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Global Broadband and Innovations (GBI) Program: Overview of Services

The Obama administration's Economic Stimulus Package allocated $7.2 billion to boost U.S. broadband infrastructure, particularly in rural areas. This is in keeping with recent data showing that for every 10% increase in broadband subscriptions, there is a 1.4% increase in economic growth in developing countries.

The GBI Program leverages these same dynamics across USAID's international development portfolio. GBI builds off a history of earlier ICT-related initiatives such as the Leland Initiative and more recently the Last Mile Initiative (LMI). It provides essential support for broadband expansion programs across USAID countries. Further it leverages broadband and mobile to improve the Agency's sector-specific programs through enhanced use of ICTs.

The following provides a brief overview of the three areas in which the GBI Program provides ICT-related support to USAID. Each of these areas is further defined through additional one-page Summaries that provide added detail.

Support to Bureaus and Missions

The GBI Program has been constructed to provide value-added services to the Program and Regional Bureaus, as well as the Missions. This ICT-related support takes several forms and includes the following:

- Research and Consulting
- ICT Assessments
- National ICT Strategic & Tactical Planning
- Program-Project Design & Execution
- Local Capacity Building
- Exploring and Building ICT-Related Public-Private Partnerships
- Procurement Instruments for Buy-in

Infrastructure-Specific Support

Since the mid-1990s, there has been a near global-wide explosion of mobile networks, a dynamic largely brought about by market liberalization. While this represents significant progress, in many countries there remain market inefficiencies limiting extension of broadband and mobile into more rural areas. The GBI provides Infrastructure-related support in the following areas:

- Legal and Regulatory Reform
- Frequency Management
- Strengthening Regulators
- Universal Service Funds
- Extending Services to the Rural Edge

Sector-Specific Support

Whereas the infrastructure support is a key program focus of EGAT's Infrastructure and Engineering Office (I&E), and holds potential for delivering value-add across USAID's development portfolio, within USAID most ICTs are deployed in a program-specific arena. These deployments are in support of economic growth, education, health, agriculture, trade, etc. The GBI Program reaches across these programs by providing the following value-added services:

- Research and Consulting Services
- Program-Specific Assessments
- PWS-TOR Development of ICT Components
- Project Design and Execution
- Exploring-Developing Shared Solutions

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Global Broadband and Innovations (GBI) Program:
Connectivity, Mobile and ICT Innovations

"The global deployment of broadband networks will be as powerful a transformational force for the 21st century as the progressive installation of electricity networks was in the first decades of the 20th century.

… connectivity to broadband networks will be vital to the ongoing development of every nationworldwide."
Mr. Hamadoun Touré, Secretary General of the ITU

"We are pushing to expand Internet access around the world."
Hilary Rodham Clinton, U.S. Secretary of State

"...We have the potential to deploy more resources, build deeper partnerships, and utilize innovative technologies to achieve new progress for our mission."
Dr. Rajiv Shah
USAID Administrator

The U.S. Agency for International Development's new Global Broadband and Innovations (GBI) program has been designed tofocus the Agency's attention and resources on leveraging the adoption of Information and Communication Technologies (ICTs) across it's development portfolio. The GBI Program's focus includes:

Connectivity—GBI provides support for continued market reforms for expanding availability and affordability of access for broadband and mobile Internet services. This includes enabling a growing number of countries to adopt effective Universal Service Funds (USFs) for extending sustainable rural broadband and mobile networks. Innovative new technologies and business models are being explored to introduce new, more cost efficient solution sets for reaching out to the rural edge and closing the digital gap in a environmentally and economically sustainable approach.

Mobile—Worldwide there are an estimated 5 billion mobile phone subscribers—close to 70 percent of the world's population. The GBI program seeks to accelerate local adoption of mobile-based solutions that contribute to extending vital socioeconomic related development activities through these expanding mobile networks. A key focus in this area is on mobile applications that have potential for greater scale and replication that allow faster adoption and broader penetration of successful solutions across the planet.

Innovations—The high tech community has a long history, and in fact is built on the introduction into the marketplace of innovative technology solutions and applications. Typically these are developed by and for mature, developed markets. The GBI program focuses on seeking and gaining global scale from innovative solutions that are more aligned with the conditions and priorities of emerging & developing economies.

Implementation of the GBI Program includes an IQC with Integra LLC and a Cooperative Agreement with NetHope, a consortium of international NGOs with partnerships and support from firms including Intel, Microsoft, Cisco, and several others.

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Global Broadband and Innovations (GBI) Program: Network Enabled Applications

The Global Broadband and Innovations (GBI) Program is an Agency-wide program with two priority areas: 1) extending the reach of broadband, including enhanced mobile networks, into more remote rural areas as key infrastructure for extending reach of USAID's socioeconomic services through NGO and contractor partners, and 2) leveraging the extension of these networks for delivering network-enabled value-added application support across USAID's development portfolio.

Unfortunately USAID's deployments of information and communication technologies (ICTs) are usually considered "one-offs." ICT solution sets are embedded into each project, often as a purchased and/or customized solution tailored to an individual project. This one-off approach has several downsides: 1) high solution costs associated with single implementations, 2) high ongoing maintenance-update costs that frequently are not factored in for the period following the projects close, and 3) institutional staffing costs to provide ongoing technical support (a post-project cost frequently not picked up by the implementing institutions).

With the expanding availability of broadband Internet, there is an emerging complementary trend of commonly used applications migrating to the internet. This is referred to as "cloud computing," or at times simply "shared services." Increasingly, both public and private sector organizations are finding it cost effective to move in-house ICT solutions such as e-mail, file services, payroll, accounting, etc., to the "cloud."

The GBI Program seeks to identify and define the best known solutions within these applications, improve them, and place them into "the cloud," making them available across international development community as a low cost, high value added service (Software as a Service, SaaS).

Within the USAID context, this is a rich opportunity to improve the leveraging of USAID's development funding by focusing on reusable solutions.

For the sector-specific Program Offices (e.g., education, health, agriculture, economic growth, etc.), the opportunity exists to create an innovative approach to ensure quality solutions can be deployed across their programs.

For the Missions this holds the potential for better use of funds by investing less into developing ICT-enabled solutions, and more toward core project implementation components.

These shared solutions will be developed through several different approaches. One approach is to use a single project as a platform for designing and building a solution to meet the immediate project needs, and then using it to develop a replicable solution. Another approach is to use several projects to undertake a shared purchase of an existing solution, thus lowering project costs.

This shared solutions approach is a core element being pursued through the GBI Alliance. This partnership will provide the opportunity to develop shared solutions through a rich partnership of high tech companies, international NGOs, and foundations.

