy and Loan Agreement covering all of the above and acceptable to the Government and WB which covers a complete enumeration of all Project Affected People (PAPs), their affected assets etc.
 - Prepare detailed resettlement implementation schedule and phasing in accordance with phasing of construction work. Prepare TOR and cost estimate for NGOs/Agencies for RP & ILRP implementation. Prepare TOR and cost estimate for External Monitoring NGOs/Agencies.
- d. Indigenous People's Plan (IPP)**
- Prepare an indigenous people's plan (IPP) in accordance with WB's Policy, if any indigenous people, such as tribes or settlers, as per WB's definition, are likely to be affected significantly by the project.
 - Provide on the job training and knowledge transfer to the executing agency and Government personnel to implement the IPP.
 - Assist the executing agency to (i) prepare an IPP implementation schedule, (ii) establish safeguard units, and (iii) recruit NGO/Agency for IPP implementation.

Task 18: Technical Specifications & Bidding Documents

In consultation with BR and World Bank about procurement packaging and procurement method analysed and recommended in Task 12, the Consultant shall prepare technical specifications and draft bidding documents suitable for the agreed packaging and procurement strategy option.

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For the repose to this TOR, the Consultant shall assume that the Technical Specifications and bidding documents to be prepared, shall be suitable for a competitive 2-stage Design & Build contract under FIDIC conditions of contract (The World Bank, and other multinational organisations including EU funding programs and the European Investment Bank require FIDIC forms) for the construction of Multimodal Transport Hub at Dhaka Airport Station (DABB).

Task 19: Implementation Capacity

The Consultant shall assess the need for developing capacity and institutions for successful implementation of the project. This shall include:

- a) Address the need for coordination among BR, BRT, MRT, the Elevated Express way, Dhaka Roads Department and others to achieve the desired development outcomes of the project. The Consultant shall propose institutional options for enhancing coordination
- b) Analyze BR (agency and daughter companies) capacity gaps in project management, procurement and fiduciary, management of social and environmental safeguards, and provision of market competitive freight and logistics services. Develop a capacity building program for building skills in this area
- c) Conduct market analysis of suppliers for goods and works to be procured in the project and help BR in preparing Project Procurement Strategy for Development (PPSD) for the proposed project and a procurement plan. Assist in preparatory workshops and meetings, if required, for project preparation and discussion with stakeholders
- d) Assist BR in preparing high value procurement Bidding Document/RFP at the beginning of the project to facilitate the project readiness, and if required, assist in the bidding process and review of bid evaluation reports in e-GP system.



(II) Consultancy Services for Feasibility Study and Conceptual Design to facilitate construction of Multimodal Transport Hub (MmTH) at Dhaka Kamalapur Station

Introduction

The World Bank has received a request from the Government of Bangladesh (GoB) to finance improvements to strategic rail facilities in Bangladesh, including the redevelopment of the existing railway station building, yard and railway facilities at Dhaka Kamalapur Railway Station Multimodal Transportation Hub. This term of reference is for preparing a plan to relocating operational and maintenance facilities in Kamalapur Station to other appropriate sites on Bangladesh Railway (BR) to make way for TOD development of the station land; preparing a conceptual design for the Kamalapur station building and yard facilities; and preparing a bankable feasibility study for the investments in facility relocation, new station building and yard improvements.

Key Project Requirements

1. To provide a well-functioning multimodal station providing for efficient interchange of passengers between the railways and other urban transport modes
2. To establish the physical infrastructure of station building, yard facilities and connections to housing and commercial spaces to be built around the station to meet the functional requirements of the station and yard operations. This will include (not exhaustive):
 - a) Dhaka Kamalapur Station Yard Remodeling
 - b) Reconstruction of Dhaka Kamalapur Railway station building and other station facilities
 - c) Relocation & reconstruction of diesel locomotive workshop
 - d) Shifting of rolling stock operation & light maintenance facilities (including locomotive repair shed, train washing arrangement, training center, running room & fuel supply system)

Background

Bangladesh Railway (BR) is an agency of the GoB that provides railway infrastructure, passenger services and freight services in Bangladesh. The railway is vertically integrated and does not currently allow private operators. BR is headed by a Director General, supported by functionally organized Additional Directors Generals (for rolling stock, infrastructure, finance, marketing and planning, and operations). Operations are organized geographically between East and West and subdivided into geographical divisions. The Ministry of Railways oversees BR and formulates rail policy. Railway prices require approval by the Cabinet of Ministers.

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BR operates a network of just over 3000 route-km. The network was originally broad gauge (1676 mm) in the Western half and meter gauge (1000 mm) on the Eastern half. BR has significant investment projects underway or in study to expand its network and operations, and to dual gauge the main meter gauge routes.

BR operates a network of just over 3000 route-km. The network was originally broad gauge (1676 mm) in the Western half and meter gauge (1000 mm) in the east. BR has significant investment projects underway or in study to expand its network and operations

The capital city of Bangladesh, Dhaka, is connected with Northern, Southern, Eastern and Western regions of the country by the Dhaka-Tongi railway section, which is the busiest corridor of the Bangladesh Railway network. The Dhaka-Tongi section is a mixed traffic section of route serving both passenger and freight traffic.

Dhaka Kamalapur Railway Station, completed in 1968, is the central railway station in Dhaka. It is the largest railway station of the country and the most important terminal for communication between Dhaka and the whole of Bangladesh. Dhaka Kamalpur station is connected with the entire country's rail network (platforms 1 to 7) through the Dhaka-Tongi section, and a single suburban line to Narayanganj (platform 8). There are currently some 150 diesel traction trains per day operating on this section of route between Dhaka Kamalapur and Tongi (estimated capacity 112 trains), which are predominantly diesel traction passenger trains carrying some 120,000 passengers per day, with some parcel and container freight trains.

Dhaka Kamalapur Railway Station is planned to be connected to a number of interfacing transportation projects: MRT Lines 1, 2 4 and 6; platforms for conventional rail and a possible new airport rail line from Kamalapur to DABB airport; intercity and local buses; platforms for high-speed rail lines (BR have completed a feasibility study and detail design for construction of a High-Speed Railway between Dhaka & Chattogram); and retail and other high-density land uses. The Motijheel station of MRT Line 6 will be connected to Kamalapur by means of a proposed "skywalk". The Dhaka Elevated Expressway is designed along the Atish Dipankor Road at the eastern border of the project site. BBA is also conducting Feasibility Study of "Subway" program which also assumes underground connection(s) with the MmTH.

On the other hand, as the present conceptual plan, existing Dhaka Locomotive Workshop need to relocate another place of outside Dhaka. Dhaka Diesel Workshop is an important establishment for heavy maintenance of Meter Gauge Locomotives. Without creating new Locomotive workshop, it could not be possible to abolish existing Dhaka Workshop at Kamalapur station area. Therefore, building a new workshop is the prerequisite of creating Multimodal Transport Hub at Kamalapur station.

The existing iconic main station building, which has cultural heritage value, will be retained and renovated as a Railway Gallery.

The Project Location





Source: BR Presentation to WB April 2022



Source: Google Earth 11 January 2024

The Bangladesh Public Private Partnership Authority (PPPA) signed a G2G Memorandum of Cooperation (MoC) with the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT), on the 15 June 2017. The Bangladesh Cabinet Committee on Economic Affairs (CCEA) approved the project on 17 October 2018. The PPPA and MLIT renewed the MoC on the 5th October 2022. Kamalapur MmTH is a complex and challenging PPP project. To facilitate the realisation of Kamalapur MmTH project, JICA undertook a data collection survey on Kamalapur station area redevelopment with a final report date March 2022.

At present, BR is working with Kajima Corporation of Japan on the development of a commercial, retail and residential facilities at the Kamalapur Station multimodal transportation hub.

This TOR concerns the development of the new railway station building, a new station yard layout and the relocation of existing railway facilities to enable the G2G Bangladesh Japan PPP project to proceed. An effective working relationship between the railway project and the G2G PPP project is required.

Objective

The objectives of this assignment are:

- To develop a master plan for the redevelopment of the Kamalapur station building, yard, operational and maintenance facilities at the Kamalapur MmTH
- To prepare a conceptual design for the Kamalapur station building and yard, including the relocation of operational and maintenance facilities (the heavy maintenance diesel workshop has been specifically identified by BR to be relocated outside the station area) and bidding documents, based on this design, for detailed design and construction of the same;
- preparing a bankable feasibility study, covering the technical, social, environmental (includes computing carbon emission inventory), and economic and financial viability for the investments in facility relocation, the new station building and redesigned yard.

Scope of Work

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The consultant shall undertake the following tasks. Throughout this assignment consultant shall work closely and collaboratively with staff from BR, so that their analysis is well understood and concerns of BR have been addressed.

Inception

Task 1: Literature Review, Initial Interviews, Site Visit, and Inception Report

The consultant shall develop a contextual understanding of the construction of assignment through the following activities.

f) Review existing studies and reports related to the proposed project investments. These would include:

- The Government of the People's Republic of Bangladesh / World Bank: The Strategic Plan Transport for Dhaka – 2005; By: The Louis Berger Group Inc / Bangladesh Consultants Ltd
- Dhaka Transport Coordination Board / Ministry of Communications / The Government of the People's Republic of Bangladesh / JICA: Preparatory Survey Report Dhaka Urban Transport Network Development Study - final report March 2010; by Katahira& Engineers International / Oriental Consultants Co., Ltd. / Mitsubishi Research Institute, Inc.
- Dhaka Transport Coordination Board / Ministry of Communications / The Government of the People's Republic of Bangladesh / JICA: Preparatory Survey Report Dhaka Urban Transport Network Development Study Phase 2 - summary October 2011; By Katahira& Engineers International / Oriental Consultants Co., Ltd. / METRO Development Co., Ltd.
- The Government of the People's Republic of Bangladesh: Roads Division / Ministry of Communication: The National Integrated Multimodal Transport Policy - Unofficial English Version; August 2013
- Dhaka Transport Coordination Authority (DTCA) / JICA: The Project on The Revision and Updating of the Strategic Transport Plan for Dhaka (RSTP) Urban Transport Policy – November 2015; by: Almec Corporation / Oriental Consultants Global / Katahira& Engineers International
- Dhaka Transport Coordination Authority (DTCA) / JICA: The Project on the Revision and Updating of the Strategic Transport Plan for Dhaka – draft final report November 2015; by: Almec Corporation / Oriental Consultants Global / Katahira& Engineers International
- Dhaka Transport Coordination Authority (DTCA) / JICA: The Project on the Revision and Updating of the Strategic Transport Plan for Dhaka – final report / summary November 2016; by: Almec Corporation / Oriental Consultants Global / Katahira& Engineers International



- BEZA (Bangladesh Economic Zones Authority): Prefeasibility Report Dhaka SEZ (Special Economic Zone) -30 November 2016; by: IIFC
- Civil Aviation Authority, Bangladesh / Ministry of Civil Aviation and Tourism / The Government of the People's Republic of Bangladesh / JICA: Preparatory Survey for Dhaka International Airport Expansion Project – final report March 2017; by: Nippon Koei Co., Ltd.
- JICA: The Preparatory Study on the Dhaka Mass Rapid Transit Development Project (Line 1) in Bangladesh – final report (summary) December 2018; By: Almec Corporation / Oriental Consultants Global / Nippon Koei Co., Ltd. / Katahira& Engineers International
- Bird, Julia, Yue Li, Hossain Zillur Rahman, Martin Rama, and Anthony J. Venables. 2018. Toward Great Dhaka: A New Urban Development Paradigm Eastward. Washington, DC: World Bank
- Herrera Dappe, Matias, Charles Kunaka, Mathilde Lebrand, and Nora Weisskopf. 2020. Moving Forward: Connectivity and Logistics to Sustain Bangladesh's Success. Washington, DC: World Bank
- JICA Data Collection Survey on Kamalapur Station Area Redevelopment Final Report March 2022
- The Government of the People's Republic of Bangladesh / WTO Cell / Ministry of Commerce: Policy Review/Policy Study/Policy Paper Preparation on National Integrated Multimodal Transport Policy, 2013 February 2023; By: South Asian Network on Economic Modeling (SANEM)
- JICA Kamalapur Transit-oriented development (TOD) study 2018

