



**DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS**  
**Regional Office No. XII**

**TERMS OF REFERENCE**

**Consulting Services for the Feasibility Study of the Proposed  
Tulunan-Cumbio-Koronadal City Bypass Road and Cumbio-Lutayan-Koronadal Road;  
Provinces of North Cotabato, Sultan Kudarat and South Cotabato**

**1 INTRODUCTION**

The proposed Tulunan-Cumbio-Koronadal City Bypass Road and Cumbio-Lutayan-Koronadal Road; Provinces of North Cotabato, Sultan Kudarat and South Cotabato has an approximate length of 71.757 kms. It traverses the municipalities of Tulunan, Cumbio and Lutayan in North Cotabato and Koronadal City in South Cotabato. The said road starts from Makilala-Allah Valley Road and ends at Marbel-Makar Road.

The DPWH shall select, by way of a Quality Based Evaluation/System, (QBE/QBS) and open local competitive bidding (LCB), a Consultant with experience, knowledge, and expertise in similar projects to deliver the required services pursuant to the provisions of Republic Act 9184 otherwise known as the "Government Procurement Reform Act" and its revised Implementing Rules and Regulations (IRR) and the latest Government Procurement Policy Board (GPPB) Issuances for Consulting Services.

**2 OBJECTIVES**

The main objective of the proposal under this TOR is to determine the viability of the proposed Tulunan-Cumbio-Koronadal City Bypass Road and Cumbio-Lutayan-Koronadal Road considering the technical, and economic aspects, among others. Additionally, the Feasibility Study (F/S) shall ensure that value engineering/value analysis (VE/VA) is undertaken with regards to the selection of the best possible alignment/structural configuration. This is to ensure that the best scheme for providing the project's intended outputs will be selected that would yield the highest value-for-money (VfM).

By the end of the consulting period, the Consultant is expected to produce a comprehensive F/S based on updated information with a definite and realistic implementation plan of the recommended scheme based on the alternatives/configurations considered, among others, including the preliminary engineering concept/design and economic evaluation. Specifically, it aims to achieve the following undertakings:

- 2.1 Determine the Annual Average Daily Traffic (AADT) in major and adjoining road sections including that of the converging traffic at the intersections relevant to the project influence area, and assess the existing and future conditions of the relevant road network based on capacity and safety measurements such as Level of Service and other network performance parameters or factors;
- 2.2 Establish trip patterns based on zones<sup>1</sup> and/or existing and future land use in the study area and identify volume distribution in major and adjoining road sections during peak and non-peak hours;

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<sup>1</sup> A zone is an area, especially one that has different characteristics from the ones around it or is used for different purposes. (Cambridge Dictionary)

- 2.3 Establish Traffic Growth Rates (TGR) based on ecological factors such as population distribution, average income per family and product consumption per capita;
- 2.4 Determine the soil profile at the project site as basis for the design;
- 2.5 Identify possible geological and geotechnical hazards and recommend structural and non-structural measures to reduce the effects of these hazards;
- 2.6 Produce a complete plan and profile of the project site incorporating the design that compliments the existing terrain;
- 2.7 Estimate the quantities and cost of each component of the project.

### 3 SCOPE OF CONSULTING SERVICES

The scope of works of the Consultant under this TOR shall include, but not necessarily be limited to, technical and economic considerations to establish the overall viability of the investment in coordination/consultation with beneficiaries and other stakeholders as necessary. The consulting services will include the following major activities:

#### 3.1 Alignment Survey

- 3.1.1 Identify at least three (3) possible alignments and/or structural configuration considering among others, technical difficulties, connectivity to the existing national road network, investment requirement; and
- 3.1.2 Present to the Implementing Office together with the reviewing offices (Planning Service) the best alignment or structural configuration based on the appropriate and agreed selection method (multi-criteria analysis) for approval, using geographic information system (GIS) maps (referenced to WGS 84).

