1. BACKGROUND

The Ministry of Transport (the “Ministry”) of the Hashemite Kingdom of Jordan has expressed an interest in obtaining support from the European Bank for Reconstruction and Development (the “EBRD” or the “Bank”) for the preparation of a modernised and enhanced system of Light Rail Transit (“LRT”) operations between El-Mahatta in Amman (the “City”) and the Queen Alia International Airport (the “Project”).

Public sector transportation in Jordan is poorly regulated and the Ministry has requested the Bank’s assistance in establishing structured public transport services across the country through various interventions, including this Project. Through these interventions the Ministry would like to reduce traffic and congestions on roads, improve health and safety of the public as well as reduce pollution. The Project will be designed to address the lack of public transportation, especially from/to the airport by improving transport links with the airport and introducing institutional reform in the sector and introduction of public service contracts and a private sector operator, as feasible.

The Project aims to utilise the existing rail corridor from Amman central station at El-Mahatta to Jeeza, a 35 km long single track narrow-gauge railway passing through Um El Heran and Elubbeh stations (with passing lines) and including 1 tunnel, 1 bridge, 3 road underpasses and 21 at-grade road crossings, of which 5 are major (2x2 road). Connection to Queen Alia International Airport would require additional 2 km branch line and airport terminal. Currently in poor condition, services on the line are limited to weekly tourist steam train which runs to Jeeza and occasional airport services (for example, pilot airport service during snow conditions last winter season). Moreover, the rail line forms part of the national rail network around Amman centre and to the south towards Aqaba port, including disused connection with Amman dry port, near Um El Heran station, with plans for reinstatement of national train services, resulting in possible mixed usage of the Project rail line.

In order to identify EBRD’s potential involvement in the Project, the Bank is seeking a consultant (the “Consultant”) to provide an initial assessment of project rationale and outline feasibility, including an expert analysis of various technical considerations, route analysis and connectivity, investment requirements (rolling stock and infrastructure) and potential private sector involvement in the operation of the future LRT system.

2. OBJECTIVES

The overall objective is for the Consultant to prepare for the Bank an independent Pre-Feasibility Study for the Project. The Consultant shall carry out the following tasks:
(i) determine project rationale within existing urban and transport planning frameworks of the project corridor, including Greater Amman Area, Queen Alia International Airport and national rail network;
(ii) review proposed LRT corridor and station/terminal locations, with respect to land availability, urban integration issues and transport interconnectivity;
(iii) review current traffic flows, notably public transport services (airport buses etc) along the El-Mahatta, Amman – Queen Alia Airport corridor (routes, frequencies, ridership);
(iv) identification of project options considering inter-alia rail gauge, train type (tram, tram-train or train), line capacity (single-double track, signalling etc), alignment/nodal connectivity and level of service. The proposed LRT options shall integrate urban and transport-level planning and the potential for suburban rail services along the airport link.
(v) determine an initial ridership demand forecast for each project option, based notably on level of service and interconnectivity and using local and international benchmarking where appropriate;
(vi) identify system requirements capable of meeting forecast demands in the City, analyse project barriers and risks, such as construction risk for the LRT rail infrastructure;
(vii) identify implementation options (including public and PPP) with related public sector, prepare initial cost/revenue flows for LRT operation; and,
(viii) define an action plan including further studies and implementation arrangements.

3. **SCOPE OF WORK**

The Consultant will analyse and present the following tasks in the form of a concise, coherent report.

**Task 1: Review project rationale and LRT corridor**

The Consultant will review all available studies and information from various sources which will be given to the Consultant free of charge and the Consultant will perform consultations with major stakeholders implicated in the future LRT. The review shall cover inter alia information about the current structure of urban transport market in Amman, including:

- All relevant urban and transport planning studies and master plans for areas covered by the project corridor, notably Greater Amman Area, Queen Alia International Airport and national rail plans;
- Current status of the existing old rail track between Queen Alia International Airport and the City, land availability, condition of rail permanent way and facilities;
- Existing studies on LRT project and interconnecting urban transport services, notably planned BRT system;
- Existing ticketing system and requirements for a basic yet improved ticketing system for the future LRT.
- Existing practice of regulating and monitoring the public transport services in the City;
- Institutional set-up for rail implementation, operation and fare collection
The Consultant will analyse the rationale for the LRT system with relation to current urban and transport master plans and ongoing and planned development projects along the corridor. Particular attention will be paid to integration with planned development of public transport system and connection nodes/LRT stations.