Review the G2G arrangements and plans for TOD development around Kamalapur station

Review the relevant documents related to the G2G agreements and the plans of the Japanese company working on the project. Meet with representatives of Kajima Corporation of Japan and other stakeholders to understand the state of their planning and the interfaces between the station and the TOD developments around the station

g) Conduct initial interviews with BR staff concerned with investment requirements and operations

BR will provide names/positions of staff to be interviewed

h) Visit the transport and rail facilities in the Kamalapur railway station area

This would include the existing Dhaka Kamalapur railway station area including the station yard, railway facilities, existing transportation facilities including road, bus, coach



terminal, and planned areas for MRT lines 1, 2, 4, 6, Dhaka Elevated Expressway, the proposed BBA subway and BR HSR terminal.

i) Review existing BR designs and construction works proposed that would affect the Kamalapur railway station area

BR have some initial concept development options for Kamalapur as outline in Annex 4. Proposed construction works include the Dhaka- Tongi- Joydebpur Railway Expansion Project, currently schedule for completion in 2027. The project will increase capacity from current 112 trains (actual 144) to 250 trains on the Dhaka-Tongi section and 90 trains (current 44) on the Tongi-Joydebpur section, the relocation of the Kamalapur Inland Container Depot (ICD) to Dhirashram (Note: Dhaka Kamalapur station physical development can only begin after the Kamalapur ICD) is shifted to Dhirashram)

j) Review Key Interface work with BR and the Transactional Services Advisory Consultant
PPP Authority signed an agreement with Ernst & Young LLP to obtain transaction advisory services for the PPP Project titled "Construction of Multi-Modal Transport Hub at Dhaka (Kamalapur) Railway Station" on July 10, 2023.

The Consultant shall meet with BR and Ernst & Young to agree the boundary of the Transactional Services scope of work to avoid duplication. Relevant data collected and made available to BR by the Transactional Services Advisory Consultant covering Topographic Survey and Land Use Survey; Infrastructures and Utilities; and Traffic Survey should be reviewed. By agreement with BR, this data may be used by the Consultant.

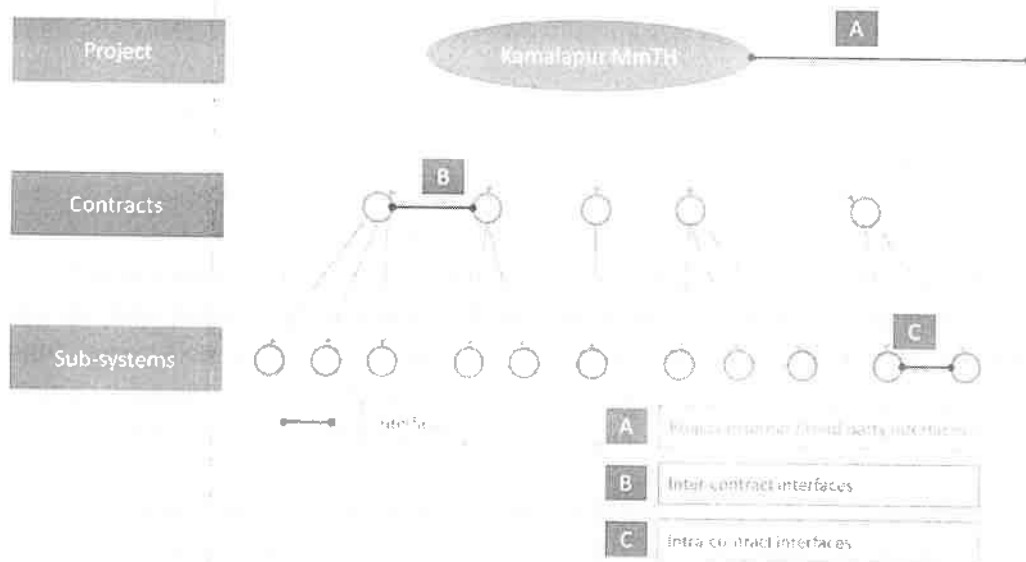
Based on this initial review, the consultant shall prepare an **Inception Report**, outlining its findings and confirming or proposing changes to its work plan.

Delivery

The feasibility study and conceptual design for the redevelopment of the existing station building, yard and railway facilities at Dhaka Kamalapur railway station multimodal transport hub is a complex project. The project has a large number of stakeholders and interfaces (project external / third party interfaces; Inter-contract interfaces; and Intra-contract interfaces). See figure 1.

Figure 1: Project Interfaces

(41)



The Kamalapur Station multimodal transportation hub development offers an opportunity to demonstrate effective partnership working between the joint Clients, namely the G2G Bangladesh Japan PPP project for developing the commercial, retail and residential facilities at Kamalapur Station multimodal transportation hub, and the BR WB project for the development of the new railway station building, a new station yard layout and the relocation of existing railway facilities. An effective working relationship between the railway project and the G2G PPP project, and with the interfacing MRT, Road, HSR and BBA projects will be required. The success of this project will rest upon open and transparent communication between all Clients and BR supported by a clear and responsive governance framework. Consultant shall propose a working structure for this communication throughout the project and support its implementation throughout the study period.

The Consultant shall deliver the project with specific consideration of Stakeholder identification and consultation. The project shall further be delivered with consideration of safety and risk management; systems engineering and integration management.

The Consultant shall maintain regular communication, briefing meetings and reporting with BR and World Bank on the progress of the work. Initial and developing technical findings shall be presented and any areas of concern addressed.

Task 2: Stakeholder Management

Stakeholder Management is defined herein as "the systematic identification, analysis and planning of actions to identify, communicate with, negotiate with and influence stakeholders".

Stakeholders are defined as "all those who have an interest or role in the environment, performance and/or outcome of the project or are impacted by the project, whether internal or external to BR".

The objectives of the Stakeholder Consultation process are to achieve:

- Ensuring relevant stakeholder requirements become project deliverables

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- Creating acceptance of project deliverables to all
- Communicating of project benefits to all
- Building support for change
- Demonstrating clear communication and accountability

A significant part of the project communications with external stakeholders will be carried out by BR. The Consultant shall work closely with BR and support BR in responding to the relevant stakeholders.

International experience with multi-modal station development highlights the need for close coordination and cooperation of the various stakeholders of the different modes of transport and the effective integration of the station building, yard and railway facilities into a single station complex system.

The Consultant shall undertake effective stakeholder identification and consultation process to understand stakeholders' interests and concerns about the station and to reflect their needs in the design of the station. Key stakeholders include (not exhaustive):

- a) Dhaka Metropolitan Police (DMP)
- b) Dhaka Metropolitan Transport Authority (DMTA)
- c) Dhaka BRT
- d) Hazrat Shahjalal International Airport
- e) Dhaka Mass Transit Company Limited (DMTCL)
- f) Directorate of Road Transport Maintenance (DRTM)
- g) Dhaka Transport Coordination Authority (DTCA)
- h) Dhaka Transport Coordination Board (DTCB)
- i) Government Inspector of the Bangladesh Railways (GIBR)
- j) Ministry of Communication (MOC)
- k) Ministry of Housing and Public Works (MOHPW)
- l) Ministry of Railways (MOR)
- m) Public Private Partnership Office (PPPO)
- n) Rajdhani Unnayan Kartripakkha (RAJUK)
- o) Road and Highway Department (RHD)
- p) Regional Transport Committee (RTC)
- q) Bangladesh Fire Service & Civil Defence (FSCD)
- r) Operators of all the connecting infrastructure (BRT / MRT / Airport)
- s) Japan International Cooperation Agency (JICA)
- t) World Bank (WB)



The consultant shall survey current and potential users of the station to understand their needs. This survey shall specifically include women, whose travel needs are typically different than men's needs, people with disabilities and other disadvantaged groups.

The results of this analysis will be summarised and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 3: Safety Management

Safety consideration and effective management is paramount during both the initial development stages through to the construction and operation of a railway station building and operating railway yard system.

A safety management plan shall be developed which will describe how the project shall comply with all relevant statutory provisions. The safety management plan should be updated as the project develops.

A Cyber Security Network and Information Systems (NIS) strategic response plan shall be developed in line with Bangladesh legislation.

The results of this analysis will be summarised and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 4 Risk Management

The consultant shall conduct a comprehensive assessment of the hazards and risks inherent in the redevelopment of the DABB airport railway station to identify and set up a process for managing hazards and risks throughout the development of the station building, yard and railway facilities. See Annex 4 on Risk Management.

The Consultant shall prepare and maintain a risk management plan to confirm the objectives, roles and responsibilities, definitions, hazard and risk management process, risk mitigation measures, including the consideration of optimism bias for the development of the Kamalapur station MmTH.

The results of this analysis will be summarised and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 5: Systems Engineering and Integration Management

Railways are first and foremost a system. Railways must be designed, constructed, operated and maintained holistically, but also take account of the importance of interfaces between its constituent parts, some of which are safety critical and upon which the integrity of the railway system depends. See Annex 5 for more information on systems engineering and integration.

The Consultant shall apply effective System Engineering and Integration Management for the project work.



A systems engineering management plan (SEMP) shall be prepared by the Consultant and updated as a live document as the project develops.

A systems integration and interface management plan (SIIMP) shall be developed prepared by the Consultant and updated as a live document as the project develops. An interface matrix (IM) shall be developed by the Consultant. The IM shall be updated as the project develops.

The results of this analysis will be summarised and presented in the Assessment Report and provide input to the **Master Plan, Concept Design and Feasibility Study Reports.**

Conceptual Development of Dhaka Kamalapur Station Building, Yard, and Facilities

Task 6: Demand Analysis

The consultant shall prepare a forecast of the passenger and freight usage of the new Kamalapur station through 2050. This forecast should consider the flow of passengers between each mode connecting at the station (between, *inter alia*, commuter rail, intercity rail, metro, BRT, local bus, taxi, auto & motorbike, bicycle, pedestrian) and the peak period flows between modes that would need to be accommodated in the station.

The demand analysis should include the following activities.

- a) Analyze the Traffic Survey data collected by the Transactional Services Advisory Consultant (refer to Task 1 item e), and by agreement with BR, this data may be used by the Consultant
- b) Collect and analyze traffic survey data of the connecting urban transport projects (e.g., BRT, MRTs, FDEE)
- c) Conduct and analyze traffic survey data in the Kamalapur railway station and nearby stations
- d) Analyze BR traffic data by origin and destinations and survey passengers using Kamalapur railway station and other connected stations Narayanganj to Kamalapur and Kamalapur to Joydebpur
- e) Analyze traffic surveys, forecasts and studies of other modes of transport in the adjacent area (e.g., road traffic, rickshaws, bus, coaches)
- f) Analyze the TOD development plans for the Kamalapur station area to understand the impact the TOD development will have on the generation of passengers

The Consultant shall review and update the BR traffic and revenue forecasts for the rail traffic for the Dhaka-Tongi railway section (which is busiest corridor of the Bangladesh Railway network). This should take into consideration recent economic trends, development in the type and volume of railway section traffic, changes in regional trade relationships, competition from alternative transport modes, and other market developments. Based on this review consultant shall prepare a robust traffic and revenue forecast for the station to 2050

The Consultant shall identify the main factors that affect usage of the station and use them to conduct sensitivity analysis. The Consultant shall prepare three traffic scenarios—low, most likely, high—that show the impact of varying the key demand drivers.