#### 3.2 Traffic Survey<sup>2</sup>

- 3.2.1 Conduct 12-hour manual classified volume count on the midblock sections and 12-hour for intersections for two (2) consecutive days during the midweek (survey form template is provided in Annex B1);
- 3.2.2 Collect and review previous traffic data on road sections within the study area from the Department of Public Works and Highways Traffic Database and/or other credible sources and develop traffic daily factors and seasonal factors. The consultant shall officially request for the appropriate RTIA database to utilize the obtained adjustment factors together with the results of the required surveys in item 3.3.1 to determine the Annual Average Daily Traffic on major and adjoining road sections relevant to the project;
- 3.2.3 Characterize the future supply of transport facilities in the study area in order to establish the links among the available modes such as mass transit systems, sea transport, etc.;
- 3.2.4 Identify major traffic generating sources and subdivide the study area into 'zones' based on the existing land use and future land use and other data in the documents prescribed in *Section 3.1. Socio-Economic Data Gathering*. The zoning shall conform but not necessarily limited to the existing codes of Department of Interior and Local Government;

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<sup>2</sup> In proper coordination with the Implementing Office. See Annex A for the Traffic Survey Methodologies.

- 3.2.5 Conduct Origin – Destination (OD) Survey on selected stations as identified in Annex C and establish trip patterns based on vehicle type, trip purpose, vehicle occupancy, etc. (survey form template is provided in Annex B2). The Consultant must provide details of the results of the OD Survey in the report together with a concise description of vehicular movement based on the established zones as in item 3.3.4 which includes but not limited to: (i) relationship between the generation and attraction of traffic by the established zones; (ii) the competitive and complimentary characteristics in relation to the existing and proposed modes of transport such as rail and air transport routes; and (iii) traffic assignment of volume in the network considering the current and future layout of the network;
- 3.2.6 Conduct travel time and delay survey during peak and off-peak hours along significant segments in the study area as identified in Annex D and determine the average travel time required using the existing routes or current road network configuration. The summary of information shall adopt but not necessarily be limited to the minimum information set by Project Preparation Division of Planning Service, Department of Public Works and Highways (survey form template is provided in Annex B4);
- 3.2.7 Use any appropriate traffic forecasting/ network analysis models such as the JICA – STRADA, VISSIM, VISUM or its equivalent in the traffic demand forecasting and network analysis which can be exported to the existing software of the Department. The Consultant shall prepare the necessary data inputs and comprehensively provide all the information required to run the model and clearly illustrate the output needed to evaluate the project. The Consultant shall provide a detailed report showing all the inputs and assumptions used in the model; and
- 3.2.8 Based on the selected model, compare implementation alternatives and illustrate the resulting volume accumulation, queuing, delay and other technical indicators that can be harnessed from said model such as vehicle-kilometers, vehicle-hours, congestion level, and transport cost which will serve as basis for the subsequent economic comparison and evaluation.

### **3.3 Topographical Survey**

- 3.3.1 Undertake preliminary topographical survey along the selected alignment. The Consultant shall set out and establish reference points at appropriate locations as key control points of the survey. These points shall be used as benchmarks for identification and use during the subsequent engineering surveys. The levelling shall be tied to the existing government benchmarks in the area. ("Geo-tagging");
- 3.3.2 Conduct profiling with cross-sections taken at fifty (50) meters interval, unless local conditions require cross-section at closer intervals so as to provide the necessary details for earthwork, quantity calculations with an accuracy of twenty percent (20%) of the final quantities. Profiles and cross-sections shall be determined plus one hundred (100) meters beyond construction limits;
- 3.3.3 Prepare topographic maps with contours at 50-meter interval and coordinates and vicinity plan. All survey plans shall be prepared on reproducible materials of high quality;
- 3.3.4 River/creek profile and river/creek cross sections shall be surveyed for 500 meters each upstream and downstream sides from the centerline of the bridge. Cross-sections shall be measured at 50-meter interval;
- 3.3.5 Conduct preliminary inventory for potential road slope disasters in the road section under study. The road slope disasters in the road shall be determined and classified according to the categories identified in the JICA Manual on the Study on Risk

