UGANDA

TERMS OF REFERENCE
 FOR THE FEASIBILITY STUDY AND DETAILED DESIGN OF ROAD LINKS TO PORT BELL AND JINJA PIER

BACKGROUND

1. The Ministry of Works and Transport (MoWT) in representation of the Government of Uganda, under its National Development Plan II (NDP II), has made plans for: (i) the remodeling and expansion of the two ports of Port Bell and Jinja pier (including civil works on buildings, structures, and necessary dredging, channelization and stabilization works), (ii) improving the hinterland road and rail connections (either through the rehabilitation, widening of existing links if feasible or through the construction of new links). Other interventions also planned include the refurbishment of existing ships (MV Pamba and MV Mwanga) and purchase of new ship to replace MV Kabalega; as well as undertaking hydrographic/bathymetric surveys including installation of aids to navigation, development of navigation charts, and installation of weather monitoring and warning systems. In light of the, the Government of Uganda through MoWT has applied for financing from IDA to implement the above plans. Accordingly, MoWT intends to use part the funds to procure providers to undertake the said works and purchases under the premises of the proposed Lake Victoria Transport Program Series of Projects 1 (SOP 1) for Uganda.

2. Lake Victoria is the largest of all African lakes and the second widest in the world (length of 337km and a width of 240km). Its surface area that is approximately 69,500 km² is shared by Tanzania (49%), Uganda (45%) and Kenya (6%) percent respectively. The lake is situated between latitudes 0°30' N and 2°30' S and between longitudes 31°50' E 34°10' E . The Lake Victoria occupies a shallow depression in Africa and has a maximum depth of 84 m (276 ft) and an average depth of 40 m (130 ft). The lake has a shoreline of 4,828 km (3,000 mi), with islands constituting 3.7% of this length and is divided among three countries: Kenya (6% or 4,100 km2 or 1,600 sq mi), Uganda (45% or 31,000 km2 or 12,000 sq mi) and Tanzania (49% or 33,700 km2 or 13,000 sq mi). It contains numerous islands, such as the Sese archipelago, a chain of 62 islands in the north-western section of the lake in Uganda.

3. The catchment area of Lake Victoria holds a population of around 35 million people and an approximate Gross Domestic Product (GDP) of some US$ 30 billion, or around 40 percent of the total GDP from the East Africa Community Countries of Uganda, Kenya and Tanzania. Significant economic potential exists around the lake, encompassing a variety of economic
opportunities, such as hydropower generation, agriculture, irrigation, fishery, tourism and inland water transportation. The majority of the people who live around the lake depend on agriculture and fisheries for their food and livelihoods. Although its contribution to GDP has been declining due to the growth of other sectors, such as mining, tourism and agriculture; Lake Victoria still remains crucial for inclusive growth, contributing to 20-30 percent of GDP and employing 60-70 percent of the total workforce.

4. Port Bell is a small port and industrial center located at the head of the Murchison Bay, south-east of the capital city, Kampala. It’s found approximately 1.6 km away from the Luzira town. The port was constructed in the 1960’s as a rail wagon terminal, though has some facilities for berthing other types of vessels. It has a harbor, which is used for inland waterway transport of passengers and goods on the lake, both domestic and regional. Lake Victoria ferries operate from the port to other inland ports on Lake Victoria including Jinja (Uganda), Kisumu (Kenya) and Mwanza (Tanzania) giving the port both a national and regional significance. The rail wagon terminal is constructed on artificial (reclaimed) land at the head of which is a pier some 65 meters long and 20 meters wide, which acts as a causeway to the rail wagon loading dock. The latter consists of a link-span and hoisting towers (design to raise and lower the bridge depending on the freeboard of the ferry and differences in water levels), guide walls, and berthing dolphins for mooring the ferries in Mediterranean fashion for stern loading/offloading. The pier is a sheet piled wall construction with a reinforced concrete deck, the eastern part of which can be used for loading/offloading ships. Although this area is used mainly to berth a small floating dock. Port Bell has one mobile crane, and one forklift truck, both of which appeared to be dysfunctional. The entrance road is narrow and constrained, reflecting encroachment and parked vehicles. The 9km rail link is in poor condition, and has not been used for many years and is currently overgrown.

