



# PROJECT: STRENGTHENING THE CORE CAPABILITIES OF THE LIBERIA TELECOMMUNICATIONS AUTHORITY (LTA)

## LIBERIA INTERNET EXCHANGE POINT (LIXP) REPORT AND RECOMMENDATIONS

**May 2021**

This publication is made possible by the support of the American People through the United States Agency for International Development (USAID) and was prepared by Integra Government Services International LLC in partnership with Atlantic TM for the Digital Frontiers Project.

# **ProICT: Strengthening the Core Capabilities of the Liberian Telecommunications Authority (LTA)**

## **Liberia Internet eXchange Point (LIXP) Report and Draft Recommendations**

Contract No. (Prime): AID-OAA-A-17-00033

Subcontract No. 1003249-C-20-022

Submitted: May 26, 2021

Prime Contractor: DAI Global, LLC

Subcontractor: Integra Government Services International LLC  
1156 15<sup>th</sup> Street NW, Suite 800  
Washington, DC 20005

Author: David N. Townsend

**May 2021**

This publication is made possible by the support of the American People through the United States Agency for International Development (USAID) and was prepared by Integra Government Services International LLC in partnership with Atlantic TM for the Digital Frontiers Project.

## **CONTENTS**

CONTENTS	I
LIST OF FIGURES	I
ACRONYMS	II
EXECUTIVE SUMMARY	I
1. INTRODUCTION	3
2. SITUATIONAL ASSESSMENT OF THE LIXPA	5
3. SWOT ANALYSIS OF LIXPA	7
4. RECOMMENDATIONS	10
ANNEX I. STRATEGIC PLAN OUTLINE/Framework	13
ANNEX II. REPORT OF THE SUSTAINABILITY AND STRENGTHENING OF LIXPA	16

## **LIST OF FIGURES**

SWOT ANALYSIS OF LIXPA	6
------------------------	---

## ACRONYMS

<b>A4AI</b>	Alliance for Affordable Internet
<b>ACE</b>	Africa Coast to Europe
<b>AU</b>	African Union
<b>CCL</b>	Cable Corporation of Liberia
<b>ECOWAS</b>	Economic Community of West African States
<b>GSM</b>	Global System for Mobile Communications
<b>ICT</b>	Information Communication Technology
<b>ISOC-Liberia</b>	Internet Society Liberia Chapter
<b>ISP</b>	Internet Service Provider
<b>ITU</b>	International Telecommunication Union
<b>IXP</b>	Internet Exchange Point
<b>LibTelCo</b>	Liberian Telecommunication Corporation
<b>LIXP</b>	Liberia Internet Exchange Point
<b>LIXPA</b>	Liberia Internet Exchange Point Association
<b>LTA</b>	Liberia Telecommunications Authority
<b>LTRTIP</b>	Liberian Rural Telephony Infrastructure Project
<b>MNO</b>	Mobile Network Operator
<b>NSRC</b>	Network Startup Resource Center
<b>OFC</b>	Optic Fiber Cable
<b>PIU</b>	Project Implementation Unit
<b>SOW</b>	Scope of Work
<b>SWOT</b>	Strengths, Weaknesses, Opportunities, and Threats
<b>TVWS</b>	Television Whitespace
<b>UAF</b>	Universal Access Fund

<b>USAID</b>	United States Agency for International Development
<b>USF</b>	Universal Service Fund
<b>USG</b>	United States Government
<b>VSAT</b>	Very Small Aperture Terminal



## EXECUTIVE SUMMARY

This report has been prepared as part of the consulting assignment “Strengthening the Core Capabilities of the Liberia Telecommunications Authority (LTA),” sponsored by the United States Agency for International Development (USAID) Digital Frontiers Project, under the Promoting American Approaches to Information and Communications Technology (ICT) Policy and Regulation (ProICT) Activity. The report provides review, analysis, and recommendations relating to the status and prospects for the Liberia Internet Exchange Point Association (LIXPA), toward the goal of transitioning LIXPA to an independent and sustainable management structure.

