eBelize
Accelerating Development

Ministry of the Public Service,
Governance Improvement, Elections &
Boundaries and Sports

ICT National Strategy

Consultants: Juan Carlos Namis Adam Montserin Dr. Geraldo Flowers

TABLE OF CONTENTS

Executive Summary 4

An Introduction to Belize 10
- Geographical and Population Distribution 10
- Economy 14

National ICT Strategy Background 16
- ICT Strategy and National Socio-Economic Development 16

ICT Strategy Methodology 21
- Belize's Approach to ICT Strategy Development 21

The Current State – ICT in Belize 2011 23
- e-Readiness Defined 23
  - Belize's Technology Penetration 25
  - Internet Affordability in Belize 26
  - Internet Access in Belize 27
  - ICT Education in Belize 28
  - ICT in the Belizean Workforce 29
  - ICT in Government of Belize 30
  - ICT in Belizean Commerce 34
  - ICT in Belizean Businesses 35
  - ICT Legal Framework in Belize 36
  - ICT Trade Policy and Regulations in Belize 37
  - Telecommunications Policy in Belize 38
  - Conclusion 39

Belize National ICT Strategy 2011 - 2016 40
- National ICT Vision 40
  - Enhancing and Harmonizing the National Telecommunication Infrastructure 44
  - Enhancing Education Using Ict 46
  - Developing the eCommerce Infrastructure 47
  - Connect Belize – Bridging the Digital Divide 51
  - Creating Jobs – Developing the local ICT Industry 55
  - Modernizing the Public Sector Using ICT 59
    - Summary of Key Programs 62

Governance 65
Financing the National Strategy 65
National ICT Strategy Implementation Approach 68
Proposed ICT Governance Structure 69
The National Program Unit 71
The Government Ops Center Unit 71
The e-Government Unit 73
The Manpower Development Unit 73
The E-Procurement and Financing Unit 74
Critical Success Factors 75

Appendix 76
Appendix A - Acknowledgements 76
Appendix B – Road Map 80

EXECUTIVE SUMMARY

Belize is poised to make a quantum leap in all areas of national development by exploiting the power of Information and Communication Technologies (ICT). Through the implementation of this National Information and Communications Technology Strategy's (National ICT Strategy) programs we will accelerate the creation of a more prosperous future for all Belizeans.

ICTs have transformed the world, and the lives of millions in every faucet of life all around the world. The way we communicate, interact, learn, do business, take care of our health, socialize and care for each other are all influenced by ICT. In so many dimensions the transformation enabled by ICTs have been breathtaking.

Belize deserves and demands nothing less. This National ICT Strategy outlines the path to accelerated development for all Belizeans though leveraging the power of ICTs. It places Information and Communication Technologies at the center of Belize's social and economic development as a dynamic industry sector in itself, and in support of the development of other sectors of Belize.

ICT can be of enormous benefit to the socio-economic development of a country in two ways. Firstly, it can be used as a productive sector in and of itself, mainly for the creation of jobs and the addition of knowledge-based exports. The sectoral approach focuses on developing a country's economy by using ICT as a production sector; hence, in short term the human resources as inputs and markets to absorb the outputs are required for success. Both of these are addressed through numerous strategies for industry promotion, incentives for investors, training and development of human resources etc. The output of such efforts would be the creation of at least 5,000 new jobs via the development of cyberparks and research and technology centers that will also harness new technologies that could spin off into other productive sectors as well. Belize has already attracted more than 1,000 new jobs in this sector with very little proactive assistance and incentives to this industry.

Secondly, ICT can also be of enormous benefit to the socio-economic development of a country as an enabler of such development. This approach focuses on the long term goals and objectives of the country which obviously should lead to an more economically prosperous Belize. Here the country needs to take up the challenge of raising, feeding, educating and providing economic opportunity for all of its population; thereby

satisfying the 18 targets set out under the eight Millennium Development Goals. The targets set out by Horizon 2030 are also clearly in line with this Strategy. In order for this to be realized, many cross-cutting strategies across various sectors are devised keeping in view ICT as a means for improving the efficiency of planning, executing and monitoring of the projects for that sector. This enabling approach occurs when ICT is diffused into masses at all levels enabling maximization of benefits and welfare. In Belize's case the sectoral approach should be combined with the diffusion or enabler approach to maximize benefits of economic growth in the short term without trading-off the sustainability of the same in longer run. The ICT vision and strategy should focus on people and not just on technology. For this to happen, it is important to develop both the ICT vision and strategy with people in mind and with the involvement of these very same people.

Major outputs from utilizing both of the above approaches include the following:

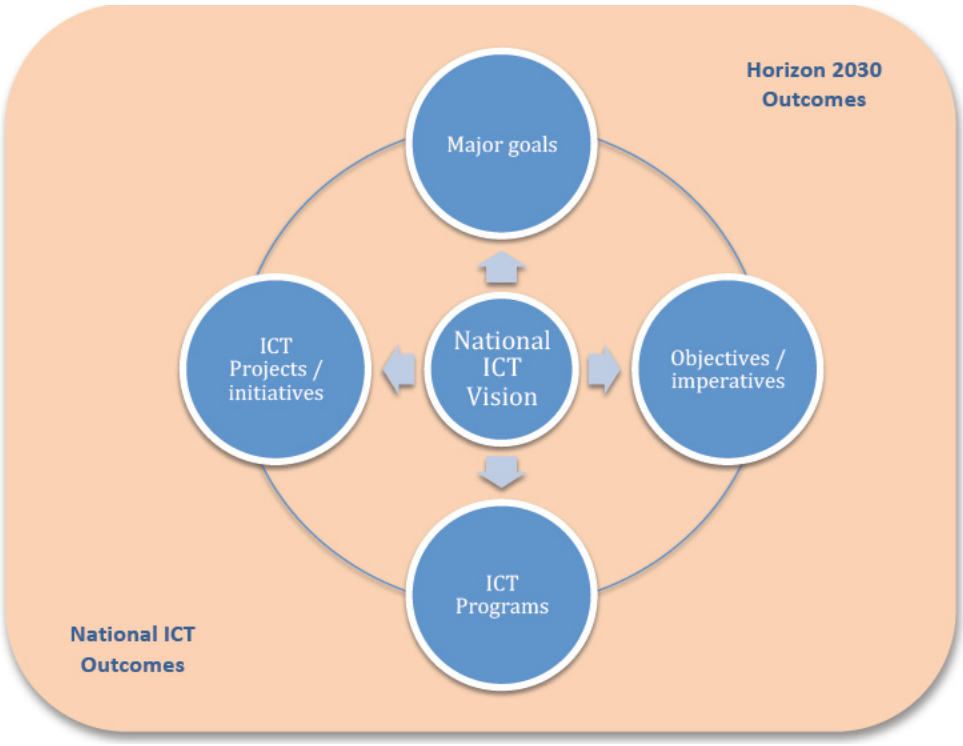
- Increasing access – particularly to rural areas though, for example, the use of stationary and mobile telecenters so that teachers in each village can enhance their educational qualifications on-line, rural women can have ready access to health and nutritional information and rural young people can access a high school education online;
- Enhancing Education – by creating attractive multimedia based curricula and pedagogy and developing distance education modalities;
- Enhancing efficient production and business processes – by developing e-commerce activities, particularly for Small and Medium Enterprises and for Micro-enterprises;
- Modernizing the delivery of public services – by putting more public services online, increasing revenue collection, and increasing efficiency though the shared delivery of public services;
- Reliability of data collected and disseminated in all sectors for better planning – by promoting the creation of a national statistical information management system promoting better sharing and validation of data being produced by governmental and civil society agencies according to internationally acceptable standards;
- Job creation in the ICT sector – by the creating at least 5,000 new jobs in the ICT industry through the creation of cyberparks and technology centers.

This strategy has been developed through wide consultation with and participation of the public and private sector, academia, civil

society representatives, and NGO's in Belize (see Appendix A for the list of participants). It builds on the successes from across Belize and other countries in leveraging ICTs for national development. Significant gains are currently being made by public and private sector organizations, academia and civil society in utilizing ICT for improved effectiveness and efficiencies. However the need to accelerate development in all areas has never been more urgent than now as Belize faces challenges and opportunities of increased global competition, the need for economic diversification, rapidly evolving citizens' needs, ever increasing demands on health, education and security services and the threat of increasing competition at a blinding rate to our businesses.

Driven by the overall national development outcomes identified in Horizon 2030, the National ICT Strategy identifies the National ICT Outcomes needed for accelerated development, the two major Goals that will be focused on, the six strategic Imperatives that must be addressed and the six major Programs and twenty eight Initiatives/Projects recommended for implementation that will be executed over the five year period of the Strategy. A snapshot of the interconnected components of the strategy is presented in Figure 1:

Figure 1 – Interconnected Components of the Strategy



The National ICT Strategy presents a Vision that focuses on *Accelerated development and improved quality of life for all Belizeans through universal access and widespread usage of Information and Communication Technology.*

Accelerated development that is empowered by ICTs will become a reality by *putting Information and Communication Technologies (ICT) at the center of Belize's social and economic development as a dynamic industry sector in itself (as a sector), and in support of the development of other sectors of the economy (as an enabler) in order to foster, accelerate and sustain long-term social, cultural and economic development of the country.*

This is the Mission of the National ICT strategy. It will be executed through a collaborative and participative approach that involves the Government of Belize (GOB), along with the private sector, civil society and international development partners. Together, though a leadership driven governance approach, the national ICT strategy will be aggressively implemented.

The National ICT Strategy envisions that accelerating national development will be empowered by pursuing two major goals. Firstly Universal Access to ICTs, ensuring ICT accessibility, acceptance and usability by anyone, anywhere, at anytime, and through any media and device, and secondly Widespread ICT usage in every aspect of national development including security & crime reduction, improving health care, improving the effectiveness and efficiency of Government, developing competitive businesses and building new industries.

The achievement of these goals will come about by addressing six major Objectives over the next five years. These objectives are the heart of the strategy:

- Open ICT – Creating a vibrant, competitive and open telecommunication industry that enables the availability and accessibility of quality and affordable telecommunication services to consumers and fostering social and economic benefits to the country;
- ICT In Education - Infusing all aspects of the education systems with ICTs for improved delivery and learning, and improved access to education by all;
- ICT in E-Commerce – Creating a well developed ICT services sector and driving the adoption and usage of ICT in all dimensions of business operations to create competitive advantage at the business and country levels;
- eInclusion – Bringing the benefit of ICTs into all segments of the population, including people who are disadvantaged due to education, age, gender, income,

disabilities,ethnicity, and/or those living in remote regions;

- Job Creation through local ICT Industry Development – Creating at least 5,000 new jobs through the development of the local ICT Industry;
- Acclerating eGovernment - Significantly improve the performance of government through the usage of ICTs, to meet the evolving needs of the people of Belize and create a safe society.

Each major objective consists of key Programs and Projects (Initiatives) that will be implemented with relentless passion. The six key Programs are identified below with details of the Projects/Initiatives in the body of the strategy.

OBJECTIVE	PROGRAMS
Open ICT	Enhancing and Harmonizing the National Telecommunication Infrastructure
ICT in Education	Developing ICT in Education
ICT for e-Commerce	Developing ICT for e-Commerce
e-Inclusion	Connect Belize: Bridging the Digital Divide
Job Creation Through Local ICT Industry	Creating Jobs Through the Development of the Local ICT Industry
Acclerating eGovernment	Modernizing the Public Sector Using ICT

Implementation of the National ICT Strategy is outlined as a planned and collaborative approach. Public/Private partnerships will be pursued as the modus operandi of strategy implementation. The role of the international development and funding communities will also be actively promoted, particularly in terms of the transfer of information, benchmarking and keeping abreast of developments in the sector.

GOB will encourage the private sector, civil society and international development agencies working in Belize to partner with government in building out infrastructure, in developing Belize's human resources, in providing jobs and in taking on development activities. Integral to the implementation process will be:

- GOB's leadership and (along with the private sector, foreign investors and its international partners) the commitment of resources;
- Smart partnerships with key sectors from private sector, civil society, foreign investors and the international development agencies;

- The involvement of all stakeholders in the execution and the continuing development of the action plan to accompany this National ICT Strategy;
- Rigorous pursuit of outcomes outlined within the Strategy.

The National ICT Strategy will also seek to attract local and foreign investors and development grants through various investment packages and incentives, sufficient workspace with supporting technology infrastructure, as well as a pool of trained workers and professional staff. Potential investors and development agencies will be aggressively targeted through a focused promotional strategy.

A centralized GOB ICT Department will be created under the direction of a Chief Technology Officer. It will be charged with implementing the ICT Strategy under the direction of an ICT Cabinet Committee chaired by the Minister of the Public Service or his designee and comprised of GOB, private sector, civil society and international partners. The Department also expects to be able to finance the ICT Strategy through the creation of a Universal Access Fund financed through a levy on the telecommunications and cable company sectors to meet the goals of increased ICT access and usage, which in turn will increase revenues to these sectors.

Today Belize makes a quantum leap. The future is within reach, and through strong leadership and the pursuit of the goals and objectives identified, the vision of accelerated development and the improved quality of life for all can become reality.

AN INTRODUCTION TO BELIZE

GEOGRAPHICAL AND POPULATION DISTRIBUTION

Located on the Caribbean coast of Central America, Belize combines both Caribbean and Latin characteristics. The country is located at 17°15' north of the equator and 88°45' west of the Prime Meridian on the Yucatán Peninsula. It borders the Caribbean Sea to the east, with 386 km of coastline. It has a total of 516 km of land borders—Mexico to the north-northwest (250 km) and Guatemala to the south-southwest (266 km). Belize's total size is 22,960 km², of which 22,800 km² is land and 160 km² is water. This makes the country about twice the size of Jamaica, about half the size of Nova Scotia, slightly larger than Wales, and slightly smaller than the U.S. state of Massachusetts.

