**TERMS OF REFERENCE**

**IFD/CMF**

**Research and Analysis on broadband infrastructure protection plan to strength the ICT border connectivity in borders in Central-America**

**(RG-T3044)**

1. **Background**

Inefficient border crossing management is one of the most significant factors affecting Central America's logistic performance and competitiveness. The use of inefficient control procedures and inadequate infrastructure increases costs and waiting times and reduces predictability in the movement of people and goods throughout the region. For some years, the Bank has been supporting countries in the region to identify and implement measures to address these challenges. However, to ensure the benefits of the installation of non-intrusive technology, modernization of equipment and border infrastructure, it is necessary to improve the poor state of connectivity faced by border control agencies.

The connectivity problems faced by border control, migration, health, and safety systems would translate into critical issue. For example, in Nov, 2017, Juan Santamaría en Alajuela y Daniel Oduber en Liberia Airport migration system was downed in Costa Rica, and this caused huge chaos. This system down affected all the airlines’ delay and people had to wait at the airport until this issue was solved. The problems at the national level are aggravated by the recurrent weaknesses of regional information systems that deal with intraregional processes. As a result, many people who are crossing the border spend more time, even some are getting fines to filing document wrongly and/or loosing document. This manual process is not only inconvenient and uncomfortable for ordinary people but also, it can be very easy target to the criminal who wants to illegally cross the border. These are one of the known issues among the Central America, and to resolve these, all the countries from Central America is putting a lot of effort modernization of border control system and network

Finally, the implementation of initiatives that countries are promoting to improve border management demand a more solid and reliable information transmission. Recently Nicaragua announced that total 5 locations of border control facilities are planning to be modernized with IDB fund, and more countries are willing to modernize their system and infrastructure. These kinds of projects will be conducted a lot near future. These modernization projects imply an increase in the volume and frequency of documents transmitted electronically, placing greater pressure on national and regional information systems.

One of the main historical factors causing the inadequate ICT connectivity in Central America is the lack of availability of adequate backbone infrastructure and regional interconnection points. To address this issue, six Central American countries (Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and Panama) created the consortium called REDCA (*Red Centroamericana de Telecomunicaciones*) as a broadband regional operator in 2013, with the aim of using the infrastructure of the electrical regional network; SIEPAC (*Sistema de InterconexiónEléctrica de los Países de América Central*). Since that moment, REDCA has started provided wholesale telecommunication services in the region.

1. **Consultancy objective(s)**

The main objective of this consultancy is to support designing of border broadband infrastructure protection plan; by providing analyzing the capacity and security of the data center in the border agency; by identifying critical technological infrastructure in border area; by analyzing threats and vulnerabilities on identified critical infrastructure systems; and by designing infrastructure protection measures to strengthen each of the critical infrastructure systems.

1. **Activities and Products**

**Main Activities**

The selected candidate will:

1. **Data analysis**: Identify important information stored in data center of the control agencies and analysis the capacity and security of the data center. It will include an analysis of encryption method used when important data is stored and transmitted.
2. **Identify critical technological infrastructure**: Identify critical systems which will store or transmit important data in border area. The systems that require seamless service in particular will be identified into major critical infrastructure.
3. **Technological Security threat analysis**: Analysis of threats and vulnerabilities on identified critical infrastructure systems. It will cover technological issues (e.g. unauthorized access, service failure), and managerial issues (e.g. information security policy, awareness).
4. **Design technological infrastructure protection measures**: Development of infrastructure protection recommendations to strengthen each of the critical infrastructure systems identified previous assessment. These recommendations will include the design of response strategy against external attacks and system failure, cybersecurity resilience system, and capacity building for the safety of critical infrastructure systems.

**Products**

Throughout the contract the consultant will provide key points of broadband infrastructure protection plan in the border area based on the survey and analysis of the status and potential vulnerabilities. The contractual will deliver regular reports that will summarize the observations and / or recommendations regarding the strategy to enhance the safety of border infrastructure.