The results of this analysis will be summarized and presented in the **Assessment Report** and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 7: Physical, Utility and Land Use Surveys

The consultant shall conduct the following surveys to establish the physical conditions, climate risks, and land use in the Kamalapur station area, covering the existing station, yard area, and the ICD and railway facilities area indicated for the location of the new station building as indicated in Annex 4.

Note: As outlined in Task 1 e) Review Key Interface work with BR and the Transactional Services Advisory Consultant; Topographic Survey and Land Use Survey; Infrastructures and Utilities data collected by the Review Key Interface work with BR and the Transactional Services Advisory Consultant and by agreement with BR, this data may be used by the Consultant.

Topographical Survey

1. Consultant shall review existing maps and GIS data collection (including Measure Map app software such as Measure Map Pro and Agro Measure Map Pro for google maps)
2. Consultant shall conduct a "Plane Survey" to establish:
 - a) Exact boundaries and coordinates of the BR Land
 - b) Consistency with cadastral information
 - c) Exact location and size of facilities located in the BR land
 - d) Ortho-image of the BR land and surroundings
 - e) 3D images of the topography and buildings
3. Railway Track and crossings, signaling and telecommunications engineering survey data necessary to establish for the railway yard remodeling purpose covering (not exclusive):
 - a) position, shape and grade of the formation, ballast bed, tracks, and switches within the station survey boundary of circa 2.5 km
 - b) communication cables, ducting connection pits, signaling devices, and track crossing barriers and signs
4. The consultant shall conduct a Cross-section Survey of the station yard, ICD and railway facilities area

Note: All railway survey work shall be undertaken fully in accordance Bangladesh Railway standards and requirements for railway infrastructure. Survey data collected shall be in digital format and suitable for computer software design tools (BIM (Building Information Modeling) / Bentley Open Rail Designer Rail Network Design Software / Autodesk Civil 3D Rail Design software etc.)

Land Use Survey

1. General
 - a) Land history
 - b) Confirmation of land boundaries in terms of "ownership" and "users" [+ existence of agreements between neighboring landowners]
 - c) Use of Lands (e.g., residential, commercial, roads, parks)

- d) Location, configuration and size of buildings/structures and land fixtures
- 2. Survey of BR owned lands (present)
 - a) Confirmation of boundary for each land use and current status
 - b) Current status of each housing unit and residents
 - c) Key information on non-residential buildings/structures and facilities
 - d) Survey on non-BR occupants
 - e) Car ownership ratio, parking locations
- 3. Survey of adjacent lands to BR owned land
 - a) Status of adjacent land boundaries in terms of "ownership" and "users"
 - b) Identify an special issues to be considered regarding land use pattern and requirement base change of land use
 - c) Issues, requests, and/or challenges for an improvement

Infrastructure and Utilities

The Consultant shall undertake an infrastructure and utilities survey. This identify and locate existing facilities and easements including for the following utilities:

- a) Water
- b) Sewerage
- c) Gas
- d) Electricity
- e) Telecommunications
- f) Others

Climate Risks

The Consultant shall review meteorological surveys and data and other information on climate risk to identify the climate risks (e.g., heat, flooding) that must be addressed in the conceptual design of the station.

The results of this analysis will be summarized and presented in the **Assessment Report** and provide input to the Master Plan, **Concept Design** and **Feasibility Study Reports**. The Consultant shall make available all the detailed information collected, including the Assessment Report in both hard copy and digital format

Task 8: Infrastructure Assessment

The Consultant shall assess the physical condition of the existing Dhaka Kamalapur railway station, including: yard and track infrastructure; station platforms and building; station electrical, mechanical, plant, road access and parking; utilities; and any other relevant facilities. Such assessment would include (not exhaustive):

- a) a geotechnical assessment of the subgrade and surrounding areas
- b) review of drainage structures
- c) assessment of the station building structure
- d) assessment of the station electrical, mechanical and plant equipment



- e) assessment of Building Services including HVAC equipment
- f) assessment of ventilation and firefighting equipment
- g) assessment of toilet and welfare facilities, including water supply
- h) analysis of bridges (road and pedestrian) and other structures
- i) assessment of track condition
- j) assessment of the station yard area including current and proposed remodeling works
- k) assessment of the station / station yard loading and unloading facilities (parcels, baggage)
- l) assessment of railway station access roads and connections
- m) assessment of level crossings

In conducting the infrastructure assessment, the Consultant shall assess the train control systems in operation / new works in progress on the Dhaka-Tongi railway section. This assessment shall be used in the Concept Design for the Kamalapur station and yard area.

The results of this analysis will be summarized and presented in the **Assessment Report** and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 9: Operational Assessment

The Consultant shall review BR passenger and freight operations to/from the Dhaka-Tongi railway section including operations from the interconnected MRTs, DEE, Subways to understand the demands that passenger and freight operations will put on the station and yard facilities.

The Consultant shall review how that operation would evolve to handle the forecast traffic volumes, particularly following the completion of the Dhaka-Tongi-Joydebpur Railway Expansion Project (4-tracking Dhaka Kamalapur-Tongi, 2-tracking Tongi-Joydebpur; 2-tracking Dhaka Kamalapur- Narayanganj; and freight traffic growth with traffic from Bhanga via the Padma bridge joining the Narayanganj to Dhaka Kamalapur section at Gandaria, and continuing through Kamalapur onto Tongi / Dhirasram ICD

The Consultant shall review the feasible alternatives and discuss with BR any potentially superior alternatives to the infrastructure investments proposed.

The results of this analysis, and the consultant's confirmation of the suitability of the agreed technical solutions will be summarized and presented in the **Assessment Report** and provide input to the **Master Plan, Concept Design and Feasibility Study Reports**.

Task 10: Relocating Operational and Maintenance Facilities in Kamalapur Station

The Consultant shall analyze, develop and finalize the feasibility study, DPP, conceptual design and other reports for relocating the existing operational facilities in Kamalapur Station.

The Consultant shall consider the current plans for TOD development at Kamalapur Station and the nearby stations on the Kamalapur to Tongi section of route.



To create space for the G2G Bangladesh Japan PPP project for the commercial and residential development plans, it has been identified that the existing station building, station platforms, railway tracks and yard, the Inland Container Depot (ICD), residences and others, should be moved. Alternative maintenance and operational facilities need to be developed before abolishing present facilities. It has been calculated that this would provide a total area of land of 156 Acres, as summarised:

156 Acres

Description of Existing Facilities

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> • Platforms- 8.92 acres • ICD- 49.61 areas • Yard- 15 acres • Residence- 27 acres • Station Building- 1.22 acres • Others- 54.25 acres | <ul style="list-style-type: none"> • Diesel workshop • Diesel Loco shed • DEMU shed • Passenger Carriage shed • ICD to be moved to Dhirashram (ADB project) • Washpit lines • Stabling line / sick line | <ul style="list-style-type: none"> • Loco lines • Container line • Parcel line • Carriage sheds • Escape Lines (Shunting Lines) • Fuel storage • Railway Mosque • Puratan Bazar • Juma Mosque |
|---|--|--|

The consultant shall analyze and prepare the comparative study that will reflect the viability of shifting existing operational and maintenance facilities economically and financially. Detail relevant study and documents have to be produced that needed for investment project.

The Consultant shall analyze the existing maintenance facilities of rolling stocks at Dhaka Station area and review the relevant study of BR's RCIPF Project to finalize the feasibility study, detail design and bidding document for Land acquisition and construction of a new diesel locomotive workshop for decentralizing of heavy maintenance facilities from city center. The Consultant shall also finalize layout drawing, conceptual design and bidding document for operational and maintenance facilities at kamalapur station area.

Report from RCIPF Project will be provide for further detail analysis to finalize required documents and reports needed for the development investment of operational and maintenance facilities outside the Kamalapur station MmTH boundary

The Consultant shall work closely with BR operational and maintenance staffs to determine what railway facilities must be retained in the Kamalapur yard area and which functions / facilities can be handled outside the station yard area, which is prime real estate area of Dhaka, and could be made available for commercial development.

The Consultant shall consider the change in commuter traffic from Narayanganj terminating at Dhaka Kamalapur, now being able to continue as through traffic onto Tongi, and from Tongi continuing to Narayanganj. Also, freight traffic from Bhanga via the Padma bridge joining the Narayanganj to Dhaka Kamalapur section at Gandaria, and continuing through Kamalapur onto Tongi / Dhirasram ICD. Light commuter train facilities considered a requirement to be retained at Kamalapur may now be considered for provision at both Narayanganj and Tongi, with BR



land at Kamalapur utilised for a redesigned yard with provision for future growth for a significant number of intercity, commuter and freight train operations.

The results of this analysis shall be summarized and presented in the **Assessment Report, Concept Designs, DPPs and Feasibility Study Reports etc.**

Task 11: Master Plan for Kamalapur Station Aligned with TOD

The Consultant shall prepare a Master Plan for the Kamalapur station and yard that aligns with the transit-oriented development plans for the area surrounding the station and provides for efficient interconnections with other modes of transport. The Master Plan to be prepared by the Consultant will not require detailed design of any Project components but will necessarily contain the preliminary designs and sufficient details to judge the viability, constructability, and feasibility of various layouts as well as the estimated cost related to such development.

The Dhaka Kamalapur station MmTH Master Plan shall provide a framework that sets out opportunities for change within and around the station, with the dual aims of improving the operations, interchange, and passenger experience of the station itself, and of making the station a catalyst for good growth that impacts positively on the surrounding community (see Annex 2).

A comprehensive understanding of the station, its issues and requirements, shall be developed and analysed by the Consultant for their relationship to and impact on the wider context and provide a well-functioning station in terms of:

- a) Accessibility, legibility and connectivity
- b) Safety and security
- c) Operational capacity issues and safeguarding opportunities
- d) Interchange and intermodal provision

Sustainability shall be embedded in the masterplan which shall set out sustainability aims and ambitions from the start and provides a strategy for implementation. The sustainability strategy should be fully integrated with all the aspects of the masterplan; it could touch upon social inequalities and community benefits, sustainable mobility and active transport modes, green space and biodiversity, whole life carbon assessment, and energy efficient development.

The Master Plan shall be developed around the future yard plans/operational infrastructure made available by the Railways for the Project Station. The same shall be reviewed by the Consultant and may recommend improvements / adjustments while developing the Master Plan. The Master Plan for Kamalapur station shall cover as a minimum:

- The history of the station
- The urban context
- Developments and third-party schemes
- The condition of the station
- Capacity issues and forecasts
- Existing and planned interchange (BR, HSR, MRT, Bus, Subway)
- Accessibility issues and wayfinding
- Ticketing – sales and gates
- Rolling stock and platforms
- Future transport projects and expansion

(4)

- Retail and commercial opportunities
- Station servicing (deliveries and refuse collection)

The Master Plan, with supporting drawings and reports prepared as part of the Master Plan development, shall meet the requirements of this TOR.

The results of this analysis will be summarized and presented in the **Master Plan for Kamalapur Station Report**.

Task 12: Concept Design

The Consultant shall prepare a concept design for the redevelopment of the Dhaka Kamalapur railway station building, yard and facilities. The Concept Design to be prepared by the Consultant will not require detailed design of any Project components, but will necessarily contain the preliminary designs and sufficient details to judge the viability, constructability and feasibility of various layouts as well as the estimated cost related to such development.

