

Transforming Access Initiative: 40 by 2021

Liberia '40 in 2021'

Today, the Republic of Liberia (Liberia) has approximately 7% Internet penetration. In order to achieve growth in economic, education and health networks, it is imperative that increased access to the internet happen to promote 21st century inclusiveness. The primary objective of the “40 in 2021” project is the digital transformation of Liberia into an innovation zone, offering greater opportunities to all its citizens. This will be accomplished by enabling the build-out of a national education and health network on unlicensed frequencies, affordable wireless technologies, and increasing the country’s connectivity to 40% in three years.

Implementation of the project will happen through a Public – Private – Philanthropic Partnership, with three signatories leading the way: Syracuse University (SU) as the lead for project accountability and design, Imcon International, Inc. (Imcon), and the Government of Liberia. In addition, the Imcon Liberia Foundation and One Planet Education Network (OPEN) deep engagement is essential to the project. Participation from additional universities and firms, and we hope foundations, will collaboratively make this project a success.

Of course the most essential project supporter is the government of Liberia. This support is documented in the Memorandum of Understanding executed on September 20, 2018, between SU, Imcon, The Ministry of Education, Republic of Liberia and the Ministry of Health, Republic of Liberia. To meet health and education connectivity objectives and legal requirements, it is imperative Liberia facilitates the allocation and authorization of use of a government controlled unlicensed frequency bundle and rights of way in order to build the Liberian Broadband Education and Health Network (BEN).



The “40 in 2021” project establishes a national broadband network using an unlicensed frequency bundle, and leverages the new technology of Imcon’s Internet Backpack to permit connectivity both within, and beyond, the technical reach of the national wireless education and health broadband backbone network. It is through the Imcon Internet Backpack that Liberian schools, hospitals, and health clinics will be networked, establishing the Liberian BEN serving all Liberian Counties. Upon establishing connectivity through the Liberian BEN, schools, teachers and students will have access to project-based STEM educational content and curricula

provided by OPEN and Syracuse University.

A large part of the educational impact includes “train the trainer” support. This additional support will educate Liberian school teachers on their newly available resources and how to implement them. They will continue to receive support after initial delivery and have access to the OPEN school network. Students will

connect with other students within Liberia and in classrooms all over the world. This will help prepare children for participation in the global workforce and strengthen the Liberian economy. It opens the possibility for the next generation to work collaboratively as one to solve the real-world challenges of tomorrow.



The project will also lead to the establishment of ‘Little Neighborhood Libraries’ within Wi-Fi reach of select schools and hospitals, which will serve as community hotspots and sources of printed educational and other reading material. This will help to build Liberian communities as a whole and magnify the impact. “40 in 2021” project also plans for the deployment and integration of an Electronic Health Record (EHR) with the Liberian healthcare system. An EHR will be made available to Liberians, in addition to Hu-manity.co’s blockchained personal data rights application (#My31) provided by the Internet Backpack platform.

While the partners will launch the project and create the Liberian BEN, they will also focus on capacity building to enable the anticipated future transfer for continuing operation a local entity under a Build-Transfer-Operate model. For initial support, SU’s School of Information Studies (iSchool) will establish a Network Operations Center (NOC), Security Operations Center (SOC), and Backpack Operations Center (BOC) on campus for remote monitoring and support of the Liberian BEN.

The initial establishment and operation of the NOC/SOC/BOC facility will provide SU students hands on, real world opportunity to test and build their skills. SU students will benefit by not only honing their craft but also taking pride in that something they are a part of is making an impact on the world. The NOC/SOC/BOC will communicate continuously with and exchange data and information with a mirrored set of centers that will be established in Liberia. Liberian students and technical personnel will be educated and trained by SU in order to establish and run a NOC/SOC/BOC facility in Liberia for when the Liberian BEN is transferred. These SU-trained individuals will play a key future role in ensuring the sustainability of the Liberian BEN.

The building of the Liberian BEN itself is just the first step of the 40 in 2021 project. Once established the innovative education, experiential learning, training, research, and assessment activities become the focus to ensure impactful results and sustainability beyond 2021. Education and Training of Trainers, Leaders, Teachers, and Technicians in Liberia is where the true win comes for Liberia. Increasing entrepreneurship, innovation, education and the country’s economy as they fully arrive in the 21st Century.