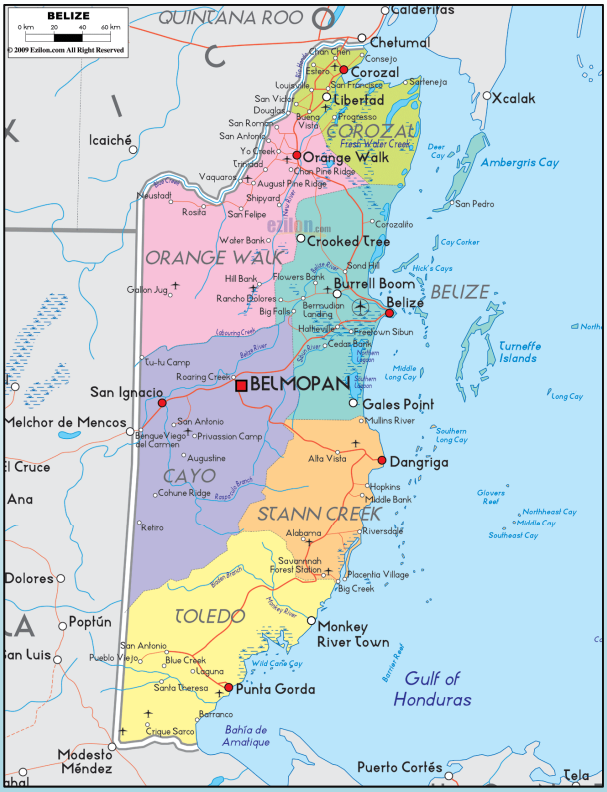
The western border consists of lowland forest, highland plateau and the Maya mountains in the south. Most rivers rise in the west of the country and flow eastwards to the sea through low-lying, often swampy, coastal plains. About 60% of the country is covered by forest containing an abundance of fauna and flora. Larger scale agriculture, involving bananas, citrus and sugar cane, is concentrated in the low-lying areas. Elsewhere, most cultivation is small-scale and largely for subsistence. The Mayan population and rural Guatemalan migrants employ variations of slash-and-burn shifting forms of cultivation.

Administratively, Belize is split into six districts (see Figure 2), which, from north to south, are Corozal, Orange Walk, Belize, Cayo, Stann Creek and Toledo . The northernmost district, Corozal (with a population of 40,354 according to the 2010 census), has a common border with Mexico and is predominantly Mestizo and Spanish-speaking. The main economic activities are the cultivation of sugar cane and the Corozal Free Zone (CFZ) on the border with Mexico.

Orange Walk (with a population of 45,419), immediately to the south is based around the town of the same name. Its economy is also dominated by sugar cane, although small scale agriculture prevails in the western areas and potatoes, onions and soy beans are grown for sale. Orange Walk contains several Mayan cultural sites, and like Corozal, it is predominantly Mestizo and Spanish-speaking.

Belize district (with a total population of 89,247 according to the 2010 Census) is dominated by the city of Belize which contains around 17.1% (or about 53,352 inhabitants according to the 2010 Census) of the country's population. Satellite settlements extend outward along the main roads but the district also contains several rural villages along the Belize River. The topography is almost entirely low-lying and often swampy. It has a major Mayan site at Altun Ha but the main tourist attractions are the Cayes. Ambergris Caye, the largest of the Cayes, has as its capital the town of San Pedro, which is developing rapidly as one of Belize's largest urban centers (with a population of 11,510 according to the 2010 Census). Two thirds of the country's Creole (Belizeans who are predominantly of African descent) population lives in this district.

Figure 2 – Political/Administrative Map of Belize



Source: http://www.ezilon.com/maps/north-america/belize-maps.html

Cayo is the largest district in terms of land area and second largest in terms of population (72,899 according to the 2010 Census). It contains Belmopan, the administrative capital of the country, as well as the twin towns of San Ignacio/ Santa Elena, and the large Mennonite enclave at Spanish Lookout. It also hosts several eco-tourism establishments aimed at capitalizing on the largely unspoilt forest area populated by a wide range of plant, animal and bird species, and proximity to several important old Mayan sites, including Tikal across the border in Guatemala. The main road to Guatemala crosses this district at Benque Viejo del Carmen.

Stann Creek District (with a population of 31,166 according to the 2010 Census), located further south along the coastline, includes the developing tourist settlement of Placencia, several Garifuna villages, notably Hopkins, as well as the larger town of Dangriga. The population is split approximately equally between the Creoles, Garifuna and Mestizo. It is the country's major producer of bananas and citrus fruits, mostly cultivated in large plantations. Several shrimp processing enterprises have been established in the coastal parts of the district.

Finally, Toledo, the southernmost district (with a population of 30,538 according to the 2010 Census), is the centre of Belize's Mayan population as well as the most rural of the districts. Villages here tend to be smaller and more dispersed than in the rest of the country, where many are located along the major roads. There are small concentrations of Garifuna and East Indians with the former mostly found in coastal villages. It produces significant proportions of the country's rice, corn and peas, almost entirely from small holdings. In the last few years, cacao production has increased substantially. Traditionally, Toledo has been the poorest and most rural district in the country, partly due to its peripheral location relative to the rest of the country's administrative, commercial and tourist centers.

People of Belize

Source: "The Garífuna: Weaving a Future From a Tangled Past," September 2001, *National Geographic* magazine
Photograph by Susie Post Rust

Source: www.fullgospeltemple.com

Figure 3 below shows the population distribution of the districts according the Belize 2010 Household and Population Census.

Figure 3 – Urban/Rural Population Distribution, Belize 2010 Census

	2010		
	Total	Urban	Rural
Belize	89,247	65,042	24,205
Cayo	72,899	36,152	36,747
Orange Walk	45,419	13,400	32,019
Stann Creek	32,166	9,096	23,070
Corozal	40,354	20,254	20,100
Toledo	30,538	15,384	15,154
Total	**312,698**	**138,796**	**171,827**

Source: Belize 2010 Housing and Population Census

ECONOMY

The economy of Belize is multi-faceted, with major sectors being agriculture (citrus, sugar, bananas), fisheries, manufacturing (including petroleum) and tourism, as well as the financial and trade infrastructure (tertiary sector). The general structure of the economy is illustrated in Figures 4 and 5.

Figure 4: GDP by Activity (in $Millions BZE)

	2005	2006	2007	2008	2009	2010 (Three Quarters Only)
GDP at constant 2000 market prices	2163.1	2263.8	2291.3	2339.0	2376.9	1843.0
Primary Industries (Agriculture, Forestry and Fishing)	382.4	358.1	283.9	258.8	277.9	179.1
Secondary Industries (Manufacturing, Electricity, Water, Construction)	315.9	395.8	404.9	463.4	505.5	388.4
Tertiary Industries (Wholesale and Retail Trade, Hotels and Restaurants, Transport and Communications, Other Private Services, Producers of Government Services)	1,172.7	1,192.5	1,250.1	1,285.8	1275.8	996.5
All Industries at Basic Prices	1,878.0	1,955.4	1,949.4	2005.8	2061.3	1592.8
Taxes less subsidies on products	285.1	308.3	337.2	333.2	315.7	248.2

Source: Central Bank of Belize 2009 Annual Report and the Statistical Institute of Belize

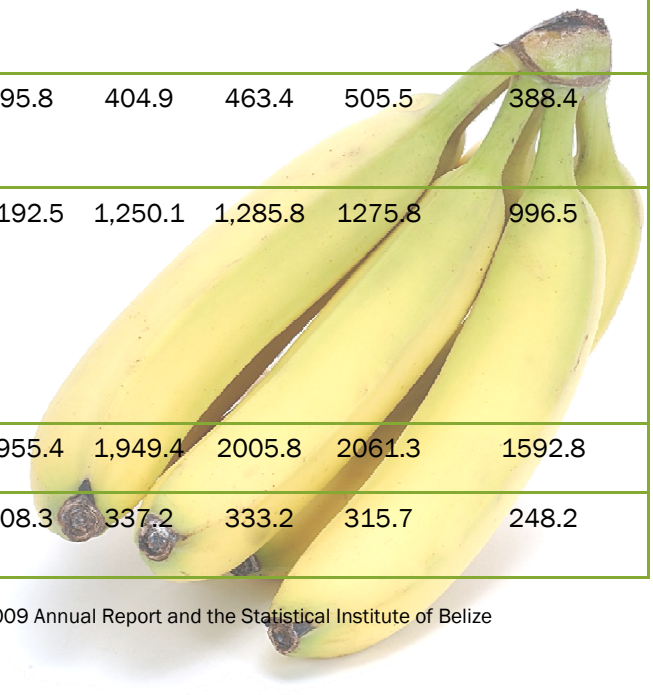


Figure 4 above shows the distribution of GDP by activity, while Figure 5 on the following page shows that Belize's economy is primarily based on services which account for over half of GDP with agriculture now accounting for little over 10% of GDP. The share of secondary industries has increased since 2005 with the exploitation of oil reserves.

Figure 5: Percentage Contribution of GPP per Sector

Sectoral Distributional Constant 2000 GDP (%)	2001	2002	2003	2004	2005	2006	2007	2008	2009
Primary Activities	14.4%	13.3%	16.9%	18.1%	18.1%	16.2	12.8%	11.1%	11.7%
Secondary Activities	17.2%	17.2%	15.2%	15.1%	14.6%	17.5	17.7%	19.8%	21.3%
Tertiary Activities	57.6%	56.2%	53.7%	57.8%	58.7%	57.5%	59.9%	55.0%	53.7%

Source: Central Bank of Belize 2009 Annual Report

As shown in Figure 6 below, GDP/capita in constant dollars over the ten year period 2000-2010 has increased by approximately 21.4%. The population has increased by about 30% during that same period. Therefore, GDP/capita growth has not kept up with population growth in this decade.

Figure 6 – GDP Per Capita (2000-2010) in US$

	2000	2001	2002	2003	2004	2005
GDP per Capita current US$	$6,656	$6,786	$7,198	$7,212	$7,466	$7,637
Population	240,204	257,000	264,000	274,000	279,000	283,000
		2006	2007	2008	2009	2010
GDP per Capita current US$		$8,060	$8,212	$8,531	$8,500	$8,400
Population		287,000	292,00	300,000	310,000	312.698

Source: International Monetary Fund, the CIA Factbook and the Belize 2010 Housing and Population Census

NATIONAL ICT STRATEGY BACKGROUND

ICT STRATEGY AND NATIONAL SOCIO-ECONOMIC DEVELOPMENT

Information and Communication Technology (ICT) has emerged as one of the biggest revolutions of recent times. The Net revolution has ushered in enormous possibilities for leveraging technology not only to enhance productivity and efficiency but also to develop innovative business models and strategies in every sector and to develop community participation and empowerment thereby increasing democratic governance. Countries all over the world are using ICT applications to increase efficiency, accountability, enhance transparency and increase revenue collection as well as to reduce poverty by enhancing their productive and e-commerce centers.

A National ICT Strategy is a vision for a country where information and communication technology is not a mere information and communication tool but a primary vehicle for enhancing education and health care, improve service delivery, refine policy formulation and implementation, empower citizens, and increase business opportunities for the private sector.

The catalyst for many countries that have been very successful at doing this, such as Singapore and South Korea, is the development of a national ICT strategy with this vision at its core. In South Korea, for example, a comprehensive ICT strategy has been a key driver in the miracle rebound of its economy from the financial crisis of the late 80s; the ICT industry's contribution to GDP growth rose from a mere 4.5% in 1990 to an astounding 50.5% in 2000.

Countries such as Singapore and South Korea, as well as Barbados and Costa Rica to a large extent in our region, have also realized

that for the National ICT Strategy to be successful, it must be incorporated into the overall development strategy of the country. It should assess the prospects and options for promoting the ICT industry, for using ICT in key sectors of the economy, and for empowering and networking all stakeholders involved in national development and democratic governance initiatives. It should also systematically address how to use ICT as an enabling tool, in combination with other instruments, to address the two overarching goals of national development in developing countries such as Belize:

(1) sustainable economic growth - driven by participating in a highly dynamic global industry and by diffusing ICT to enhance broad based, economy wide competitiveness;

(2) poverty reduction - facilitated by broad-based economic and social growth, accelerated human development and nationwide empowerment.

Sustainable Economic growth is achieved though enhancing competitiveness and growth across broad sectors of the economy. ICT can be used to achieve this in two ways:

1. Developing the local ICT industry - the local ICT industry, and particularly, the newly enabled services such as Business Processing Outsourcing (BPOs), presents major opportunities for job creation and participation in e-commerce by many developing countries. The decline in the cost of telecommunications and access to the Internet worldwide have given rise to the globalization of business-support services and the outsourcing of back-office work to developing countries like India and the Philippines. Over 50 nations currently export software and ICT-enabled services. In Kenya, for example, Naushad Trading Company which sells local wood carvings, baskets and pottery, grew from US$ 10, 000 to over US$ 2 million in the two years since it went online.

2. Using ICT across the board - A second major thrust for competitiveness and broad economic growth is to *use ICT* in the most critical industries and services of the country, promote ICT diffusion among micro, small and medium enterprises (typical of most industries in developing countries such as Belize) to make them more efficient and effective, and deploy ICT for modernizing government-to-business transactions. Although it is up to the private sector to take the lead in such use, governments can influence and accelerate this process through various means, including establishing the necessary laws and regulations for e-commerce, and providing incentives for investments that would alter managerial practices and strengthen supply chains. Perhaps most promising for

competitiveness is the use of ICT in government in support of business-to-government transactions.

By one estimate, business in developing countries spend about 20% of their revenues on transactions with governments, including accessing information and forms, applying for permits, and submitting taxes. An effective and transparent government is a critical ingredient in a competitive business climate and an attractive investment environment. A recent pilot to modernize tax administration in Russia (assisted with World Bank financing) has introduced ICT-enabled transformation in the administration's interactions with businesses and citizens, eliminated the long lines for tax submissions, drastically cut all kinds of transaction costs, closed opportunities for corruption, and at the same time, raised the badly needed tax revenues.

The second overarching national goal in many developing countries such as Belize is *reducing poverty and accelerating human development*. ICT could support poverty reduction strategies by informing policy making, delivering effective health and education services, facilitating citizen to government transactions and public sector reforms, and promoting participation and accountability. Recent emphases on poverty analysis and on mainstreaming results-oriented development programs have reinforced the need for relevant, reliable and timely information for policy formulation and program implementation and adaptation. As suggested earlier, ICT can also be deployed to extend access and improve quality of education, health and other social services.

The promise of improving citizen to government transactions (C2G) has inspired many governments to innovate one-stop, single window services, such as Singapore's eCitizen, and to integrate electronic government into their broader public sector reforms. Even less integrated and more modest bottom up initiatives such as land record computerization in Karnataka, India, have delivered land certificates in 15 minutes, instead of 20-30 days, and in the process, reduced transaction costs and corruption, created a viable land market, enhanced the creditworthiness of farmers, and improved the life of the common man.

A major opportunity for using ICT in poverty reduction is to provide information and knowledge to rural populations and to empower local development agents to serve the poor. A variety of informational and connectivity advantages

can accrue to the poor through improved operational capacities of the specialized local agencies. One example is Chile's electronic rural information system which connected farmers' organizations, rural municipalities, NGOs, and local government extension agencies to the Internet. It was estimated that transmitting information on prices, markets, inputs, weather, social services, and credit facilities cost 40% less than using traditional methods. Similar pilots and programs have been applied in Mexico. In Maharashtra, India, a cluster of 70 villages is covered by the "wired village" project, which is modernizing the local cooperatives, and aiming to provide agricultural, medical, and educational information to the facilitation telecenter booths in the villages.