The Concept design documentation shall be developed fully in accordance with Bangladesh Railways Standards, Manuals and Specifications. See Annex 8 Specifications Relationship Diagram

The concept design should include the following work packages (not exhaustive):

a) Options for the new Kamalapur station yard layout design

The consultant shall develop in close consultation with BR, new station yard layout options, base on work in Task 10: Options Analysis & Plan for Relocating Operational Facilities in Kamalapur Station.

The Consultant shall consider a baseline option based on the existing yard baseline footprint, with heavy maintenance facilities relocated on the Kamalapur to Tongi section, but the light maintenance and cleaning facilities for passenger traffic remaining at Kamalpur. The existing functional requirements including turnout speeds shall be retained.

The Consultant shall develop the new options for the Kamalapur yard layout to increase capacity allowing more trains and more transfers; The new yard options shall consider (not exhaustive):

- the main traffic flows are physically separated from each other (as far as possible within the given space) and have their own dedicated tracks
- The layout of the existing tracks are optimised for speed and headways (this is a key functional requirement of the station)
- the provision of an optimum number of switch and crossings for traffic growth projections providing higher reliability (less failures due to a reduction in switches, less crossing movements)
- Shorter travel times. The station entry and exit speed for freight and passenger trains is increased from 15 km/h to 40 to 80 km/h
- a simplified traffic control



The Consultant shall rank new Kamalapur station yard options based on a multi-criteria evaluation which shall include a qualified cost benefit analysis (considering financial and operational aspects, such as delay minutes). Only options with a positive result shall be taken forward for further analysis

b) Passive provision for future railway electrification

The Consultant shall consider the passive provision for future railway electrification of the railway. This will principally involve the electrification system physical dimension requirements above track level; and suitable overhead electrical safety clearances required for a 2x25 kV ac / 25 kV ac system

c) Options for commercial/residential development of the space above the station

The Consultant shall consider in the Concept design, options for commercial/residential development of the space above the station and the air rights over the railway yard and platforms identified in the Master Plan work. This would include:

- Legal review confirming whether BR has the right to develop these spaces
- Technical analysis demonstrating how such developments would work physically with other development in the station and surrounding area
- Financial analysis showing the additional costs and benefits of developing these spaces
- Analysis of options for involving the private sector in development of the spaces, including analysis of risks and stakeholders

Reference should be made to the JICA Preparatory Study on The Dhaka Mass Rapid Transit Development Project (TOD) Final Report December 2018, the JICA Study Team prepared a TOD Concept Plan around Kamalapur Station

d) Climate and disaster risk analysis

The Consultant shall carry out a climate and disaster risk screening for the project site and build into the analysis the need for resilience measures such as improved drainage design to address key risks.

e) Station Architecture, user analysis and planning

The Consultant shall consult with BR regards applicable BR Station Planning Guidelines. The station design shall consider the architectural significance of the Kamalapur railway station and its cultural heritage

The Station should be developed in a way which provides a pleasing environment, value for money and a high-quality experience to the user. The station design shall facilitate the safe and efficient flow of passengers to ensure passenger satisfaction.

Station design shall consider the impact on both the natural environment and neighbours, and to consider how this can be minimised. Steps should be taken to minimise energy usage and embodied energy. Preference should be given at station for cycling and other methods of public transport. Design should consider the future and changes to the climate.

(4)

f) Network and train operations planning

The Consultant shall consider Network and Train operations planning requirements in the development of the station

g) Station security analysis

Station security analysis will be needed to advise the design team of the degree of physical security provision and passive security through security awareness in design. It should be determined if space will be required to provide body and luggage scanning facilities at the station and the staffing required to support this facility. This will have an impact on the station passenger capacity. The avoidance of conventional glass structures and the introduction of blast-resistant glazing and windows (such as ETFE light weight glazing solutions) need to be at the forefront of secure design. Public space kept free from obstruction and easily monitored from centrally placed control room facilities must and must form part of the integrated brief for the designers.

h) Station control centre

The Consultant shall develop the optimum station control centre layout and location, where all the required equipment dedicated to monitoring passenger services within the station are located (CCTV monitors, public address console, fire alarm console, telephone with BR Operations Control Centre. Etc.)

i) Commercial Retail Facilities Provision

The Consultant shall consider the opportunity for commercial retail facilities provision within Kamalapur station

j) Ticketing and Revenue Protection (gating or non-gating of interchange)

The Consultant shall consider the requirement for Ticketing and Revenue Protection (gating or non-gating of interchange), and its impact on station capacity

k) Passenger flow modelling analysis

The Consultant shall undertake passenger flow modelling analysis to determine passenger interchange capacity (Primary movements arrival departure and segregation from the different transport modes BR / MRT / Expressways / Subway / Road users)

The use of pedestrian flow modelling shall be developed to facilitate the establishment of station footprints that will ensure adequate provision for passengers and facilities is provided without the risk of future passenger congestion. The modelling shall identify the areas with the highest footfall past possible retail frontages and the locations that can exploit the commercial opportunity without impeding passenger movements.

l) Ensuring Accessibility for All

The Consultant shall develop the design to ensure accessibility for all. The Consultant shall undertake surveys to fully understanding the unique needs of women, people with disabilities, and other disadvantaged groups that will use Kamalapur station

Accessibility considerations are key to ensuring that railways provide a safe and welcoming environment for all customers. Poor design limits access for people with

disabilities, the elderly, and many other groups, including foreigners, to employment, education, training, health, or social services (Snider and Takeda, 2008). Universal design is defined as "the design of products and environments to be usable by all people, to the greatest extent possible, without need for adaptation or specialised design. While the concept emerged primarily regarding disability issues, universal design strives to be a broad-spectrum solution that helps everyone, including elderly people, people with strollers, pregnant women, and children, in addition to people with disabilities. Its goal is to remove physical barriers and create a more inclusive environment" (Snider and Takeda, 2008)

m) Vertical Access Provision (lifts, escalators, stairs)

The Consultant shall develop the optimum solution for vertical access location and provision of lifts, escalators and stairs, to ensure the safe flow of passengers does not exceed design capacity with a provision for future growth. Particular consideration shall be made for people with mobility and other disabilities

n) Civil Engineering

The Consultant shall develop the civil engineer design required for the works, including site drainage, access roads, parking etc.

o) Infrastructures and Utilities (Water, Sewerage, Gas, Electricity, Telecommunication)

The Consultant shall develop the required designs for infrastructure and utilities covering water, sewerage, gas, electricity and telecommunications

p) Structural Engineering

The Consultant shall develop the required structural engineering designs for the station, yard and railway facilities

q) Electrical, Mechanical and Plant Engineering

The Consultant shall develop the design for Electrical, Mechanical and Plant Engineering for the station

r) Building Services

The Consultant shall develop the design for the station building services, including HVAC

s) Ventilation and fire Engineering

The Consultant shall develop the ventilation and fire engineering infrastructure necessary for the station, with consideration that all passenger and freight trains are diesel powered. This shall include liaison and agreement with Bangladesh Fire Service & Civil Defence (FSCD)

t) Lighting, CCTV security, digital display and passenger information systems

The Consultant shall develop the design for the station Lighting, CCTV security, digital display and passenger information systems

u) Energy efficiency and climate resilience

The Consultant shall review the proposed investments for opportunities to green their use through wastewater treatment, ballast cleaning, use of renewable energies



(rooftop solar), energy efficient electrical plant & equipment, intelligent controls and other such measures.

v) Station Signalling and Train Control System

The Consultant shall develop the signalling and train control design for the Kamalapur station and yard area re-signalling. This shall include consideration of the signalling and train control system required in the Kamalapur station area, regards functionality and interoperable compatibility with existing BR systems, including existing signalling and train control systems in operation. The design shall also consider new works planned and in progress on the adjacent sections of Kamalapur to Tongi, Kamalapur to Narayanganj and Kamalapur to the Padma Bridge rail link

w) Rolling stock depots, cargo handling facilities and operating plan

The Consultant shall develop the design for the station Rolling stock depots, and cargo (including heavy parcels) handling facilities. The Consultant shall prepare an operating plan for this work

x) Station Building, Yard and Facilities including HV power lighting Towers, transformers, switchgear, cables

The Consultant shall develop the design for the station building, yard and facilities including HV power lighting Towers, transformers, switchgear, cables

y) Station Operations and Maintenance

The Consultant shall develop and provide a station operations and maintenance plan

z) Implementation schedule

The Consultant shall develop provide a implementation plan for the development of the station. This shall include enabling and staging works to minimise disruption to operating BR traffic

aa) Concept design Drawings

The Concept Design to be prepared by the Consultant shall be supplemented with complete structural/ architectural/Mechanical/Electrical/Plumbing/Fire Protection (MEPF) drawings for all the components related to development planned. Drawings shall be provided showing options where appropriate. Scale 1:1250 with 1:500 details & cross sections where appropriate with an overall location plan scale 1:1250 / 1:2500 / 1:5000

bb) BIM & Digital Twins

The Consultant shall consider the benefits of the application of Building Information Modelling (BIM) and Digital Twin for the station complex.

BIM is the process of creating and managing digital information about the station asset and is a critical tool for designing within a complex environment involving multiple disciplines and constraints. The Digital Twin concept builds on BIM by creating a virtual representation of the station asset which uses smart technology to feed real time data into the digital models, enabling the smart operation of the building

- cc) Estimation of the capital, maintenance, and operating costs during the lifetime of the project

The consultant shall prepare an estimate of the capital, maintenance, and operating costs during the lifetime of the project for each of the technical options identified. These costs shall be benchmarked against unit costs with similar projects in the East and South Asia sub-regions. This shall include phased investments. The level of detail shall enable the evaluation of the technical options and costing of the investment

The level of detail of costing shall enable the Economic and Financial tasks to be undertaken

- dd) Land Value Capture (LVC)

Land Value Capture (LVC) is a way to capture the increase in the value of land and development generated by the improved accessibility of transportation. Improved access has value which is reflected in land and property values. The Consultant shall provide an estimate of Land Value Capture (LVC). This estimate shall build on analysis Options for commercial/residential development of the space above the station

- ee) Financing Options

The Consultant shall provide financing options for the station works. See Task 15 Financial Sustainability Analysis

- ff) Packaging and Procurement Options Analysis

The Consultant shall analysis and make recommendations for the packaging and procurement options for the Kamalapur station building, yard remodelling and relocation of railway facilities. The analysis shall also consider operations and maintenance requirements for the works

The analysis shall include consideration of best value practice for works of similar scope. It is expected that the analysis shall include consideration of: PPP (public private partnership) both user-charge PPP and service payment PPP; EPC (engineering, procurement and construction), DBB (Design-bid-build) and DB (Design-Build); and consideration of a packaging mix of different procurement types for the works e.g.: PPP station Building, D&B FIDIC contract for Yard remodelling and relocation of railway facilities

The results of the Concept Design process will be summarized and presented in the **Concept Design Report**.

Feasibility Study

The Consultant shall prepare a bankable feasibility study, covering technical (including climate and disaster resilience), economic, financial, social and environmental feasibility for the investments covered by concept design. This feasibility study will summarise and incorporate the results of:

- a) the traffic forecast prepared in Task 6
- b) the infrastructure and operations analysis carried out in Tasks 8 and 9, together with technical analysis made in developing the Options Analysis & Plan for Relocating Operational Facilities in Kamalapur Station; the Master Plan; and the Concept design; to provide a technical feasibility assessment

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c) Cost estimation of the capital, maintenance, and operating costs during the lifetime of the project carried out in Task 12

d) The analysis and recommendation of packaging and procurement options for Kamalapur station building, yard and railway facilities carried out in Task 12

It will additionally include the results of tasks 13 – 15.