5. The multimodal connections for this port include both road and rail links. The existing 8 km long one meter gauge rail line link from Port Bell to the Kampala main line is in dilapidated condition. The existing road link is a **9m wide** single carriageway road in very poor condition. In addition, the current road link is heavily congested and operating above capacity due to traffic generated from the fast growing urban sprawl developments and rapid settlement expansions in the Port Bell and surrounding areas. The sorrow state of the connecting land mode links makes the operational efficiency of Port Bell to be quite limited, and the modal share of inland water transport as a whole to be of least significance.

6. Jinja port was also constructed in the 1960’s as a rail-wagon terminal, though also has some facilities for berthing other types of vessels. The rail-wagon terminal at Jinja is located 80 km east of Kampala on the north shore of the Nile River which flows out of the lake. The rail-wagon terminal is of similar construction to that at Port Bell, except that the concrete pier is some 40 meters long and 14 meters wide. The access to the port is difficult for both road and rail, due to
the dilapidated nature of this infrastructure. There is sufficient space in the port for storage and parking. There is no cargo handling equipment, but the linkspan is in relatively fair condition.

7. In carrying out the assignment, the Consultant shall liaise with key stakeholders like KCCA a UNRA and Jinja Municipal Council to find out the plans and progress with key road infrastructure links in the vicinity of both Port Bell and Jinja Pier, and their potential impact on the hinterland connection links being proposed.

8. The land use pattern in Port Bell and surrounding areas is characterized by residential, commercial and/or industrial and administrative settlements. Among the major commercial hubs located in his vicinity include Uganda Breweries Limited a division of East African Breweries and maker of Uganda Waragi, a triple-distilled gin and Bell beer; and Quality Chemical Industries Limited the US$40 million factory is the only one in sub-Saharan Africa that manufactures triple ARV therapy medication. Other land mark institutions located within PorBell include Directorate of Water and Development (DWD) and Luzira Maximum Security Prison that has a capacity of 20,000 inmates. Currently, Port Bell only accesible through Port Bell-Jinja road. From here, cargo designated to various destinations including Jinja, Kampala, Mbarara, Gulu and South Sudan is then transported along the major national roads. Among other major destination of cargo include Kampala Industrial Business Park (KIBP) in Namave and Inland Container Deport (ICD) in Mukono.

9. While executing this assignment, the consultant shall select alignment options that provide coordination and integrated with already existing and planned road facilities and interchanges. Notable among these road networks to be considered include KIBP; Mukono ICD; Kampala-Jinja road; Kampala Southern Bypass; and Kampala-Entebbe Expressway with a spur to Munyonyo.

10. Like Port Bell, Jinja Pier in Jinja Town Centre division, is located along the shore of Lake Victoria. Out of the total population of 468,256, the Jinja pier is surrounded by population of 21,447 within JMC, and 22464 in Kimaka/Nalufenya respectively. The land use pattern within this area characterized by commercial, industrial, Administrative and residential settlements. Because of its close proximity to the source of the Nile the area also acts as major tourist destination. The Multi model connection to Jinja Pier is by both rail line and a series road networks that are both in dilated states. The major access road to pier includes single carriage Nile Crescent road-2.8km and dual carriage Eng Zikosooka way connecting to Madhivani Roundabout along Jinja-Mbala-Tororo Road. For cargo destined to Kampala, the pier can be accessed through through Nalufenya road (1.6KM) currently under rehabilitation by Uganda Support to Municipality Infrastructure Development (USMID) and Clive road (0.65km) that interconnects to the Eng Zikukosoka way. It’s therefore desired that selection of alignment chosen should consider the most cost effective options of providing connectivity to connectivity.
to Jinja New Nile Bridge, planned Kampala-Jinja New Expressway and Jinja industrial area. The traffic mix in this area is characterized by heavy good vehicle, saloon cars, trucks and pickups.

Current Ongoing Studies

11. On February 2nd 2011, a contract was signed between the Republic of Uganda represented by Ministry of Works and Transport and M/S. OSK Ship Tech A/s-Denmark (member in charge) in association with M/S. CASE International Consultants Ltd, M/S Dan Marine A/S and M/S Niras A/S to provide consultancy services for the design and supervision of shipbuilding/construction of the proposed containership/wagon ferry to replace MV Kabalega and improvement and expansion of port facilities at Port Bell and Jinja Pier.