The Situational Analysis of LIXPA’s recent and current status recognizes that, despite being established in 2015, the Association, and the Liberia Internet Exchange Point itself, have not progressed sufficiently toward taking on the full role envisioned, to serve as the primary point of interconnection for licensed Internet Service Providers (ISPs) in Liberia. The Bylaws and Constitution of the LIXPA were adopted in June 2019, four years after its incorporation, with LTA having initial oversight responsibility. In November 2020, the LTA announced that they had formally transferred authority over the Exchange to the LIXP Association, elections were held for new executive leadership among the member ISPs. LTA also tasked the LIXPA with the responsibility to fully operationalize the Exchange, ensure its sustainability, develop a Strategic Plan, a website, and other objectives.

The report recognizes that there are considerable challenges to achieve these goals. A SWOT analysis reveals several key findings:

- Strengths
  - The foundations of the IXP are in place, and major ISPs are participating;
  - LTA is supportive;
  - Organizational structure and by-laws have been adopted; and
  - Operational authority has been transferred and Officers have been elected.
- Weaknesses
  - Plans and procedures not yet adopted, overall operations not fully launched;
  - No full-time assigned personnel;
  - Isolation from regional networks; and
  - Lack of data to understand needs.
- Opportunities
  - Potential for significant cost savings, quality improvements for members;

- Opportunity for growth in demand, local traffic, and content; and
- Integration with potential e-government platforms and services.
- Threats
  - Disinterest or slow movement to operationalize and implement plans;
  - Inadequate management of resources; and
  - Uncertain political, regulatory backing.

The report provides a set of key recommendations for addressing the challenges and moving LIXPA forward. These include:

1. **Enhance LIXPA's organization and operations by engaging permanent staff:** New staff should include a full-time General Manager and a (at least) half-time Technical Director.
2. **Develop, adopt, and implement a LIXPA Strategic Plan,** per LTA's directives, which will establish key targets, priorities, and milestones for the Association's development. Annex I to this report provides a recommended draft Framework for such a Strategic Plan.
3. **Report to LTA** on progress and activities quarterly, indicating steps taken toward the organization's objectives and both development and implementation of the Strategic Plan, as well as matters such as membership, budgets, and traffic utilization.



## **I. INTRODUCTION**

Under the United States Agency for International Development (USAID) Digital Frontiers Project, DAI Global subcontracted Integra Government Services International LLC (Integra) in partnership with Atlantic-TM Cameroon to implement the Promoting American Approaches to Information and Communications Technology (ICT) Policy and Regulation (ProICT) Activity and provide consultancy services towards strengthening the core capabilities of the Liberia Telecommunications Authority (LTA). The primary purpose of the engagement is to strengthen the core capabilities of the LTA with regulatory and technical expertise in areas the LTA identified in consultation with USAID and subsequent conversations with the technical team.

ProICT Liberia consists of the following six workstreams:

1. Modernizing the regulations governing the deployment of fiber optic cables.
2. Developing regulatory standards for television whitespace (TVWS) and related rural access technologies.
3. Assisting the LTA's administration to develop, optimize, and implement strategies for the Liberian Universal Access Fund (UAF).
4. Providing advisory and technical assistance to the LTA to help strengthen its role in transitioning the Liberian Internet eXchange Point (LIXP) to an independent and sustainable management structure.
5. Strengthening the Network Type Approval regime at the LTA.
6. Assisting with the reorganization of Liberia's FM radio spectrum to allow for the highest and best use of these critical radio frequencies.

### **PURPOSE OF THIS LIXP REPORT**

This report specifically concerns the fourth workstream highlighted above (i.e., providing advisory and technical assistance to the LTA). The purpose of this LIXP Report is three-fold:

1. To understand the current state of the LIXP Association (LIXPA), as well the constraints faced by the LIXPA today in Liberia. LIXPA Liberia is entrusted with the challenging goal of peering as much intra-Liberian internet traffic within Liberia as possible, rather than the traffic being sent outside Liberia just to come back into the country at costs to Liberians;
2. To conduct a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis and assess the LIXPA in its current state and prospects; and
3. To provide recommendations for improving the LIXPA's working and governance, primarily for the LIXPA Board of Directors, but also for the LTA's consideration.

This report also provides the basis for training the LIXPA Board of Directors and the LTA on the recommendations herein.