Task 13: Scoping of Environmental, Social and Gender Impacts

The Consultant shall undertake an assessment of the expected environmental, social and gender impacts of the proposed passenger and freight services, and the defined investments, in a manner consistent with the World Bank Guidelines for Environmental and Social Framework, including its 10 Environmental and Social Standards (ESSs), as well as Bangladesh environmental Conservation Rules (ECR) 2023, and relevant laws of Bangladesh. It shall consider all relevant direct, indirect, and cumulative environmental and social risks and impacts of the proposed project.

The ES assessment will begin by a preliminary baseline analysis, natural trend in ES ecosystem, scoping for the ES assessment followed by the assessment of the risk and impact of the project activities. The risks and impacts shall take into account:

- j) those defined by the Environmental, Health, and Safety Guidelines (EHSG)
- k) those related to community safety
- l) those related to climate change
- m) any material threat to the protection, conservation, maintenance, and restoration of natural habitats and biodiversity
- n) those related to ecosystem services and the use of living natural resources, such as fisheries and forests
- o) any prejudice or discrimination toward individuals or groups in providing access to development resources and project benefits, particularly in the case of those who may be disadvantaged or vulnerable
- p) negative economic and social impacts relating to the involuntary taking of land or restrictions on land use
- q) impacts on the health, safety, and well-being of workers and project-affected communities
- r) risks to cultural heritage

The Consultant will also consider all relevant Associated Facilities (if any) to determine the extent to which they can be brought in line with the requirements of the ESSs. The assessment should also focus on those aspects that present the most significant risks, taking into account the extent to which implementing specific measures will be technically and financially feasible.

The risk and impact analysis will lead to the development of indicative mitigation measures by the Consultant and to be implemented by the implementing authority. This will include



development of TORs for further studies ES Management Framework (ESMF), ES Impact Assessment (ESIA), Resettlement Planning Framework/ Action Plan (RPF/RAP), Labor Management Procedure (LMP), Waste Management Plan, ES issues inclusion in Contractor Bid Document and other document necessary as per the feasibility study.

The results of this analysis will be summarized and presented in the **Feasibility Study Report**.

Task 14: Economic Feasibility Analysis

The Consultant shall carry out an economic analysis for project investments in accordance with the World Bank economic analysis guidelines, demonstrating the economic costs and benefits to Bangladesh of the proposed investments. This would include inter alia time savings, reduced road deterioration, accident cost reductions, reduction in transport costs, maintenance costs, increased access to job, education and health facilities and reductions in other environmental and social externalities. It would also include an estimation of the GHG impact of the project, priced at the shadow price of carbon used by the World Bank.

The analysis shall include:

- a) Estimation of the economic internal rate of return (EIRR) and the net present value (NPV) for all identified alternatives, compared to a defined "do-minimum" alternative using a standard benefit/cost methodology and a defined appraisal period. Costs and benefits should be expressed in constant economic prices (defined base year)
- b) All economic costs and benefits should be shadow-priced, as appropriate, to reflect local conditions, e.g. labour costs, value of freight time, vehicle costs, fuel subsidy, taxes and levies, etc. Growth in the real value of time and value of life should be included in the analysis
- c) The economic appraisal should include, where appropriate, the costs associated with any necessary expropriation of land and property
- d) Economic analysis should include the Greenhouse Gas Accounting and Shadow Price of Carbon as per the World Bank Guidance note which will be provided to the Consultant, using the WB range on price of carbon
- e) The Consultant is expected to undertake sensitivity and formal risk analyses (explaining clearly the analysis for an educated non-technical audience) on the parameters that are estimated with the greatest uncertainty, e.g. traffic and travel time forecasts, cost estimate etc. The Consultant is also expected to calculate the switching values of critical parameters⁵

The results of this analysis will be summarized and presented in the **Feasibility Study Report**.

Task 15: Financial Sustainability Analysis

The consultant shall analyse the financial sustainability of the investment in the Kamalapur multimodal station. This analysis shall include:

⁵Consistent with the approach outlined in Pedro Belli et al. (2001) *Economic analysis of investment operations analytical tools and practical applications*, World Bank Institute



- e) Investment costs for constructing the station, including options with greater or lesser development of air rights and other spaces over the station
- f) Sources of financing and funding for construction of the station. This may include, *inter alia*, grants or loans arranged through the national government, support from the municipal government directly or through the Dhaka Mass Transit Development Project, support from the TOD development around the station being carried out on a G2G basis with support from the Government of Japan, sale or leasing of land development rights held by BR at the station and yard or by other interested parties. The earlier stakeholder consultant will have provided insights into parties that have an interest in development of the multimodal station and the resources they may be able to contribute to the investment in the station
- g) Operations and maintenance cost of the station. This will identify which parties may be responsible for operation and maintenance of certain parts of the station. For example, BR may be responsible for operating and maintaining the rail part of the station, while the metro could be responsible for operating the metro station
- h) Sources of funding for operation and maintenance of the station. This may include, *inter alia*, support from BR and the other transport modes connecting to the station, parking revenues, commercial revenues from leasing of retail space in the station, advertising in the station, and rental of office or residential space above the station and yard

Consultant shall prepare a financial model for the station that allows analysis of various financing and funding options. Consultant shall use this model to develop a funding and financing plan for the station. Such analysis and plan may inform the structuring of a public private partnership for construction, operation, and maintenance of the station.

The results of this analysis will be summarized and presented in the **Feasibility Study Report**.

Task 16 Land Acquisition Plan, Resettlement Plan, IPP

Land Acquisition Plan (LAP)

Land acquisition may be required for relocation of maintenance facilities from Kamalapr Railway Station. In that case, Consultant shall prepare LAP & other associated documents for these components.

Consultant shall do the following but not limited to:

- Collect Land Acquisition Plan of existing BR land; certified latest Khatians; latest approved Mauza Map, Gazettes and other records from DC offices and consult BR's estate office records for identify the ownership of lands within the finalized Construction Right of Way (CROW). In case of anomaly DC's offices record are to be followed. Based on these documents, establish the land ownership in the finalized CROW. Within total land uses for the CROW, identify BR owned land, private land to be newly acquired and land to be required from Government khas/other Government agencies (if any).



- Carry out 100% census and prepare detailed data base of all Project Affected People (PAPs), their affected assets, inventory of losses, identify categories for impact and eligibility of affected people for the loss of structure, trees, crops etc as per Government laws and regulations of Bangladesh related to Land Acquisition.
- Prepare district wise Land Acquisition Plan (LAP) based on latest gazette Mauza Maps with estimated cost and detailed plot schedule. The latest gazette Mauza maps are to be digitalized showing the proposed alignment including acquisition and requisition boundaries, plot number, labels of mauza, upazila and districts homesteads, angle at change of direction of alignment, and other physical features with appropriate legends for incorporation in the study report. The mauza map will constitute a basis for calculation of land acquisition and requisition areas of the affected plots at the pre-project condition. The Plot schedule will contain the following information:

Upazila:

Mauza:

JL No.:

SN	Plot No	Khatian No.	Total Area of Plot Acre	Type of Land (as per record)	Area to be Acquired (Acre)	Full/Partial (of plot to be acquired)	Remarks
Total:							

- Prepare complete Land Acquisition Proposals for land acquisition of private land and land requisition of Government khas/other Government agencies' land. Land Acquisition Proposals are to be ready to be submitted to the approving authority as per "Acquisition and Requisition of Immovable Property Ordinance 1982" and "Immovable Property Acquisition Manual 1997" or latest manuals, laws and regulations of Bangladesh related to Land Acquisition (if required).
- Keep liaison with respective agencies for obtaining necessary clearance towards acquisition of land. Assist arranging meeting of different statutory committee as well as other committee formed by GOB from time to time in the matter of land acquisition.
- Assist Project Director in Land Acquisition process especially during feasibility of DC office, issuing of notice under section 3, Joint verification and handing over land to BR (if required).
- Perform other tasks as given from time to time by the client in the matter of Land Acquisition. Assist Project Director in Land Acquisition process specially during feasibility of DC office, issuing of notice under section 3 of Land Acquisition Act of GOB, Joint verification and handing over land to BR (if required).
- Perform other tasks as given from time to time by the client in the matter of Land Acquisition.

- e. Resettlement Plan (RP)
7. Consultant shall do the following but not limited to:
- Based on ROW fixed by topographical survey and Land Acquisition Plan, conduct 100% census to define categories for impact and eligibility of affected people for compensation and number of titled and non-titled Entitled Persons (EPs).
 - Prepare a matrix of entitlements covering compensation and other assistance for all types of impacts to fully replace lost assets, income, and livelihood in compliance with the ADB's Safeguard Policy Statement (2009) or other latest publishing.
 - Carryout detailed land market survey. Assess the replacement value for lands, all types of structure, other assets, crops, and trees and discuss in detail the valuation methodology used. Identify additional top-up compensation for land, structure etc are to be paid to the Titled EPs as per replacement Value. Specific measures are to be taken for severely affected poor people, ethnic minorities, Women headed families or other vulnerable households.
 - Prepare a detailed database covering EP based detailed information such as family members, their earnings & expenditure, type wise detailed inventory of assets and loss, replacement value of loss, entitlement of EP for compensations, willingness to participate in income restoration program and interested training etc. as per entitlement Matrix.
 - Prepare detailed cost estimate for implementation of Resettlement Plan where cost involving Land Acquisition is to be paid by DC office; entitlement wise cost estimate for implementation of Resettlement Plan, cost estimate for implementation of Income restoration Program and cost estimate of NGOs/Agencies are to be mentioned separately.
 - Prepare a Resettlement Plan (RP) based on 100% census in accordance with WB's Policy and Loan Agreement covering all of the above and acceptable to the Government and WB which covers a complete enumeration of all Project Affected People (PAPs), their affected assets etc.
 - Prepare detailed resettlement implementation schedule and phasing in accordance with phasing of construction work. Prepare TOR and cost estimate for NGOs/Agencies for RP & ILRP implementation. Prepare TOR and cost estimate for External Monitoring NGOs/Agencies.
- f. Indigenous People's Plan (IPP)
- Prepare an indigenous people's plan (IPP) in accordance with WB's Policy, if any indigenous people, such as tribes or settlers, as per WB's definition, are likely to be affected significantly by the project.
 - Provide on the job training and knowledge transfer to the executing agency and Government personnel to implement the IPP.
 - Assist the executing agency to (i) prepare an IPP implementation schedule, (ii) establish safeguard units, and (iii) recruit NGO/Agency for IPP implementation.



Task 17: Technical Specifications & Bidding Documents

In consultation with BR and World Bank about procurement packaging and procurement method analysed and recommended in Task 12, the Consultant shall prepare technical specifications and draft bidding documents suitable for the agreed packaging and procurement strategy option.

For the repose to this TOR, the Consultant shall assume that the Technical Specifications and bidding documents to be prepared, shall be suitable for a competitive 2-stage Design & Build contract under FIDIC conditions of contract (The World Bank, and other multinational organisations including EU funding programs and the European Investment Bank require FIDIC forms) for the redevelopment of the Kamalapur railway station building, yard and facilities..

Task 18: Implementation Capacity

The Consultant shall assess the need for developing capacity and institutions for successful implementation of the project. This shall include:

- g) Address the need for coordination among BR, MRT, the Elevated Express way, Dhaka Roads Department and others to achieve the desired development outcomes of the project. The Consultant shall propose institutional options for enhancing coordination
- h) Analyze BR (agency and daughter companies) capacity gaps in project management, procurement and fiduciary, management of social and environmental safeguards, and provision of market competitive freight and logistics services. Develop a capacity building program for building skills in this area
- i) Conduct market analysis of suppliers for goods and works to be procured in the project and help BR in preparing Project Procurement Strategy for Development (PPSD) for the proposed project and a procurement plan. Assist in preparatory workshops and meetings, if required, for project preparation and discussion with stakeholders
- j) Assist BR in preparing high value procurement Bidding Document/RFP at the beginning of the project to facilitate the project readiness, and if required, assist in the bidding process and review of bid evaluation reports in e-GP system.