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Global Broadband and Innovations (GBI) Program:
Technical Assistance for Universal Service Funds

As part of its overall strategy to expand connectivity, the GBI Program works with Universal Service and Access Funds (USAFs) to provide telecommunications access to households in remote rural areas. In sub-Saharan Africa USAFs hold large amounts of funds and therefore massive potential for contributing to connectivity expansion. But a recent survey conducted by the ITU of 45 African countries (with 35 respondents) notes that many of these funds sit unused:

> ***"As a whole, the 15 sub Saharan African countries that have legally created UASFs are collecting about US $140 million per year. These countries have collected a cumulative total of about US $468 million, but have disbursed a cumulative total of only about US $40 million. This means that the UASFs have disbursed a revenue-weighted total of 12.7% of the collected amounts. This result is generally representative and is not skewed by any particular country."*** *

Reasons that sub-Saharan African USAFs underspend are broad and include issues of organizational structure, independence, strategy and capacity. GBI believes that by working with these funds processes can be improved and more money can be directed at the problem of lack of access. GBI's program of assistance to USAFs includes:

Expanding Awareness/Best Practices
Though USAFs across the world serve the same purpose, in fact they are often run differently in each country. Consequently, a number of different approaches have been tried in response to a common set of challenges. GBI aims to work with a broad group of USAFs, identify best practices, spot the most pressing problems, and develop shared toolkits and modules that can be used to harmonize and improve USAF development.

Supporting New USAFs
A number of countries have passed legislation supporting USAFs, but have not as of yet moved forward with their implementation. Here GBI's focus is on supporting countries in their initial establishment of a USAF: specifically on creating effective institutional structures and building capacity.

Improving Existing USAFs
Even USAFs that have been in operation for quite some time face challenges. Example can include disbursing processes, lack of clear strategic and operational plans, and managing project implementation. Here the focus is on working with USAFs to identify areas for improvement, and then providing them with technical assistance to facilitate change.

Coping with Digital Convergence
In past years USAFs had focused primarily on providing fixed line voice telephony to remote regions. As the internet came into being many moved into telecenters. Now, with the increasing integration of voice, data, and broadband services new USAF business models are needed. GBI works with USAFs, both nascent and well established, to refocus their operations in order to take account of this emerging technological reality.

* *Sepulveda, Edgardo. Report on Universal Access and Service Funds in the sub-Saharan Africa Region, ITU, 24 March 2010*

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Global Broadband and Innovations (GBI) Program:
Support for Program Specific Use of ICTs

The GBI Program has been designed to provide programmatic support in two key areas; broadband and mobile infrastructure, as well as the innovative use ICTs in USAID programs. With this support GBI will expand and enhance the creation and delivery of value-added content and services for program initiatives in the areas of health, education and training, agriculture-food security, economic and business development, and government access.

Two dominant themes upon which this GBI support will be based are increased scalability and replication. The goal is to increase the efficiency and effectiveness of deploying ICT solution sets so that USAID moves away from what are often "one-off" ICT solutions deployed at a project level, and towards common-shared solutions that can be deployed across multiple projects, by multiple NGOs and contractors.

The GBI Program supports programs through the following:

Network-Enabled Applications

Over the past few years there has been a growing trend towards increased reliance on "cloud computing," which makes it possible for organizations to gain access to selected ICT-solution sets through the Internet. This approach lowers costs, reduces start up time, and provides greater potential for scale sustainability. This most often requires broadband—hence the close linkage within the GBI Program.

Mobile Applications

The exponential growth of mobile networks provide valuable infrastructure for delivering development-related content and services. And as these networks are further enhanced to deliver broadband access to the internet, USAID has the potential for even greater ICT leverage. Mobile network expansion provides USAID with the opportunity to launch and/or support the establishment of a local, entrepreneurial mobile application development industry. In addition to delivering commercial apps, this can be used as a local source for developing targeted localized development related mobile-apps.

Common-Shared Solution Sets

The GBI Program has put into place a Cooperative Agreement with NetHope, a consortium of international NGOs with a number of supporting U.S. high tech companies such as Intel, Microsoft, and Cisco. A dominant focus of this GBI Alliance is to develop and place onto the "cloud," common-shared applications that support USAID's international development programs and projects.

Cisco Entrepreneur Institute

The Office of Development Partners/Private Sector Alliances Office (ODP/PSA) has recently reached an agreement with Cisco Systems, Inc. for promoting their Entrepreneur Institute—an extension of their successful Networking Academies that works with local public and private sector organizations to promote entrepreneurship for social and economic development. The goal is to implement 10 Institutes over the next two years. More information on this program can be found at www.ciscoinstitute.net.

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Global Broadband and Innovations (GBI) Program:
GBI Tech Seminar Series

The Global Broadband and Innovations program is a major USAID initiative in the ICT4D space that focuses on expanding access to telecommunications in the developing world and facilitating the innovative use of ICT for development.

GBI also provides information and resources to USAID employees on the latest in ICT4D. This information is provided in a variety of ways including the GBI Portal (www.GBIportal.net) and the GBI Tech Series.

The GBI Tech Series provides a venue for discussing and exploring a variety of ICT4D topics pertaining to USAID's development efforts. Seminar participants are exposed to innovative development approaches through 60-90 minutes workshop sessions that include presentations and panel discussions.

Diverse topics such as participatory mapping, providing low cost mobile connectivity, and youth engagement, which focus on emerging issues and lessons learned and that are drawn from the experiences of those within USAID, other US government agencies and the implementing partner community are of particular interest.

The GBI Tech Series takes place monthly and is usually scheduled during a lunch hour, but times may be flexible as needed.

Those interested in making a presentation must submit a topic proposal including the following:

- Topic for presentation and session title
- Presentation method (panel discussions, lecture, interactive session, etc)
- Session abstract
- Available dates

We will confirm receipt of your proposal; and should your topic be selected for the series, we will coordinate with you regarding specific arrangements.

The GBI Tech Series is designed for USAID and State Department staff and are held at USAID headquarters in the Ronald Reagan Building. At this time travel support is not provided.

For more information on the GBI Tech Series, please contact Laurie Moy, lmoy@integrallc.com; or Alison Padget, alison.padget@nethope.org .

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USAID/NetHope Alliance:
Implementing Instrument

The primary focus of the **Global Broadband and Innovations (GBI) Program** is to provide leadership on a range of information and communication technology (ICT) related activities across USAID's development portfolio. This includes not only infrastructure, but also the leveraging of that infrastructure to support broadband and mobile network-enabled applications for programs including education, health, agriculture, and economic growth.

The GBI Program focuses strategically on two priority areas:

1. Extending the reach of broadband, including enhanced mobile networks, into more remote rural areas as a key infrastructure for extending the reach of socioeconomic services through USAID's NGO and contractor partners, as well as others working within the international, national, and local development community, and
2. Leveraging the extension of these broadband and mobile networks for delivering network-enabled value-added application support across USAID's development portfolio.

