BACKGROUND

Nigeria’s federal road network extends over 36,000 kilometers under the authority of the Federal Ministry of Works (FMW). In addition, there are more than 30,500 kilometers of state roads, and 130,000 kilometers of local government roads. Maintenance of the federal roads is the responsibility of the Federal Roads Maintenance Agency (FERMA), which reports to the FMW. Law enforcement on federal roads is the joint responsibility of the Federal Road Safety Corps (FRSC) and the Nigeria Police.

Over the past years, efforts have been initiated to modernize the management of federal roads. These included setting up a dedicated unit in the FMW – Road Sector Development Team (RSDT) – to implement a road sector development and maintenance program (RSDMP) supported by the World Bank and the African Development Bank. The platform for this implementation is the Federal Road Development Project (FRDP). Road Safety is one of the key components of the FRDP’s framework agreement and there is a partnering arrangement between the FMW and FRSC aimed at developing the capacity of the FRSC to enhance her operational capabilities. To that effect, the FRSC is proposing the development of a National Road Traffic Crash Data Management System (NRTCDMS) for federal roads, to be functional by 2015.

The proposed system is envisioned to assist the Federal Roads Safety Corps (FRSC) and all other stakeholders in establishing the actual record of road crashes, and in implementing data-driven countermeasures with a focus on results to reverse the trend of increasing crash rates in the country. The system should reflect the state of international practice, in a way that suits local needs and conditions. The NRTCDMS should improve the technical capacities, skills and management capabilities of the FRSC and other agencies associated with road safety thus improving their ability to manage efficiently and cost-effectively road safety improvement activities.

OBJECTIVE

The objective of the present Consulting Services is to help the Federal Road Safety Corps put in place and effectively use a suitable Road Traffic Crash Data Management System so as to improve on the quality of Road Traffic Crash Data reporting in Nigeria. The main objective of this assignment is the customization and implementation of a web-based application with a Proven Crash Analysis Software Product, in addition to the associated capacity building and training based around the new solution.

In more specific terms, the objective is to have in place a functional web-based, GIS-enabled computerized system for improving Road Traffic Crash Data collection, analysis and dissemination based on a proven and flexible Road Traffic Crash data management solution. The FRSC is open to creative ideas around how to meet this objective. This is bearing in mind that FRSC’s requirements are unique and thus a regular “Commercial-off-the-shelf” (COTS) solution might not be best fit for its needs. On the other hand, the custom development of a fresh solution may be challenged due to the possible risk of resource overruns and failure. Hence the Consultant’s approach should be to adapt and customize a proven solution to meet our requirements, which also brings in international best practice and reduced risk to Nigeria. The Consultant’s proposal must identify the basic software they propose to use, and report on experience of its adaptation to meet users’ needs.
It is intended to achieve this aim in two phases: Phase I – design a system to reflect the existing situation, options for improvement, design of an improved system and Phase II – supply and installation of a system and its testing and validation.

Phase I – design a system to reflect the existing situation, options for improvement, design of an improved system – is the main subject of this assignment.

The proposed NRTCDMS is expected to support the FRSC in achieving the following objectives:

- Preventing or minimizing Road Traffic Crashes on the highway using data-driven countermeasures with an increased focus on results;
- Increasing cooperation and accountability for results amongst different road safety stakeholders in Nigeria;
- Conducting research into causes of motor Road Traffic Crashes and methods of preventing them and putting into use the result of such research;
- Determining and enforcing speed limits for all categories of roads and vehicles and controlling the use of speed limiting devices;
- Cooperating with bodies or agencies or groups in road safety activities or in prevention of Road Traffic Crashes on the highways:
  - Regulating the use of mobile phones by motorists; and
  - Regulating the use of seat belts and other safety devices.

The key road safety stakeholders who will benefit from this project include: Federal Road Safety Corps (FRSC); The Nigeria Police; Federal Ministry of Works; Federal Ministry of Health; National Bureau of Statistics; Road Sector Development Team (RSDT); and the National Planning Commission.