Technology Transfer, training, Study tour

The Consultant shall organize overseas training program for 7 days for 8 Engineers/officers of Bangladesh Railway (including 1 official from MOR & 1 Official from Planning Commission) in developed countries regarding Modern method of Railway Track maintenance. Moreover, the consultant shall arrange local training for capacity building of BR officials in Bangladesh and also submit comprehensive capacity development plan for BR personnel.



Deliverables

The consultant shall produce the following deliverables on the schedule shown below.

Table 1: Deliverables, Timeline and Payment Milestones

Deliverable	Time from Contract Signing	Payment Milestones
1. Mobilization		10%
2(a). Inception report for construction of MmTH at DABB	2 months	2%
2(b). Inception report for facilitation of construction of MmTH at Dhaka Kamalapur Station	1 month	3%
Separate Inception Reports will summarize initial findings, any changes to proposed scope, timing, or methodology of work (including regular BR / WB briefing meetings and reporting) and Quality Management Plan. Covers Task 1 of respective ToRs.		
3(a). Assessment report for construction of MmTH at DABB	5 months	8%
3(b). Assessment report for facilitation of construction of MmTH at Dhaka Kamalapur Station	6 months	12%
Separate Assessment Reports will cover the results of Tasks 2 to 9. The Assessment Report shall include as live documents: a stakeholder management plan; a safety management plan; a risk management plan; a systems engineering and integration management plan.		
4. Preparation of a TOD Plan for Dhaka Airport Railway Station	6 months	1.2%
This report, along with its documentation and drawings will cover the results of Task 10 as outlined in the relevant Terms of Reference (TOR).		
5(a). Facilities Relocation Plan for construction of MmTH at DABB	8 months	2.8%
This report will present the analysis of options for the development of the new yard layout and functions/facilities currently located at DABB airport railway station with relocation plan. Covers Task 11 of the relevant Terms of Reference.		
5(b). Facilities Relocation Plan for facilitation of construction of MmTH at Dhaka Kamalapur Station	8 months	6%
This report will present the analysis of options for relocation of functions/facilities currently located at Kamalapur station with relocation plan. Covers Task 10 of the relevant Terms of Reference.		
6(a). Master Plan aligned with TOD and multimodal interfaces for construction of MmTH at DABB	9 Months	4%
This report, documentation & drawings will cover the results of Task 12 of the relevant TOR		

(Signature)

Deliverable	Time from Contract Signing	Payment Milestones
6(b). Master Plan aligned with TOD and multimodal interfaces for facilitation of construction of MmTH at Dhaka Kamalapur Station This report, documentation & drawings will cover the results of Task 11 of the relevant TOR.	9 months	6%
7(a). Concept Design for construction of MmTH at DABB This report, documentation and drawings will cover the results of Concept Design Task 13	10 months	4%
7(a). Concept Design for facilitation of construction of MmTH at Dhaka Kamalapur Station This report, documentation and drawings will cover the results of Concept Design Task 12	10 months	6%
8(a). Feasibility Study for construction of MmTH at DABB This will be bankable feasibility study reflecting inputs from all prior tasks plus task 14-17.	11 months	6%
8(b). Feasibility Study for facilitation of construction of MmTH at Dhaka Kamalapur Station This will be bankable feasibility study reflecting inputs from all prior tasks plus task 13-16.	12 months	9%
9(a). Technical Specifications and Bidding Documents for construction of MmTH at DABB This report will cover the results of the Technical Specifications and Bidding Documents Task 18.	12 months	4%
9(b). Technical Specifications and Bidding Documents for facilitation of construction of MmTH at Dhaka Kamalapur Station This report will cover the results of the Technical Specifications and Bidding Documents Task 17.	14 months	6%
10(a). Implementation Capacity for construction of MmTH at DABB This report will cover the results of the Implementation Capacity Task 19.	12 months	4%
10(b). Implementation Capacity for facilitation of construction of MmTH at Dhaka Kamalapur Station This report will cover the results of the Implementation Capacity Task 18.	15 months	6%
		100%

Administration

(4)

The contract will be administered by Bangladesh Railways. Bangladesh Railways will provide the following support to the consultant:

- Provide previous or existing studies conducted relating to the assignment.
- Provide data within BR's possession and relevant policy documents.
- Help with the establishment of contacts with other relevant stakeholders to facilitate the Consultant's work in undertaking the study. Assist the Consultant in working with other Government agencies that may have information that is important for the Consultant to properly undertake the assignment.
- Access to project site.
- Access to relevant BR staff.

Consultant Qualifications

The consultant will be a firm with experience in urban transport and railways, with specific experience in station design and construction, in Bangladesh and internationally. The firm shall demonstrate experience in designing multimodal stations in urban environments, transit-oriented development and land value capture and structuring public-private partnerships for rail stations.

The Feasibility Study and Conceptual Design for the Redevelopment of the existing Railway Station Building, yard and facilities at Dhaka Kamalapur Railway Station Multimodal Transportation Hub is a complex scope of work.

The Consultant is responsible for proposing a senior and high-quality team appropriate for undertaking the assignment as envisaged in the Terms of Reference, to the required standard. It is expected that the team will include the following International and National staff, who should ideally be full-time employees of the consultant.



Qualifications, Experience and Responsibilities of Consultants
CONSULTANCY SERVICES

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
A International Consultants :				
1	Team Leader (Senior) Key Expert [For SD1 & SD2]	Graduation in Civil / Railway or equivalent relevant Engineering	20 years total professional experience, preferably 12 years' experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years' experience as Project Manager/Team Leader for similar type consultancy. Working experience in FIDIC based contract and SAARC region would be preferable.	• In-charge of overall feasibility study, design tender document preparation consultancy services. Review all available reports, data and information's. • Responsibility for the successful planning, execution, monitoring, risk management, quality control, time & cost management and closure of a project. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all other experts. • Co-ordinate among experts of different discipline; Sub-consultants; Employer; related agencies & other stakeholders etc. • Recommend phasing of construction packages and finalize the phasing before Draft Final Feasibility Study Report. • Prepare Feasibility Study Report, Design Report, Bid Documents, Rolling stock Demand Analysis Report and other reports mentioned in the TOR with the assistance of his team. • Monitor the progress, prepare a standard progress report and submit it in due time. • Arrange power point/animated/multi-media presentations and meetings and response to any query raised by Project Steering Committee/ Project Implementation Committee/ Other government agencies and donor agencies etc. • Produce reports for visit of donor agency/high officials of Bangladesh and arrange field visits. • Arrange weekly progress meeting, Monthly progress meetings, and special technical meeting (if required) and issue minutes. • Arrange co-ordination meeting among experts and sub-consultants. • Discuss any matter with the Employer before finalization. Other tasks assigned by the Employer.



Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
2	Architect (Senior) Key Expert [For SD1]	Graduation in Architecture	15 years total professional experience, preferably 10 years experience in Transportation field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Architect or similar post for similar type consultancy, Architectural designing at least 5 large service Building. Working experience in SAARC region and using bridge design software would be preferable.	Responsibility for Architectural designing of railway stations, including the layout of platforms, waiting areas, ticketing counters, and other facilities ensuring that the design meets functional requirements, optimizes passenger flow, and provides a comfortable and aesthetically pleasing environment. Architects shall consider the surrounding urban or natural environment when designing railway infrastructure. Create structures that harmonize with the landscape, complement existing architecture, and contribute positively to the local context. Prioritize accessibility in station design, ensuring that the facilities are easily accessible to passengers of all abilities. This includes designing accessible pathways, ramps, elevators, and signage in compliance with accessibility standards. Incorporate safety and security features into station design to protect passengers, staff, and assets. This may include designing secure entrances, implementing surveillance systems, and ensuring clear sightlines for security personnel. Responsible for the aesthetic aspects of railway infrastructure, including building facades, interior finishes, and public spaces. Integrate sustainable design principles into railway projects, considering factors such as energy efficiency, material selection, and environmental impact. Collaborate closely with engineers, planners, and other professionals to ensure that the architectural design aligns with technical requirements, operational needs, and project objectives. Ensure that their designs comply with relevant building codes, regulations, and standards governing railway infrastructure. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
3	Station Security Design Expert (Mid-Level) [For SD1]	Graduation in Security Management/ Civil Engineering/Architecture	12 years total professional experience, 10 years experience in transport sector (preferably in railway field), 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Station Security Design Expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Responsible for evaluation of security risks and vulnerabilities specific to the railway station environment. Develop security design plans tailored to the station's layout and operational needs. Specify security systems and measures such as access control, surveillance, and screening checkpoints. Collaborate on contingency plans and response protocols for security incidents. Ensure security designs comply with regulations and industry standards. Collaborate with stakeholders to align security objectives with project goals. Incorporate advanced security technologies into the station design. Develop training programs to educate staff and passengers on security procedures. Monitor and evaluate security measures for ongoing effectiveness and enhancement. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
4	Urban Designer/ Planner (Senior) [For SD1]	Graduation in Urban Planning or relevant subject	15 years total professional experience, preferably 10 years experience in Transportation field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Urban Planner or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Responsible for Assessing potential sites for the hub, considering accessibility, existing infrastructure, and land use patterns. Develop a comprehensive plan for the hub, integrating various transportation modes and facilities to optimize connectivity and efficiency. Design the layout and circulation patterns to facilitate seamless transfers between different modes of transportation. Prioritize accessibility features to accommodate users of all ages and abilities. Incorporate green infrastructure and sustainable transportation practices into the hub's design and operations. Engage stakeholders to gather input, address concerns, and build support for the project. Develop policies and regulations that support the development and operation of the hub. Oversee the project from planning to construction, coordinating with various stakeholders to ensure successful completion. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
5	TOD Specialist (Senior) Key Expert [For SD1]	Graduation in Urban Planning/ Urban design/ Transport Planning or relevant subject	12 years total professional experience, 10 years experience in transport sector (preferably in railway field), 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Station Security Design Expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Responsible for Conducting site assessments to evaluate the potential for TOD around the transport hub, considering factors such as land use patterns, transportation connectivity, existing infrastructure, and market demand. Develop TOD master plans that outline the spatial layout, land use mix, building density, and design guidelines for the development of transit-oriented neighborhoods around the transport hub. Work with local authorities to establish zoning regulations, land use policies, and development incentives that support TOD principles and facilitate the implementation of TOD projects. Promote the development of mixed-use projects that combine residential, commercial, retail, and recreational amenities within walking distance of the transport hub, fostering a diverse and vibrant urban environment. Engage with stakeholders, including residents, businesses, community organizations, and government agencies, to gather input, address concerns, and build consensus around TOD projects through community meetings, workshops, and outreach activities. Coordinate with transit agencies to enhance transit service levels, improve transit access, and integrate transit facilities, such as bus stops, light rail stations, and bike-sharing stations, into the TOD area to maximize transit ridership and accessibility. Incorporate sustainable design principles, such as energy efficiency, green building practices, stormwater management, and green spaces, into TOD projects to minimize environmental impacts and enhance the quality of the built environment. Evaluate the effectiveness of TOD projects in achieving their goals, such as reducing car dependency, increasing transit ridership, promoting active transportation, and fostering economic development, through performance metrics and indicators. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
6	Railway Operation & Transport Planning Expert (Senior) (Key Expert) [For SD1 & SD2]	Graduation in relevant subject	15 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Railway Rolling Stock Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	- Recommend station yard layout, maintenance & operation facilities, passenger amenities, freight carrying facilities, container handling facilities etc. of the proposed components as identified during study. - Provide input during finalization of scope of work, phasing of work, preparation of study report, detailed layouts, designs, drawings, Specifications, BOQ items & quantity and tendering services. - Develop a strategy to achieve universal access to the railway system. - Assessment of present and future transport demand, de-bottling existing network, future network requirement, Options identification and Evaluation for capacity creation, Capacity building : with focus on development of the passenger and freight Transport Models - Assign tasks of all other experts. - Co-ordinate among experts of different discipline; Sub-consultants; Employer; related agencies & other stakeholders etc. - Prepare Transport Planning of existing and upcoming corridors, Analysis Report and other reports mentioned in the TOR with the assistance of his team. - Responsible for cross Border Traffic analysis, freight traffic analysis. - Responsible for collecting traffic demand analysis of other mode of transport (such as highway, waterway, airway etc) - Explore tourism opportunities through railway mode of transport. - Discuss any assumption with the Employer before finalization. - Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
7	Structural Engineer (Senior) [For SD1 & SD2]	Graduation in Civil / Structural or equivalent relevant Engineering	15 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Railway Rolling Stock Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	- Responsibility for designing all functional and residential buildings, platforms, platform sheds, foot over bridge etc. of the proposed components as identified during study. - Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to all functional and residential buildings, platforms, platform sheds, foot over bridge and other related structures as recommended by the consultant for different components. - Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. - Co-ordinate among staff/experts working for building related works for different components and inform the updates to Team Leader/ Deputy Team Leader. - Discuss design criteria, location of the buildings, the approaches, uses and any other matter with the Employer before finalization. - Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
8	Railway Track, Alignment and Yard Expert (Senior) (Key Expert) [For SD1 & SD2]	Graduation in Civil or equivalent relevant Engineering	15 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Alignment Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for designing alignment and related works of the proposed components as identified during study. • He will also be Responsible for designing the railway track of the proposed components as stipulated in the TOR. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to embankment construction and Track works. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts and subconsultants working for topographic survey & geo-technical investigation for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
9	Rolling stock Expert (Senior) (Key Expert) [For SD1 & SD2]	Graduation in Mechanical Engineering or equivalent relevant subject	15 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Railway Rolling Stock Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for designing rolling stock of the proposed components as stipulated in the TOR. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to workshop/depot/shed manufacturing and maintenance. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts working for bridge related works for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
10	Railway Workshop Expert (Senior) [For SD1]	Graduation in Mechanical or equivalent relevant Engineering	12 years total professional experience, preferably 10 years experience in railway sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Locomotive Workshop Expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for designing locomotive workshops of the proposed components as identified during study. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to workshop/depot/shed manufacturing and maintenance. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
11	Railway Signaling & Telecommunication Expert (Mid Level) [For SD1 & SD2]	Graduation in Electrical Engineering/communication/IT or equivalent relevant subject	12 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Railway Signal/Telecommunication Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for designing signaling of all the components. • Responsibility for setting out phasing of work and temporary system to be adopted during conversion of meter gauge single line into dual gauge double line. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to Signal & telecom works. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts working for telecom system related works for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
12	Railway energy efficiency and climate resilience expert (Mid Level) [For SD1 & SD2]	Graduation in Environmental Engineering/Environmental Science/Civil Engineering or equivalent related field	12 years total professional experience, preferably 10 years' experience in Transportation/Railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience in Railway energy and climate resilience expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Analyze and optimize energy consumption across railway operations. Develop strategies to mitigate climate change impacts on rail infrastructure. Influence policies to promote sustainable practices and resilience measures. Evaluate and implement cutting-edge technologies for energy efficiency and resilience. Collect and analyze data to inform decision-making and track progress. Collaborate with stakeholders to achieve sustainability goals. Educate railway staff on energy-efficient practices and resilience strategies. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
13	Fire Safety Expert (Mid Level) [For SD1]	Graduation in fire science, fire safety engineering, or equivalent related field	12 years total professional experience, preferably 10 years experience in Transportation field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Fire safety expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Evaluate fire risks associated with railway infrastructure, including stations, depots, and rolling stock, identifying potential hazards and vulnerabilities. Ensure adherence to relevant fire safety codes, standards, and regulations applicable to railway facilities, ensuring that designs and operations comply with legal requirements. Design fire protection systems and equipment tailored to railway environments, including detection, suppression, and evacuation systems, to mitigate fire risks and enhance safety. Develop comprehensive emergency response plans and procedures for railway facilities, outlining protocols for evacuation, firefighting, and coordination with emergency services. Provide fire safety training to railway staff, equipping them with knowledge and skills to respond effectively to fire emergencies and prevent incidents through proper protocols and procedures. Collaborate with project teams, engineers, architects, and regulatory bodies to integrate fire safety considerations into the design, construction, and operation of railway projects, ensuring that safety is prioritized at every stage. Stay abreast of advancements in fire safety technology, regulations, and best practices, continuously updating fire safety protocols and systems to reflect the latest standards and innovations. Coordinate with emergency responders and relevant authorities to facilitate swift and effective responses to fire incidents on railway premises, minimizing potential damage and ensuring the safety of passengers and personnel. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
14	Cost Estimator/Quantity Surveyor (Mid Level) [For SD1 & SD2]	Graduation in Civil or equivalent relevant Engineering	12 years total professional experience, preferably 10 years experience in Transport sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Quantity Surveyor or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for preparation of BOQ, rate analysis and Cost estimate of all the proposed components as identified during study • Preparing and Presenting Cost Estimates for Projects and Programs Financed by the WB • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts working for feasibility study, detailed design and preparation of tender documents for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss BOQ items, rates and detailed estimate with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
15	Transport Economist (Senior) [For SD1 & SD2]	Graduation in Transportation Engineering / Economics or equivalent Subject	15 years total professional experience, 10 years' experience in transportation field (preferably in railway sector), 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years' experience as Transport Economist or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	- Responsibility for setting out survey questionnaire and data collection requirements to assess traffic demand as stipulated in the TOR. - Based on traffic demand prepare traffic forecast for each component following WB's 'GUIDELINES For the ECONOMIC ANALYSIS' and 'Financial Due Diligence'. - Assist the Rolling stock expert to prepare Rolling Stock Demand Analysis Report. - Manage and superintend the day-to-day working of traffic survey and maximum utilization of available experts and staff. - Co-ordinate among staff/sub-consultants working for different components and inform the updates to Team Leader/ Deputy Team Leader. - Discuss any matter with the Employer before finalization. - Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
16	Financial Analyst (Mid Level) [For SD1]	Graduation in Finance/Accounting/Economics or equivalent relevant Subject	12 years total professional experience, preferably 10 years experience in Transport sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years' experience as Financial Analyst or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	- Develop financial plans and budgets for the project. - Estimate project costs for various phases. - Create financial models to assess project feasibility. - Identify and secure funding sources for the project. - Prepare financial reports and presentations for stakeholders. - Assess and mitigate financial risks associated with the project. - Ensure compliance with financial regulations and standards. - Forecast project revenues, expenses, and cash flows. - Analyze project financial performance and make recommendations. - Collaborate with project stakeholders on financial matters. - Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
17	BIM Technician (Mid Level) [For SD1]	Graduation in relevant Subject	12 years total professional experience, preferably 3 years experience in railway sector, 3 years' experience in similar type feasibility study and design consultancy, including preferably 3 years experience as BIM Technician or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Develop 3D models of railway infrastructure, including tracks, stations, bridges, tunnels, and other structures, using BIM software. Collaborate with engineers, architects, designers, and other stakeholders to coordinate the design and construction of railway infrastructure within the BIM environment, ensuring consistency and compatibility across disciplines. Perform clash detection analysis to identify and resolve conflicts between different elements of the railway infrastructure, such as clashes between tracks and structures or clashes between mechanical, electrical, and plumbing (MEP) systems. Create visualizations, renderings, and animations of the railway infrastructure to communicate design intent, facilitate stakeholder engagement, and support decision-making throughout the project lifecycle. Extract quantities and generate material takeoffs from the BIM models to support cost estimation, procurement, and construction planning for railway projects. Develop construction sequencing and phasing plans based on the BIM models to optimize construction efficiency, minimize disruptions, and ensure safety during the construction of railway infrastructure. Organize and manage BIM data, files, and documentation using BIM collaboration platforms and document management systems to ensure version control, data integrity, and accessibility for project stakeholders. Conduct quality assurance checks on BIM models to verify compliance with project requirements, standards, and specifications, and ensure the accuracy and completeness of the BIM deliverables. Provide training and technical support to project team members on BIM workflows, software applications, and best practices for effective utilization of BIM technology in railway projects. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
18	Digital Twin Technician (Mid Level) [For SD1]	Graduation in relevant Subject	12 years total professional experience, preferably 3 years' experience in Transport sector, 3 years' experience in similar type feasibility study and design consultancy, including preferably 3 years experience as Digital Twin Technician or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Develop and maintain digital twin models of railway infrastructure components, such as tracks, stations, signaling systems, and rolling stock. Collect and integrate data from various sources, including sensors, IoT devices, engineering models, and operational systems, to populate the digital twin models with real-time data. Conduct simulations and analysis using the digital twin models to evaluate performance, predict outcomes, and optimize operations. Monitor the real-time performance of railway infrastructure using the digital twin models, implementing control strategies to optimize operations and improve efficiency. Implement predictive maintenance strategies using the digital twin models to anticipate equipment failures and optimize maintenance schedules. Visualize and communicate insights from the digital twin models to stakeholders, facilitating informed decision-making and collaboration. Collaborate with stakeholders across different disciplines to ensure the digital twin models align with project requirements and support project objectives. Manage the data infrastructure supporting the digital twin models, ensuring data integrity, security, and availability. Provide training and support to stakeholders on how to use and interpret the digital twin models effectively. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
19	Passenger Flow Analyst (Mid Level) [For SD1]	Graduation in Transportation Engineering/Civil Engineering/Urban Planning or equivalent relevant Subject	12 years total professional experience, preferably 3 years' experience in railway sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Passenger Flow Analyst or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Gathering data on passenger movements within the railway system, including entry and exit points, transfer points, and travel patterns. Analyzing the collected data to identify trends, patterns, and peak travel times. This analysis helps in understanding passenger behavior and demand. Using historical data and statistical models to forecast future passenger demand. This is crucial for planning infrastructure upgrades, service changes, and resource allocation. Assessing the capacity of stations, trains, platforms, and other infrastructure elements to accommodate current and future passenger volumes. Recommending improvements or expansions as needed. Identifying opportunities to optimize passenger flow and improve operational efficiency. Using simulation software to model different scenarios and evaluate the impact of proposed changes on passenger flow. Working closely with other stakeholders such as engineers, planners, and operations managers to integrate passenger flow considerations into the overall project planning and design. Presenting findings, forecasts, and recommendations to project stakeholders in clear and concise reports. Communicating complex technical concepts effectively to non-technical audiences. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
20	E & M Expert (Mid Level) [For SD1]	Graduation in Electrical/ Electronics/ Electromechanical Engineering or relevant Subject	12 years total professional experience, preferably 8 years experience in railway sector, 5 years' experience in similar type feasibility study and design consultancy, including preferably 3 years experience as Electromechanical Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Design and develop electromechanical systems and components used in railway infrastructure, ensuring they meet project requirements and industry standards. Ensure seamless integration of electromechanical systems with other railway components, to ensure safe and efficient operation. Ensure electromechanical systems comply with safety regulations and standards, conducting risk assessments and implementing safety measures as needed. Manage electromechanical engineering aspects of the project, including planning, budgeting, and coordinating activities with other project teams. Maintain accurate documentation related to electromechanical systems, including drawings, specifications, and technical documentation. Collaborate with stakeholders, including engineers, contractors, and regulatory authorities, to address electromechanical engineering requirements and ensure project objectives are met. Identify opportunities for improvement and efficiency in electromechanical systems design, operation, and maintenance, driving innovation and efficiency in railway projects. Provide training and support to project team members and end-users on electromechanical systems and equipment to ensure safe and effective operation. Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
21	procurement/ Contract expert (Senior) [For SD2]	Graduation in Law or Engineering or relevant subject.	15 years total professional experience, preferably 10 years' experience in transportation field (preferably in railway sector). 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Procurement/ Contract Specialist or similar post for similar type consultancy. Working experience in 10 projects to prepare FIDIC based Bid Documents for large construction funded by international donor agencies such as ADB/WB/JICA etc. Working experience in ADB funded projects and SAARC region would be preferable.	• Responsibility for preparation of bid documents incorporating all inputs from relevant experts for all construction package as decided during feasibility study and prepare evaluation criteria following WB's Guidelines as well as 'Standard Bidding Documents'. • Update the bid documents if any changes occur after approval of the project and/or during the course of time (if required). • Discuss all the contents with the Employer before finalization and inform promptly if any modification is required in the agreed bid document. • Provide assistance to PD in pre-bid clarifications, addendums, corrigendum's, evaluation of bids etc. for all the projects. • Co-ordinate among experts/staff working for different components and inform the updates to Team Leader/Deputy Team Leader, and the Employer. • Provide assistance in selection of sub-contractor under TA Consultancy, including negotiation and selection of sub-contractor. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
22	Track maintenance Workshop expert (Mid Level) [For SD2]	Graduation in Mechanical or equivalent relevant Engineering	12 years total professional experience, preferably 10 years experience in railway sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Track Maintenance Expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	• Responsibility for designing Track Maintenance workshops of the proposed components as identified during study. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to workshop/depot/shed manufacturing and maintenance. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.