A fundamental component of achieving this second priority is the leveraging of public-private partnerships (PPPs). Toward this end, the GBI Program and NetHope have come together to form the GBI Alliance. This relationship places a priority on the second of these two focus area, recognizing that within the NetHope ecosystem, there is a connectivity component as well.

NetHope is a rich consortium of 32 of the largest international NGOs working in over 180 countries (www.nethope.org). NetHope's partners include several US based high tech companies such as Intel, Cisco, Microsoft, and Google and international industry associations such as the Global VSAT Forum (GVF). Other supporting organizations include the Rockerfeller Rockefeller Foundation, the Gates Foundation, and the W.G. Kellogg Foundation.

NetHope's core mission is to serve as a catalyst for ensuring its members have access to the best information and communication technology and practices when serving people in the developing world.

Their focus is on five strategic initiatives:

- Connectivity
- Field Capacity Building
- Emergency Response
- Shared Services
- Innovation

Through the GBI Alliance, USAID will be working closely within the NetHope ecosystem to target high priority areas needing special attention, develop requirements for common ICT solution sets, and ultimately develop and make available across the NGO community, shared solutions that can be implemented by the NGOs as core components of their projects. The goals of this collaboration are to reduce implementation time, lower the implementation and operational costs, enhance the quality of support through shared solutions, and help ensure richer and more scalable, replicable, and sustainable use of ICT solutions.

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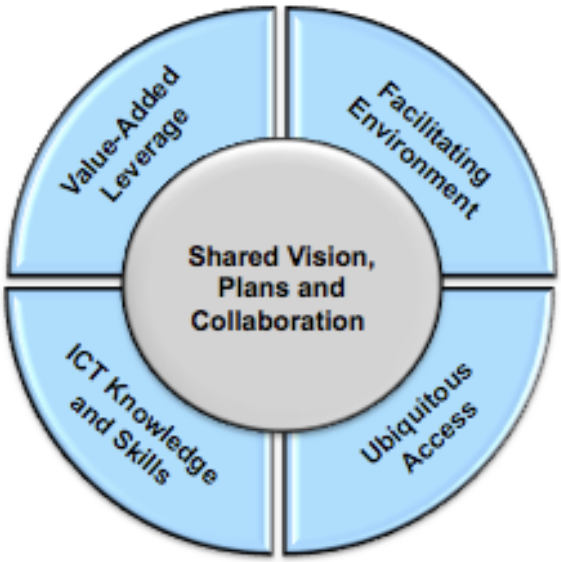
Global Broadband and Innovations (GBI) Program:
In-Country Ecosystem for Change

Leveraging ICTs can be viewed as expanding access, and then delivering value-added applications over this access. But in order to achieve success, there is the need for an integrated ecosystem. This paper outlines key ecosystem components.

Shared Vision, Plans and Collaboration

The core to the ecosystem is having a single national-level focal point—a nexus for bringing about results over an extended period. There is the need for an in-country advocate to provide leadership, coordination and integration between the public sector and key private sector participants



Facilitating Environment

A second essential building block is the creation of a facilitating legal-regulatory environment. Here the commitment migrates to legal and regulatory change. Often the telecom regulatory function must be strengthened. To address an urban-rural divide, a universal access or service fund (UASF) should be considered. Often changes are needed to allow for electronic access to financial services, education to support ICT-enabled learning and certifications, health services to allow for video-based doctor visits with the ability to issue remote prescriptions, etc.

Ubiquitous Access

Delivering ubiquitous access is the domain of the private sector. This actualizes L&R changes, with a focus on achieving affordable pricing and extending access to rural localities. The adoption of a newer generation of lower-cost lower-power telecom solutions suitable for expanding sustainable rural broadband/mobile deployments holds a key, as do refined business-financial models more suitable for small-scale deployments.

ICT Knowledge and Skills

This element includes enhancing the entrepreneurial capacity, along with technology-specific knowledge and skill sets. This is an area where there are a number of international firms such as Cisco, Microsoft, Intel, and others offer technical skill training. This training often leads to certifications—each reflecting a requisite skill level to enter the local and international workforce.

This upgrading of capacity focuses on technical and soft skills such as project management, supervision, and management.

Value-Added Leverage

Ultimately the value derived by enhanced access to broadband is in its use—the Application of the technology. It is the adoption by both the public and private sectors that enhances delivery of value-added services across all sectors, all localities.

The focus here is on improving government, services, health services, education, agriculture, financial services, and business development.

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Global Broadband and Innovations (GBI) Program:
Extending Access to Rural Communities

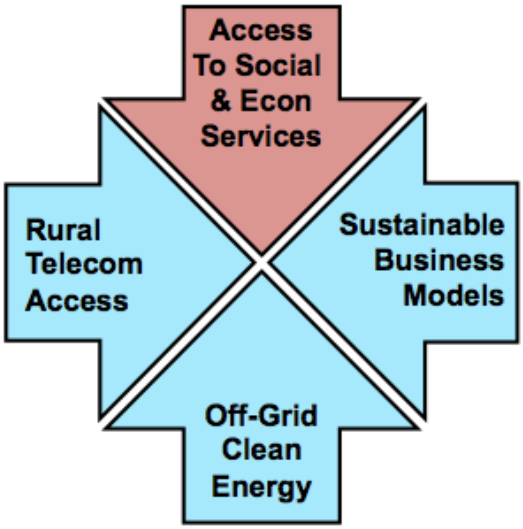
Demographic data reflects approximately 56% of developing country populations, an estimated 2.85 billion, live in small rural communities—2.95 million discrete localities.

This population is often the most socio-economically disadvantaged, with women and indigenous ethnic minority groups carrying the heaviest burden brought about by this isolation.

Access to Social and Economic Services

These rural populations are also often a priority for international donor and government programs.

As reflected in the large number of rural localities worldwide, leveraging ICTs may be the only viable approach for delivering socioeconomic services for years to come.



These services range from basic voice and text services capable of providing mobile money, mobile agriculture, etc. With broadband, more sophisticated services can be provided to these remote locations—education, health services, access to government, etc.

Rural Telecom Access

Nearly 50% of the rural populations in developing countries are without access to electricity and voice services. Virtually all are without affordable broadband services.

The current challenge is in reaching these rural communities. Fortunately over the past few years a number of commercially viable innovative technologies solutions have surfaced, capable of delivering high quality access at a significantly reduced cost.

These dynamics include a move towards small cell solutions, along with broadband distribution and long-distance backhaul solutions using unlicensed frequencies. A new generation of Ka band satellites also holds rich potential.