Lake Victoria Transport Program

12. The proposed Lake Victoria Transport Program represents the first project(s) to be prepared under the Integrated Corridor Development Initiative (the Intermodal Strategy) in the EAC countries, endorsed at the 3rd EAC Heads of State Retreat held in Nairobi, November 29-30, 2014.

The proposed Lake Victoria Transport Program will involve a Series of Projects (SoP), one per country, each using a blend of national IDA credit funds and regional IDA credit funds on a 1/3 to 2/3 split, depending on the eligibility of the components. The first SOP will also involve the provision of an IDA grant to both of the regional bodies to facilitate the management of the program, and the harmonization of the institutional framework. The total LVTP program is envisaged to amount to some US$630 million, excluding the IDA grant, split between the three countries in the following manner: (i) Uganda US$75 million; (ii) Tanzania US$75 million for the lake infrastructure, and US$270 million for the railway; (iii) Kenya (US$50 million); and Rwanda (US$ 160 million).

OBJECTIVES OF THE ASSIGNMENT

13. MoWT, Uganda wishes to contract a consultancy firm to carry out a feasibility study of the alternatives for the rehabilitation and widening of the existing 9 km Port Bell Road link that runs from Port Bell pier and connects to the main Jinja Road (A109) or between three other alternatives to be explored by the Consultant between Port Bell and the Kampaala Industrial Business Park in Namanve, with subsequent detailed design for the chosen alignment; and feasibility study and detailed design for the upgrading, and improvement of the existing 4 km road link connecting Jinja Pier to the main Jinja Road (A 109). Detailed designs will inform the final road projects to be financed for the improvements in the overall connectivity and operational efficiency of Port Bell and Jinja Pier ports.

SCOPE OF WORK
14. The consultant shall be required to undertake the following tasks.

**Task A: Review of existing documentation**

The consultant shall review the modernization plans for Port Bell, land use and transport integration plans for Kampala, Jinja town development plans, as well as other related documentation available about current MoWT planning for the transport sector modernization of road, rail, IWT linkages to facilitate a better transport system both within Uganda and the connectivity with other major nodes (ports, towns) in the East African region.

**Task B: Survey of existing road and environs conditions**

The Consultant shall undertake a detailed field survey and investigation of the 9km existing road link Port Bell to Jinja Road, and the 5 km Jinja Pier to Jinja-Kampala Road including but not limited to the following activities:

(i) *Detailed road reconnaissance and inventory* of existing assets including pavement, shoulders, sidewalks, structures, roadside facilities, road furniture, complementary drainage facilities, and existing utilities;

(ii) *Visual condition survey* at 1 km intervals to document the current condition of the road (road type, defects including but not limited to rutting, potholes, edge breaks, racking, raveling, stripping, corrugations, edge deterioration, shoulder and sidewalk condition, embankments and cut slope conditions);

(iii) *Pavement strength investigations* using FWD equipment on paved surfaces at 100m intervals with switching tests in alternative lane sides, and undertaking DCP testing along the two roads at 500m intervals;

(iv) *Soil and materials investigation survey* including trial pits for soil sample testing also at 500m intervals, with accompanying pavement profiling up to a 1m depth to understand the existing pavement formation and characteristics; as well as testing of naturally occurring, already exploited or potential borrow pit material sources with results for soil classification, grading, Atterberg limits, CBR, moisture/density relationships for gravel sources, and Los Angeles Abrasion, Aggregate Impact Value, Aggregate Crushing Value, Ten Percent Fine Value, Sodium Sulphate Soundness, Bitumen Affinity, Specific Gravity and Water Absorption, among others;

(v) Topographical survey including the setting first of permanent control points\(^1\) (at 1 km maximum intervals); and secondary points (at 250m intervals), and thereafter capturing the horizontal alignment of the existing road with plans drawn to 1:2,000 scale and capturing all junctions, kerbs, drains, culverts, road furniture, utilities, buildings and other developments or structures, water courses, vegetation and forest cover within a 15m radius either side of the existing road center line; levelling along the existing road centerline at 25 m intervals

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\(^1\) The consultant shall ensure that the permanent control points are lined to the existing National Grid/Datum reference beacons and benchmarks, and all coordinates captured using the Universal Transverse Mercatur (UTM) system.
to capture the longitudinal profile; cross-sectional levelling at 25 m intervals, and at any local irregularity; and

(vii) *Road safety audit* of the existing road and junctions including inventory of road safety furniture, road marking, speed control measures, schools, hospitals, residential areas, speed limits, and all related road safety hazards and dangerous spots.