Perhaps the area of most promise is in the use of ICT to promote broad participation, grassroots innovation, and social learning, thereby increasing democratic governance. Telecenters or community information and communication centers can play several roles: provide affordable public access to ICT tools including the Internet; extend and customize public services, including those offered through e-government; provide access to information in support of local economic activities and learning opportunities; and connect and network people. The last function proved to be the highest priority for many communities who would otherwise have remained isolated. These centers have enabled them to carry out local dialogue, share practical and locally-relevant information, and support community problem solving. Given the limited relevance of the vast amount of global Internet content to these communities, the role of these centers in networking and creating local content becomes all the more important. Community centers could also provide women with a medium to participate as producers, consumers-providers-users, counselors-clients. In South Africa, women's organizations are linked to various resource web sites which aim to mobilize women around common concerns. Digital literacy

centers in Benin and Ghana have become an important instrument of empowerment of low-income communities, enhancing employability, increasing capabilities, and extending learning opportunities beyond those available in educational institutions.

The world is in the midst of a revolution in which new and evolving digital ICTs are extending the horizon of what countries, companies, institutions and individuals might achieve if they work together to create rich collaborative networks from which new knowledge, ideas and innovations spring. By ensuring the development of a solid national ICT strategy, many countries can position their economies for competitive advantage in a global knowledge-driven technology. Those who understand the process can direct their efforts towards learning the new practices and may find a route to leaping forward and catching up. This will involve a great degree of learning and understanding the impacts of ICT on markets, organizations, competitive strategies, innovation as well as the implications for services, employment, education, regional and spatial development and poverty reduction.

Furthermore, a successful ICT strategy requires a country's substantial investment in human capital, active absorption of technology, ability to raise awareness, build coalitions, clarify roles and responsibilities, mobilize and complement market forces, as well as scale up and leverage ICT. The ultimate focus of a national ICT strategy should be to promote the diffusion of ICT across the board as a General Purpose Technology.

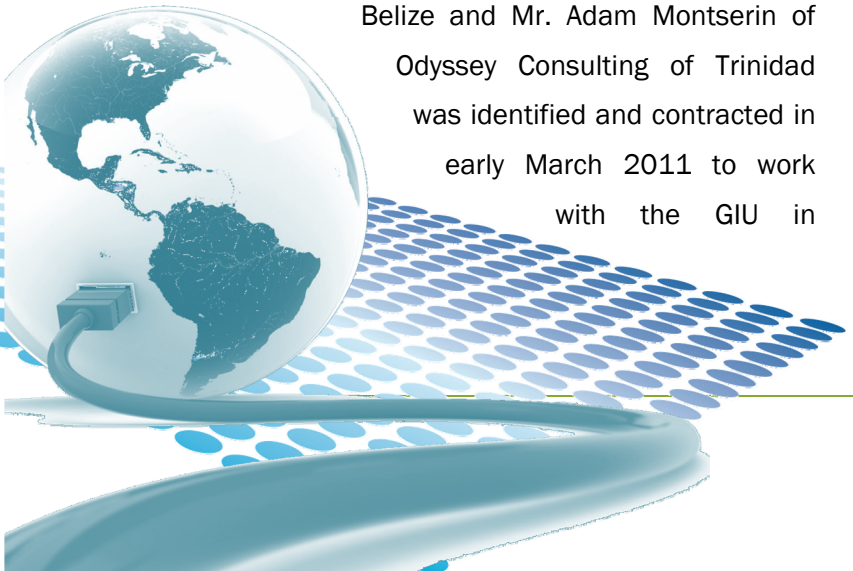
ICT STRATEGY METHODOLOGY

BELIZE'S APPROACH TO ICT STRATEGY DEVELOPMENT

The goal of the *e- Belize: Accelerating Development* National ICT Strategy is to identify how ICT and participation in the digital economy can help the Government of Belize reach more expeditiously its objectives in terms of economic and social progress and growth. It was an initiative of the Ministry of the Public Service, Governance Improvement, Elections and Boundaries, and Sports (MPS) of Belize and was spearhead by its Minister John Salvidar and the Ministry's Chief Executive Officer (CEO) Charles Gibson. The Ministry's Governance Improvement Unit (GIU) headed by Mrs. Freya Parham August (with Mr. Dwight Gillette and Mr. Antonio Madrid) was assigned the task of identifying and working with a consulting team to develop Belize's National ICT Strategy.

The consulting team of Juan Carlos Namis and Dr. Geraldo Flowers of e-Data Ltd. of Belize and Mr. Adam Montserin of Odyssey Consulting of Trinidad was identified and contracted in early March 2011 to work with the GIU in developing the National Strategy. The consulting team:

1. Developed a planning process and initiated consultations with the MPS Steering Committee, the Government of Belize's (GOB) Information and Communication (ICT) Task Force and the GOB's CEO Caucus as part of the development of the National ICT Strategy;
2. Surveyed each GOB Ministry and relevant department via an e-Government questionnaire in order to assess the current state (Strengths and Weaknesses) of GOB's ICT development and conducted phone interviews of all of the secondary schools and the University of Belize in order to assess the current state of ICT development in Belize's education system.
3. Conducted 30 individual countrywide interviews with relevant GOB Ministries, Departments and Statutory Boards, private sector ICT companies, international funding agencies, and civil society executives in order to identify ICT related problems and opportunities (Opportunities and Threats) related to ICT development in Belize.



A Visioning workshop was conducted by the Consulting Team in early April 2011 with key stakeholders from GOB, the private sector and civil society to develop the Vision, Mission and Strategic Outcomes for the Belize National ICT Strategy. The team also conducted a two day Strategy Development workshop in late April 2011 with the same key stakeholders to develop National Strategies designed to accomplish the Strategic Outcomes identified in the Visioning workshop held earlier. As well, the team shared a draft of the Belize e-Readiness Assessment and Benchmarking reports produced by the team for input and feedback from the key stakeholders and to enlighten the Strategy Development process.

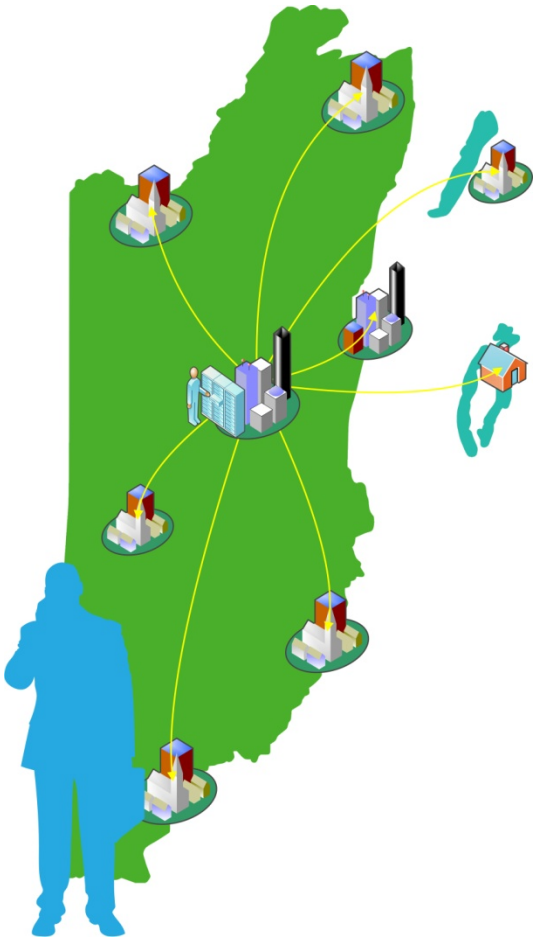
The first draft of the National ICT Strategy was presented to the MPS and GOB's ICT Task Force in the middle of May 2011. A presentation of the findings and recommendations from the National ICT Strategy was also presented to GOB's CEO Caucus in the third week of May 2011 for

input and feedback. As well, a Cabinet Paper based on the findings and recommendations from the National ICT Strategy was prepared and presented by Minister John Saldivar to GOB's Executive Cabinet and to the Prime Minister for endorsement and approval. An official Launch of the National Strategy was then conducted to kick off the implementation of the Strategy.

THE CURRENT STATE – ICT IN BELIZE 2011

E-READINESS DEFINED

e-Readiness is the degree to which a country is prepared to participate in the networked world. According to the "*e-Readiness Guide: How to Develop and Implement a National e- readiness Action Plan*" e-Readiness is generally defined as the degree to which a country is prepared to participate in the digital economy with the underlying concept that the digital economy can help to build a better society. Regardless of a country's level of development, e-Readiness is assessed by determining the relative standing of its society and its economy in the areas that are most critical for its participation to the networked world.[1]



According to the Economist Intelligence Unit, e-Readiness is not simply a matter of the number of computer servers, websites and mobile phones in the country, but also things such as its citizen's ability to utilize technology skillfully, the transparency of its business and legal systems, and the extent to which governments encourage the use of digital technologies.[2] When a country does more online—or, as is increasingly the case, wirelessly—the premise is that its economy can become a more transparent and efficient one.

[1] GeoSINC International (April 2002). *e-Readiness Guide: How to Develop and Implement a National e- readiness Action Plan*.

[2] Economist Intelligence Unit (2005). *The 2005 e-readiness rankings: a white paper from the Economist Intelligence* Unit. (http://graphics.eiu.com/files/ad_pdfs/ERR2004.pdf)

Before any country commences on a comprehensive connectivity program, it is important to understand its current level of e-Readiness. As stated above, e-Readiness is the degree to which a community is prepared to participate in the global information society, and is gauged by assessing areas that are most critical to the adoption of Information and Communication Technology (ICT).

Belize's e-Readiness assessment provided a current snapshot of the country's ICT capacity in several different areas including:

- Industry and Finance
- Government
- Human Resources
- Infrastructure
- Legal and Regulatory

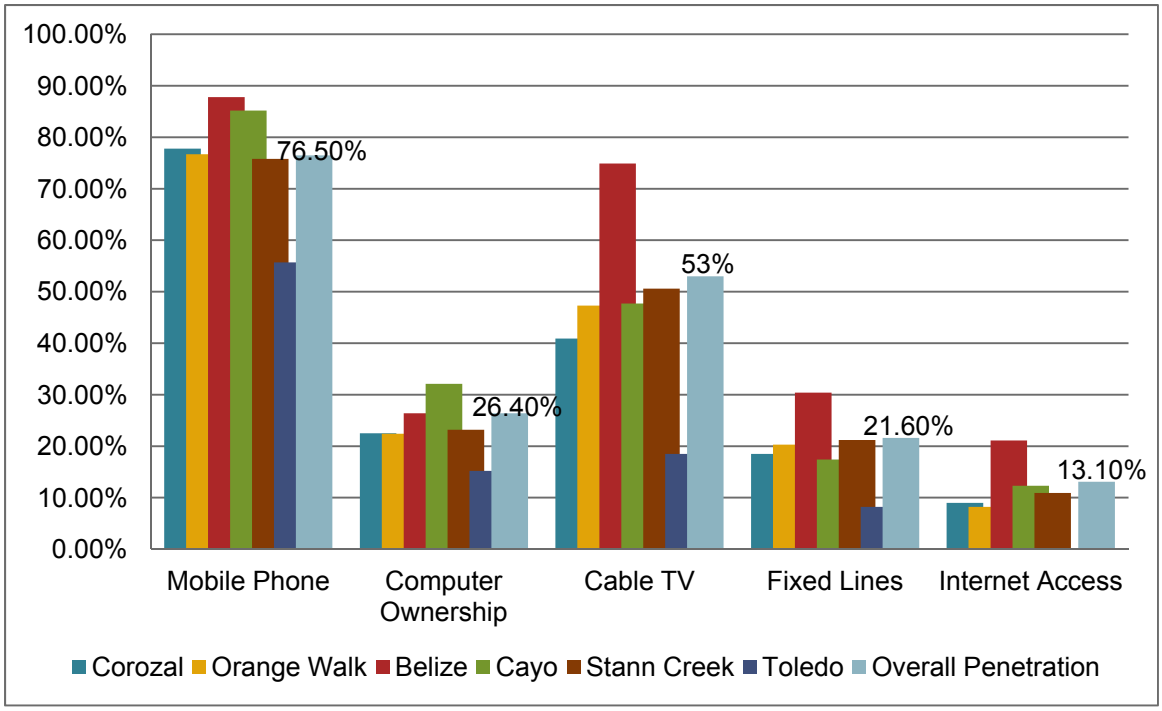
The framework for this analysis was adapted from the *"Readiness for the Networked World: A Guide for Developing Countries"*, an internationally recognized methodology published by the Center for International Development at Harvard University. Additional data to support the findings and conclusions came from a variety of sources including:

- The 2010 National Census of Belize;
- An e-government survey of all of the Government of Belize's (GOB) Ministries conducted by the consultants as part of the development of the strategy;
- A survey of secondary schools also conducted by the consultants as part of the development of the strategy;
- 30 interviews with key stakeholders conducted by the consultants as part of the development of the strategy;
- Content analysis of all of GOB's current websites;
- Secondary data analysis of data provided by the Belize 2009 Scoping Exercise Report conducted under the auspices of the Ministry of the Public Service by David Gingell, a consultant from Malta.

BELIZE'S TECHNOLOGY PENETRATION

Figure 7 below presents the current state of technology penetration in Belize as provided by the 2010 National Household and Population Census of Belize.

Figure 7- District Technology Penetration by Household



Source: Belize 2010 Housing and Population Census

The above data reveals that although Belize ranked 128 out of 184 countries according to the United Nations e-Government survey of 2010, the country is already an active member of the global information society. It has embraced cell phone and cable TV services to the extent that more than three fourths of households in Belize possess a cell phone and more half of the households in Belize have cable TV services. The reasons for this are two-fold:

1. Belize does possess the infrastructure for this to be possible;
2. These services are currently being provided competitively and at a cost that the majority of Belizeans can afford.

INTERNET AFFORDABILITY IN BELIZE

On the other hand, computers and internet service, while readily available in most urban center and some rural ones as well in Belize, is just not affordable for the average Belizean as Figure 8 reveals.