Management for Sediment-Related Disaster: soil slope collapse, rock slope collapse, landslide, road slip, debris flow, river erosion and coastal erosion; and

- 3.3.6 Use any advanced technology/methodology related to the activity (i.e. LiDar) if necessary, provided that implementation of the survey and data processing will be faster, safer and more efficient. The Consultant shall prepare the necessary data inputs and comprehensively provide all the information required in processing the data to clearly illustrate the output needed to evaluate the project.

### **3.4 Cost Estimate**

- 3.4.1 Prepare the cost estimate using the unit price analysis method for various improvement alternatives, broken down into, among others, materials, equipment, and labor (skilled and unskilled) (see Annex G). The estimates shall include the initial cost of construction, detailed engineering, supervision, acquisition of right-of-way and resettlement compensation, Environmental Management Plan (EMP)/ Impact Management Plan (IMP) cost and environmental monitoring cost, price escalation and contingencies;
- 3.4.2 Classify, if necessary, the cost items into local and foreign currency components and the corresponding taxes. The foreign currency component (distributed into direct and indirect) shall include, inter alia, items such as depreciation or rental rates on equipment, materials and supplies for which the Philippines is a net importer, wages of foreign personnel and overhead and profit of foreign firms to be employed while the local currency component shall include the acquisition of right-of-way, cost of local materials and supplies, local wages, etc.;
- 3.4.3 Calculate the quantities of each work item of the different types of work to be carried out; and
- 3.4.4 Estimate the maintenance cost in the same manner as the construction cost.

### **3.5 Economic Evaluation**

- 3.5.1 Assess and calculate economic benefits accruing to the road network improvement with the implementation of the project to include inter alia, the following: (i) reduction in road user transport cost and travel time broken down into normal, diverted and generated traffic components; (ii) improvement in efficiency of the network (decongestion), capacities and other related measurements; (iii) savings on improvements in road maintenance and repair cost, if any, and in consideration of the frequency of intervention and (iv) other quantifiable benefits that can be accrued to the project as identified during the socio-economic data gathering;
- 3.5.2 Assess the quality and quantify to the extent possible the social and other indirect benefits accruing to the government and society such as traffic safety, accident reduction, carbon monoxide reduction, improved land use, decongestion of central business districts, etc.;
- 3.5.3 Perform economic analysis on a “without project” and “with project” scenario basis considering disruption costs during implementation, if applicable, and determine the viability of the project using indicators such as Economic Internal Rate of Return (EIRR), Net Present Worth (NPW), and Benefit – Cost Ratio (BCR). The Consultant shall undertake shadow pricing assessment for foreign and labor cost components based on the requirements set by the National Economic and Development Authority (NEDA);
- 3.5.4 Undertake sensitivity assessments of key parameters such as investment cost, traffic growth factors, traffic volume, and diverted traffic of sufficient range and detail to permit rational examination of possible implementation alternatives; and

- 3.5.5 Discuss the non-quantifiable social benefits in light of their importance to the national economy and socio-economic objectives of the government with particular emphasis to the areas directly influenced by the project. The discussion shall include but not necessarily limited to: (i) identification of benefits; and (ii) pattern of distribution of benefits.