1. **CHARACTERISTICS OF THIS CONSULTANCY**

**QUALIFICATIONS:** Master’s degree in information security or related fields with 5 years of experience and must have extensive experience and high-level understanding of issues pertaining to ICT, CIP, broadband infrastructure, ranging from policies and regulations to technologies. Since the focus of the activities is on research broadband infrastructure protection plan to enhance border connectivity, the proven experience in the design and implementation of ICT projects and policies will be highly weighed. The contractual must have effective presentation and communication skills to facilitate understanding of government officials of LAC countries in an effort to enhance technology skills and capacities. Considering the important role of government in implementing broadband services and the provision of funding by the government of Korea, the contractual with experience in working with government counterparts would be strongly preferable.

**Type of consultancy:** Individual

**Starting date and duration:** 24 months from the signing of the contract

**Place(s) of work:** IDB Headquarters in Washing, DC

**Payment:** bi-monthly

**Coordination:** The supervision and coordination of this consultancy will be the responsibility

of Antonio García Zaballos (IFD/CMF), Team Leader of this operation ([antoniogar@iadb.org](mailto:antoniogar@iadb.org)).

**Payment and Conditions:** Compensation will be determined in accordance with Bank’s policies and procedures. The Bank, pursuant to applicable policies, may contribute toward travel and moving expenses. In addition, candidates must be citizens of an IDB member country.

**Consanguinity:** Pursuant to applicable Bank policy, candidates with relatives (including the fourth degree of consanguinity and the second degree of affinity, including spouse) working for the Bank as staff members or Complementary Workforce contractual, will not be eligible to provide services for the Bank.

**Diversity:** The Bank is committed to diversity and inclusion and to providing equal opportunities to all candidates. We embrace diversity on the basis of gender, age, education, national origin, ethnic origin, race, disability, sexual orientation, religion, and HIV/AIDs status. We encourage women, Afro-descendants and persons of indigenous origins to apply.

**TERMS OF REFERENCE**

**IFD/CMF**

**Support Strengthening the ICT border connectivity in borders in Central-America**

**(RG-T3044)**

1. **Background**

Inefficient border crossing management is one of the most significant factors affecting Central America's logistic performance and competitiveness. The use of inefficient control procedures and inadequate infrastructure increases costs and waiting times and reduces predictability in the movement of people and goods throughout the region. For some years, the Bank has been supporting countries in the region to identify and implement measures to address these challenges. However, to ensure the benefits of the installation of non-intrusive technology, modernization of equipment and border infrastructure, it is necessary to improve the poor state of connectivity faced by border control agencies.

The connectivity problems faced by border control, migration, health, and safety systems would translate into critical issue. For example, in Nov, 2017, Juan Santamaría en Alajuela y Daniel Oduber en Liberia Airport migration system was downed in Costa Rica, and this caused huge chaos. This system down affected all the airlines’ delay and people had to wait at the airport until this issue was solved.

The problems at the national level are aggravated by the recurrent weaknesses of regional information systems that deal with intraregional processes. For example, 4 countries of Central America (El Salvador, Guatemala, Honduras, and Nicaragua) had agreed to have easy cross border process, so called “Central America-4 Free Mobility Agreement, CA-4) However, when the people are trying to cross the border, the border control request to complete complicated manual paper work, which are continuously changing time to time by locally (by each counties). Also, the sharing/transferring data between borders, sometimes is not completed properly, thus it creates confusion for people who is crossing the borders.

As a result, many people who are crossing the border spend more time, even some are getting fines to filing document wrongly and/or loosing document. This manual process is not only inconvenient and uncomfortable for ordinary people but also, it can be very easy target to the criminal who wants to illegally cross the border. These are one of the known issues among the Central America, and to resolve these, all the countries from Central America is putting a lot of effort modernization of border control system and network

Finally, the implementation of initiatives that countries are promoting to improve border management demand a more solid and reliable information transmission. Recently Nicaragua announced that total 5 locations of border control facilities are planning to be modernized with IDB fund, and more countries are willing to modernize their system and infrastructure. These kinds of projects will be conducted a lot near future. These modernization projects imply an increase in the volume and frequency of documents transmitted electronically, placing greater pressure on national and regional information systems.