In particular, this review shall consider type and level of service to be provided, considering suitable running speed for airport service and possible mixed rail operation on all or part of the line and potential for complete or partial upgrade to dual track. Technical issues shall consider inter-alia route alignment of possible connection to Mahatta bus/BRT terminal (approx. Km 4), new branch line and rail terminal at Queen Alia International Airport (additional 2 km) and future rail depot location; line capacity (single or double track, signalling..); train type (electrification or diesel) and safety issues (fencing; securing of level crossings etc).

The corridor shall consider inter alia proximity to population and economic centres, land availability either along the existing LRT corridor or elsewhere, alignment constraints, inter-connectivity with other transport modes, environmentally sensitive areas.

This task shall identify project options for subsequent assessment which integrate urban and transport-level planning priorities and based on principal factors for project viability, notably rail gauge, train type (tram, tram-train or train), line capacity (single-double track, signalling etc), alignment/nodal connectivity, level of service and potential for suburban rail services along the airport link.

It is expected that up to four options would be prepared and costed, based on different LRT corridors, standards and/or demand scenarios.

**Task 2: Determine current public transport services and initial ridership demand forecast**

The Consultant will document the public transportation connecting with the planned LRT.

The Consultant will assemble information from previous and existing studies and surveys to establish a database appropriate for the LRT project planning and evaluation purposes, including use of outputs from the existing traffic model for the Greater Amman area, as appropriate for the needs of the study.

The Consultant will make suitable preliminary estimates based on provided input from the Ministry and assumptions, supported by spot checks and best engineering judgement. This shall include the assessment of existing traffic levels from the airport to Amman (if suitable data is unavailable, the Consultant shall conduct minimum one-day survey of traffic flows to/from airport by all modes, with particular focus on bus connections). This will include suitable assumptions (and thereby risks) to determine potential for future modal switch in favour of the LRT system, based on estimated level of service.

Based on the above, the Consultant will prepare an indicative passenger demand forecast for years of operation 1, 5, 10, 15 and 20 and presented as normal, diverted and generated traffic for the major traffic sections along the LRT route (i.e. between stations or groups of stations). These estimates of daily peak hour and annual passenger volumes will be one of main criteria
by which the financiers and their advisers will use to proceed on to further project preparation.

**Task 3: Identify system requirements for LRT system**

Based on the demand and route network analysis the Consultant will propose outline operational characteristics of the LRT system to conform to a level of service compatible with expected peak hour demand and modern LRT operation as an international airport link comprising number and capacity of trains used for service provision, frequency of services, length between stops and estimated/forecasted number of passengers. The Consultant will also provide a justification for the envisaged fleet in terms of available depot size, space, maintenance and servicing capacity.

The Consultant shall prepare outline cost estimate, based on international benchmarking and local cost comparisons, which should cover the following works components.

- Client’s direct costs – project management and supervision
- Utilities diversion – indicative estimate
- Civil Engineering – structures and tunnels
- Track way and track way cover
- Rail systems
- Roads and public spaces, urban facilities
- Road traffic signalling
- Stations
- Power supply equipment
- Low voltage and OCC
- Workshop & Depot
- Rolling Stock

The Consultant will provide indicative price ranges on a per kilometre basis and expected useful life for standard LRT trains from various established manufacturers, including cost of necessary spare parts, maintenance equipment, to be procured together with the new LRT trains (under the same contract).

The Consultant will provide outline cost estimates for operation and maintenance, on a cost per km basis based for the selected routes network and planned scope and quality of the service.

The Consultant shall also define project barriers and risks, as well as possible mitigating actions, applying qualitative approach to the following components amongst others:

- Institutional ownership
- Land availability
- Permits and approval
- Utility relocation
- Design
- Construction
- Ground and underground condition
The proposed LRT route network scheme will be discussed with a committee of the Bank and the Ministry of Transport / Amman City to make sure that all assumptions and LRT elements are estimated properly.