**Specific Tasks of the Assignment**

Although the principal content of the Consulting Services will cover mainly the Phase I activities described below, new tasks may appear in response to political, social and technical circumstances and requirements. The Consultant will need to be adaptable to changes in conditions and the assignment, possess intellectual flexibility and remain capable to operate also in unpredictable circumstances. The key activities under the assignment will be undertaken under the following tasks:

**Phase I – Review of Existing Situation and Design of System**

Specific objectives of the first task of the project are to:

- Review the process of data collection and operation of the road crash database in Nigeria and draw lessons that can guide the implementation of a new system;
- Report on good practice overseas and identify the key elements needed to improve the system currently in use in Nigeria;
- Review the crash record form used by law enforcement and develop a new reporting form that meets the essential data needs for crash analysis and countermeasure design. The proposed revisions to the law enforcement crash reporting form should be discussed and agreed with FRSC, the Nigeria Police and other potential users of the output data;
- Explore opportunities for linking hospital data on crash injuries with law enforcement crash records;
- Recommend options for the crash location coding system, including: the suitability of the available/proposed digital road maps; the need for adding any necessary roadside detail to the maps and how this might be done, and; the practicality of law enforcement officers using portable GPS devices and/or hand-held data recording devices to capture data and locate crash sites;
- Recommend options for the timely transfer of crash records to FRSC headquarters;
- Produce a comprehensive and detailed plan for the implementation of a sustainable crash data system. This is to include as a minimum:
  - Identification of the institutional structure and personnel for operating the system;
o Identification of potential users and how they will access the data;
o Identification of base network data, such as digital maps, and what will need to be
procured/updated for implementation;
o Identification of a migration plan for existing data including how it will be achieved given the
referencing limitations;
o Functional design for the system to ensure that it meets the needs of Nigeria;
o Identification of likely hardware and networking, including internet, requirements; and
o Training program to be associated with its implementation. This work needs to identify any
potential obstacles to its successful implementation and use and how they will be resolved;
- Present proposals and provide technical advice at meetings with the FRSC, Police and other
stakeholders.

The principal outputs of Phase I will be:
- An institutional framework to meet the objectives described above which describes the
responsible of the respective government agencies/organizations and the procedures to be used by
each to meet these responsibilities. This will be prepared in draft for discussion and comment from
the FRSC and other potential users of the outputs from the data system. In particular road engineers
responsible for highway design standards, road safety audits, blackspot programs, including health
and education specialists responsible for road safety campaigns. On receipt of comments the
framework will be finalized and submitted for approval; and,
- A functional design for the software, definition of hardware needs and proposed associated training in
system use. The design will be prepared in draft for discussion and comment from the RSDT/FRSC
and other potential users of the outputs from the data system, in particular road engineers responsible
for highway design standards, road safety audits and blackspot programs. On receipt of comments the
design will be finalized and submitted for approval.

The second phase of the project (Supply, installation – including training, validation, and maintenance of the
system) will be subject to agreement of an implementation plan with RSDT/FRSC and other relevant
stakeholders. Its timing will depend on the availability of other key elements – for example digitized road
maps to an acceptable level of detail.

The second phase of the project will only proceed after finalization and formal approval by RSDT/FRSC of
the framework and functional design described above.

Outline of Functional Design

The following items are likely to be included in the functional design prepared during Phase I; however they
are given here for guidance only. The final design will be prepared during the first phase of the project and
will be subject to approval by RSDT/FRSC.