Off-Grid Clean Energy

The new generation of small cells and long-distance connectivity solutions also require lower demands for electricity.

Parallel to this, there are viable clean electricity solutions emerging, including solar, wind, and pico-hydro. And in the near future, small-scale biofuel solutions—all being suitable for meeting demands in off-grid settings.

Also, new business models are emerging in these off-grid settings, where there are opportunities for leveraging a community-based network as an anchor tenant for bringing electricity into the rural community via micro-grids.

Sustainable Business Models

Ultimately there is the need to achieve financial sustainability. New business models needs to focus around the deployment of thousands of community-based microtelcos. One model is where these local deployments are through a franchise arrangement. Others include build-own-operate or build-own-transfer models.

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Global Broadband and Innovations (GBI) Program:
Implementing Instruments

In October of 2010, USAID's ICT Division located with E3/E&I Office, launched an Agency-wide GBI program. This program id built on a model that focuses on both expanding **Access** and **Applications**.

With the launching of the GBI program, two new implementing instruments were put into place to provide support. These instruments are in addition to the ICT Division having a long-term relationship with the USTTI. Since the launch, the GBI program has also put into place an Interagency Agreement with the Department of State. Further, the GBI is partnering with the Science and Technology Office, on a cooperative agreement with the Blum Center.

The following provides a short description of these implementing instruments.

Integra LLC

Integra LLC is a small business providing GBI support primarily in the areas of national broadband planning and universal service and access funds (USAF). They are currently engaged in supporting five countries, with more in the planning stage. http://www.integrallc.com

NetHope

NetHope is an NGO with 34 international NGO members, with a focus on providing ICT solutions to its members. It has pulled together a rich ecosystem of high tech supporters and Foundations. NetHope currently supports the GBI program in its **Access** agenda, through a focus on extending rural broadband.

The cooperative agreement is also supporting several program Offices for support in the **Applications** arena, including health, mobile payment, youth gaming, human trafficking, and portal/cloud services. http://www.nethope.org

U.S. Telecommunications Training Institute

The ICT Team has had an engagement with USTTI for over 20 years. This NGO provides a wide-range of technology-related training with seminars and classes from other USG Agencies and U.S. based high tech firms. Typically the training is through one or two-week sessions. USTTI has graduated over 8,500 students from 170 countries. The latest focus is on augmenting their in-U.S. based training with on-line training courses. http://www.ustti.org

Technology Leadership Program

The TLP is a new Interagency Agreement between USAID and the State Department that allows the GBI program to gain access to USG legal and technical resources. The agreement is such that the GBI program funds the travel-related costs associated with providing short-term in-country technical assistance, with a priority focus on **Access**-related topics.

Resources are available from State, the Federal Communications Commission (FCC), the Department of Commerce's National Telecommunication and Information Administration (NTIA), the Department of Treasury, the Broadcasting Board of Governors (BBG), and others.

UC Berkeley Labs

The GBI program is also partnering with USAID's S&T Office, supporting a USAID-Blum Center cooperative agreement. Specifically this engagement focuses on leveraging new technologies—exploring solutions developed by UC Berkeley Labs that has potential value to USAID's programs. The focus is on moving these promising solutions from the Lab to the Field.

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Global Broadband and Innovations (GBI) Program:
Program Overview

USAID's GBI program is designed to provide a comprehensive approach for harnessing the power of ICTs across USAID's development portfolio. The program is structured as having two core components: Access and Apps (applications). Each of these components breaks down into two elements. The GBI strategic focus is to serve as a catalyst for social and economic change.

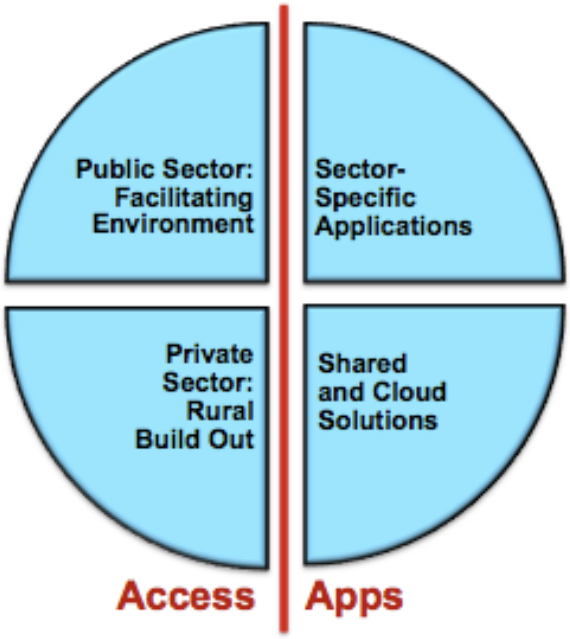
This Overview document provides a summary of the core components, with additional one-page documents providing more in-depth descriptions.

Access

The Access component focuses resources on extending both voice and broadband, with a specific thrust on rural communities. Within the Access component the GBI program addresses two elements.

Public Sector: Facilitating Environment – a fundamental requirement for extending access is a legal and regulatory environment that facilitates private sector investment required for build out. While there are a number of topics needing to be addressed, the GBI program concentrates on three: 1) national broadband plans, 2) universal service and access funds, and 3) promoting "white space" frequencies.

Private Sector: Rural Build Out – ultimately the private sector makes the needed investments for extending voice and broadband networks. The GBI program works with carriers, mostly mobile network operators (MNOs) and ISPs, in the areas of: 1) adopting a new generation of low-cost solutions that can be powered by clean energy, 2) adopting business-financial models more suitable for small-scale rural deployments, and 3) adopting use of unlicensed "white space" frequencies for expanding lower cost rural coverage.



Apps

The Apps component focuses resources on gaining the value-add from the expanding access. Within this component the GBI program addresses two complementary elements.

Sector-Specific Applications – increasingly ICT solutions, specifically applications, are being built into USAID's programs as an integrated element for delivering value to the target recipients. At this time there are a number of programs where Apps are a priority element, including health, education, agriculture, m-payment services, etc.

Shared and Cloud Solutions – with the growing Access and Apps, this element focuses on creating a portal to facilitate sharing of common solutions as well as supporting access to cloud-based services residing on the Internet.