### **STRUCTURE OF THE LIXP REPORT**

The structure of this report is as follows:

- Section 1: Introduction outlines the purpose and structure of this report.
- Section 2: Situational Assessment of the LIXPA provides an analysis of the status of LIXPA including a problem statement.
- Section 3: SWOT Analysis maps various aspects of the LIXPA.
- Section 4: Provides recommendations based on situational analysis, strategic assessment, and international best practices.
- Annex I proposes an outline and framework for a LIXPA Strategic Plan.
- Annex II provides a copy of a “Report of the Sustainability and Strengthening of LIXPA.

## 2. SITUATIONAL ASSESSMENT OF THE LIXPA

This section provides a situational assessment of the LIXPA as of early 2021. It includes a review of the recent activities and context of LIXPA, and a summary problem statement concerning its status.

The information and findings are based on documents and inputs provided by the LTA, conversations with the new LIXPA Chairwoman, and discussions with LTA officials involved with overseeing LIXPA. The international best practice comparative analysis was significantly derived from materials developed by the Network Startup Resource Center (NSRC) of the University of Oregon, which has assisted in developing several IXPs across the African continent.<sup>1</sup>

### LIXPA RECENT CONTEXT

The LIXPA was incorporated on March 20, 2015. The founding members consisted of Liberia Telecommunications Corp (LibTelCo), Cellcom, Lonestar/MTN, Novafone, and the Internet Society Liberia Chapter (ISOC-Liberia).

LIXPA is a not-for-profit association established to operate an IXP in Liberia. It also serves as a point of interconnection for licensed ISPs in Liberia. Other purposes identified include sharing information with international bodies, entering into any necessary contracts, raising and investing funds as necessary, and any other relevant activities. The LIXPA is registered at the offices of the Cable Corporation of Liberia (CCL) in Monrovia. The Registered Agent is the ISOC.

The Bylaws and Constitution of the LIXPA were adopted in June 2019, four years after its incorporation. At this time, the LTA was added as a founding member and the Association was open to the membership of other ISPs. The Bylaws and Constitution also identify the key officials and management structure of the LIXPA, including the Executive Committee, Chairperson, Annual Meeting, etc. and indicate that the Association shall be funded through “agreed contributions from its members.”

After technical planning and arrangements by engineers from member operators, the LIXP was officially launched at a formal ceremony on August 6, 2015. By 2018, the LIXP had attracted additional participant ISPs, and Google had established a cache at the site. Although the LIXP planned to produce an operations manual, no details have been provided and there is no evidence of one to date.

A short report on the sustainability and strengthening of LIXPA was recently prepared (for convenience, a copy is provided in Annex 2).<sup>2</sup> It provides some further background and context, and elaborates on the objectives of the LIXP, including goals such as proper management, raising new revenue, and encouraging locally hosted content.

### 2020: TRANSFER OF AUTHORITY, NEW LIXPA MANAGEMENT TEAM

---

<sup>1</sup> “BGP for All: IXP Design”. Network Startup Resource Center (NSRC) Training Resources. Accessed May 11, 2021. [https://learn.nsrc.org/bgp/ixp\\_design](https://learn.nsrc.org/bgp/ixp_design)

<sup>2</sup> “Report of the Sustainability and Strengthening of LIXPA” (no author or date identified)

In November 2020, the LTA announced that they had formally transferred authority over the Exchange to the LIXP Association. There were elections for new executive leadership among the member ISPs, and a formal induction ceremony was held. The new officers (by the operator) of LIXPA are:

- Lonestar MTN – Chair;
- K3 Liberia - Co-chair;
- Powernet – Secretary; and
- LibTelCo – Treasurer.

The LTA’s Board of Directors included specific requirements and responsibilities in transferring management to LIXPA. These include “*to fully operationalize the Exchange and to commit itself to ensure its sustainability,*” and also to “*develop and manage a functional website, contribute to the accessibility of local content and get innovative for the benefits of its users.*”<sup>3</sup> The LTA also expects LIXPA to develop a strategic plan, submit quarterly reports, and adopt an operational manual.

### **IXP PROBLEM STATEMENT**

There are many key outstanding challenges with the LIXP and LIXPA.