**Task 4: Preliminary project structure and financial analysis**

Based on the confirmed scope of new operations, the Consultant will review options for private-sector participation in LRT construction and operation, based on suitable level of risk transfer to ensure value for money for public sector, on the basis of local experience and international benchmarking. Given uncertainty on ridership levels, it is likely that this would focus principally on PPP options without revenue risk transfer to private sector and include operating concessions and/or leasing options. The options will need to ensure provisions for sustainable maintenance of the LRT system and fleet.

Within the assessed options, the Consultant will define the role of the public implementation body and provide an initial outline of the regulatory and contractual arrangements that will be needed between the LRT operator and the public sector.

The Consultant will prepare, and provide the Bank with, estimates of passenger and fare revenue forecasts. It will take into account the envisaged train delivery schedule, capacity of new trains and demand on the route. Suitable use of phased service development shall be considered to allow for progressive ramp-up of investment and service level, based on observed ridership and structured feeder services and service quality of LRT operation.

For the recommended option, the consultant shall define an action plan including further studies and implementation arrangements required to prepare the project and meet the requirements of the financiers to mobilise investment funds.

**4. IMPLEMENTATION ARRANGEMENTS AND DELIVERABLES**

The Consultant will work under the direction of the EBRD, but will interact closely with the Ministry of Transport. The Consultant shall report all findings to the EBRD.

It is anticipated that the Consultant will visit Amman twice to carry out the above work. The execution period for the work will be a maximum of 12 weeks from the mobilisation date.

The Consultant will be responsible for covering its own costs from the allocated budget, including local transportation, visas, interpretation, translation, accommodation, living expenses, communications, materials, printing and report preparation.

**Deliverables:**

The Consultant will submit the following deliverables:
<table>
<thead>
<tr>
<th>Title</th>
<th>Elapsed Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draft LRT Pre-Feasibility Study Report</td>
<td>M + 9 weeks</td>
</tr>
<tr>
<td>Final LRT Pre-Feasibility Study Report</td>
<td>M + 12 weeks</td>
</tr>
</tbody>
</table>

M = mobilisation date

All deliverables will be submitted to the Bank in both English and Arabic languages, with 1 hard copy in Arabic and 1 in English, and all reports submitted electronically in both Word and PDF.

**Donor Visibility:**

Given the assignment is funded through the EBRD’s donor funded technical cooperation programme, the Consultant will be required to support the client to ensure visibility of these resources. Support on these visibility aspects can be obtained from the Bank’s Communications Department. Measures could include but not be limited to:

- All documents produced by the Consultant should mention donor support and bear the logo of the donor, when appropriate.
- Donor support to the project should be acknowledged in any public communication (press releases, launch of facilities)
- Local representatives of donors should be invited to any public event organised to promote the project (press conferences, inaugurations, possibly stakeholder participation programmes)

Please contact EBRD for further information on donor visibility only. Some donor visibility guidelines can also be provided by the Bank to Consultants at the start of an assignment.

5. **CONSULTANT PROFILE**

The Consultant shall have extensive experience in LRT planning, operation and maintenance. They should have experience in the region and in carrying out similar assignments. The team tasked with the assignment shall include the following key resources:

- Urban Transport Specialist: preferably with 15 years’ experience in planning and preparation of LRT systems in major cities, design and implementation train procurement, operations and maintenance;
- LRT expert: preferably with a minimum of 15 years’ experience in procurement, operations and maintenance of public transport railway systems including LRT;
- Transport economist: preferably with 10 years’ experience, familiar with public transport railway systems;
- Legal specialist: preferably with 10 years’ experience in commercial law practice including PPP, transport sector and/or regulation; and,
- Other local experts.

6. **REFERENCE DOCUMENTS**

The list is to be finalised:
• Greater Amman development master plan
• Greater Amman transport plan
• Queen Alia Airport development master plan
• National rail development strategy-master plan
• Traffic counts/studies (as available) for Amman-Queen Alia Airport
• Studies (if any) for rail development, Amman-Queen Alia corridor
• Amman-Zarqa BRT feasibility study, May 2015? (for Mahatta terminal development/connectivity; economic parameters)