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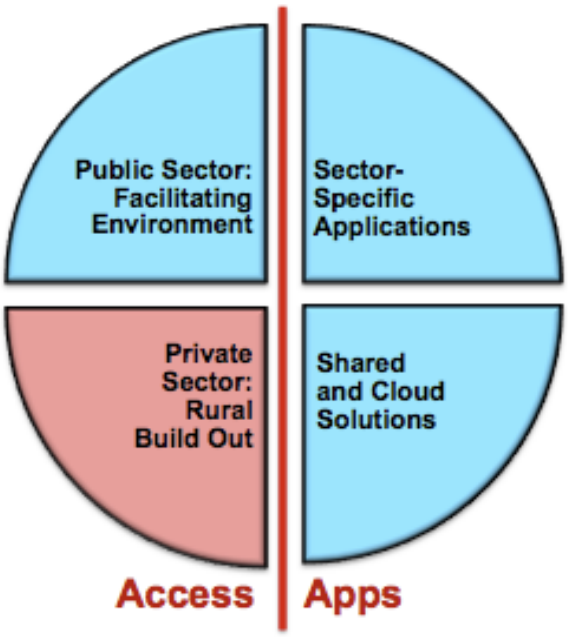
Global Broadband and Innovations (GBI) Program:
Private Sector: Rural Build Out

With market liberalization, the private sector will make investments to expand both voice and broadband services. The one area where obstacles remain however is in extending voice and broadband services into rural communities.

The primary obstacles needing to be overcome relative to expanding rural build out include: 1) there are simply more profitable markets in urban settings with greater return on investment, and 2) there is most often an imbalance in the amount of capital investment required to reach rural customers relative to the revenue potential of low-density low-income populations.

The GBI program is designed to provide technical assistance on three primary topics.



Adoption of New Technologies

Rural deployments often rely on long distance backhaul, typically via microwave, with distribution typically by mobile networks. With public sector focus on expanding national broadband, the microwave backhaul in part is replaced by higher-capacity fiber. For reaching isolated small communities off this fiber backbone, unlicensed WiFi and newer Super WiFi solutions hold rich potential.

For distribution of broadband, there are several technology dynamics at play, including migration from 2G-to-3G-to-4G, along with the migration from a larger macro cell architecture to a small cell architecture. Combined these new technologies offer both voice and broadband over a single network at a much reduced cost. Further, these solutions can be supported by clean energy solutions (solar, wind, pico-hydro) due to low power requirements. Result: lower capital and lower operating costs.

Appropriate Business Models

With smaller community-sized deployments there is the need for carriers to adjust their business models, as there could well be tens-of-thousands of small cell deployments. These could be via the adoption of a franchise model, a build own operate model, or a build own transfer model.

The key is to adopt an approach that allows for rural build out to take place parallel to more profitable urban build out such as to narrow the urban-rural broadband divide.

Utilizing White Space

With the public sector migrating frequencies in the sub-1GigaHertz range, there is the rich potential for expanding rural broadband access via unlicensed “Super WiFi.” These frequencies have the advantages of both long-distance and non-line-of-sight coverage. These attributes combine to extend broadband coverage at a substantially lower cost.

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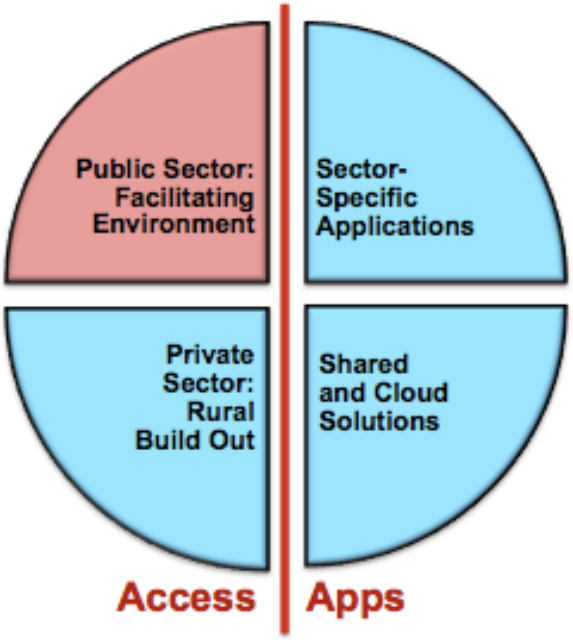
Global Broadband and Innovations (GBI) Program:
Public Sector: Facilitating Environment

Fundamental to expanding voice and broadband services is a facilitating legal and regulatory environment that actively promotes carrier build out. This becomes especially critical in two key areas: 1) expanding national broadband, and 2) extending voice and broadband into rural communities.

In recent years there has been a movement towards market liberalization that supports competition. This has most often been focused on expanding voice services, with the global explosion of mobile voice services being a result.

More recently the focus has shifted to expanding broadband access.

The GBI program is designed to provide technical assistance on a range of topics in this component, with concentrated attention on three topics.



National Broadband Plans

With the recognized socioeconomic value of broadband, increasingly countries are placing attention on the need for having a comprehensive approach for ensuring national build out. Whereas an open and competitive market can often address expanding voice services, the backbone costs associated with broadband requires a more strategic national approach in order to secure private sector investment, and to ensure the build out does not result in an urban-rural broadband divide.

The GBI program provides technical assistance to countries to develop or update existing national broadband strategies. This is frequently linked with establishing or refining a Universal Service and Access Fund (USAF).

Universal Service and Access Funds

Historically USAF's have focused on extending voice services into rural communities. This has most often been by a subsidization model to bridge the gap between carriers' cost of delivery and revenue. With newer technologies there is now the potential to reshape the USAFs such that a single network delivers both voice and broadband services. Further, with the new lower cost technologies, there is the potential to substantially lower costs such that the USAF can become a source of capital for attracting and shaping private sector investments.

White Space

An exciting opportunity now emerging is the reallocation of frequencies being used for analog radio and TV broadcast to digital. This migration frees up frequencies in the sub-1GigaHertz range—frequencies that have excellent properties for supporting long distant transmission of broadband at a low cost. This is especially critical for extending rural access.

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USAID
FROM THE AMERICAN PEOPLE

Global Broadband and Innovations (GBI) Program:
Extending Rural Access with Clean Energy

For the past 20 years, leveraging information and communication Technologies (ICTs) has become an integrated element across USAID's development portfolio. Studies from the World Bank, IFC, and others have documented the economic value of telecommunications. Further, the United Nation's Broadband Commission has drawn direct linkages between broadband and achieving the Millennium Development Goals (MDGs).

Parallel to this ICT uptake there has been considerable ICT-related innovation. This has substantially reduced both cost and electricity demand. These dynamics are allowing ICTs to reach off-grid rural populations—populations that are often the focal point of USAID programs.

Extending mobile and broadband access to reach rural populations is a major thrust of the Global Broadband and Innovations (GBI) program. It is within this focus that there are rich opportunities for melding ICT and Clean Energy engagements:

Rural Community Deployments

The GBI program focuses on extending mobile-broadband access to rural communities that are currently without access. This includes working with the private sector, typically the mobile operators by providing technical assistance for deploying these new low-cost low-power solutions. These solutions are suitable for small community-level deployments and are suitable for being powered by clean energy.