Figure 8 – Internet Affordability (Standard Home Internet Service Plan)

High Speed Internet Service	Monthly Charges BZE$	% GDP Per Capita 2008 Annual Figures (BZE$12,920)
256K	$100	9%
512K	$179	17%
1MB	$300	28%
2MB	$500	46%
4MB	$850	79%

Source: Belize Telecommunication Limited

The above figure reveals that even for a 1MB of internet service, the average Belizean would have to spend more than ¼ of their annual income to afford it. A 4 MB household internet connection (very common in households in the Caribbean) would cost the average Belizean a mortgage payment (and a high one at that!) or more than ¾ of their annual income. This is perhaps the reason why only 13.1% of Belizeans have internet in their homes.

It is a very similar story within the Belizean business community. Although most companies have PCs and Internet access, very few companies (with the exception of the major industries) have invested in dedicated data lines or extensive office automation. As there are only a small number of consumers currently on-line (and most of these are tourists), there is still little rationale for companies to use the Internet as a business medium (except for the tourism industry). Most are using it for e-mail and for a basic web presence, i.e., static web sites. However, if the internet rates were to decrease, many more Belizeans would go online which would spur the development of more e-business in Belize.

INTERNET ACCESS IN BELIZE

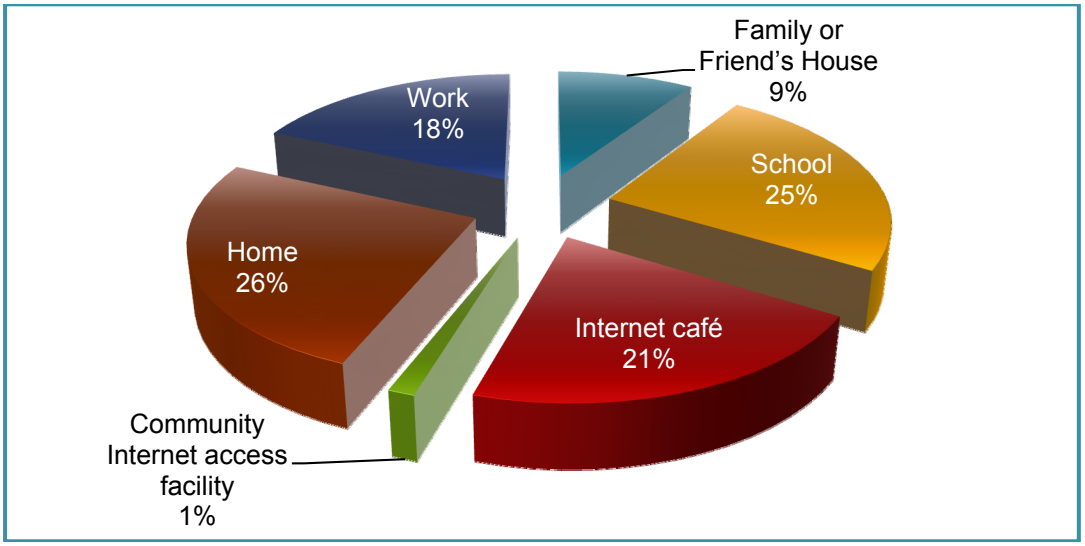
Figure 9 – Internet Users 5 Years or More by Type of Access Device and District

	Corozal	Orange Walk	Belize	Cayo	Stann Creek	Toledo	Total
Total	**7,108**	**8,523**	**29,637**	**17,914**	**6,414**	**3,979**	**73,535**
Computer Only	5,969	6,983	24,947	15,319	5,499	3,553	62,270
Computer and Mobile Device	646	807	3,393	1,566	496	260	7,168
Mobile Device Only	187	228	738	261	129	39	1,582
DKNS	306	505	559	768	290	127	2,555

Source: Belize 2010 Housing and Population Census

Figure 9 above reveals that the Belize 2010 Household and Population Census indicates that about 23.5% of Belize's population or about 73,535 Belizeans had accessed the internet sometime in 2010. Figure 10 below shows the likely places for Belizeans to access the internet.

Figure 10 - Place of Internet Use



Source: Belize 2010 Housing and Population Census

Figure 11 - ICT in Secondary Education in Belize by District

District	Number of Students	Number of Computer Labs	Number of Computers	Most common Internet bandwidth
Belize	6,130	24	474	512
Cayo	3,726	13	386	1MB
Orange Walk	1,932	6	107	512
Corozal	1,786	5	124	1MB
Stann Creek	1,985	6	199	512
Toledo	1,639	3	75	512
Total	**17,198**	**57**	**1,365**	

Source: Telephone interviews and surveys and the Belize 2010 Housing and Population Census

Figure 11 above provides an indication of the pervasiveness of computers and computer labs in the secondary schools of Belize.[3] The data is presented broken down by the six major districts of Belize. It indicates that Belizean high schools have about one computer for every 12 students. They also have an average of about one computer lab per high school as there are about 57 high school computer labs in the country. Most of the high schools in Belize are located in urban areas; therefore, most have access to the Internet.

There is recognition that the rural population is "under-served" in terms of ICT in education in Belize. The Ministry of Education (MOE) has strongly underlined the importance of utilizing distributed and e-learning as an important means to overcome the current educational divide between the cities and municipalities, on the one hand, and the villages on the other (personal communication, Kevin Harris, 15th March 2011). Yet the application of an e-learning strategy to bridge the educational divide still demands the articulation of a policy and strategy on how villages in rural areas are to be technologically supported.

The aggressive introduction of ICT for education requires not only a strong technological backbone but also a strong pedagogical one. ICT in education requires the appropriate skills

[3] Most Belizeans still get their first formal computer class at a high school and not at a primary school. Data regarding computers in primary schools were not available at the time of the writing of this report; however, it is widely believed that most primary schools in Belize do not have internet service or computer labs.

to develop educational content – whether for traditional classroom delivery or for e- and distributed learning. Ideally, this should be centrally based in order to maximize scarce skills, to ensure that content is of the appropriate quality and reflects curriculum requirements, as well as to secure the promulgation of such content at a national level.

Moreover, the introduction of ICT Internet based facilities for schools requires a strong security framework that ensures that children are restricted from accessing high risk and pornographic content and that such blocking is maintained on a daily basis in order to ensure that it gives real rather than just perceived security. This is fundamental in order to provide the adequate level of protection to children as well as to secure parental trust and confidence in the provision of internet access to their children.

It is pertinent to underline that, there does not seem to be an ICT in Schools strategy that seeks to define a cohesive and coordinated way forward. There is no national ICT curriculum. In essence what this means is that schools – which are both church and state schools - set their own curriculum for ICT.[4]

ICT IN THE BELIZEAN WORKFORCE

According to the 2009 Scoping Exercise Report, The Belize Chamber of Commerce and Industry opines while many firms have some form of Internet access, relatively few employees have individual access. Employees that do have their own e-mail accounts typically work for large firms. The total number of corporate websites is unknown, but is thought to be quite high. However, these sites are typically modest in nature, with limited information that is not updated regularly. In terms of computer applications, some office automation software is in use. Larger firms have some enterprise application software.

The Chamber of Commerce also opines that the use of ICTs in the workplace is also fairly limited. Although virtually all businesses have computers and access to the internet, a significant number of employees share computers and only a few have personal e-mail addresses for use in the work environment.

[4] The Caribbean Examinations Council (CXC) does set a regional CXC Computer Science exam which many secondary schools in Belize prepare their students for.

ICT IN GOVERNMENT OF BELIZE

As part of the preparation of the *e-Belize – Accelerating Development* National ICT Strategy, the consulting team undertook a series of individual consultations with government ministries and departments. They also conducted a website content analysis of the www.belize.gov.bz portal of GOB ministries' links. In addition, the consulting team conducted an e-government survey of all of GOB ministries requesting ICT related information.

Analysis of the information indicates that, overall, GOB has made considerable investments in ICT to-date. Some Ministry offices feature modern computer and telephony equipment. They communicate with citizens, businesses, and other Government offices via telephone, e-mail, and the Internet, in addition to face-to-face. In addition, at least three Ministries (Ministry of Finance, Ministry of Health and Ministry of Police and Public Safety) have installed management information systems and several others (such as Immigration, Foreign Affairs and Trade, Labor and Natural Resources) are in the process of doing so.

Computer technology now plays an increasingly significant role at the operational level of all GOB Ministries and Departments. All of the 19 Ministries and Departments who completed the survey have access to the internet and e-mail, most use the Microsoft Office Suite, and at least half of the Ministries have a functioning website.

The introduction and use of ICT in the public service, however, has been limited by a lack of coordination and integration in the planning and implementation of these initiatives. This is due largely to the absence of a Policy and Strategic framework which would provide the requisite direction and guidelines for the adoption and utilization of ICT resources in the public sector. Given the present level of adoption and use of computer technology, the implementation of this National ICT Strategy (which addresses to a large extent ICT in Government) will bode well for the further advancement of the GOB's public sector modernization agenda.

Approximately half of all GOB Ministries (8 of the 17) have a Ministry website and thirteen of the seventeen feature a Web site from one of their departments. Additionally, those who do not have a web site do have a web link on the new government portal (www.belize.gov.bz). However, government Web sites (as well as the GOB Portal) typically feature static government centric information on the Ministry and its divisions, including mandate, services offered, organizational structure, contact information, and "frequently asked questions". Based on the

United Nations "web measure" index of the state of online services from a country's government, the information gathered on GOB websites indicate that GOB is currently transitioning the "Emerging and Enhanced" stages of online service delivery (the first two Stages on the four Stage scale). [5]

While it does not seem to be part of an overall e-Government strategy, certain GOB Ministries and Departments are expanding the scope of their electronic service delivery offerings. The Ministries of the Attorney General, Economic Development, Education, Foreign Affairs, Natural Resources (Meteorology Office), Ministry of the Public Service, Ministry of Tourism (Belize Tourist Board) and Ministry of Transport and Communications (NEMO) are offering electronic downloadable and printable forms. The Belize National Library Service offers an electronic library service and the Belize Meteorology Department offers a "two way interaction service" for citizens requesting weather reports, which puts their sites between Stage Two and Stage Three of the UN's "Web measure model: Stages of e-government evolution" scale. [6]

There is still much to do to enable full e-Government in Belize. Currently, basic information is now accessible on-line. However, ministries do not yet offer highly valuable electronic transactions such as benefits registration, application for training

[5] EMERGING PRESENCE is Stage I representing information, which is limited and basic. The e-government online presence comprises a web page and /or an official website; links to ministries/departments of education, health, social welfare, labor and finance may/may not exist; links to regional/local government may/may not exist; some archived information such as the head of states' message or a document such as the constitution may be available on line, most information remains static with the fewest options for citizens.

ENHANCED PRESENCE is Stage II in which the government provides greater public policy and governance sources of current and archived information, such as policies, laws and regulation, reports, newsletters, and downloadable databases. The user can search for a document and there is a help feature and a site map provided. A larger selection of public policy documents such as an e-government strategy, policy briefs on specific education or health issues. Though more sophisticated, the interaction is still primarily unidirectional with information flowing essentially from government to the citizen.

[6] TRANSACTIONAL PRESENCE is Stage III that allows two-way interaction between the citizen and his/her government. It includes options for paying taxes; applying for ID cards, birth certificates/passports, license renewals and other similar C2G interactions by allowing him/her to submit these online 24/7. The citizens are able to pay for relevant public services, such as motor vehicle violation, taxes, fees for postal services through their credit, bank or debit card. Providers of goods and services are able to bid online for public contacts via secure links.

Please refer to: http://www2.unpan.org/egovkb/egovernment_overview/webmeasure.htm

programs, job applications, and electronic payments.

Information and communication technology, in the form of modern computers, telephones and network solutions, is pervasive throughout GOB. However, the usage of electronic systems and processes is still very minor compared with the usage of paper-based ones. Desktop computers may be used to produce documents and presentations, but it is very rare that they are used to access vital data. Database servers contain some client information, but more often than not it is used as a backup for paper files, not the central record itself. Much is still in paper. Although more sophisticated information systems are being introduced including document management solutions, their usage is still very limited.

There is no central secure government network. However, there are many separate networks including Smart Stream, which is a secure network run by CITO on behalf of the Ministry of Finance (MOF) for applications relating to accounting, income tax, and service tax; a network created by the Ministry of Health to promulgate the Belize Information Health System (BIHS) to cities and municipalities; and a network created by the Belize Police Force to promulgate the Crime Reporting Information Management System (CRIMS) also to cities and police stations.[7]

There is no standard for office automation use although, from the e-government survey conducted, the software tool most prevalent is Microsoft Office 2007. It is, however, pertinent to note, that with the exception of users who have authorized access to Smart Stream the general consensus is that most installations of the Microsoft application software is unlicensed.[8]

There are no data centers in Belize. The building of a National ICT Centre by the Ministry of the Public Service, financed by the Government of Taiwan, whilst an excellent development, does not yet have this role as its mandate. There is no doubt that, if properly planned, the new National ICT Centre can act as a Central Data Centre with appropriate robust facilities to assure (i) consolidation of ad hoc hardware; (ii) streamlined utilization of hardware; (iii)

[7] There is also a project underway to link the Police, Immigration and Prison together via a common database to provide more intelligence regarding crime. This is being sponsored by the United States government.

[8] The Ministry of the Public Service through its Belize National Information and Communication Technology Center is in the process of discussions with Microsoft Corporation for the feasibility of purchasing a Microsoft Enterprise license for GOB, its statutory agencies and schools.

greater levels of security; (iv) greater levels of resilience; (v) better utilization of technical resources and rationalization of such resources to the optimum level; (vi) reduction of the Total Cost of Ownership by ensuring that facilities are not replicated unnecessarily.

Furthermore, the resources assigned to support ICT policy and operations within the Ministry of the Public Service, as well as the line Ministries, are limited at best. Even a large, important Department such as Immigration only has a staff of two IT individuals. With the possible exception of the Ministry of Health, most ICT Departments seem currently understaffed.

There is no ad hoc financing for ICT within the Government of Belize. In essence, ICT financing is a line vote item that is assigned to each Ministry and Department as part of the budgetary process. This primarily means that ICT is not recognized as a corporate – horizontal – program that transcends the Government of Belize which thus requires dedicated financing in order to secure the promulgation of ICT.

ICT IN BELIZEAN COMMERCE

Figure 12 below shows the current licensed Business Processing Outsourcing organizations in Belize. In 2010, these organizations generated approximately US$18,736,164 and approximately 1,095 jobs. The genesis for this came about in 2000 when the Government encouraged the opening of a private e-commerce park, opened by Datapro International Inc in the Belize City Export Processing Zone (EPZ) thereby guaranteeing freedom from taxes to incoming dotcoms. The park has successfully stimulated Belize's e-business sector. Subsequently, EPZ were expanded to be able to operate anywhere in the country as long as they receive the requisite permits from the Ministry of Economic Development.