#### 4 REPORTING AND DELIVERABLES

- 4.1 Final results will be presented to the Implementing Office and the reviewing offices.
- 4.2 During the contract period, coordination meetings with the District Engineering Office and Regional Offices concerned must be conducted to: (a) initiate agreements, (b) discuss the progress of the work and preliminary output; (c) make comments and suggestions on a timely basis; and (d) resolve problems and issues that may be encountered. All meeting highlights and discussions shall be recorded and presented as Annex in the succeeding report to be submitted.
- 4.3 Further, aside from the specified scope of works mentioned above, the Consultant may propose additional works to enhance the study. The scope of any additional proposed works by the Consultant shall be established within the first months of the study, subject to the approval of the DPWH.
- 4.4 The Consultant shall report the progress of all activities in the course of the contract implementation. The Consultant shall submit the following but not limited to:
- 4.4.1 **Inception Report.** which shall contain the detailed work program for the undertaking, methodologies, dates of report submissions and schedule of activities proposed to meet the requirements set in this Terms of Reference. The MCA (Multi-Criteria Analysis) and its evaluation will be done by the consultant and should be based on available data and shall be included in this report. A total of five (5) copies of the report shall be submitted to the implementing office in six (6) weeks after the commencement of the consulting service. The Inception Report shall also be presented to the implementing and reviewing offices prior to finalization.
- 4.4.2 **Monthly Accomplishment Report.** This report shall commence immediately after commencement of contract. It will be submitted every 25th of the month and shall be signed by the Consultant's project-in-charge and authorized representative. The report shall be emailed to the project-in-charge of DPWH. For initial report, all target dates of completion per activity as well as its percent of contract cost shall be established. This report shall include status report, physical and financial as well as developments, issues, findings as of the report period. A total of three (3) copies of the report and electronic file (editable and in PDF) shall be submitted to the implementing office.
- 4.4.3 **DRAFT FINAL REPORT** which shall contain the details of the consultant's findings and recommendation based on the scope of work outlined in this Terms of Reference. The report shall summarize the undertaking fully describing the methods used, findings and the investment priorities. The report shall include all relevant information which support the conclusions in sufficient detail to enable calculations to be verified and allow re-calculation with modification of the key assumption without the need of supplementary data. A total of five (5) copies of the report shall be submitted to the implementing office at least two (2) weeks prior to contract expiration. The reports shall be submitted in soft-bound copy with title of the report written at the spine together with traceable e-copies of all analyses and simulations made. The implementing Office shall issue to the Consultant a Suspension Order as a time consideration for the Implementing Office and related reviewing Offices to have ample time to transmit, circulate, review and consolidate all comments to the

said reports. Once the reports are sent back to the Implementing Office, the Implementing Office shall issue a Resumption Order upon return of the report for correction and revision.

- 4.4.4 **FINAL REPORT** which shall incorporate all appropriate revisions and clarifications on the Draft Final Report. A total of six (6) copies of the report shall be submitted to the implementing office in printed and e-copy format together with all the requirements set forth in this TOR on or before the contract expiration. The Final Reports shall be submitted in soft-bound copy with title of the report written at the spine.
  - 4.5 The major deliverables of the Study will be:
    - 4.5.1 Inception Report
    - 4.5.2 Overall Summary of Accomplishment Report
    - 4.5.3 Electronic Copy of the Complete Feasibility Study Report consolidated in one PDF file
    - 4.5.4 Electronic Copy of the Detailed Unit Price Analysis in traceable formula format
    - 4.5.5 Electronic Copy of Economic Model, in traceable formula format (excel file)
    - 4.5.6 Electronic Copy of the project alignment in shapefile, KMZ, or KML format
    - 4.5.7 Electronic Copy of the Traffic and/or Developmental Processing in traceable format
    - 4.5.8 Electronic Copy of the zones used in OD Data Processing in traceable format
    - 4.5.9 Electronic Copy of all software input and output file, if applicable
    - 4.5.10 Electronic Copy of the Drawing Volume in PDF file format
    - 4.5.11 Electronic Copy of the Drawings in CADD file format
    - 4.5.12 Plan and Profile with the Final Alignment incorporated in the Topographic/Hydrographic Plans
    - 4.5.13 Preliminary Highway Engineering Design and Studies/Assessment Report (typical Roadway Section, Summary of Quantities<sup>3</sup>, Table of Reference of Horizontal and Vertical Control)
    - 4.5.14 Other data/documents to be submitted shall include but not limited to:
      - 4.5.14.1 Geo-tagged Photographs
      - 4.5.14.2 Raw and Processed Data of Traffic Survey (Manual Count, Origin-Destination, and Travel Time Survey)
      - 4.5.14.3 Map of the alignment (including shape file format), plot in/convert to WGS 84
  - 4.6 All outputs shall be presented in a Feasibility Study report in English language. The Cover Page shall contain at least the following: Project Title, Name of Document, Version or Revision Number, Date Published (Month and Year) and the Name of Consultant/Author. The following shall be put either in the header or footer of all documents submitted: Page Number, Project Title, Name of Document, Version or Revision Number, Date Published (Month and Year) and the Name of Consultant/Author
  - 4.7 Electronic file formats (i.e. Microsoft Office, Adobe PDF, AutoCAD, transport model input and output files, etc.) of all reports and documents systematically organized in traceable and auditable formats shall be prepared in DVD and/or CD, 3 copies each.
  - 4.8 All Draft Final Outputs shall be submitted at least two weeks prior to the contract expiration and be subjected to review and evaluation of the Implementing Office and reviewing offices.
  - 4.9 In compliance with the ISO 9001:2015 requirement which necessitates traceability and proof of correction, a matrix of correction and comments with corresponding actions taken shall be reflected in each re-submitted report/deliverable of the project as part of its Annexes. An approval page shall also be included in the printed Final Report. (see Annex H).
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## 5 PROCUREMENT OF CONSULTING SERVICES