Anchor Tenant for Clean Community Power

In addition to extending mobile-broadband into un-served rural communities, there are at present an estimated 600,000 off-grid mobile base stations worldwide—virtually all of which are diesel powered. These base stations, along with the community deployments, provide two opportunities.

First, for these existing 600,000 base stations there is the possibility to economically migrate a portion of these to clean energy—be it solar, wind, pico-hydro, even bio-fuels. This serves to both lower the carbon footprint, but also to lower operating costs—a critical issue with increasing oil prices.

Second, for both these existing macro base stations, and the newer small cell deployments, there is the opportunity to leverage the base station as an anchor tenant for local energy generation. Under this scenario, generating capacity is over-built, allowing modest levels of electricity to be provided into the local community via a micro-grid—to a school, a government office, a health clinic, etc.

Solar Cell Charging Stations

Where mobile-Internet access either exists or is introduced, there is the local demand for cell phone charging. This represents a local community micro-small business opportunity. Also, in meeting this demand it increases revenues to the mobile operator and thus sustainability. A range of solar-based solutions to meet this need have recently entered the market, several with supporting models.

Solar Computer Labs & iCafés

In addition to access, there is the opportunity for melding clean energy with off-grid computer labs, public kiosks, and business use. This allows for extending Internet-based services into remote locations—again, by relying on clean energy solutions while at the same time, providing sector-specific support to USAID programs.

The combining of ICT and Clean Energy is an important leveraging opportunity for rural development-related programs. It is a primary focus of the GBI program.

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USAID
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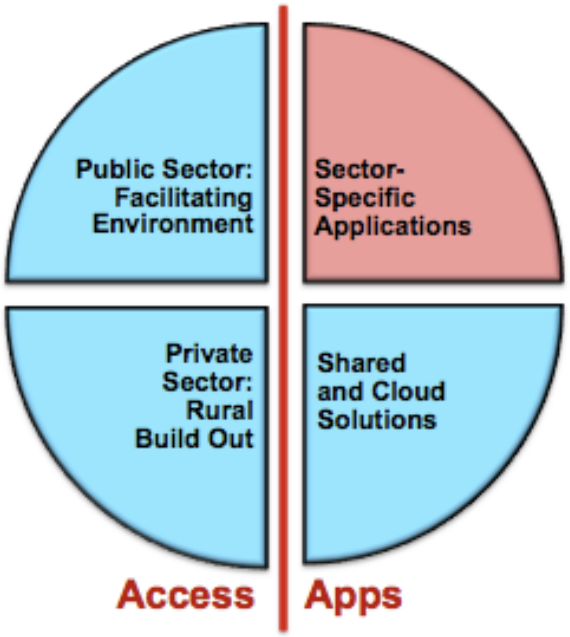
Global Broadband and Innovations (GBI) Program:
Sector-Specific Applications

A dynamic taking place within USAID in recent years has been that Apps are most often embedded into USAID's sector programs, projects and ultimately, procurement instruments, as value-add within the project context. This results in a highly distributed approach for adopting sector-specific Apps, where most are deployed by the Missions via their procurements.



Within several USAID/Washington program offices there are active Apps initiatives that serve as a sector-specific nexus for moving towards common solutions.

This theme seeks to place the sector program offices in a lead position for providing direction and coordination associated with the use, adoption and promulgation of sector-specific Apps being deployed across USAID's development portfolio.

The goal is to move the Agency towards the adoption of standardized solutions where practical and encourage/support the broad adoption of common shared solutions that represent best practices.

Two other Apps themes are taking place within the Agency.

Sector Priorities

At this time there are several high priority Apps being advanced by selected programs. These efforts support Agency-level strategic initiatives, where the Apps serve an essential role in extending reach or adding value to the specific program.

- **Mobile Money**. A high priority is being placed on expanding the adoption of mobile-based payment, and other financial services through its Better than Cash program.
- **Mobile Agriculture**. With the increased strategic focus on Feed the Future, USAID places high priority on supporting farmers with ready access to weather and pricing information.
- **Education**. An Agency priority is improvement of literacy levels with ICT playing a key role in several areas.
- **Health**. USAID's focus alongside PEPFAR is to create a set of mobile health interoperability guidelines as well as to provide support of maternal and child health; this places a priority on leveraging ICTs as part of related solutions being explored.

Agency Coordination

The focus of this theme is the establishment and convening of an informal working group that serves as a nexus for ensuring an appropriate level of Agency coordination. The Mobile Solutions Division within IDEA Office (USAID/A/IDEA/MD) is leading this coordination.

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USAID
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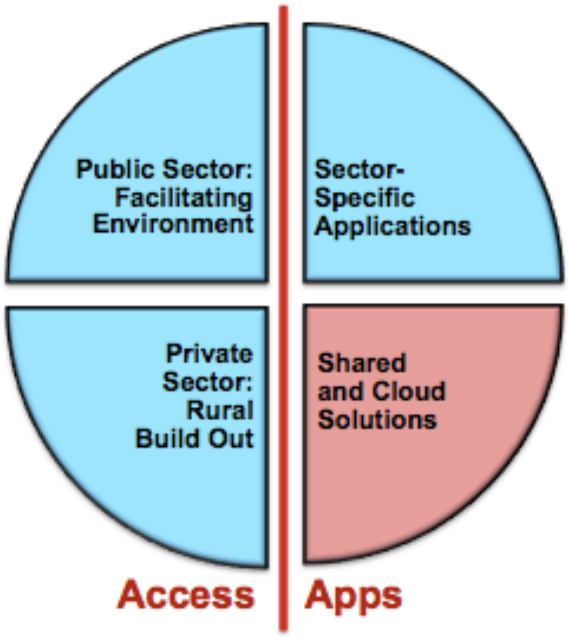
Global Broadband and Innovations (GBI) Program:
Shared and Cloud Solutions

The leveraging potential of expanding access, combined with the richness of the applications environment, has created a rich opportunity for expanding the delivery of value-added socioeconomic services to a larger audience at a reduced costs.

However, due to the distributed nature of USAID, it also has created a situation where there is risk of inefficiently investing in Apps that perform many of the same solutions. To date this is being addressed by improved internal coordination.

This element seeks to further the leveraging of shared Apps by making them openly available to not only USAID, but to the larger international development community. The approach consists of two key elements:



Applications Portal

The thrust of this element is to create an online portal aimed specifically at providing a common online location for presenting and identify solutions having specific value-added to the international development community. Some of these will have been developed on behalf of USAID's programs and projects, but others will come from other international development organizations, NGOs and commercial firms that offer appropriate solutions. An initiative is currently underway through the GBi Alliance with NetHope, with participation by NGOs and several high tech firms.