Figure 12: Current BPOs in Belize

Name of Company	Sector	Operational Period	# of Employees
Fulton Data Processing	Data Processing/ICT	2009	68
Infotel International Limited	Call Center	2009	82
Prospera Belize Ltd. (e-commerce)	Data Processing/ICT	2010	2
Administrative Corporate Services Ltd. (management services)	Data Processing/ICT	2010	10
Cititrust International Inc. (e-commerce)	Data Processing/ICT	2010	3
Cititrust International Ltd. (e-commerce)	Data Processing/ICT	2010	3
Clear Call Belize Limited	Call Center	2010	37
Ready Call Center Limited	Call Center	2010	778
Transparent BPO Limited	Call Center	2008	105
ICSL (Belize District)	Data Processing	2008	1
		Total Employees	**1,089**

Source: Ministry of Economic Development of Belize

Given its location in the centre of the Americas and its demographics (native speakers of English and Spanish), and the popularity of its offshore legislation, it should be open to Belize to become a centre of e-commerce activity. The development of an information or knowledge economy that services the US makes strategic sense given that Belize is in the same time zone as the US, is close to the US, has intelligent and knowledgeable people, and the cost of labor is far lower than would be found in the US.

ICT IN BELIZEAN BUSINESSES

The 2009 Scoping Exercise Report stated that the Belize Chamber of Commerce and Industry, whilst acknowledging that it has no hard data on the state of the information economy within Belize as it has yet to date to carry out a survey on this matter, is of the considered opinion that the use and penetration of ICT for businesses purposes is limited. In this regard the Chamber believes that use of ICT, where it has been availed of, is primarily of electronic communications and potential basic office applications.

The set-up of industry and business within Belize, with the exception of a small number of large operators such as the banks, hotel operators, etc, are micro-enterprises. Given the GDP / capita and the fact that, with the exclusion of the service industry related to tourism, securing a web presence is not perceived to be a productive investment particularly given that achieving this is seen to be prohibitively expensive.

Operations in the tourism industry are seen to make most use of ICT – both for the promotion of the enterprise's service or product or for back offices purposes. The Chamber is of the considered opinion (the Belize Tourism Industry Association is a member of the Chamber) that ICT web presence by tourism service providers is primarily limited to a static web presence. The Chamber believes that there is no e-tourism infrastructure in Belize – a matter of concern given the actions being taken in this regard by competitors to Belize tourism.

ICT LEGAL FRAMEWORK IN BELIZE

The successful implementation of e-government policies and processes can be significantly enabled by a proper legal framework for their operation. A requirement for ICT related processes to be introduced and adopted is their formal legal equivalence and standing with the paper process. Many governments are now aware of the need for framework to provide for enforceable electronic transactions, both in the e-government sphere and for e-commerce, and have taken action. For example, the legal recognition of digital signatures is necessary if they are to be used in e-government for the submission of electronic forms containing sensitive personal or financial information.[9]

While the Government of Belize has enacted several key legislation: Computer Wagering and Licensing Act of 1995, The Belize Copyright Act revised 2003, the Electronic Transactions Act (2003), Electronic Evidence Act (2003), Freedom of Information Act (1994, amended in 2000), and the Archives and Records Service Act (2004), and the Interception of Communication Act 0f 2010, there are other critical areas which must be addressed if any e-Government related Strategy is to have any meaningful impact, in particular:

- Computer and Computer Related Crime/Computer Misuse: makes attempted or actual penetration or subversion of computer systems a criminal act and prohibits the unauthorized access, use of or interference to any program or data held in a computer and to a computer itself.
- Privacy and Data Protection: sets requirements for the proper handling and protection of personal information held within information processing systems and to protect the privacy of individuals in relation to personal data, to regulate the collection, processing, keeping, use and disclosure of certain information relating to individuals and to provide for matters incidental thereto or connected therewith.[10]

[9] The Electronic Transactions Act of 2003 does allow for the use of electronic signatures in Belize.

[10] The Belize Interception of Communications Act of 2010 does address some of these issues although not in their totality.

ICT TRADE POLICY AND REGULATIONS IN BELIZE

Belize is one of the few countries that have enacted legislation allowing for the establishment of online wagering. Its Computer Wagering Licensing Act, 1995, which came into force on May 28, 1996, provides for the proper conduct and regulation of gambling via the Internet.

In addition, the Electronic Transactions Act of Belize was passed in 2003. The objectives of the Act are:

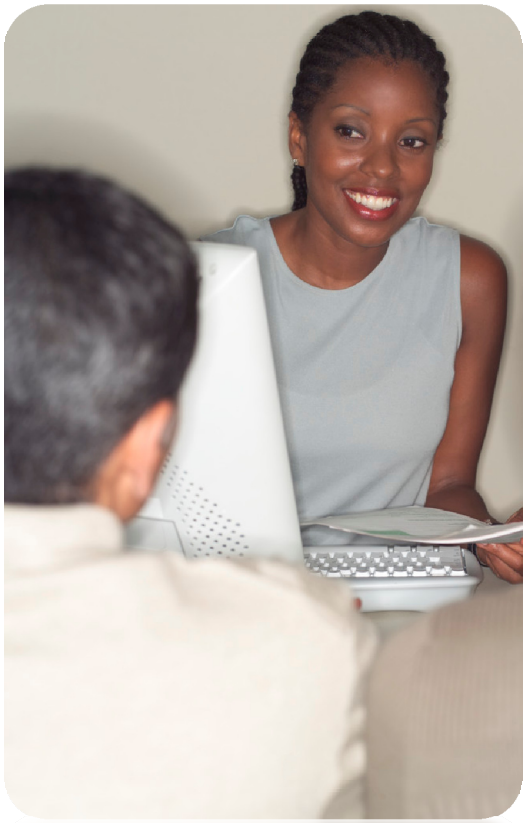
a) to eliminate legal barriers to the effective use of electronic communications in transactions;

b) to promote the harmonization of legal rules on electronic transactions across national boundaries;

c) to facilitate the appropriate use of electronic transactions;

d) to promote business and community confidence in electronic transactions; and

e) to enable businesses and the community to use electronic communications in their transactions with government.



TELECOMMUNICATIONS POLICY IN BELIZE

The Government of Belize passed the Belize Telecommunications Act in 1987 which constituted Belize Telecommunications Ltd (BTL). BTL was granted a 15 years exclusive license to operate in Belize. In tandem, an Office of Telecommunications was constituted to regulate BTL as well as to administer spectrum management.

The objects of the Belize Telecommunications Act (BTA) of 1987 were to:

> *"provide for the regulation and control of telecommunications matters in the public interest, and for that purpose to (a) promote reliable and affordable telecommunication services of high quality accessible to Belizeans in both urban and rural areas in all regions of Belize; (b) foster increased reliance on market forces for the provision of telecommunications services and to ensure that regulation, where required, is efficient and effective; (c) promote the provision of telecommunication services that meet all the economic and social requirements of users, including disabled persons; (d) encourage investment and innovation in the telecommunications sector; (e) ensure and promote fair pricing and the use of cost-based pricing methods by providers in Belize; (f) ensure compliance with accepted technical standards in the provision and development of telecommunication services; (g) promote stability of the telecommunications sector; (h) protect the interests of telecommunications users, service providers and consumers; (i) preserve national security interests; (j) ensure the efficient use of the radio frequency spectrum; (k) ensure the safety of the public by maintaining access to emergency numbers at all times irrespective of non-payment by the consumer."*

The powers of regulation are vested by BTA in the Public Utilities Commission (PUC).

BTL was subsequently privatized and in December 2002 was granted an 'Individual License'. In the same month, December 2002, a second 'Individual License' was issued to International Telecommunications Limited – which, however, went out of operation within a few years. In August 2003, an 'Individual License' was granted to Speednet Communications Limited.

It is pertinent to note that in May 2007 the goodwill, properties, assets, obligations and

rights of Belize Telecommunications Limited as well as its employees were transferred to Belize Telemedia Limited (BTL).

This means that in essence there are two telecommunication providers in Belize. It is pertinent to note, however, that BTL is the only Telecommunications Provider – that is it owns the international connectivity gateway as well as the land installed dark fibre and the national telecommunications grid. Speednet Communications Limited operates primarily through BTL – and its core business appears to be wireless telephony.

The 2009 Scoping Exercise Report opines that one fundamental effect arising from BTL's sole telecommunications provider status is its power to block access to VoIP in order to protect its international line revenue. The use of VoIP either for domestic and international purposes is not possible in Belize unless access is granted by BTL. The inability of Government Ministries and departments to use VoIP technology to minimize telecommunications costs and for society and the economy at large to apply teleconferencing technology to overcome communications logistical issues arising due to the geo-disparity of cities, municipalities and villages strategically constrains the ability for Belize to adopt an aggressive pace in establishing an information society and an information economy that places e-government as its kernel.

CONCLUSION

It is pertinent to note that nothing was revealed in the e-Readiness assessment that would hinder Belize from becoming a world class ICT state in the course of the lifespan of this Strategy (five years) if the political and business "will" was there to turn the situation around. Even with the high cost of internet in Belize, many Belizeans (over 73,000) have embraced the internet. Over three fourths of Belizeans households own a cell phone and over half have cable TV service. Because Belize has a young population (with over half under the age of 24), it is even more likely that many more Belizeans will seek to become a part of the global information society. Belize currently has the infrastructure to meet their needs. It is not a question of hardware or software but "people-ware". The "will" to do the right thing is what is needed.

BELIZE NATIONAL ICT STRATEGY 2011 - 2016

Stakeholders from across Belize have defined the Vision for Belize by utilizing and leveraging the power of ICTs.

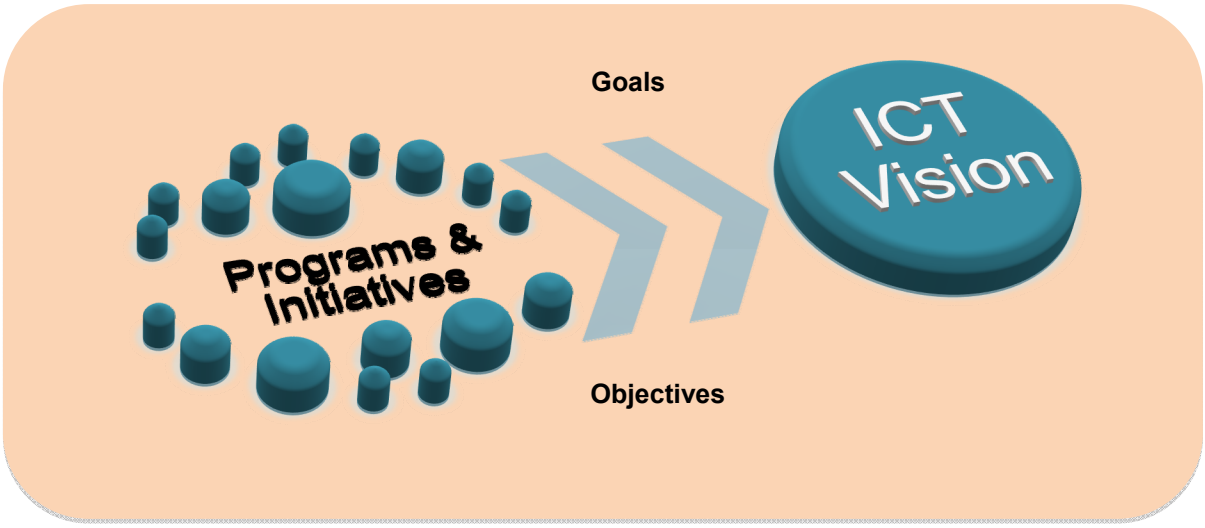
NATIONAL ICT VISION

ACCELERATED DEVELOPMENT AND IMPROVED QUALITY OF LIFE FOR ALL BELIZEANS *THROUGH UNIVERSAL ACCESS AND WIDESPREAD USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGY.*

The National ICT Vision articulates the future that will be created through the implementation of this strategy. Creating this future will result in accelerated national socio-economic development of the country leading to "an improved quality of life for all Belizeans". Connecting to the future as defined by the Vision and outcomes requires a strategic approach to implementing the necessary programs and initiatives; this will create a powerful focus where the investment of energy and resources will bring about a synergistic effect in achieving the outputs required.

Accelerating national development will be empowered by pursuing major goals, objectives and implementing a series of programs that consist of critical projects. These are shown in Figure 13 and described on the next page:

Figure 13



MAJOR GOALS

Two major goals will be pursued over the five year period of the National ICT Strategy:

- Firstly, Universal Access to ICTs, ensuring ICT accessibility, acceptance and usability by anyone, anywhere, at anytime, and through any media and device.

- Secondly, Widespread ICT usage in every aspect of national development including security & crime reduction, improving health care, improving the effectiveness and efficiency of Government, developing competitive businesses and building new industries.

These are the focus of the Belize National ICT Strategy and are driven by the Vision. All of the objectives, programs and projects are aligned to these two goals in a powerful and synergistic way that will accelerate national development.

MAJOR OBJECTIVES

The achievement of these goals will come about by addressing seven major objectives over the period. These objectives are the heart of the strategy and have been aligned with the outcomes identified to ensure that important and critical elements of national development are addressed.

- eInclusion – Bringing the benefit of ICTs into all segments of the population, including people who are disadvantaged due to education, age, gender, income, disabilities, ethnicity, and/or those living in remote regions .
- eGovernment – Significantly improve the performance of government through the usage of ICTs, to meet the evolving needs of the people of Belize and create a safe society
- Open ICT – Creating a vibrant, competitive and open telecommunication industry that enables the availability and accessibility of quality and affordable telecommunication services to consumers and fostering social and economic benefits to the country.
- ICT In Education – Infusing all aspects of the education systems with ICTs for improved delivery and learning, and access to education by all
- ICT Business & Industry – Creating a well developed ICT services sector and driving the adoption and usage of ICT in all dimensions of business operations to create competitive advantage at the business and country levels
- eHealth – Significantly improving the delivery of primary and secondary health care through the infusion of ICTs in the health care system, and empowering better life choices by citizens, especially the vulnerable, including the children and youth, the poor, elderly, especially those in remote rural communities by enabling access to health information and services empowered by ICTs.
- E-heritage – Protecting and preserving Belize's natural resources heritage through ICT enabled management, outreach and education to all Belizeans and visitors to preserve protect and develop Belize's natural resources.