**Task C: Traffic, O-D and Axle load surveys**

The Consultant shall undertake road traffic, O-D and axle load surveys and analysis including determining existing traffic patterns, traffic volumes, congestion levels, traffic management and traffic control situation, modal share of traffic generated from the ports, origin-destination surveys to determine main nodal traffic generation and destination centers, types of cargo, axle load surveys and make determinations on the modal and traffic assignment distributions expected after the road links restoration, construction, and port modernization. The Consultant shall at a minimum undertake traffic surveys (at least two locations strategically chosen) to record traffic patterns on the existing road, and on adjacent road sections (at least two locations strategically chosen), and classifying by vehicle type for at least a 7 day period with five 16 hour counts and two 24 hour counts (1 week day, 1 weekend). The consultant shall simultaneously undertake O-D surveys at the traffic count location sites, as well as axle load survey measurements of truck and heavy goods traffic. The consultant shall use the base results, and make reasonable projections to generate traffic and ESAL loadings for a 20 year period to feed into the detailed design process.

**Task D: Hydrological Survey**

The Consultant shall undertake a hydrological review of the catchment area for the road in question, document existing drainage facilities (drainage structure and condition inventory including type, size, length and condition of cross-drainage bridges, other structures, culverts, and side drainage including side drains, mitre drains, catch-water drains); collect data on rainfall patterns and other hydrological records, make a determination on their condition and adequacy compared to projected runoffs and design return periods, and finally make recommendations as to the needed drainage works to ensure a properly drained road system according to MoWT Design Manual as appropriate.

**Task E: Feasibility Study and Assessment of Alignment Alternatives**

Using the results from tasks A, B and C, the Consultant shall undertake a feasibility study to evaluate the reasonability and economic efficiency of: rehabilitating and widening the existing 9 km road link from Port Bell to Kampala-Jinja road versus the re-alignment of the road to connect Port Bell to the Kampala Industrial Business park in Namanve (three alternatives to be explored); and rehabilitating and widening the existing 5 km road link from Jinja Pier to Kampala-Jinja road to a Class 1b paved standard versus alternative re-alignments to connect Jinja Pier to the main Kampala-Jinja Road (three alternatives to be explored). This work shall include a full cost-benefit economic evaluation using established economic evaluation criteria and models for a 20 year design period. The Consultant shall also take into consideration other key determinant factors like social and environmental costs and concerns associated with the different alternatives e.g. high resettlement impacts, wetland destruction, or need for complex and costly structures. The Consultant shall present the final proposed alignment options for both
ports to the Client for their approval before moving on to the detailed engineering design stage. The final proposed alignment shall as much as possible attempt to make use of the existing road reserves or uninhibited land to avoid excessive project construction and compensation costs.

Task F: Detailed Engineering Design

The Consultant shall use the data and information collected from Tasks A to E to prepare a detailed engineering design for the chosen alignment options connecting Port Bell, and Jinja pier to their target road connections and destinations. Specifically the detailed engineering design shall include but not limited to the following key aspects

(i) Detailed Road Alignment: including a full horizontal alignment design respecting minimum radii as per design guidelines, indicating super elevations and need for widening, at a scale of 1:2000, vertical alignment design respecting maximum permissible gradients, and including the need for cuts and fills to raise embankments at a scale of 1:200, as well as typical cross-sections every 20m at a scale of 1:50, typical cross sections of junction layouts at a scale of 1:50, speed management and road safety features, and road safety design (including all the infrastructural design features to be included like climbing lanes, proposed drainage structures, crossing structures, design of junctions/interchanges, provisions for pedestrians and cyclists, provisions of parking for heavy goods vehicles, special bus-lays for pavement preservation, traffic management purposes, as well as road safety of users)