- 5.1 The Implementing Office shall select, by way of a Quality-Cost Based Evaluation (QCBE), a Consultant (sole proprietorship, partnership or joint venture) with experience, knowledge, and expertise in conducting feasibility studies for road, bridge, road slope protection, and sediment and water related projects both in urban and rural areas to deliver the required services pursuant to the provisions of Republic Act 9184, otherwise known as the "Government Procurement Reform Act" and its revised Implementing Rules and Regulations (IRR) and the Procurement for Consulting Services, GPPB.
- 5.2 The Approved Budget for the Contract (ABC) is based on an estimated number of person-months for specific staff positions, and time-based and dimension-based reimbursable items.
- 5.3 The ABC shall be the upper limit or ceiling for acceptable bid prices. If any of the bid prices is higher than the ABC, the bidder submitting the same shall be automatically disqualified. There shall be no lower limit or floor on the amount of the award.
- 5.1 A contract will be awarded to the Bidder whose offer is the most advantageous to the Government. The selection factors and sub-factors for this project are listed below in descending order of importance:
  - 5.1.1 Professional qualifications (key personnel) necessary for satisfactory performance of required services;
  - 5.1.2 Specialized experience and technical competence for work required;
  - 5.1.3 Capacity to mobilize required and qualified personnel and accomplish the work in the required time; and
  - 5.1.4 Past performance on contracts with Government agencies and private industry in terms of cost control, quality of work, and compliance with performance standards.

### **Professional Qualifications (Key Personnel)**

- 5.2 Bidders should identify personnel who will be responsible for implementing and managing contract activities and provide information on personnel proposed for the subject contract.
- 5.3 Bidders should demonstrate their total strength of key disciplines and availability of such resources (i.e., current workload, etc.)
- 5.4 Firms may subcontract and/or associate to enhance their qualifications.
- 5.5 Following are the key positions/areas of expertise anticipated to be required under the contract:

KEY STAFF	Min. No. of Years of Experience in Proposed Position	Required Qualification
1. Project Manager	10	Bachelor's Degree in any of the following fields Finance, Economics, Engineering (Licensed), Urban and Regional Planning preferably with Master's Degree in Transport Planning/Traffic Engineering/Urban and Regional Planning. He/she must have a minimum of 10 years of experience in feasibility studies with 5 years in transport planning and relevant fields. He/she must have experience with managing at least two feasibility studies in road and bridge projects.