MAJOR THEMES AND DESIRED OUTCOMES

1. **Universal access and widespread usage of ICTs for improved national productivity, efficiency & innovation and the creation of a knowledge based society;**

   Outcomes:

   - ICTs substantially enhances development of the Belizean economy, national productivity, efficiency and innovation;
   - Universal and Open Access to ICTs by all of Belize to develop as a knowledge based society and to enhance democratic governance;

2. **Crime reduction and the improved security of citizens**

   Outcomes:

   - All security agencies operate with up to date and shared information sources to reduce the crime rate and improve security of citizens;

3. **Improving and modernizing the delivery of public services**

   Outcomes:

   - Improved efficiency of the public service and effective delivery of public services based on citizen needs through the use of ICTs;

4. **Improved competitiveness of businesses and development of e-Commerce**

   Outcomes:

   - A vibrant, competitive and open telecommunication industry by removing barriers to entry in-order to reduce cost and increase range of services;
   - A well-developed ICT Service Sector, managed and staffed by qualified ICT Professionals;

5. **Improved education system**

   Outcomes:

   - An Educated and Trained Belizean Workforce and Citizenry (in particular the youth), Possessing the required Attitudes, Knowledge and Skill Sets to fully utilize ICTs';
   - ICTs form an integral part of the education system at the primary, secondary and tertiary levels enabling the design delivery of ICT infused curriculum through ICT empowered and traditional channels;
   - More effective teacher training and operation and management of the school system utilizing ICTs and shared information

6. **Improved healthcare**

   - Belize healthcare developed through the effective utilization of ICTs by health care intuitions, and health care workers;
   - Primary health care is improved through the public and community leaders accessing health – lifestyle information that influences better health – lifestyle choices across Belize;
   - Belize's vulnerable including the youth, poor, elderly and remote rural communities have access to health information and services empowered by ICTs.

7. **Protection of our natural resources and heritage**

   - Belize's natural resources heritage is protected through ICT enabled management and through outreach and education to all Belizeans and visitors to preserve protect and develop Belize's natural resources.

KEY PROGRAMS

Each major objective consists of key programs and projects (initiatives) that will be implemented with relentless passion. The key programs are identified and described below.

- ENHANCING AND HARMONIZING THE NATIONAL TELECOMMUNICATION INFRASTRUCTURE
- ICT IN EDUCATION
- DEVELOPING THE E-COMMERCE INFRASTRUCTURE
- BRIDGING THE DIGITAL DIVIDE – CONNECT BELIZE
- CREATING JOBS - DEVELOPING ICT INDUSTRY
- MODERNIZING THE PUBLIC SECTOR USING ICT

ENHANCING AND HARMONIZING THE NATIONAL TELECOMMUNICATION INFRASTRUCTURE

The country of Belize needs to take action to create a vibrant, competitive and open telecommunication industry that enables the availability and accessibility of quality and affordable telecommunication services to consumers and fostering social and economic benefits to the country.

While the number of ICT users in Belize is growing, there are still significant segments of the population that do not have ready access to telecommunication; in particular, Internet services. The challenge for GOB, in collaboration with its private sector, civil society and international development partners, is to encourage the development of a vibrant, high-quality, low-cost telecommunications infrastructure which all citizens have the opportunity to access.

GOB in collaboration with the private sector, civil society, and its international development partners will implement the following Projects/Initiatives to facilitate the enhancement and harmonization of the Belize national telecommunications infrastructure:

- Develop a comprehensive and sound **competitive framework for communications** services matching international best practices by promoting competition, innovation, and investment in broadband services.
- Promote and facilitate domestic and foreign investment in **additional Internet backbone** in an international competiveness mode in order to bring more telecommunication capacity and

redundancy to the Belizean market. This will greatly aid in getting the country ready to become a major player on the international ICT industrial market stage in areas such as cyber-park development and the development of Business Processing Outsourcing (BPOs);

- Maintain an independent, effective, fair and transparent **Telecommunications Regulatory Authority**. The Public Utilities Commission (PUC) is critical in setting the right tone for the telecommunications market, and for providing regulatory certainty, ensuring non-discriminatory treatment of telecom and ISP providers, and in preventing anti-competitive behavior. The GOB via the PUC will ensure that all telecom and ISP providers have non- discriminatory access to the International Internet Gateway (ARCOS fiber) and those prices and service level agreements for wholesale Internet bandwidth are calculated on a cost- based formula and a reasonable return of investment for the dominant operator. This healthy environment will provide the certainty necessary for attracting large investments required for infrastructure development and service provision, which will be a catalyst to improving Internet penetration and cost reduction to the general Belizean populace.
- Allow for the **competitive development of unfiltered Internet services** in Belize by avoiding the imposition of regulations that might impede development and access to new technology such as Voice-Over the Internet (VOIP). This will spur the creation of new socio-economic opportunities and reduce the cost of international calls; thereby allowing Belize to be more competitive and innovative on par with the rest of the region and the world.
- Maximize efforts to bring voice and data services to under-served populations, by coordinating efforts from all social sectors involved and by **creating a universal access fund** paid by telecom and ISP providers.
- Promote the creation of a market which maximizes the use of national infrastructure and that has the capacity to provide the delivery of triple-play services (Voice, Data and Video) under one single platform. This will allow operators to enhance their service portfolio, reduce investment costs, and provide a cheaper service to the consumer.

ENHANCING EDUCATION USING ICT

Belize has long recognized the strategic importance of education and training as a principal instrument of economic and social development. Belize already has internet access and IT computer labs in most its secondary schools. This has enabled the significant growth of basic computer literacy and skills among those of school-age population who are still in school. GOB and its private sector, civil society and international development partners recognize the need to both widen and deepen this process, and therefore commits, to pursuing the following:

- The ICT Curriculum for lifelong learning program will ensure that ICTs form an integral part of the education curriculum at all levels as a core subject area and also a learning and curriculum delivery tool. Initiatives including the development of a holistic ICT Plan for education, Primary and Secondary curriculum design, will be initiated to ensure that all areas of the education value chain benefits from the application of ICTs.
- The ICT Facilities development program will provide the necessary equipment and facilities for the ICT empowered delivery of primary and secondary curriculum, and student access to information and learning materials. Several initiatives will be implemented including School Net providing broadband Internet connectivity to primary and secondary schools and libraries across Belize; Smart classrooms initiative equipping primary and secondary classrooms with ICTs for the delivery of learning materials, ICT learning Labs will equip all primary and secondary schools with computer labs for use by students. Additionally the secondary school system will benefit from two major initiatives targeting the management of education information and the provision of training material via eLearning.
- The ICT capacity for teachers & librarians program addresses the capacity to deliver new curriculum, learning resources and information, in new and innovative ways utilizing ICTs in the education system. Primary and secondary teachers and librarians will be exposed to the ICT training initiative that continuously upgrade their skills to design and deliver learning material utilizing ICTs.

Teachers are the front line troops in the development of Belize. They should be accorded the status, facilities and role of key change agents not only in delivering the skills of the next generation, but for their influence over the community,

especially rural communities. The highest priority must be given to their engagement and support as a part of this National ICT Strategy.

It is recommended that all teachers be trained in the use of ICT, and in its integration into the curriculum for teaching and learning. It is also recommended that all teachers be provided with a personal computer and access to the Internet at a reduced cost. The objective is to facilitate teachers having a PC in their homes to develop competencies which will enhance teaching and learning of students in the classroom. Accompanying this should be the development of on line and offline teacher training courses so that teachers can continually upgrade and certify themselves, thereby increasing the number of trained teachers in the country.

DEVELOPING THE eCOMMERCE INFRASTRUCTURE

The Internet and electronic commerce represent tremendous social and economic potential for countries such as Belize. The ecommerce development program seeks to create an enabling environment including the requisite legal and regulatory framework that will enhance consumer confidence and protection, electronic payment systems, digital certification and authentication and intellectual property protection. Initiatives will be implemented to address the requirements in all of these areas as follows.

ELECTRONIC PAYMENT SYSTEMS

The availability of effective electronic payment systems is a significant element of electronic commerce and electronic business, enabling government, and wholesale and retail businesses electronically using electronic payments.

The electronic payment infrastructure for Belize's banks is build in silos in which each financial institution develops its own electronic and online payment infrastructure without any kind of common national standards and interoperability framework. Belize should and must develop and legislate a Common Electronic Payment System that integrates all local banks into a common banking switch interbank network.

Belize's Common Electronic Payments System (BEPS) will include but not be limited to the following services in its network to all participating banks:

- Shared Nationwide ATM and Point of Sale Network, provides the switch which enable bank customers to conveniently

access their funds anywhere from any of the participating banks' ATMs.

- e-Debit, enables the purchase amount to be immediately deducted from the savings or current account direct into the retailer's or merchant's bank account. This provides consumers with better cash management and peace of mind as all transactions are PIN based. In addition, the new card is embedded with a sophisticated, tamper-resistant smart chip to protect consumers against the risk of fraud.
- Mobile Prepaid Top-Up via ATM, offers more convenience for mobile phone subscribers to top-up through BEPS' ATMs.
- Interbank ATM Fund Transfer (IBFT), allows bank customers to transfer funds from one account to another account in another bank. The beneficiary will receive the funds immediately and instantaneously, as the transfer is online and in real-time.
- Interbank Payments, makes interbank funds transfer more convenient to bank customers via an electronic channel. It enables payments to be made without the need to raise physical supporting vouchers or documents such as cheques, bank drafts, etc. It is an interbank fund transfer system that facilitates payments and collections via the exchange of digitized transactions between banks. For corporations, it is ideal for high volume interbank payments such as payroll payments. As for individuals, it is ideal for transactions such as credit card payments and loan repayments. It offers bank customers, be it an individual or corporation, a secure interbank fund transfer system/channel for all sorts of payments through direct debiting of the customers' account(s) and crediting into the beneficiaries account; with all participating banks.
- Financial Processing Exchange (FPX), opens new doors for e-Commerce, in particular business to business (B2B) and business to commerce (B2C) payments. FPX is an alternative payment channel for customers to make payment at e-market places such as websites and online stores as well as for corporations to collect bulk payment from their customers. It leverages on the Internet banking services of participating banks and provides fast, secure, reliable, real-time online payment processing. FPX provides complete end-to-end business transactions, resourceful payment records, simplified reconciliation and reduced risks as fund movements are between established financial institutions.

SINGLE WINDOW TRADING SYSTEM

A single window trade system enables international (cross-border) traders to submit regulatory documents at a single location and/or single entity. Such documents are typically customs declarations, applications for import/export permits, and other supporting documents such as certificates of origin and trading invoices. Partners in such a system could include:

- Beltraide
- BAHA
- Ministry of Finance
- Ministry of Agriculture
- The Port Authority
- The Customs Brokers Association
- Belize Ports Limited
- The Customs Department
- The Bureau of Standards
- The Ministry of Health
- The Police Department

The main value proposition for having a Single Window for a country or economy is to increase the efficiency through time and cost savings for traders in their dealings with various government authorities for obtaining the relevant clearance and permit(s) for moving cargoes across national or economic borders. In a traditional pre-Single Window environment, traders may have had to contend with visits and dealings with multiple government agencies in multiple locations in order to obtain the necessary papers, permits and clearance in order to complete their import or export processes.

There is no single definitive viewpoint of what a single window trade system should be. A common definition of the term "Single Window" is:

"A facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfill all import, export, and transit-related regulatory requirements. If information is electronic then individual data elements should only be submitted once."

The concept is recognized and promoted by several world organizations that are concerned with trade facilitation. Among these are the United Nations Economic Commission for Europe (UNECE) and its Centre for Trade Facilitation and Electronic Business (UN/CEFACT), World Customs Organisation (WCO), SITPRO Limited of the United Kingdom and the Association of Southeast Asian Nations (ASEAN).

It is recommended that Belize adopts such as system to promote and enhance e-Commerce including enhancing the revenue collection system for government.

CONSUMER CONFIDENCE AND PROTECTION

This initiative will build consumer confidence in electronic commerce by providing protection from fraud and from misleading and unfair conduct and commercial practices, respect for consumer privacy, private sector initiatives, global cooperation, consumer and business education, and effective means of dispute resolution.

DIGITAL CERTIFICATION AND AUTHENTICATION

This initiative will enable greater security of the eCommerce environment by developing the legal and policy frameworks that emphasize standards in authentication technologies that help identify parties to electronic business transactions, and provide means by which they can reliably sign documents, assent to transactions, and verify documents' integrity.

INTELLECTUAL PROPERTY PROTECTION

This initiative will provide Legal protection of intellectual property in the online environment for the creation of local content. Consumers will also have confidence that they can rely on trademarks as trusted indicators of the origin and quality of their on-line purchases.

CONNECT BELIZE – BRIDGING THE DIGITAL DIVIDE

The Connect Belize program will ensure that all Belizeans have equal access to ICTs by implementing initiatives that expand broadband connectivity to communities and homes in both urban and rural Belize and bridge the digital divide by ensuring that adequate facilities for access is within the reach of persons. This program will bring the benefit of ICTs into all segments of the population, especially to people who are disadvantaged due to education, age, gender, disabilities, ethnicity, and/or those living in remote regions.

Good governance is high on many countries development agenda, including Belize, premised on the belief that it is a prerequisite for improved national socio-economic performance as well as national cohesion and state building. As a result, there is clearly a movement toward changes in the areas of public administration and governance systems and institutions in most of the world today. Increased emphasis on good governance has generated greater demands from citizens for effective and participatory governance structures and services. There are rising demands as well for access to public information, which has direct implications for ICT applications in the governance domain. Indeed, the role of ICTs in enhancing good governance is becoming an issue of critical importance as democratization gains ground around the world.

Three major programs will be implemented over the period as follows:

- The connect Rural Belize initiative,
- The Community Access Center (Telecenters) initiative,
- The ICT awareness, and promotion and ICT education for communities initiative

ANTIGUA & BARBUDA

Mobile Computer classrooms give Antigua's public school students access to computer technology and Wi-Fi.

Source: http://www.tropos.com/news/pressreleases/2007_11_29.php

RURAL CONNECTIVITY –E-VILLAGE

In the rural communities, commercial investment in telecommunications infrastructure has followed a typical pattern: slow and weak investment. As a result, rural communities suffer a "distance penalty" that increases communication costs and makes it more difficult to attract businesses and growing families. Rural communities can use advanced telecommunications services, particularly the Internet, to help them bridge the gap. It is recommended that the Government of Belize improve the connectivity of rural areas which will provide to residents access to information and training and digital opportunities leading to poverty reduction. Funding from an established Universal Access Fund and from international funding agencies through grants/loans can be used for the funding of this project.