(ii) Upon completion of the detailed design, stake out the right of way limits in sufficient detail for the boundaries of properties which are to be acquired. Set out these boundaries in the field and on property maps and prepare schedules of land to be acquired, including details of utilities to be shifted and encroachments (such as trees and hutments) to be removed, in the detail required by the (MOWT) and the local planning authority to enable the land acquisition process and human re-settlement planning

(iii) Prepare detailed pavement design for a 20 year design life based on design standards stipulated in MoWT design standards or other international best practices in consultation with the MOWT. The pavement design should consider factors such as traffic loadings; outputs of geotechnical investigation and road condition survey; and road deflection measurements.

(iv) Prepare detailed design of Structures using information collected about hydrology e.g. catchment characteristics, rainfall, stream channel characteristics, design discharge, linear waterway, scour depth etc for all the cross drainage works and bridges in compliance with MoWT design standards and/or other internationally acceptable standards. The model study and other necessary hydraulic analysis shall be carried out as per MoWT/International standards and accordingly length and siting of the Bridge shall be finalized. The design will be developed to maximize the use of standard components and superstructure designs. In particular for smaller structure-box and pipe culverts, under and overpass structures, etc-precast alternatives will be preferred.
Substructures will be dimensioned on the basis of detailed site investigations and will reflect current international practice in selecting foundation type the consultant will also take into account the time required for the construction of alternatives, and give preference to those which minimize construction time.

(v) Prepare detailed Traffic Control and other facilities including pavement marking and sign layout plans. Both are to be based on current international practice for roads of this type, adjusted through, discussion with the MoWT to suit Ugandan conditions.

(vi) The consultant shall prepare a bill of quantities and cost estimate using established design techniques, and best practice recommendations. The Consultant shall also prepare a sample bidding document to allow for the procurement of works to undertake the works, including complementary engineering drawings and photos.

Activity G: Transfer of Knowledge/Training of Counter Part staff

14. The Consultant will arrange for orderly and timely transfer of all intellectual property accruing from the project to MoWT who remain the owners of the same and retain the right to use it at will without further reference to any party except where specifically agreed. This will include design data, calculations and reports; drawings and their basis; etc. The property will be provided in both hard and soft (in CD’s) format. The consultant will also be expected to transfer skills to five civil engineers on all aspects of the assignment during the consultancy period. The Consultant must propose training approaches and methods to undertake the knowledge transfer including but not limited to:

   a) **On Job Training:** The Consultant will provide On-job training for feasibility of and detailed design of road links and project management by attaching project engineers during the implementation of the project.

   b) Specialized Training Considering the Regional Importance and Complex Nature of the Project, the Consultant shall conduct special/in-depth training for MoWT staff at his home office on the following topics:- (i) Geometric and Pavement design using modern software’s; (ii) Hydrology and Hydraulic analysis; (iii) Project Management; (iv) Geotechnical investigations (v) Project Procurement & Contract Management. The training should be arranged for attached civil engineers for each field. The consultant should elaborate in his proposal the details of training for the above modules and training fields. The Consultant must propose training approaches and methods to undertake the knowledge transfer.

   c) The consultant’s price for the training should include full accommodation (hotel, meals), visa expenses, local transportation facilities, daily allowance for incidental expenses for the entire duration and for each staff, Economy class returns air ticket (round trip air fare) between Uganda and Consultant’s home office.
INPUTS TO BE PROVIDED TO THE CONSULTANT

15. The consultant shall be furnished with the modernization plans for Port Bell and Jinja port as well as the available data in respect of existing road infrastructure related to the two ports. However, such data may be incomplete and the consultant shall be required to undertake all tasks indicated in these ToRs, and carry out further research to get the full complement of data and information necessary.

16. The consultant shall complete the assignment within five months of the date of an effective contract.

CONSULTANT’S KEY STAFF

17. The Consultant can propose their list of key personnel to undertake the assignment. However, at the minimum, the Consultant should have the following experienced personnel in their proposed profile: (i) Team Leader, (ii) Highway Design Engineer, (iii) Materials/Geotechnical Engineer, (iv) Bridge/Structural Engineer, (v) Surveyor, (vi) Drainage Engineer/Hydrologist, (vii) Traffic Planner/Engineer, (viii) Transport Economist, and (ix) Road Safety Specialist.