- While general duties of officials and rules of procedure for meetings are described in brief, there is no discussion in the Bylaws of how the LIXP is to operate, nor of any other technical provisions;
- The recent short report on the sustainability of the IXP describes some key challenges and recommendations for LIXPA. These include, for example, the need for the peering parties to be more committed and engaged, including:
  - Providing equipment and content for the IXP;
  - Raising awareness;
  - Engaging a full-time staff; and
  - Bringing the LTA into a more active role in governance<sup>4</sup>; and
- There remains a considerable lack of clarity as to the status, operations, and possibilities for the LIXPA. The report on sustainability touches on some of the key issues that need to be examined further. It appears that the LIXP is not fully operational and does not currently host much content. These conditions need to be studied, and the barriers and opportunities more fully determined.

---

<sup>3</sup> E-mail from Zotawon D. Titus, Commissioner, LTA, Nov. 25, 2020.

<sup>4</sup> Note: The author of the report is not identified, so it is not immediately clear if the LIXPA Executive has officially endorsed its findings.

Members need to be more fully engaged and a dedicated staff needs to be established, with a clear mandate of responsibilities, and targets for the development of the IXP.

Furthermore, with traffic and costs growing, along with cybersecurity concerns, there is an increasingly vital need for Liberia ISPs to take maximum advantage of the LIXP framework. The facility should be based on robust cooperation among its members while remaining competitively neutral. It should also operate on a cost-effective basis, ensuring a high quality of service and reliability. It should produce tangible net cost savings for all members, and support the expansion of local data services and content across Liberia, as well as greater regional cooperation.

### 3. SWOT ANALYSIS OF LIXPA

A SWOT analysis, providing key views on the status and direction of LIXPA, helped to identify key strengths and weaknesses that could help exploit opportunities and mitigate the risks arising out of the threats.

**FIGURE I. SWOT ANALYSIS OF LIXPA**

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• The foundations of the IXP are in place, and major ISPs are participating</li> <li>• LTA is supportive</li> <li>• Organizational structure and by-laws have been adopted</li> <li>• Operational authority has been transferred and Officers have been elected</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Plans and procedures not yet adopted, overall operations not fully launched</li> <li>• No full-time assigned personnel</li> <li>• Isolation from regional networks</li> <li>• Lack of data to understand needs</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Potential for significant cost savings, quality improvements for members</li> <li>• Opportunity for growth in demand, local traffic, and content</li> <li>• Integration with potential e-government platforms and services.</li> <li>• Opportunity to address and mitigate cybersecurity risks</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Disinterest or slow movement to operationalize and implement plans</li> <li>• Inadequate management or resources</li> <li>• Uncertain political, regulatory backing</li> </ul>

Below a further elaboration of the areas identified in the above illustration is presented.

#### STRENGTHS

1. **The foundations of the IXP are in place, and major ISPs are participating:** Liberia has taken the most important first organizational steps, with the cooperation of the key ISPs, to

participate together in the LIXP. This demonstrates that they recognize the potential and are prepared to collaborate in their mutual self-interest.

2. **The LTA is supportive:** The LTA has been involved with LIXPA since the beginning and continues to maintain strong interest and support for its development and success. In particular, Commissioner Titilope Fakuade met with the team and has expressed her intention to continue to support and monitor LIXPA development.
3. **Organizational structure and bylaws have been adopted:** The main initial organizational steps have been taken, including adopting by-laws, although they may need to be reviewed and revised.
4. **Operational authority has been transferred and Officers have been elected:** The recent steps to transfer authority from the LTA to LIXPA's Board, and the election of officers, indicates that LIXPA is prepared to move forward more proactively.

## **WEAKNESSES**

1. **Plans and procedures are not yet adopted, and overall operations are not fully launched:** Despite the positive organizational steps, there are no formal plans, including a strategic plan and operational manual, or other key documented procedures and policies to govern LIXPA's operations going forward.
2. **No full-time assigned personnel:** LIXPA does not have a formal, full-time staff to manage its day-to-day operations, develop and issue plans and reports, liaise with the LTA and member operators, and perform all other functions which call for a committed effort.
3. **Isolation from regional networks:** LIXPA does not have any formal relations with regional IXPs, which could help develop its capabilities and grow its services.
4. **Lack of data to understand needs:** There does not appear to be any concerted effort to date to collect and analyze member operators' traffic data, including national and international internet usage, to provide a foundation for designing the most efficient means of interconnecting and sharing resources.