COMMUNITY ACCESS CENTERS – TELECENTERS

DESIRED OUTCOMES

1. *Universal Access to Information and Communication Technology (especially for poor urban and rural areas);*
2. *Poverty Alleviation And Crime Reduction through Distance Education and workforce training, particularly of low income women and youth in urban and rural areas;*
3. *Dissemination of Information for community development including the provision of health, agriculture, trade information and enhanced access to government services (birth registration, application for permits, job and land applications etc…) online using ICT.*

A telecenter may be defined as a shared site that provides public access to information and communications technology whose main purpose is to increase public access to the Internet and to services available over the Internet. The basic telecenter that is common in Latin America and the Caribbean has fairly standard features. It consists of premises stocked with several computer terminals and simple furnishings consisting of chairs or classroom desks for users and regular desks or tables on which the terminals sit. The main service offered to the public is access to the Internet (chatting, e-mail and Web browsing) and often also to elementary software (word processing, spreadsheet). However, telecenters have also been used for education and training and for providing vital government services online.

4. *Enhancing democratic governance through increased community connectedness and participation.*

BENEFITS OF TELECENTERS

- *Rural Connectivity* - Rapid developments in wireless technology have made it possible to overcome physical hurdles (distance, topography), at a reasonable cost, that for long have limited the development of telecommunications infrastructure in rural areas of Latin America and the Caribbean. The benefits of such investments in telecenters should be maximized by providing Internet services and not just rural telephony. Shared access to these services through telecenters can increase the impact of these interventions.
- *Training* - ICT training interventions should be geared primarily towards young people. The young adapt most quickly and easily and is most skilled at using the new technologies. Since young people are a large group in Belize, with the longest productive horizon ahead of them, there is a high return on investments aimed at improving their productive capacity. The starting point should be the strengthening of the formal education system, so that it incorporates the effective use of the new technologies. Teacher training is often a critical determinant of impact on youngsters. Telecenters can be an important complement to formal education reform, providing support to students and teachers after school hours and increasing Internet access for teachers, parents, recent graduates and the community at large. In addition, telecenters can be used for online workforce training using programs such as the International Driver's License ICT training program for low income urban youth, thereby enhancing their job prospects leading to poverty reduction and crime alleviation.
- *Dissemination of Information* – Telecenters can be used to launch portals that offer public services online, aimed primarily at meeting the economic and social needs of the low-income population, including educational portals using simple language that broaden labor and self-employment opportunities. For example, it can be used to provide birth registration, application for permits, job and land applications etc… online using ICT. It can also be used to provide a database of jobs and people looking for jobs connecting citizens, government and the private sector.

The **ICT AWARENESS AND PROMOTION** program will boost awareness, build interest and create a demand for ICTs in communities across Belize. Through the initiatives in this program Belizeans will become aware of the benefit that ICTs can have in every aspect of their lives and become familiar with the use of ICT tools. This program is in fact a change program designed to create the demand for ICTs as the Connect Belize program makes the access to ICTs within reach of all Belizeans. Major initiatives under this program include the Annual Belize ICT Roadshow, School Based ICT awareness competitions, Multimedia ICT promotions, National Awards for ICT innovation. This should also include education regarding the legal and regulatory frameworks that are already in place in Belize for fostering a competitive ICT environment.

The **ICT EDUCATION FOR COMMUNITIES PROGRAM** will provide an enabling environment to facilitate ICT literacy for all citizens but especially children and youth. This will allow them to enter labor force with relevant ICT skills that will contribute to new revenue streams that are ICT enabled.

CREATING JOBS – DEVELOPING THE LOCAL ICT INDUSTRY

The local ICT industry programs is designed to create a well developed ICT services sector and driving the adoption and usage of ICT in all dimensions of business operations to create competitive advantage at the business and country levels. ICT will become the basis for new local business as well as a means to increase the efficiency and competitiveness of established sectors. Key aspects of the program include:

- The provision of ICT incentives which focuses on creating the environment that promotes and rewards the use of ICTs in business and the growth of the ICT industry. Various incentives will be created toward this end including effective removal of taxes and import duties on ICT products and related accessories, implementing the Access to ICT Capital initiative that develops Public/Private partnerships to provide funding to jumpstart certain ICT industries, with private sector funding as the preferred source for capital.
- Nurturing the growth of a competitive ICT sector through the implementation of the Competitive ICT Businesses initiative that will ensure that competitive local ICT companies have an opportunity to become key suppliers of GOB ICT needs and benefit from the knowledge transfer when international ICT providers participate in local business opportunities. Additionally one of the major ICT industry growth initiatives will focus on the establishment of Cyber-parks for the provision of ICT related jobs by attracting investors operating in a competitive environment.

  The Cyber-park initiative will train our youth for the industry and establish facilities including factory shells and office buildings that are equipped with advanced ICT infrastructure. The focus of the Cyber-parks will be to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge- based institutions.

The establishment of Cyberparks for the provision of ICT related jobs has become one of the kinds of incentives used to attract investors operating in a knife-edge competitive environment in many developing countries.

It is recommended that GOB and its local and international partners seek investment to promote the availability of workspace for BPOs, including factory shells and office buildings, through the creation of Cyberparks. Private sector partners should also be encouraged to invest in developing

these facilities. Government should consider positively joint approaches to such ventures. The objective should be to encourage the location of such facilities in areas of relevant and advantageous infrastructure, and where there is a catchment of trained and trainable human resource. Advantage will be taken of the existence of available unused structures that lend themselves to easy conversion.

Government should also consider the provision of such facilities that would allow for economies of scale in the use of shared facilities, infrastructure, and transmission equipment.

.

CYBERPARKS

INTRODUCTION

A Cyber Park according to the International Association of Science and Technology Parks (IASP) is " An organization managed by specialized professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions. Cyber parks play a significant role in stimulating national IT development and establishing logical links with the global market through forging partnerships for developing information and telecommunication technologies. A Cyber Park can act as a catalyst to develop the business infrastructure for such a mission.

Developing countries have increasingly relied on cyber parks as a preferred tool for promotion of IT industry. These countries are often constrained by severe infrastructure limitations. Therefore, it is easier for them to provide world class infrastructure in select areas. Developing countries like India and China have concentrated on state-of-the art physical, communication and social infrastructure in cyber parks to enable IT companies from around the world to operate BPO (Business Processing Outsourcing) and ITES (International Technology Enabled Services).

Unlike other industrial clusters, cyber parks are not constrained by factors such as the availability of natural resources, or raw materials. The key resource requirement is availability of quality manpower. One of the main reasons for the success of China and India in the IT sector can be attributed to their highly educated and skilled manpower. It has been observed that cyber parks generate spillover effects, leading to a virtuous cycle of local economic development. Cyber park development helps generate the impetus to local development of industries such as building construction, real estate, retail, lifestyle and recreation.

DESIRED OUTCOMES

1. *Poverty Alleviation though accelerating economic growth;*
2. *Job creation and career growth particularly for low-income women and youth and for technical and technology graduates;*
3. *Leveraging international knowledge resources to enhance a country's economic and ICT base;*

BENEFITS OF CYBERPARKS

- *Employment Growth – the local BPO industry in Belize has already created over 1,000 jobs in the country. Beltraide asserts that with concerted GOB and other local support, that number could well be over 10,000 in five years.*

- *Other Businesses Spread Effects – Cyber Parks can also create a boost for other local industries such as the local construction industry as one of the inputs that it needs most is large working spaces. As mentioned above, Cyber park development also helps to generate the impetus to local development of industries such as building construction, real estate, retail, and lifestyle and recreation.*

- *Hiring of Technical and Technology Graduates – Cyberparks and the companies located in them are always looking for technical and technology graduates. This is why many of them locate near to a university or technical school. Beltraide intends to work with the ITVET and the sixth forms and University of Belize to develop the pool of skilled workers necessary for BPOs and ITES organizations to operate effectively in Belize.*

- *Foreign Exchange Earned – Cyberparks are a great foreign exchange earner as they provide the infrastructure and human resources for international BPOs and ITES to operate in the country. For example, in 2010, BPOs in Belize generated over US$18,000,000 in Belize and employed over 1,000 people. Beltraide asserts that with concerted GOB and other local efforts, BPOs and ITES can generate nearly US$150 Million in the next five years.*

- *Local Bandwith and Technology Enhancements – The development of cyber parks can also spur the development of other ICT related enhancements such as greater local bandwidth and other IT related technologies not currently available locally such as VOIP. Because ICT companies in the cyberparks will be requesting greater bandwith that what is currently available in Belize (4MB), they will spur the local Telecommunications Providers to provide more bandwith which can then be made available to the local market. The same can also be said of ICT related technologies not currently available to the local market.*

MODERNIZING THE PUBLIC SECTOR USING ICT

eGovernment programs will significantly improve the performance of government through the usage of ICTs, to meet the evolving needs of the people of Belize and create a safe society. This will be achieved through the implementation of key programs & initiatives including:

- The Connected government program focuses on implementing the Public Sector Network (GOBNet). GOBNet will be a single, holistic backbone infrastructure for the whole of the GOB public sector. It will connect the existing networks to enhance standardization, security, and data sharing as well as enhancing more effective communication and realize cost savings. It will also replace the existing approach where each GOB ministry or department designs, develops, installs and maintains its own network – an approach which has led to fragmented and more expensive service delivery. As well as reducing operating costs and complexity, GOBNet opens up new opportunities for information sharing and increasing local and national participation.
- The GOB Information management program will enable effective and efficient management of government information and business continuity. The focus of this program will be the development of a national data center infrastructure for GOB. This approach will rationalize the various data storage/server rooms across government to provide more effective & efficient information management and the delivery of information based services to Belizeans. The building of a National ICT Centre by the Ministry of the Public Service and financed by the Government of Taiwan, whilst an excellent development for Belize, seems to be at this time an initiative in isolation. There is no doubt that, if properly planned, the new National ICT Centre can act as the Central Data Centre for GOB with appropriate robust facilities to assure (i) consolidation of ad hoc hardware; (ii) streamlined utilization of hardware; (iii) greater levels of security; (iv) greater levels of resilience; (v) better utilization of technical resources and rationalization of such resources to the optimum level; (vi) reduction of the Total Cost of Ownership by ensuring that facilities are not replicated unnecessarily.
- The Government Software Warehouse (GOBApps) program will focus on the coordinated development and acquisition of computer applications to

be used across GOB ministries, departments and agencies. These include (to cite a few):

- An enterprise-level Human Resources system;
- A unified electronic mail system, including collaborative tools such as calendar, documents sharing, and instant messaging;
- Financial Information systems
- The integrated development of a National Security system including the Judiciary, Prisons, Immigration, Police Department, Belize Defense Force, Coast Guard, and Customs Department;
- The National Health Information system;
- Geo-Spatial Data Management;
- Data warehouse and analytical tools for easy access to economic indicator;
- A comprehensive School Management system
- A secure and effective Vital Registration System that has country-wide reach;
- e- learning systems and distance education systems

- The Government information & services online program will make available all appropriate government information through channels that are easy to access by citizens. Government information and services will be delivered electronically through multiple channels including the eGovernment Portal, Government information and services kiosks' and the Government information & services hotline. Government information and services will also be delivered through the Community Access Center initiative and the Mobile ICT Classroom initiatives identified above.
- The eGovernment Interoperability & open standards program will establish GOB's e-Government Interoperability Framework (e-GIF) that sets out the government's technical policies and specifications for achieving interoperability and Information and Communication Technology (ICT) systems coherence across the public sector. The e-GIF defines the essential prerequisites for joined-up and web-enabled government. It is a cornerstone policy in the overall e-Government strategy. The main thrust of the e-GIF is to adopt standardized specifications for all government systems, and establishing and implementing metadata across the public sector so that as the GOB becomes connected and government information and services become available online citizens can find government information and resources

more easily. The e-GIF initiative focuses on developing the necessary policy and also providing the support, best practice guidance, toolkits and centrally agreed schemas to Ministries and government agencies to subscribe to the e-GIF and make the transition to the policy requirements. In addition, the program will outline the requisite ISO standards applicable to ICT in e-government.

- The ICT Governance & Continuity program will establish the GOB Department of Information and Communication Technology that is led by a Chief Information Technology Officer/CEO whose function is to provide leadership on all GOB ICT related issues and to strengthen the governance mechanisms for coordination and decision-making. This will be discussed further in the governance model. The creation of a government information and communication department including the Chief Information Technology Officer (CITO/CEO) function, combined with the other eGovernment programs and initiatives, will make GOB a leader in government use of ICT, and will enable it to further drive substantial improvements in service delivery and transformational change for the nation as a whole.
- The eProcurement program will enable efficient and effective procurement of ICT products and services to achieve more targeted ICT investment and maximizing the value that the GOB receives from expenditure on ICT products and services given the complexity of the ICT environment and the speed of technological change. The initiatives under this program will establish the necessary policy, financing mechanisms and technological infrastructure to Plan, organize, and coordinate a strategic and common ICT procurement function including supply arrangements.