Team Leader: The Team Leader shall be responsible for the proper conduct and undertaking of the assignment and shall be the key contact between the design team and the Client. He/she must be a Registered Civil Engineer with a degree in Civil Engineering or equivalent qualification. A postgraduate degree in highway/transport engineering is an added advantage. He/She must have at least 15 years cumulative experience 10 of which should have been gained in carrying assignments of similar nature in Sub Saharan Africa. Fluency in written and spoken English is mandatory.

Highway Design Engineer: The Highway Design Engineer shall be responsible for the design of the geometrical and pavement design aspects of the road. He or she will work closely with the Team Leader during the study and shall also assist the Materials Engineer in the design of road pavement. He/She must be a registered Civil Engineer with a degree in Civil Engineering or an equivalent qualification. A postgraduate qualification in Highway Engineering or transport engineering is an added advantage. He/She must have at least 10 years of cumulative experience related to road studies and designs. He/She must have served in a similar capacity on at least five (5) projects of similar magnitude and complexity in the past 10 years. Fluency in written and spoken English is mandatory.

Materials/Geotechnical Engineer: The Materials Engineer shall be responsible for conducting and supervising the materials investigation with a view to achieving optimal design and construction. The Materials Engineer shall coordinate with the Highway Design
Engineer in carrying out the pavement design and should be conversant with current practice in testing and pavement construction strategies. He/She must be a registered Civil Engineer with a degree in Civil Engineering or equivalent qualification. A postgraduate qualification in geotechnical/pavement engineering is an added advantage. He/She must have a minimum of 10 years of specific experience in pavement evaluation, materials testing, soils investigation and pavement design. He/She must have served as Soils/Materials Engineer on at least five (5) road projects of similar nature and magnitude in the past 10 years. Fluency in written and spoken English is mandatory.

**Bridge/ Structural Engineer:** The Bridge/Structural Engineer shall be responsible for the assessment of existing bridges and design of new bridges and other structures along the project roads. He/She must be a registered Civil Engineer with a degree in Civil Engineering, or Structural Engineering or an equivalent qualification. Postgraduate qualification in Bridge/Structural Engineering is an added advantage. He/She must have a minimum of 10 years of cumulative experience related to studies and designs of bridges/structures. He/She must have served as a Bridge/Structural Engineer on at least five (5) bridge projects of similar nature and magnitude involving design of road bridges within the last 10 years in Sub Saharan Africa. Fluency in written and spoken English is mandatory.

**Surveyor:** The Surveyor shall be responsible for conducting and supervising the survey team. He/she will be responsible for planning of the fieldwork on cross-sectional levelling, horizontal and vertical alignment survey work, select known survey reference points, and determine the precise location of important features in the survey area. He/she shall be responsible for searching legal records, look for evidence of previous references survey points (geodetic reference points and national benchmarks) and analyze the data to determine the location of boundary lines and record the results of the survey, verify the accuracy of data, and prepare plans, maps, and reports. The Surveyor has to mark all properties to be affected by road alignment. The Surveyor shall be registered with Uganda Institute of Surveyors and must a holder of at least a Bachelor’s degree in Surveying or equivalent. Postgraduate qualifications in surveying are an added advantage. He/She must have at least ten (10) years of cumulative experience related to Land and engineering surveying activities. He/She must have been a Topographical Surveyor on at least two (5) projects of similar nature and magnitude within the last 10 years in Sub Saharan Africa. Fluency in written and spoken English is mandatory.

**Hydrologist/Drainage Specialist:** The Hydrologist shall be responsible for estimating and assessing the relationship between rainfall, run off and soils and rock features of the catchments along the project area with focus on surface water, including rivers, and dams. He/she shall study and update the available hydrological data by computer models or any other means in order to maintain and develop successful flood water management strategies. He/she shall provide advice and information to Bridge/ Structural Engineer on hydraulic characteristics of the catchments along the project area, and recommend to the other design
team members on the appropriate culverts, or other drainage structures necessary to handle the runoff volumes on the selected alignment. The Hydrologist shall be a holder of a degree in Applied Science or a degree in Civil Engineering or an equivalent qualification. Postgraduate qualification in Hydrology/Hydraulics Engineering is an added advantage. She/he must be registered with at least six (10) years working experience related to water/flood management schemes. The ability to use appropriate flood design models is essential. She/he should have served as a Hydrologist on at least two (5) roads projects of similar magnitude and complexity within the last 10 years within Sub Saharan Africa. Fluency in written and spoken English is mandatory.