2. Senior Highway Engineer	5	Registered/Licensed Civil Engineering, or equivalent, with extensive experience in pavement design, bridge design, alignment planning and related areas as international codes such as TRL/AASHTO.
3. Traffic Engineer/ Modeler	5	Registered/Licensed Civil Engineering, or equivalent, with specialization in transportation planning/engineering. He/she must have extensive experience with traffic planning, traffic growth analysis and modeling, and optimal route planning. He/she must be equipped with traffic/transport modeling software.
4. Cost/ Specifications/ Quantity Engineer/ Construction Planner	5	Registered/Licensed Civil Engineering that has experience in the field of road design development, construction planning, and preparation of detailed analysis of all applicable unit prices (conducted Bill of Quantity analysis for at least two major road projects), technical specifications, cost estimation and quantity take-off. He/she must be adept in the preparation of unit price analysis and familiar with current unit cost of materials, services and other cost items.
5. General Economist	5	Bachelor's Degree or higher in Economics and/or any related field with a minimum of 5 years of experience in the field of infrastructure development and evaluation, conduct of economic analysis for at least two feasibility studies and must be adept in economic modelling and reviewing.  (1) Bachelor's Degree or higher in Economics and/or any related field with wide experience in the evaluation of drainage, flood control and other water-related infrastructure projects

- 5.6 For each key position proposed, responses should include a description of the professional and technical qualifications and licenses necessary for satisfactory performance of required services under this task order; on-going and completed projects, specialized experience and technical competence in the type of work outlined in the Scope of Services.
- 5.7 Replacement of Consultant's Key Personnel is subject to the provision of Department Order No. 21 series of 2015 and RA 9184 and Its IRR.

#### **Firm's Experience and Technical Competence**

- 5.8 Bidders should provide information on firm's competence in the areas as required in the Scope of Services. The information should clearly summarize the nature of the services offered and the types of tasks performed.

#### **Capacity to Mobilize Required Personnel and Accomplish Work in the Required Time**

- 5.9 Bidders should note capacity to mobilize the appropriate skills needed and accomplish the work in the required time, citing previous contracting experiences and availability of proposed staff, among other appropriate evidence.

#### **Past Performance**

- 5.10 Bidder has completed work assignments similar in nature, or directly related to, the technical requirements of the Scope of Services



## **6 CONTRACT IMPLEMENTATION**

### **Study Schedule**

- 6.1 The Study shall be completed within a period of 120 calendar days commencing from the date of receipt of the Notice to Proceed (NTP).

### **Participation the Consultant**

- 6.2 Conduct the study and deliver ON TIME the results/outputs as indicated in this TOR;
- 6.3 Provide the necessary office equipment (i.e., computer, printers, office supplies, etc.) for the conduct of the study. All equipment procured for the development of the project shall be transferred to the Government by the end of the project;
- 6.4 Carry out the services in accordance with the accepted theories and practices to ensure that the final works will provide the most economical and feasible development for the study;
- 6.5 Accept full responsibility for the consulting services to be performed under this TOR for which the Consultant is liable to DPWH;
- 6.6 Perform the work in an efficient and diligent manner and shall adhere to the agreed schedule and deliverables; and
- 6.7 shall also facilitate regular meetings to ensure that the deadlines and outputs of the project are completed on schedule.

## **7 OWNERSHIP OF THE OUTPUTS/REPORTS/DOCUMENTS**

All submitted outputs/reports/documents under this contract, including but not limited to digital information, computer model and data, specifications, investigations and studies completed or partially completed, inspection logs, and photographs, shall be the property of DPWH and the use of these data for other purposes shall require written consent from the Department. Copyrights will be governed by existing laws, rules and regulations.

In case of a difference of professional opinion between DPWH and the Consultant on any matter involving technical or engineering judgment, which might affect proper evaluation of the Project or performance under the consultancy contract, the DPWH shall allow the Consultant to submit a written report. However, in urgent cases, the Consultant shall request DPWH for an immediate discussion.

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