One of the main historical factors causing the inadequate ICT connectivity in Central America is the lack of availability of adequate backbone infrastructure and regional interconnection points. To address this issue, six Central American countries (Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and Panama) created the consortium called REDCA (*Red Centroamericana de Telecomunicaciones*) as a broadband regional operator in 2013, with the aim of using the infrastructure of the electrical regional network; SIEPAC (*Sistema de InterconexiónEléctrica de los Países de América Central*). Since that moment, REDCA has started provided wholesale telecommunication services in the region.

1. **Consultancy objective(s)**

The main objective of this consultancy is to support the Central American region to strengthen the ICT border connectivity in borders by promptly sharing restricted passenger information between countries to contribute to the safety of the people and stability of the society through the effective control of restricted passengers, understanding differentials of infrastructure, equipment, IT security, software, and procedures required in order to secure the border passenger information in advance, and designing a detailed action plan to improve connectivity of border control agencies.

1. **Activities and Products**

**Main Activities**

The consulting form will conduct the following activities:

1. Assessment of challenges
   1. Research and analysis of the operation status and development plans of existing border control systems in other countries.
   2. Research of the current operation status of border passengers and restricted passengers.
   3. Diagnose of existing and projected broadband networks in the region, with the aim of having a better understanding of the current situation.
   4. Analysis of the current demand for broadband internet at the border point and future demand for 5 years based on research studies.
   5. Review of the existing regulatory frameworks and public policies for ICT development in Central America.
   6. Gap analysis showing the differences between the current offer and demand for broadband internet at the border points.
2. Design of border broadband infrastructure protection plan
   1. Build ICT system and establish application plan for utilizing border passenger information.
   2. Identify critical systems which will store or transmit important data in border area.
   3. Establish plans for building defense system against internal/external attacks toward border ICT system.
   4. Analysis of threats and vulnerabilities on identified critical infrastructure systems including technological issues and managerial issues.
3. Development of a short- and medium-term action plan to improve the connectivity of border control agencies and region
   1. Development of public policy and regulatory recommendations for the Central American countries to lowering deployment costs and improving regional cooperation.
   2. Development of a comprehensive plan to deploy the proposed network segments.
   3. Researching of plans for collecting major immigration information and related agencies and corporations.
   4. Analysis of projected installation and operation cost of information providing agencies and corporations.
4. Develop the financial analysis of the proposed action plan.
   1. Development of the recommended network design, selecting the most cost-efficient technologies to deploy the improved connectivity.
   2. EMPs for the project, consistent with the Central American counties and IDB Environmental and Social safeguards and regulations.
   3. Coordination of a workshop to validate results from all studies with stakeholders.

**Reports / Deliverables**

1. Work plan and Technical proposal of methodology to be used
2. Midpoint Report including diagnostic document
3. Final Report (Spanish and English)
4. **Method of Payment**

Payment will be made as per the following schedule, upon approval by the Team Leader responsible for this TC (see item V. below):

**Schedule of payments:**

a. 40% upon contract signature;

b. 30% upon approval of draft report; and

c. 30% upon approval of final report

1. **CHARACTERISTICS OF THIS CONSULTANCY**

**QUALIFICATIONS:** The firm will have extensive experience in the telecommunications sector, especially valued experience in border ICT system and connectivity issues. Specific domain of domestic and international broadband infrastructure is required, including but not limited to border control and integration technology. The firm must have a proven capability to deliver detailed and accurate market studies, develop a roadmap for the strengthening ICT border connectivity, and have integrated business experience in border control area, and consulting experience in Central and South America.

**Type of consultancy:** Consulting Firm

**Starting date and duration:** maximum of 12months from the signing of the contract

**Place(s) of work:** It requires travel during the period, the firm is expected to participate in coordination meetings with IDB specialists at headquarters (Washing DC).

**Coordination:** The supervision and coordination of this consultancy will be the responsibility of Antonio García Zaballos (IFD/CMF), Team Leader of this operation ([antoniogar@iadb.org](mailto:antoniogar@iadb.org)).