## **OPPORTUNITIES**

1. **Potential for significant cost savings, and quality improvements for members:** Once the LIXP is fully operational, all member ISPs will have the opportunity to realize significant savings on the costs of their international data traffic, as well as improved quality of Internet connections and speeds for end-users. Donors and international partners such as NSRC may be prepared to contribute equipment and other support.
2. **Opportunity for growth in demand, local traffic, and content:** The LIXP also offers the potential to help stimulate significant growth in demand for internet connections and data services, including local Liberian content, providing a solid impetus for content developers and hosting.

3. **Integration with potential e-government platforms and services:** The LIXP can play a central role in expanding the offering of e-government services throughout Liberia, by hosting such content for government ministries and agencies, allowing for coordination, cost savings, and high-quality services.
4. **Opportunity to address and mitigate cybersecurity risks:** The LIXP can support the need to minimize cybersecurity threats associated with malware, hacking, and other risks, by centralizing data exchange, and permitting greater cooperation among ISPs at the level of server protection and incident investigation, among other measures.

## THREATS

1. **Disinterest or slow movement to operationalize and implement plans:** While the current and recent status of LIXPA is encouraging, there is still a risk that the members will lose interest, as they focus on their priority core business requirements, leaving LIXPA to stagnate rather than grow.
2. **Inadequate management or resources:** Without new commitments to personnel resources, including full-time management staff, it will be difficult or impossible for LIXPA to achieve its goals, as the organization's officers have multiple competing responsibilities.
3. **Uncertain political backing:** It remains unclear how much political commitment the government is prepared to provide to implementing and growing the LIXP. Such commitment is essential to preventing stagnation or conflicts that may arise.

## 4. RECOMMENDATIONS

The following subsections delineate the recommended course of action that may be adopted by the LIXPA to strengthen its operational effectiveness.

### **RECOMMENDATION I: ENHANCE LIXPA'S ORGANIZATION AND OPERATIONS BY ENGAGING PERMANENT STAFF**

As currently constituted, LIXPA's activities and operations are managed only by the designated officers assigned by the member firms. These persons have significant other responsibilities within their organizations, and that LIXPA cannot always be a top priority concern. However, to operate effectively, LIXPA requires a substantial ongoing commitment of time and attention to its varied and expanding roles and tasks, with a sufficient degree of expertise and focus to ensure continuous progress. It is therefore recommended that the Board of Directors of LIXPA should engage at least two permanent staff personnel to be responsible for the day-to-day management of LIXPA.

The key staff positions that should be established, and their roles, include the following:

#### General Manager:

- Full-time position, responsible for all operations management and oversight of LIXPA on a day-to-day basis;
- Takes the lead role in planning, coordinating, and developing LIXPA's functions and relationships;
- Acts as close liaison to the Board of Directors and officers and represents their interests in implementing plans and executing priority activities;
- Prepares reports, plans, arranges meetings, consults with the Board of Directors, the LTA, and members concerning LIXPA strategy, objectives, and organization;
- Undertakes studies, market research, stakeholder consultations, and best practice reviews to support developing LIXPA operations;
- Manages LIXPA finances, budget, and payments, under the direction of the Board; and
- Qualifications include strong experience in the Liberia telecommunications industry, preferably with one of the member operators, with good management, planning, and reporting skills.

#### Technical Director:

- At least half-time position, but preferably full-time. Responsible for overseeing and coordinating all technical aspects of LIXPA implementation and operations;
- Manages the LIXP equipment facility, including setting up, coordinating the equipment space, and all other on-site functions. Conducts procurement as needed for relevant furnishings, tools, and equipment, under the authority of the General Manager;



- Works directly with member operators' assigned engineers to supervise and assist with installing and connecting the interconnection equipment, including testing and quality control;
- Works closely with and reports to the General Manager on all tasks requiring technical input and review, including studies, reports, data collection, and analysis; and
- Qualifications include a degree in electrical/telecommunications engineering, with a strong background in network design and deployment, preferably working with one of the member operators.

The precise job descriptions, tasks, qualifications, salaries, benefits, and other elements of the staff members' employment will be decided by the Board, who will have ultimate responsibility for recruiting and hiring personnel.

Note that it may be necessary to amend the bylaws of LIXPA to enable the hiring of permanent staff, as this is not explicitly provided for in the existing bylaws.