**Transport Economist:** The Transport Economist shall conduct the economic analysis for the entire project using known cost-benefit analysis models for road projects like HDM-4 or similar. He/she shall have a minimum of a degree in economics or its equivalent. A postgraduate qualification in transport economics is an added advantage. He/She must have at least 10 years of working experience in carrying out socio-economic analysis of public investment projects. He/She must have proven knowledge and experience in use of HDM-4 model. Fluency in both written and spoken English is essential.

**Road Safety Specialist:** The Road Safety Specialist shall be responsible for the road safety inspection of the existing roads, and for the road safety audit of the final detailed design. He/she will ensure that infrastructural road safety measures are appropriately incorporated into the design for a safe road operation including provision of appropriate signs and road marking, provision of guardrails, improvement of curves, installation of traffic calming measures, proper design and layout of junctions etc. He/She shall have a minimum of a degree in civil engineering, road safety or its equivalent. A relevant postgraduate qualification in the road safety area is an added advantage. He/She must have at least 10 years of working experience in carrying out road safety inspections or road safety audits of road projects within Sub Saharan Africa. Fluency in both written and spoken English is essential.

**CADD Specialist:** The candidate should preferably be a highway engineer or systems specialist with minimum 10 years’ experience of which at least 5 years must have been gained in carrying out assignments of similar nature. The person must have the capability to handle the proposed software’s independently and have the experience of carrying out all computer-aided design and drawing works for highway projects. The incumbent should be able to train a group of engineers and operators in successful use of the CADD system.

**DELIVERABLES**

18. The consultant shall submit the reports in English language. The following reports shall be required
a. An Inception Report that provides situational analysis, the work plan and details the methodology that the consultant intends to in achieving the objectives of the assignment (15 copies hard copies +7 CDS). Delivery: Two weeks after the start date.

b. A Site Investigations Report covering activities undertaken under Task B (15 hard copies + 7 CDS inclusive of all relevant raw data). Delivery: One and half month after the start date.

c. A Traffic, O-D and Axle Load Survey Report covering activities undertaken under Task C (15 copies hard copies and 7 CDs) together with raw data. Delivery: Two months after the start date.

d. A Hydrological Survey Report covering activities undertaken under Task D 15 hard copies + 5 CDS inclusive of all relevant raw data. Delivery: Two months after the start date.

e. Feasibility Study Report 15 hard copies + 5 CDS inclusive of all relevant raw data. Delivery: Three and half months after the start date.

f. Draft Detailed Engineering Design Report (15 hard copies + 5 CDS) inclusive of all relevant raw data. Delivery: five months after the start date.

g. A Final Detailed Engineering Design Report (15 hard copies + 5 CDS inclusive of raw all relevant raw data). Delivery: Six months after the start date.

h. Draft Tender Documents for both Construction and Supervision (15 copies+ 5CDs). Delivery: seven months after the start date.

i. Final Tender Documents for both Construction and Supervision (15 copies+ 5CDs). Delivery: 8 months after the start date.

The Employer shall review all the above reports and provide comments in a timely manner.

THE MANAGEMENT OF THE ASSIGNMENT

19. This assignment will be managed by the Ministry of Works and Transport in Uganda. The MoWT will designate a project supervisor, who will be the primary ‘day to day’ contact for the Consultants in Uganda. The consultant will be expected to work closely with the Uganda National Roads Authority (UNRA) and the Kampala City Council Authority (KCCA) in undertaking the assignment as these two authorities have jurisdiction over different road projects and other developments in the project area that will have a direct influence on the design. A contact point in each of those bodies will be provided to the selected consultant.

20. The implementation of this assessment will be supported by the World Bank. The Task Team Leader for this assignment will be Martin Humphreys, Lead Transport Economist, Transport and ICT Global Practice, Washington DC (1-202-458-2951) (rhumphreys@worldbank.org).