- The Consultant shall install the Road Crash Database in the FRSC HQ in Abuja;
- The Consultant shall ensure that the Database can be securely accessed from remote FRSC stations,
the FMW and other authorized users;
- The Consultant shall configure the Database to ensure that it can store, analyse and report on road
crashes and injuries, for statistical analyses, blackspot identification and other needs identified during
Task 1 of the project;
- The Consultant shall configure the Database to ensure that it can generate appropriate statistical
reporting for national reporting purposes and to meet the needs of identified users outside the FRSC;
- The Consultant shall configure the database such that it shall enable export of data to a format
suitable for publication to the International Road Traffic and Accident Database (IRTAD);
- The Consultant shall configure the Database to ensure that appropriate permissions are established for
update and viewing of traffic accident data by the relevant FRSC units; and for agreed subsets of the
data by other authorized users as defined in Phase 1 of the project;
The system must be able to reference crashes and injuries to the road network using the existing road network referencing system;
- The system must have a GIS interface, allowing it also to reference traffic accidents to the National Road Network through GIS layers provided by the FMW;
- The system must enable viewing of inventory data from the Road Management System / GIS of the FMW, including for example, pavement type, sidewalks, road signs, street lighting, guardrails and other road safety related features;
- The system must be able to view and use other GIS layers from other sources;
- The system must be able to use Inventory Data and Traffic Data from the FMW;
- The system must be able to allow analysis and reporting to try to determine the common characteristics of crashes in order to elaborate effective countermeasures;
- The system must be able to identify the locations, using available traffic volume data, where the number of crashes is significantly higher than average (blackspots);
- Where blackspots are identified the system must be able to analyse the data for the crashes which take place at these locations in a manner suitable for problem identification and development of remedial measures;
- The system should have facilities for future integration with national vehicle registration and/or licensing systems, however these will not be implemented at this stage of the project;
- The system’s architecture should be scalable to allow expansion of the system to local roads agencies and other organizations in the future; and
- The system should be web-enabled, allowing local police stations, hospitals etc. to enter, update and view traffic accident data as appropriate for their function.

**Complementary Activities**

The Client envisages that as the proposed Consulting Services progress, the relevant authorities will make the necessary decisions on the National Road Traffic Crash Data Management System development, including the acquisition and roll out of the software, the acquisition and installation of the IT infrastructure, the establishment of the relevant teams and/or units, the initiation of the data collection, and the actual use of the National Road Traffic Crash Data Management System to inform decision making or to monitor performance. The Consultant is not responsible for these complementary activities, but she/he is expected to provide advice to ensure their success. Funding for these complementary activities is envisaged from the budget of the relevant authorities and the IDA Credit.

**Reporting and Duration**

The Consultant will work closely with RSDT, FMW, and FRSC’s senior officials. The Consultant will report on a daily basis, upon request, to the RSDT unit manager or his designate(s). The assignment is expected to span over a period of 6 months, of which 4 months are expected to be consultant inputs, mostly provided from Abuja.

**Deliverables**

The following is the time schedule for the project:
- Inception Report – One month after his/her appointment the Consultant shall provide a concise Inception Report summarizing his/her approach to the task and a tentative work plan, which will be approved by the RSDT/FRSC.
- Interim Report – 3 months after appointment
- Draft Final Report – 5 months after appointment
- Final Report – 6 months after appointment

Final Report of the Phase I shall contain a 6-month Plan and Time Schedule of Phase 2 (for supply and installation of a system) approved by the RSDT/FRSC.
Qualification Requirements

The Consulting Services are to be provided by a senior individual consultant (that can be hired directly or through a firm), and it is estimated that they would require approximately 4 months of consultant’s input over a period of 6 months from the commencement date. The commencement date is envisaged to be early July/August 2014.

The Consultant shall have a higher degree in civil (traffic/road safety) engineering or computer sciences or database systems, or other relevant fields with a minimum of 15 years of professional experience in the roads sector, of which a minimum of 10 years of work experience with design, implementation, or use of National Road Traffic Crash Data Management Systems. He/she should have experience of working with traffic police and highway engineers to ensure good understanding of their data needs and the analysis of crash reports. Successful experience with deploying a National Road Traffic Crash Data Management System in an emerging or developing country would be an advantage. She/he shall have good command of English language, speaking and writing, and possess good communication and interpersonal skills.

Resources

The Consultant is responsible for arranging her/his housing in Abuja. The Consultant will be provided with transport, office, office equipment, and telecommunication facilities at the RSDT/FRSC offices. Logistics for meetings, workshops, and seminars will be the responsibility of RSDT/FRSC.

Documentation

The manuals and key documents shall be prepared using a consistent format and layout and shall be done using an ‘Information Mapping’ approach, with an emphasis on graphics and illustrations (http://en.wikipedia.org/wiki/Information_mapping). The final user manual and supporting documentation will be required in English language.

All reports should be in both electronic format and hard copy.

Copies of the reports, manuals and key documents to the Federal Ministry of Works/Road Sector Development Team (FMW/RSDT) will be submitted to the organization in Abuja at the following address:

The Unit Manager,
Road Sector Development Team (RSDT)
6, Niagara Close,
Off Erie Crescent,
Off Nile Street,
Maitama, Abuja
Nigeria