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The 40 in 2021 Republic of Liberia Operational Plan

Syracuse University

Imcon Intl Inc (III)

- Provides immediate connectivity solutions including Internet Backpack
 - Liberian schools, hospitals, ministries priority partners
 - Delaware C Corp.
 - Imcon West Africa Corporation a subsidiary
 - Supports Imcon Foundations
- Ownership: Investors

Imcon West Africa Corporation

- Operates Education Network
- Manages network expansion with partners
- Receives from Foundation:
 - 20 year sublicense rights to operate frequencies, access Rights of Way, build towers and fiber, interconnect, share costs
 - Can sell rights and network if/when other operator commits to educational service guarantee, and meets LLP's price objectives
- Ownership: III, investors
 - To be established

Imcon Liberia Foundation

- Receives right to operate on frequencies, access Rights of Way, and build towers and fiber where enhances network, for educational purposes, from LTA.
- Assigns Imcon Liberia LLP 20 year license right to operate
 - To be established

Liberian Telecommunications Authority

- Assigns rights to access frequencies
- Other ministries coordinate on project to:
 - Sets policy target of free basic access for schools to justify rights allocation.
 - Assign right to access to Rights of Way
 - Authorize access to Fiber Landing Station government capacity on commercial terms
 - Authorizes right to lay fiber where it may enhance network and lower operational costs and improve performance.

LOGIC MODEL: Liberia Project: Backpack Educator Training Program

SITUATION:

1) Liberia seeks to strengthen its economic development; 2) Liberia seeks to join the global learning community by strengthening its education system through technology; 3) This project's long and short-term goals focus on changing perceptions and behaviors by training Liberia's teachers to integrate Backpack technology into their teaching and student STEM learning.

INPUTS	OUTPUTS		OUTCOMES		
	Activities	Participants	Short-term	Medium-term	Long-term
-Funding support -Imcon International's Educational Internet Backpack technology -Liberia MOE -Liberian Inter-Agency Task Force and Advisory Group (LIATAG) -Syracuse University project team/advisor expertise -One Planet Education Network (OPEN) -Graduate and doctoral student trainers -Training designs and support materials -Existing infrastructure of training technologies -Learner access to required technologies	-Recruit/train grad/doc students for core training team -Develop OPEN curriculum to support MOE competencies -Design/develop training using OPEN learning content -Design/develop support materials -Recruit xx Liberian teachers for training -Select xx teachers to join core training team -Core training team trains teachers -Select xx trained teachers to form xx training teams. -Continue above until all teachers trained -Continued coaching of all trained teachers -Program evaluation	(<i>Those who benefit from inputs and program activities</i>) (x number) Participating Liberian teachers (x number) Students participating in school program (x number) Parents supporting student participants in program Liberian Ministry of Education	Increased teacher use of Backpack tech for teaching and learning Teacher knowledge and confidence gains in implementing OPEN program and Backpack tech Student knowledge gains across Liberia MOE competencies/ skills: Research and Problem Solving, Analytical, Creativity and Innovation, Communication, Digital & Information Literacy, and Technology Increase in student motivation for learning	Intention by teachers to continue using technology in their teaching after project completion Participating teachers seek new ways to use technology in their teaching and student learning Families of student participants report increased interest in learning at home Continued increase in use of Backpack technology in education	Liberian teachers devise new ways to use technology in education Impact on students' ability to use new technology for learning Increases in student engagement in learning activities that will impact their lives and their communities. Liberia's children are better prepared to contribute to their country's economic growth as adults.

ASSUMPTIONS	EXTERNAL FACTORS
<ol style="list-style-type: none"> 1. Liberian Ministry of Education supports this training. 2. Adequate funding is secured. 3. Schools will have varying technology bandwidth 4. Teachers will have varying teaching skills 5. Teachers and children will have varying technology skills 6. Most schools currently lack technology altogether, prior to introduction of Internet backpack. 7. Students will have varying access to technology at home 8. Some schools may need to share Backpack technology and other resources to fully participate in the educational opportunity. 	<ol style="list-style-type: none"> 1. Some children in remote areas may not be able to fully participate due to assisting parents in their work responsibilities. 2. Some teachers may find it difficult to allocate time for training. 3. Some teachers from schools in remote or isolated locations may have difficulty implementing what they learn in training due to lack of resources. 4. Some teachers may be resistant to using advanced technology in their teaching. 5. Some parents may find it difficult to support their children's learning at home due to their illiteracy or lack of technology/skills.

EVALUATION PLAN:

Evaluation will be on-going throughout the project and will include both formative and summative components.



Liberia 40 in 2021 Innovation Zone Checklist

Inter-Agency Task Force and Advisory Group

COUNTIES _____

DATE _____

COMPILED BY (NAME/CONTACT INFORMATION) _____

AUTHORIZED SIGNATURE: GOVERNOR _____

MULTI-STAKEHOLDER CO-SIGNER 1 _____

MULTI-STAKEHOLDER CO-SIGNER 2 _____

Instructions: Please confirm your Province has completed all of the following 24 Milestones (unlikely). Alternatively, describe the stage of Innovation Zone Readiness your County has achieved on each of the Milestones by checking a 'Ready or Not?' Box as indicated below. In addition to completing the Innovation Zone Checklist, further documentation of your Province's readiness may be attached as appendices.