Cloud Solutions

This element establishes partnerships with a number of private sector firms that collectively provide a rich array of development-relevant cloud services. These cloud services provide the core component for delivering shared solutions upon which greater scale of deployments is supported. The orientation is to offer shared solutions for use by international development agencies.

The focus is on cloud-based solutions with key advantages including: faster implementation, lower acquisition and operating costs, and eliminating the need for embedding complex technologies into local institutions that often lack capacity to sustain use of technology beyond the project funding provided by USAID.

The orientation is to place a priority on applications that are aligned with the Agency's priorities that eliminate duplication, and move the Agency towards the adoption of scalable and replicable "best-of-breed" solutions. It also seeks to place a focus on achieving impact beyond the confines of USAID through partnering with, and offering added value to, other international development organizations.

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Global Broadband and Innovations (GBI) Program:
Closing the Urban-Rural Divide

In December 1984, Sir Donald Maitland issued his "The Missing Link" report that placed the connectivity disparity into the international consciousness. In the 2000s this focus was relabeled the "Digital Divide." Initially viewed as a nation-to-nation issue, more recently the focus has shifted to an Urban-Rural issue.

The focus has also been reshaped in several other ways. Once dominated by voice, it now includes the Internet, even broadband. Initially limited to fixed services, the dominant focus in now mobile. It is no longer just access, but also affordability. And access now incorporates accessing value-added socioeconomic services—services tied directly to the Millennium Development Goals (MDGs).
One of the key components of USAID's Global Broadband and Innovations (GBI) program is closing this Urban-Rural divide. There is still an estimated population of 1-1.5B without access or affordable access to mobile services—substantially more without broadband access. The majority of those without access live in remote rural communities—populations often a priority for USAID programs.

The GBI program addresses this divide through focused public and private sector engagements.

Public Sector Focus

The recent market explosion in mobile services has been the result of a global move towards market liberalization. While figures differ, the mobile explosion has resulted in an estimated 5B+ mobile subscriber base.

The two remaining current constraints are:

1) access—where coverage hasn't extending into rural communities, and
2) affordability—where the costs are too high in proportion to income levels.

The primary public sector engagement of the GBI that addresses these constraints centers on providing technical assistance (TA) in establishing new, or improving existing, universal service and access funds (USAFs). Effectively these USAFs are taxes on the carriers that are placed into a government-managed fund, and redistributed back to the carriers in direct support of extending affordable rural access. The GBI program is currently engaged in supporting several countries.

Private Sector Focus

The predominant challenge for the mobile network operators (MNOs) with regards to extending services into rural communities is simply economics—higher costs of delivery and lower revenue potential. Most MNOs have already reached beyond the power grid, so fuel costs and delivery, even security, are additional issues.

Fortunately a series of recent innovations are now entering the market that significantly lower the capital and operating costs for supporting these rural deployments. Further, these innovations substantially reduce the power requirements—allowing for economically deploying clean energy solutions, be it solar, wind, or pico-hydro.

The primary private sector engagements of the GBI program include working with these MNOs and equipment manufacturers of these newer technologies, in accelerating their adoption. In addition, this work includes exploring and refining innovative business models more suitable for rural community-based small cell deployments.

The GBI takes a position that we are on the verge of having the practice, technology, and business solutions, capable of eliminating the Urban-Rural divide with regards to extending access to both affordable mobile and broadband services.

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March 2, 2012

Rural Development: Leveraging Clean Energy and ICT

For the last 20 years, leveraging of information and communication Technologies (ICTs) has become an integrated element within USAID's development portfolio. At the macro level, studies from the World Bank, IFC, and others have documented the economic value of telecommunications. The United Nation's Broadband Commission has drawn direct linkages between broadband an achieving the Millennium Development Goals (MDGs). At the implementation level, ICT are currently built into most programs, projects, and procurement instruments as critical elements—be it mobile applications for capturing and delivering health services, mobile money, mobile agricultural services, education, etc.

Parallel to this uptake of ICTs for socioeconomic development, over the last 5+ years there has been a rich dynamic of innovation within the ICT space. This has substantially lowered the cost of ICTs and also lowering the electricity power required for these ICT solutions. These dynamics allow for ICTs to be pushed further out into rural localities where ICTs can be leveraged to support more rural, off-grid populations—populations often the focal point for USAID programs.

Devices—at the device level (personal computers, laptops, etc.), average prices for suitable devices has dropped from $2,500 down to $500. Electrical power requirements have dropped from 200-250 watts for a standard PC with monitor to under 10 watts for a fully-functioning netbook. A new generation of tablet devices require under 2 watts. The opportunity now exists to deploy school computer laboratories, community ICT centers, health clinics with ICT, etc., in complete off-grid settings using clean energy.

Networks—at the network level (mobile and broadband), the carriers have already moved beyond the limits of the national power grid. The GSMA predicts by the end of 2012 there will be 640K off-grid mobile base transceiver stations (BTSs). Most all of these are powered by diesel. But here again, newer innovative solutions are driving the price point down to where smaller, community-sized BTSs are now under $50K. Further, the electrical power requirements of these newer BTSs have dropped from 3-5K watts to under 100 watts. Here too with these lower power requirements, clean energy can be used to provide the needed power—not only for the network itself, but also, by oversizing the generation capacity, leveraging the BTS as an anchor tenant within the rural community for delivering through micro-mini grids, at least modest amounts of energy to the local school, government offices, health clinic, businesses, and even households.

The potential for combining Clean Energy with ICT as an important leveraging opportunity for rural development, and is a current focus that the GBI program is pursuing in several countries at a demonstration level.

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Date: 28 February 2012

Global Broadband and Innovations (GBI) Program Concept Paper:
Establishing Regional USAF Associations

The GBI program focuses on two components, Applications and Access, with a priority focus on Access. For this Access component, the priority is placed on two key elements:

- ***USAFs***—the GBI program providing technical assistance to establish and strengthen universal service and access funds (USAFs). The dominant focus is on expanding rural access of both mobile and broadband services.
- ***Rural Connectivity Build Out***—this element includes working with mobile network operators (MNOs) to support adoption of lower cost solutions, clean energy solutions, and business models for rural deployments.

Regional USAF Associations

During the first two years of the GBI program the potential value for establishing regional USAF associations has repeatedly surfaced. This paper provides a first cut on this potential. This concept paper is designed to vet the idea, refine the concept, and generate interest and support for establishing functional, effective USAF Associations in the Asia and S. American regions. The first step is to identify the stakeholders, while designing a business model for the sustainable operation of the association.

Mission Statement: Provide a regional forum to improve the design, efficiencies, effectiveness, and transparency of country-level USAFs through the sharing of information, lessons learned, and specific country case studies.