## **RECOMMENDATION 2: DEVELOP, ADOPT, AND IMPLEMENT LIXPA STRATEGIC PLAN**

The LTA has mandated that LIXPA leadership should adopt a strategic plan to govern its development and operations in the years ahead. Such a plan will provide the foundation and guidance for advancing LIXPA's organization and activities from conception to implementation, and for achieving the Association's priority objectives. It is therefore recommended that the development and adoption of a strategic plan should be the first target activity of LIXPA management staff upon their engagement, in close collaboration with the LIXPA Board and Officers.

The strategic plan should encompass several key elements central to LIXPA's objectives and operations. These include reviewing and updating the administrative structure of the Association; setting more specific organizational objectives than those defined in the bylaws, such as precise operational targets over five years; procedures and goals for traffic utilization measuring and monitoring; financial management requirements; and other elements.

Annex I of this report provides an illustrative, recommended outline for the content of the proposed strategic plan. It is recommended that LIXPA proactively undertake a process for preparing and developing this plan, and also expeditiously implement the priority activities.

The process for preparing and adopting the strategic plan should involve the following general steps:

- High-level brainstorming and planning meetings among the Board and Management;
- Assigning specific topics to individual Board members;
- Preparing and adopting a draft plan outline by the General Manager based on Board inputs;
- Review of the draft plan by the Board;
- Submitting revised draft plan to the LTA for review and feedback;

- Finalizing draft plan by the General Manager; and
- Reviewing and adopting the final plan by the Board, with LTA approval.

### **RECOMMENDATION 3: REPORTING TO LTA**

The LTA has requested that LIXPA submit quarterly progress reports to the LTA describing the activities and progress of the Association. It should be the responsibility of the LIXPA Board to prepare and deliver such reports, and both the Board and the General Manager should ensure that they remain in regular contact with, and seek counsel and input from, LTA throughout LIXPA's operations. The initial work to organize and record relevant information can also be undertaken by the General Manager on behalf of the Board.

A typical progress report should potentially include the following elements:

- Key activities over the previous period, including progress toward specific milestones in the strategic plan;
- Updates on member connections, equipment deployment, peering arrangements, etc.;
- Budget updates, including expenditures and any revenues for the period;
- Traffic measurements (once traffic measuring protocols are in place);
- Difficulties or challenges encountered, and how they are being addressed; and
- Expectations for the next upcoming period.

The Board should present each progress report in written form to the LTA and should be available to meet and discuss its contents upon request.

## **ANNEX I. STRATEGIC PLAN OUTLINE/Framework**

Presented below is a proposed outline of the recommended LIXPA Strategic Plan. LIXPA should review and revise this outline as a first step toward producing the full plan.

### **I. General Objectives**

#### **I.1 Core Objectives of LIXPA**

- Establish and operate LIXP.
- Fully operationalize LIXP in 2021.
- Achieve sustainable financial support through contributions and revenues.
- Cooperate among members, the LTA, and Liberia citizens and government to share information on the Liberian internet sector.

#### **I.2 Objectives for Developing the Liberia internet sector via LIXP**

- Growing internet use, access, and awareness.
- Realizing cost savings for providers and users.
- Efficiently managing internet traffic.
- Locally hosting digital content, including e-government and e-commerce.
- Contributing to socio-economic development.

### **2. Organizational Development**

#### **2.1 LIXPA Membership**

- Goals and Criteria for LIXPA Membership.
- Roles and Responsibilities of Members.

#### **2.2 Board of Directors and Officers**

- Designation of Board, Officers (from bylaws).
- Roles and Responsibilities.

#### **2.3 LIXPA Management and Staffing**

- LIXPA Permanent Management Staff.
- General Manager and Technical Director Roles and Responsibilities.

- Other Personnel (as needed).

## 2.4 Other Organizational Matters

- Any other internal organizational goals, plans, or constraints.

## **3. LIXPA Operational Objectives and Targets**

### 3.1 Overall Operational Objectives

- Role of the IXP in the Liberian internet market.
- Scope and size of operations.
- Budget and financial objectives.

### 3.2 Years 1–2 Targets

- Membership and utilization of the IXP.
- International and domestic traffic passing through the IXP.
- Growth in overall Internet traffic.
- Content hosting and use targets.
- Financial and budget targets, including forecasts.
- Prepare and adopt Operations Manual.
- Establish a public LIXP website.