Milestone	Rationale	Ready or Not? Readiness Assessment (Select One)		
		Yes	In Process	No
1. Governor, Agencies, Advisory Group Agree: <i>County now an Innovation Zone</i>	Both leadership and 'rough social consensus' needed for progress	Yes	In Process	No
2. 1 st Liberian Internet Forum <i>Provincial Multistakeholder Participation</i>	Share information across firms, agencies, regions, communities	Yes	In Process	No
3. Emergency preparedness	Increase community readiness with improved coordination of information	Yes	In Process	No
4. Environmental health emergency preparedness	Enhance access to disease prevention information especially with disasters	Yes	In Process	No
5. Community networks supported	Accelerates access, lowers cost, increases engagement and adaptive use, builds demand	Yes	In Process	No
6. Educational networks supported	Enable student access to improve learning outcomes and career readiness, begin to grow regional interconnected network backbones	Yes	In Process	No
7. Infrastructure gap analysis	Identify barriers to economic growth, suggest remedies	Yes	In Process	No



8. Mobile backhaul, tower, pole attachment, Rights of Way, fiber, RF, data center, energy infrastructure-sharing authorized/encouraged	Enhance user experience, increase service efficiency, reduce cost and risk for new entrants, incumbents	Yes	In Process	No
9. IP traffic aggregation regional strategy implemented	Lowers cost, improve services	Yes	In Process	No
10. Unlicensed/Shared Services/New Entrant Experimental License & Fast Frequency Allocation at ALL Frequencies Specified Below Permitted in Province	Accelerate economic growth, open innovation, Increase competition, lower prices, improve service quality	Yes	In Process	No
11. 900 MHz	Accelerate open innovation, Improve service quality	Yes	In Process	No
12. 2.4 GHz	Accelerate open innovation, Improve service quality	Yes	In Process	No
13. 3.5 GHz	Accelerate open innovation, Improve service quality	Yes	In Process	No
14. 5 GHz	Accelerate open innovation, Improve service quality	Yes	In Process	No
15. 24 GHz	Accelerate open innovation, Improve service quality	Yes	In Process	No
16. 60 GHz	Accelerate open innovation, Improve service quality	Yes	In Process	No
17. 80 GHz	Accelerate open innovation, Improve service quality	Yes	In Process	No
18. 90 GHz	Accelerate research and open innovation, Improve service quality	Yes	In Process	No
19. Security awareness training	Increase organizational readiness	Yes	In Process	No
20. Law & policy review	Identify ways to streamline procedures across agencies for new service acceleration in Innovation Zone Provinces	Yes	In Process	No
21. Market analysis	Review barriers to market access and efficiency	Yes	In Process	No
22. Environmental assessment	Ensure negative impacts on environment are avoided or minimized	Yes	In Process	No
23. Social innovation and entrepreneurship	Is community open to entrepreneurs and community organizations	Yes	In Process	No
24. Regional and international cooperation opportunities	Review ways to collaborate more closely with neighboring Provinces, Nations, NGOs, civil society, and firms to attain UN Sustainable Development Goals	Yes	In Process	No



Appendix

If appending Information, please summarize here.

Documents may be in English or other language of Liberia

Four examples are described.

Item	Author/Agency	Title	Description	Date
1.a	Governor _____ County _____	Governor	Letter confirming support for Innovation Zone status for County _____, and confirming that Governor's staff and agencies have already, or are preparing, to undertake actions to enable implementation of Items 2-24.	Date Letter signed by Governor
1.b	Liberian Ministry of _____	Minister/Director/Secretary of _____	Similar Letter to 1.a, specifying which items and in what ways Ministry is implementing some (specify which) of items 2-24.	Signature Date
1.c	Community group _____	Representative of _____	Similar Letter to 1.b, specifying which items and in what ways community group is implementing or wishes to some (specify which) of items 2-24.	Signature Date
1.d	Advisory group member _____	_____	Similar Letter to 1.c, specifying which items and in what ways organization or firm is implementing some (specify which) of items 2-24.	Signature Date
2.	_____	_____	_____	Document Date

Note: The Advisory Group, Inter-Agency Task Force, Syracuse University iSchool WiTec and/or iConsult may offer further guidance and assistance to those contributing to Innovation Zones Milestones, if so requested and agreed.

Innovation Zone Checklist draft prepared August 21, 2017 by:

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In cooperation with: Liberian Inter-Agency Task Force and Advisory Group members, Syracuse iSchool WiTec, iConsult, and IST 466 students.

Please note any errors or omissions are the author's responsibility. The views expressed may or may not be shared by Syracuse University or other institutions with which Prof. McKnight may be affiliated.