Goals: The Goals of a Regional USAF Association include:

1. Establish a regional forum to leverage USAF-related technical assistance within the region.
2. Provide a regional forum for sharing successes and best practices from neighboring countries.
3. Accelerate the adoption of successful solutions by those countries that are lagging the maturity of regional counterparts.
4. Provide a regional mechanism for collecting and reporting USAF-related data to track country and regional progress.

Implementation/Operations: The following are required for establishing these regional Forums.

- **Global Sponsor**—one option would be a regional or global organization to serve as anchor sponsor and administrator for the regional USAF association.
- **Regional Convener**—an organizer and convener of formal discussions between country USAFs. Collaborative regional engagement will require periodic regional meetings to serve as a forum for transparent sharing of information.
- **Shared Libraries**—another key element will be shared materials, most logically through a common portal with regional-specific content.
- **Technical Assistance & Consultation**—with current technology the national USAFs have the potential to access technical assistance on successful USAF operational and structural design, lessons learned and best practices through technical assistance from a range of sources, including USAID.

Support: The regional USAF association will add value to the public and private sectors. The proposed funding approach is through a membership fee from the national-level USAFs. The second funding source will be though contributions of associate members, including foundations and high tech firms.

Those with an interest and with contributions to make to this unfolding dialog should be in touch with the GBI program as reflected below.

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Date: 10 May 2012

USAID FROM THE AMERICAN PEOPLE | GBI Program

Closing the Urban-Rural Digital Gap: Off-Grid Technologies

In recent years there has been explosive growth in the global subscription rate for mobile services. However, estimates are that there remains a gap in affordable coverage somewhere on the order of 1.0-1.5 billion potential subscribers. Of these, the overwhelming proportion live in rural communities. Several reasons account for this lack of service; 1) economics—for the carriers, there is relatively low revenue compared to cost of delivery, 2) lower hanging fruit—for most carriers, there are simply more profitable markets, 3) universal service funds—often these are not in place or are not effective in addressing this urban-rural gap, and 4) lack of electricity—in many rural localities there is simply the lack of power.

Fortunately this situation is beginning to change, with the following dynamics making this rural expansion increasingly practical.

- **Smaller-Lower Cost Pico-Micro Solutions**—most rural communities have an average population of less than 2,000, and equipment companies are just recently delivering solutions to address this market
- **Lower Cost Backhaul Solutions**—historically mobile backhauls have been proprietary—adding to the cost. The shift now is to a pure IP backhaul. And with this, edge switching is possible for keeping local calls local—a critical element when the backhaul is via satellite. IP backhaul also delivers broadband to the rural communities.
- **Solar Powered Solutions**—many of these small rural solutions are capable of being powered by solar, both at the tower-base station, as well as for the mobile handsets.
- **MicroTelco Business Model**—the emerging technical and business model needed to address the rural challenge is that of a massively parallel approach. This requires a technology that can be installed and supported by non-technical staff. Also, it requires an approach that can be supported through a local community operated approach under the license of a carrier.

While the industry is just now beginning to focus on this market, already a number of firms are starting to deliver low cost rural mobile solutions. There is considerable variance in these solutions, but some are beginning to get the monthly average revenue per unit (monthly ARPU) required for sustainability down to the $3-5/month range. The following reflect several:

VNL—VNL is a company from India that has introduced a WorldGSM product line and community business model (http://www.vnl.in).

Autobridge—Altobridge is an Irish company with a unique set of technologies and business model (http://www.altobridge.com).

STM Group—The STM Group offers complete backhaul and local distribution through their SuperPico GSM products (http://www.stmi.com).

Ubiquisys—Ubiquisys one of a growing number of Femtocell firms delivering rural low-cost rural solutions (http://www.ubiquisys.com/ub5/).

Nokia Siemens Network—NSN's Village Connection solutions deliver low Monthly ARPU solutions for rural settings (http://www.nokiasiemensnetworks.com/portfolio/products/gsm-edge/village-connection-solution)

The above represent an exciting opportunity for ultimately eliminating the urban-rural divide. The GBI program is actively researching and engaging the above firms, along with others, to better position these within the overall context of USAID's focus on addressing the rural gap.

For more information contact Joe Duncan, GBI Program Manager (jduncan@usaid.gov)

USAID
FROM THE AMERICAN PEOPLE

Global Broadband and Innovations (GBI) Program:
Leveraging Clean Energy and ICT

For the last 20 years, leveraging of information and communication Technologies (ICTs) has become an integrated element within USAID's development portfolio. Studies from the World Bank, IFC, and others have documented the economic value of telecommunications. Further, the United Nation's Broadband Commission has drawn direct linkages between broadband and achieving the Millennium Development Goals (MDGs). For USAID this has manifested itself by imbedding a range of ICT-enabled solutions into its programs—be it mobile applications for capturing and delivering health services, mobile money, mobile agricultural services, education, etc.

PHOTO: ALTOBRIDGE

Parallel to this uptake, over the last 5+ years there has been considerable innovation within the ICT space. This has substantially lowered the cost of ICTs along with lowering the electricity power required for these ICT solutions. These dynamics are allowing ICTs to be pushed further out into rural localities to reach more rural, off-grid populations, populations that are often the focal point of our programs.

It has also opened up rich opportunities to adopt and leverage clean energy ICT solutions.

A major thrust of the Global Broadband and Innovations (GBI) program is rural mobile-broadband build out. Already the explosion of mobile services into rural settings has expanded beyond the reach of national power grids. Two specific areas of GBI focus include:

Current Off-Grid Base Stations

Presently there are an estimated 600,000 off-grid mobile base stations worldwide—virtually all being diesel powered. There is the possibility to economically migrate a portion of these to clean energy—be it solar, wind, pico-hydro, even bio-fuels. The three critical drivers are: 1) lowering the carbon footprint, 2) lowering operating costs—a critical issue with raising oil prices, and 3) leveraging base stations as community anchor tenants for bringing at least modest levels of electricity into current nearby rural communities.

The Final Billion

The GBI program also focuses on extending mobile-broadband access to rural communities that are beyond those communities currently served by these off-grid base stations. This focus melds the GBI's work with the private sector on universal service funds (USFs) with carrier deployments of low-cost low-power solutions. The technical architecture for this part of the GBI is 100% off-grid—where the newer small cell solutions deliver mobile and broadband services at a substantially lower cost, and are suitable for being powered by clean energy solutions. These newer innovative solutions are driving the price point down to under $50K. And here too, by oversizing the generating capacity, and leveraging the BTS as an anchor tenant, at least modest amounts of energy to the local school, government offices, health clinic, businesses, and even households.

The potential for combining Clean Energy with ICT as an important leveraging opportunity for rural development, is a current focus that the GBI program is pursuing in several countries at a demonstration level for launching scale.

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