### 3.3 Years 3–5 Targets

- Membership and utilization of the IXP.
- International and domestic traffic passing through the IXP.
- Growth in overall Internet traffic.
- Content hosting and use targets.
- Financial and budget targets, including forecasts.
- New business activities.

## **4. IXP Utilization and Monitoring**

### 4.1 IXP Traffic Monitoring

- Implement traffic monitoring and measurement protocols (domestic and international).
- Responsibilities of members.
- Required equipment, software, terms, and conditions.

#### 4.2 Digital Content Hosting Utilization

- Protocols and requirements for content hosting.
- Domestic content partnership goals, outreach (e-government, e-commerce, etc.).
- International content hosting/caching partnership goals and plans.
- Member and staff responsibilities.
- Legal, regulatory, and political requirements.

### **5. Financial Management**

#### 5.1 Financial Management Responsibilities

- Roles of the Board and General Manager.
- Protocols, legal, and regulatory requirements for expenditures.
- Fundraising and revenue policies and objectives.
- Budget planning, targets, reporting, and audits.

## **ANNEX II. REPORT OF THE SUSTAINABILITY AND STRENGTHENING OF LIXPA**

On March 3, 2015 the Internet Service Providers (ISP) and the Internet Society Liberia Chapter (ISOC) signed an Article of Incorporation and Peering Agreement for the establishment of the Liberia Internet Exchange Point Association (LIXPA).

Engineers from all GSM companies and the Cable Consortium of Liberia (CCL) were designated to work immediately and prepare for the IXP Hosting at CCL. These engineers worked to understand space requirement, size of rack, wiring, backhauling, minimum router specs and configuration. An IP address was attained from AFRINIC to host clients on the IXP.

The Liberia Internet Exchange Point was officially launched on August 6, 2015 with the Vice President of Liberia serving as keynote speaker. The program was graced by CEOs and DCEOs of GSM companies, Senators and Representatives, Legislative committees on Telecommunications, the Minister of Posts and Telecommunications and the Board of Commissioners of the Liberia Telecommunications Authority.

Since the Launching of the IXP, LIXPA has attracted other ISPs in and out of Liberia. By June 2018, search giant GOOGLE cached at the Liberia Internet Exchange Point. Some smaller ISP's have also been attracted to LIXPA.

All peering parties and ISOC-Liberia Chapter have signed a comprehensive By-laws and Constitution to help with the management of LIXPA.

### **TOP OBJECT**

Major objectives of LIXPA are:

- The proper management of LIXPA through coordination and cooperation from all stakeholders in telecommunications sector of Liberia.
- Raise additional revenue while simultaneously speeding local data exchange, and most importantly;
- Encouraging the development of locally hosted content and services. ○ Locally hosted content and services cannot be developed in the absence of Liberia Country Code Top Level Domain (ccTLD) (.lr.).
- Acquiring .lr domain name is a serious challenge which most local enterprises are not prepared to undergo thereby swaying to generic Domain Names. (.com, .net , .org)

### **CHALLENGES**

Major challenges facing LIXP are:

- Getting peering parties to commit to resolving liabilities for the viability and sustainability of the IXP.
- Getting peering parties key decision makers to attend meetings that would strengthen the management of the IXP.

- Getting peering parties to agree to procure needed equipment for the betterment of the IXP. Ex. **Stats Server** for tracking user usage, and genuine **Bandwidth Management tool** which gives opportunity to monitor the peering switch traffic.
- Content currently on the IXP is low or no existent.

## RECOMMENDATION

- Carrying out awareness on the importance of the IXP; there is limited or no awareness of an IXP in Liberia
- Involve more key stakeholders
- LIXP should have full time management staff (skeleton staff)
- Regulator (LTA) should play a more active role than monitoring to help enforce the governance of the IXP.

## CONCLUSION

LTA, the Regulatory Authority, has been playing a de-facto management role in the absence of a governance structure regarding LIXPA. With the By-laws and Constitution in place to define the management structure, the transitional plan is to transfer management responsibility to an interim management team.

The task of the interim team is to facilitate election among LIXPA members. This exercise is expected to take place in the next four (4) months. Following that, LTA will be playing only an advisory role.