Qualifications, Experience and Responsibilities of Consultants					Annexure - III (b)
Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities	
1	2	3	4	5	
B National Consultants :					
1	Deputy Team Leader (Senior) (Key Expert) [For SD1 & SD2]	Graduation in Civil Engineering or relevant subject	20 years total professional experience, preferably 12 years' experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years' experience as Project Manager/Team Leader or Deputy Project Manager/Deputy Team Leader for similar type consultancy. Working experience in FIDIC based contract and SAARC region would be preferable	• Perform the acting role of 'The Engineer' during the absence of Project Team Leader. • Assist the Team Leader in conducting Feasibility study, detailed design and tendering services of all the projects as identified during study. • Assist the Team Leader to manage and superintend day-to-day working of experts/staffs and utilization of available resources with successful planning, execution, monitoring, risk management, quality control, time & cost management and closure of a project • Co-ordinate among experts, sub-consultants and Employer and other government agencies and donor agencies • Other tasks assigned by the Team Leader and the Employer.	
2	Architect (Senior) [For SD1 & SD2]	Graduation in Architecture or equivalent relevant subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable	Assist International Architect to prepare architectural plan and elevation of all the structure and landscape of all functional and residential buildings	
3	Urban Planner (Senior) [For SD1]	Graduation in Urban Planning or relevant subject	15 years total professional experience, preferably 8 years experience in Transport field, 8 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable. a.	Assist International Urban Planner	
4	Railway Operation Expert (Senior) [For SD1 & SD2]	Graduation in relevant Subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Railway Operation Specialist	
5	Structural Engineer (Senior) [For SD1 & SD2]	Graduation in Civil or Structural Engineering or equivalent relevant subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Structural Engineer	

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
6	Foundation/Geotechnical Engineer (Senior) [For SD1 & SD2]	Graduation in Civil / Structural or equivalent relevant Engineering	15 years total professional experience, 10 years experience in transport sector (preferably in railway field), 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Foundation/Geotechnical Engineer or similar post for similar type consultancy.	• Responsibility for Foundation designing works and geotechnical data collection of the proposed components as identified during study. • Assess the soil treatment requirements, finalize location and type of soil treatment to be adopted as per geotechnical data collection of the proposed components. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to Foundation, soil treatment & other Geotechnical related works with the collaboration of Railway Bridge Engineer, Embankment Engineer and Structural Engineer. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts and sub consultants working for sub-soil investigation, other related survey/investigations and foundation & soil treatment designing works for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss design criteria, location wise soil treatment type to be adopted and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
7	Civil Engineer (Senior) [For SD1 & SD2]	Graduation in Civil / Structural or equivalent relevant Engineering	15 years total professional experience, 10 years experience in transport sector (preferably in railway field), 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Foundation/Geotechnical Engineer or similar post for similar type consultancy.	Assist International Structural Engineer.
8	Earthwork Engineer (Senior) [For SD1 & SD2]	Graduation in Civil or equivalent relevant Engineering	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International 'Embankment /Earthwork Engineer'

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
9	Electrical and Airconditioning Engineer (Senior) [For SD1 & SD2]	Graduation in Electrical or equivalent relevant Engineering/subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	• Conduct various technical survey and tests etc. • Fix the design parameters & specifications for the power supply & transmission for each component of the project. • Quantify the amount of power required for the operation of the project and identify possible sources of power supply. • Planning & Design of power supply and distribution system, AC System. • Electrical design of stations and other infrastructures. • Help Quantity Surveyor in cost estimation. • Help Procurement Expert in preparing Tender documents. • Review of previous study (if any).
10	Railway Alignment, Track and Yard Expert (Senior) [For SD1 & SD2]	Graduation in railway / civil or equivalent relevant Engineering	15 years total professional experience, preferably 8 years experience in railway field, 8 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Railway Alignment, Track and Yard Expert
11	Survey Engineer (Mid Level) [For SD1 & SD2]	Graduation in Civil / Survey or equivalent relevant Engineering	12 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	• Conduct various topographic survey and help in identifying the alignment of proposed high speed railway. • Calculate amount of land required to be acquired and help creating all the maps including LA Map showing in the Mouza Map. • Assist 'Land Use Planner' Specialist. • Review of previous feasibility study (if any). +E24
12	Rolling Stock Expert (Senior) [For SD1 & SD2]	Graduation in Mechanical Engineering or equivalent relevant subject	15 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Railway Rolling Stock Engineer or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Assist International Rolling Stock Expert
13	Workshop Expert (Senior) [For SD1]	Graduation in Mechanical or equivalent relevant Engineering	12 years total professional experience, preferably 10 years experience in railway sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Locomotive Workshop Expert or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Assist International Workshop Expert
14	Railway Signaling & Telecommunication Engineer (Senior) [For SD1 & SD2]	Graduation in Electrical/IT or equivalent relevant Engineering/subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Signalling & Telecommunication Expert

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
15	Environmental Expert (Senior) [For SD1 & SD2]	Graduation in Civil / Environmental Engineering or Environmental Management or equivalent relevant Subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	• Responsibility for carried out environmental data and sample collection and environment related survey & investigations of the proposed components as identified during study. • Prepare Environment Impact Assessment (EIA) reports based on requirements of Department of Environment (DOE) of Bangladesh Government and WB. • Identify BOQ items to be incorporated to ensure implementation of EMP and prepare detailed Specifications, estimates, rate analysis related to environment related BOQ items. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Co-ordinate among sub-consultants and staff/experts working for environment related works for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss EIA report and any other matter with the Employer before finalization. • Keep liaison with DOE, prepare environmental clearance proposal to be submitted to DOE and assist PD for getting environmental clearance from DOE. • Present the EIA report to WB, DOE or any other officials/agencies desired by the PD and response to any query related EIA. • Other task assigned by Team Leader, Deputy Team Leader and Project Director.

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Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
16	Social Expert (Senior) [For SD1 & SD2]	Graduation in Social Science or equivalent relevant Subject	15 years total professional experience, preferably 8 years experience in railway field, 5 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Responsibility for carried out socio-economic survey, land market survey and other survey/data collection related to resettlement works of the proposed components as identified during study. • Prepare Resettlement Plan (RP) and socio-economic related part of the Feasibility study reports for all the components. • Prepare detailed entitlement matrix following guideline of donor agency(s). Submit the justification of determining lump sum resettlement benefits. • Prepare gender analysis/ gender action plan / gender impact assessment following WB's Guidelines • Prepare an indigenous people's plan (IPP) in accordance with WB's policy • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts working and sub-consultants assigned for Topographic survey and socio economic survey & land market survey for different components • Discuss entitlement matrix, TOR & estimate of INGO and any other matter with the Employer before finalization. • Present the RP report to WB, DOE or any other officials/agencies desired by the PD and response to any query related RP. • Carryout discussion meetings with APs, focus group discussion etc. to explain the impact of the project and entitlement of EPs. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
17	Transport Economist (Senior) [For SD1 & SD2]	Graduation in Transportation Engineering / Economics or equivalent relevant Subject	15 years total professional experience, preferably 8 years experience in railway field, 8 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Transport Economist
18	Procurement/Contract Specialist (Senior) [For SD1 & SD2]	Graduation in Law or Engineering or relevant subject.	15 years total professional experience, 8 years experience of similar type of project, 8 years' experience of working as Procurement / Contract Specialist or similar post. Working experience in 10 projects to prepare FIDIC based Bid Documents for large construction funded by international donor agencies such as ADDWBI/JICA etc. Working experience in international donor agency funded project would be preferable.	Assist International Procurement / Contract Specialist.
19	Financial Analyst (Senior) [For SD1]	Graduation in Finance/Accounting/Economics or equivalent relevant Subject	12 years total professional experience, preferably 10 years experience in railway sector, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Financial Analyst or similar post for similar type consultancy. Working experience in SAARC region would be preferable.	Assist International Financial Specialist.

Sl. No.	Consultants	Minimum Educational Qualification	Experience	Responsibilities
1	2	3	4	5
20	Bridge Design Engineer (Senior) [For SD2]	Graduation in Civil / Structural or equivalent relevant Engineering	15 years total professional experience, preferably 10 years experience in railway field, 8 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience as Bridge Designer or similar post for similar type consultancy, designing at least 15 major bridges in deep water. Working experience in SAARC region and using bridge design software would be preferable.	• Responsibility for designing bridge/culverts/viaducts/road over bridges of the proposed components as stipulated in the TOR. • Prepare detailed drawings, Specifications, BOQ items & quantity, rate analysis related to Bridge construction. • Manage and superintend the day-to-day working and maximum utilization of available experts and staff. Assign tasks of all related experts/staff. • Co-ordinate among staff/experts working for bridge related works for different components and inform the updates to Team Leader/Deputy Team Leader. • Discuss design criteria and any other matter with the Employer before finalization. • Other tasks assigned by the Team Leader, Deputy Team Leader and Employer.
21	Land Acquisition and Resettlement Specialist (Senior) [For SD1 & SD2]	Graduation in Social Science or equivalent relevant Subject	12 years total professional experience, preferably 8 years experience in railway field, 5 years' experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	• Prepare Land Acquisition Plan • Collect all Land related document from DC Office and other related offices. Coordinate with Social Expert. • Prepare Cost Estimate for Land Acquisition and Resettlement • Review of previous study (if any). • Other task assigned by Team Leader, Deputy Team Leader and Project Director.
22	Track Maintenance Expert (Senior) [For SD2]	Graduation in railway / civil or equivalent relevant Engineering	15 years total professional experience, preferably 8 years experience in railway field, 8 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Track Maintenance Workshop Expert
23	Cost Estimator (Senior) [For SD2]	Graduation in civil or equivalent relevant Engineering	15 years total professional experience, preferably 8 years experience in railway field, 8 years experience in similar type feasibility study and design consultancy, including preferably 5 years experience in similar position for similar type consultancy. Working experience in international donor agency funded project would be preferable.	Assist International Cost Estimator/Quantity Surveyor

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