Summary of Key Programs

PROGRAM	OBJECTIVE	PROJECTS	OUTPUTS	OUTCOMES
1. **Enhancing and Harmonizing the National Infrastructure**	To create a vibrant, competitive and open telecommunication industry that enables the availability and accessibility of quality and affordable telecommunication services to consumers and fostering social and economic benefits to the country	• Develop a comprehensive and sound competitive framework for communications services • Develop an additional Internet backbone • Maintain an independent, effective, fair and transparent Telecommunications Regulatory Authority • Allow for the competitive development of Internet services in Belize • Create a universal access fund • Delivery of triple-play services (Voice, Data and Video) under one single platform	• A widely dispersed national telecommunications infrastructure with broadband penetration into rural & urban Belize • Build provider confidence in the provision of services via ICT enabled channels • Improved penetration of computers throughout homes and businesses • A majority of the population are regular Internet users • Public Internet access available to all citizens (within 20 minutes travel) • 75% of children and youth in Belize over the age of five are regular ICT users	ICTs substantially enhances development of the Belizean economy, national productivity, efficiency and innovation;

2. **ICT In Education**	To Infuse all aspects of the education systems with ICTs for improved delivery and learning, and access to education by all	• Develop an ICT Curriculum for lifelong learning
		• Develop ICT facilities in schools including broadband internet, Smart classrooms and ICT Learning Labs
		• Develop ICT Capacity for teachers and librarians including providing teachers internet and a laptop
			• ICT programs available to youth and adults who have not completed high school or who may wish to better improve their learning capacity
			  ○ All schools connected via high-speed Internet service;
			  ○ Online education from primary school level available
			• All teachers, facilitators, instructors and librarians received ICT training for delivery of curriculum and support services, which includes students with special needs.
				An educated and trained Belizean workforce and citizenry (in particular the youth), possessing the required Attitudes, Knowledge and Skill Sets to fully utilize ICTs' in their lifelong learning;

3. **Develop an effective e-Commerce Infrastructure**	To create a well developed ICT services sector and driving the adoption and usage of ICT in all dimensions of business operations to create competitive advantage at the business and country levels	• Develop and legislate a Common Electronic Payment system • Develop a Single Widow Trading System • Develop consumer confidence initiatives • Digital Certification and Authentication • Intellectual Property Protection	• Business and commerce in Belize significantly improved • Trade significantly improved through the implementation of trade enhancing ICT initiatives such as a Single Window Trading System for Businesses and Entrepreneur, online systems for all imports and exports. • e-Commerce legislation in place that provides protection from fraud and from misleading and unfair conduct and commercial practices, respect for consumer privacy, private sector initiatives, global cooperation, consumer and business education, and effective means of dispute resolution. • Legal and Regulatory Framework in place that outlines standards in authentication technologies that help identify parties to electronic business transactions, and provide means by which they can reliably sign documents, assent to transactions, and verify documents' integrity • Legal and Regulatory Framework in place provide Legal protection of intellectual property in the online environment for the creation of local content	A well-developed ICT Service Sector, managed and staffed by qualified ICT Professionals;
4. **Connect Belize – Bridging the digital divide**	To bring the benefit of ICTs into all segments of the population, including people who are disadvantaged due to education, age, gender, disabilities, ethnicity, and/or those living in remote regions as well as promote democratic governance	• The connect Rural Belize initiative • The Community Access Center (Telecenters) initiative • ICT awareness, and promotion and ICT education for communities	• improved connectivity for rural Belize which will provide rural residents access to information, training and digital opportunities leading to poverty reduction • Public Services and online education and training available to all residents • Heightened awareness, interest and demand for ICTs in communities across Belize	Universal and Open Access to ICTs by all of Belize to develop as a knowledge based society

5. **Creating jobs by developing the ICT Industry**	To create 5,000 new jobs in five years by developing the ICT Industry	• The provision of ICT incentives initiative • Competitive ICT Businesses initiative • The Cyberpark Initiative	• Creation of an enabling environment that promotes and rewards the use of ICTs in business and the growth of the ICT industry • The creation of a vibrant, competitive and open local ICT industry by removing barriers to entry in-order to reduce cost and increase range of services. • At least 5,000 jobs created	At least 5,000 new ICT related jobs created in Belize over the next five years
6. **Modernizing the Public Sector Using ICT**	Significantly improve the performance of government through the usage of ICTs, to meet the evolving needs of the people of Belize and create a safe society	• The Public Sector Network (GOBNet) • GOB Information management project • The Government Software Warehouse (GOBApps) project • The Government information & services online project • The eGovernment Interoperability & open standards project • The ICT Governance & Continuity project • The e-Procurement project	• Harmonized ICT infrastructure and systems across the public sector ensuring fully integrated, interoperable, efficient and effective service delivery • All ministries integrated through the use of ICTs • ICTs actively leveraged in the reform of the public service • All appropriate government information and services available online • Standard policy framework for information management within Government • Citizen centric channels of information and service delivery are available utilizing ICTs to reach all citizens • Government services delivered in a way that increases citizen confidence in the public sector	Improved efficiency of the public service and effective delivery of public services based on citizen needs through the use of ICTs

GOVERNANCE

FINANCING THE NATIONAL STRATEGY

Telecommunications services are increasingly considered by governments around the world as a basic necessity of citizens, essential to full participation in the 'new information economy'. In the past, monopoly operators had to assume the costs of meeting the country's universal access objectives. These operators had to finance the delivery of essential telephone services to uneconomic regions mainly through cross subsidies, which flowed from profitable market segments (e.g. international, long-distance, business users, urban) to less profitable market segments (e.g. domestic, local, residential users, rural).

While cross-subsidies served their purpose in monopoly environments, they create problems in newly competitive environments. In particular, cross-subsidies have been known to distort market signals and place an unfair burden on certain operators. To finance their access objectives in a competitively neutral and transparent manner, an increasing number of countries are now turning to universal access funds.

UNIVERSAL ACCESS FUND FEATURES

Universal access funds receive finance from various sources and provide targeted subsidies to encourage the provision of telecommunications services by private operators in otherwise uneconomic regions. These funds can be distinguished on the basis of three key features:

1. Sources for funding. Universal access funds can be distinguished by their sources for funding. Depending on the country and its particular situation, the sources for funding have included national budgets of governments, charges on interconnecting services, levies on subscribers (e.g. on access lines) and levies on operator revenues. Funding from international development agencies is also an option. Universal access funds today tend to collect their revenues from government sources or operator levies on a widely based range of telecommunications services (as opposed to only from specific "high margin services", like international long- distance). Broad based revenue collection mechanisms are favored

because they have less of a price distorting effect on the marketplace.

2. Fund management. Universal access funds can differ in their management. While some funds (e.g. Colombia) are administered by government ministries, other funds are administered by the regulators (e.g. Peru, Chile) or special agencies (e.g. South Africa). The common perception is that funds administered by independent regulators and agencies are less likely to be influenced by government or political interest.

3. Type of services. Thirdly, universal access funds can also be distinguished by the types of services they support. Developing country funds in the past have placed greater emphasis on ensuring basic public access (i.e. voice-grade fixed access to the public telecommunications network). With the growing importance of the Internet to national economies, however, many of today's newer funds also support public access to value-added services, including Internet access. In Chile, the government has redefined its fund, which has been successful in extending basic telecommunications to rural and low-income areas, to support telecenter projects. The Fund is expected to soon launch a national telecenters program. The initial phase will be a pilot project involving the development of five self-sustaining community telecenters in various lower income urban and rural areas of Chile. An initial target is to install telecenters in each of about 90 municipal headquarters towns with over 8,000 rural inhabitants.

The following table provides a brief summary of some of the telecommunications funds that are either planned or have been implemented in developing countries and emerging markets.

Country	Fund Status	Funding Source	Fund Administrator	Disbursement of Funds
Argentina	Planned	1% of all operators' gross revenues	Operators (virtual fund)	Government to determine based on its goal to increase fixed teledensity to 0.35 and mobile teledensity to 0.20
Brazil	Operational	1% of service providers' gross operational revenues earned from the provision of telecom services	Anatel, regulatory agency	---
Chile	Operational	Government's budget	Subtel, regulatory agency	Subsidies distributed through competitive bidding (lowest bid wins)
Nepal	Operational	2% levy on the revenues of the incumbent operator, ISPs and mobile operators	NTA (Nepal Telecom Authority)	Subsidies distributed through competitive bidding

It is recommended that Belize institute a 1–2% levy of telecommunication operator's gross monthly income, ISPs, mobile phone operators, cable TV companies and radio station operators to assist in funding the National ICT strategy. It is estimated that over $1.5 Million per year can be raised from this levy. As well, this figure will be used as counterpart funding to secure grants from international partners to assist in funding of special projects.

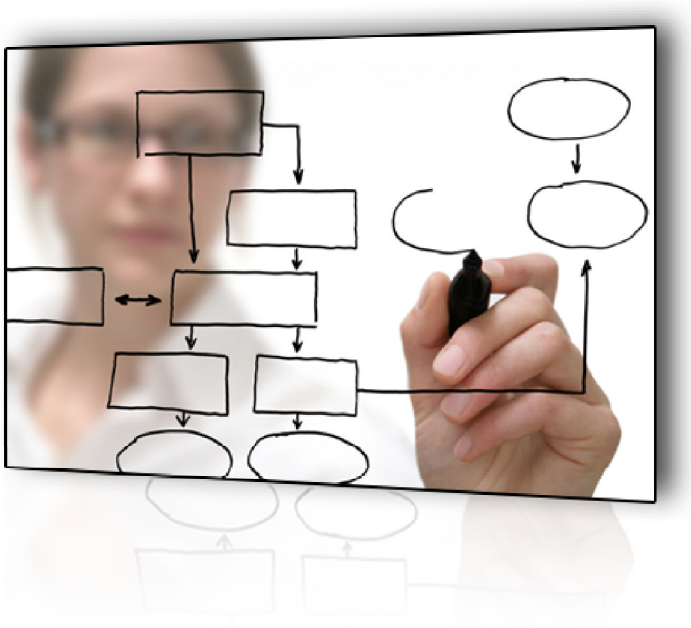
NATIONAL ICT STRATEGY IMPLEMENTATION APPROACH

Implementation of the National ICT Strategy is outlined as a planned and collaborative approach. Public/Private partnerships will be pursued as the modus operandi of strategy implementation. The role of the international development and funding communities will also be actively promoted, particularly in terms of the transfer of information, benchmarking and keeping abreast of developments in the sector.

GOB will encourage the private sector, civil society and international development agencies working in Belize to partner with government in building out infrastructure, in developing Belize's human resources, in providing jobs and in taking on development activities related to the ICT strategy for the socio-economic development of the country. Integral to the implementation process will be:

- GOB's leadership (along with the private sector, foreign investors and its international partners) and the commitment of resources;
- Smart partnerships with key sectors from private sector, civil society, foreign investors and the international development agencies;
- The involvement of all stakeholders in the execution and the continuing development of the action plan to accompany this National ICT Strategy;
- Rigorous pursuit of outcomes outlined within the Strategy.

The National ICT Strategy will also seek to attract local and foreign investors and development grants through various investment packages and incentives, sufficient workspace with supporting technology infrastructure, as well as a pool of trained workers and professional staff. Potential investors and development agencies will be aggressively targeted through a focused promotional strategy.



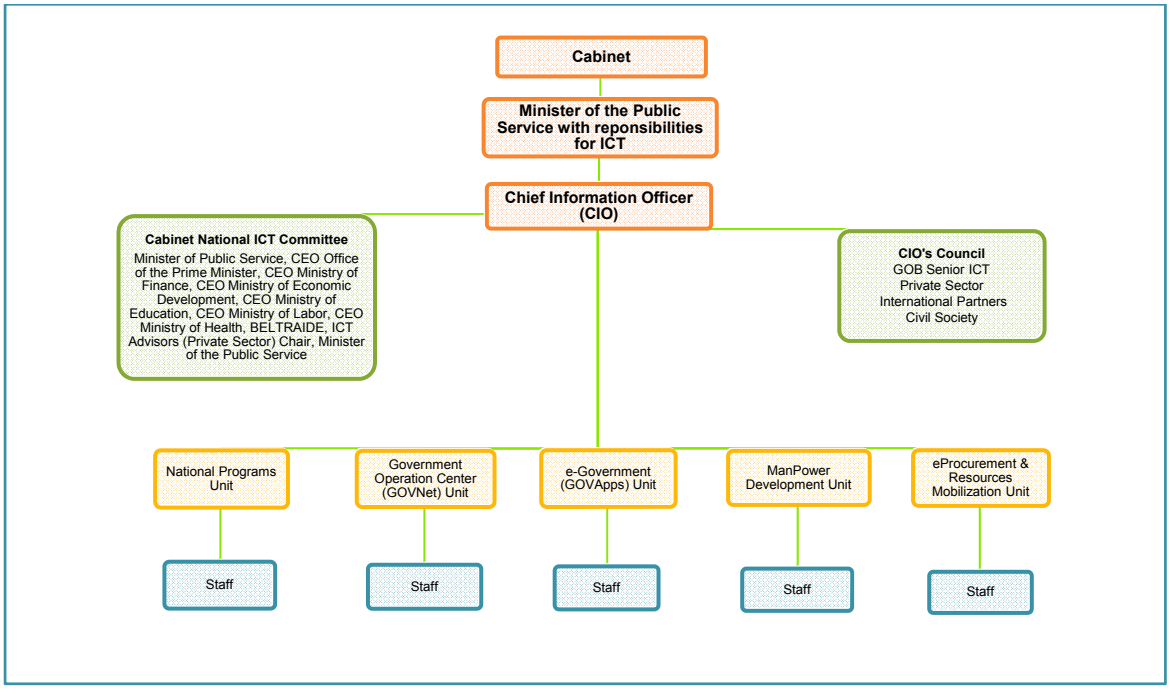
PROPOSED ICT GOVERNANCE STRUCTURE

The Proposed ICT Governance Structure is presented in Figure 14 below. The guiding policy-making body for the governance structure would be the Cabinet acting though a Cabinet ICT Committee. This Committee would be chaired by the Minister of the Public Service and would be comprised of the following members:

- The Minister of the Public Service – Chairperson
- The CEO in the Prime Minister's Office – Vice Chair
- The CEO in the Ministry of Finance
- The CEO in the Ministry of Economic Development
- The CEO in the Ministry of the Public Service
- The CEO in the Ministry of Labor
- The CEO in the Ministry of Health
- The CEO in the Ministry of Education
- The Director of Beltraide
- The ICT Chief Information Technology Officer
- The Private Sector Advisors specializing in different areas of ICT, Strategic Planning and Business Transformation

Figure 14

Proposed ICT Governance Structure



This Cabinet ICT Committee would be the chief policy-making body for implementing the ICT National Strategy. It will be tasked with the following:

- Setting collaborative strategies and achieving cooperation across ministries and agencies in order to transform government processes and deliver more integrated services;
- Facilitating a "big picture" approach to ICT issues with agencies responsible for individual ICT arrangements;
- Encouraging a cooperative approach to decision on standards, investment, security, privacy, shared infrastructure, and reuse of intellectual property; and,
- Ensuring that decisions reflect the impact and benefits across government, rather than on individual agencies alone.

A centralized GOB ICT Department will be created under the direction of a Chief Information Technology Officer. The Chief Information Technology Officer's function should include:

- Authority for driving the change agenda – The CITO should be at the Chief Executive Officer level and should also be a full member of the CEO Caucus responsible for providing executive steerage of the national ICT agenda;
- A mandate to provide independent and authoritative advice for major ICT investments – The CITO should provide expert input into all ICT-related bids and ensure all major ICT investments are consistent with agreed strategic priorities and architecture standards;
- Strong mechanisms for GOB collaboration and decision-making – Management of the GOB ICT agenda should be directed through the Cabinet ICT Committee of which the Minister of the Public Service should chair. In addition, peer assessments between GOB CEOs and Ministry/Department ICT managers and administrators should be introduced to ensure the ongoing effectiveness of collaboration arrangements. The CITO will also work along with a CITO Council comprised of senior GOB ICT Directors, and key ICT private sector, academic institutions, civil society and international development partners who provide advice and guidance on the implementation of the national ICT Strategy;
- The CITO should have an office equipped with individuals capable of focusing on ICT strategy, policy and architecture as well as an officer with grant writing/resource mobilization skills to secure funding for GOB ICT

related initiatives. The CITO office should focus on GOB ICT management and provide the necessary strategy, policy and architecture capabilities to drive the standardization agenda.

The ICT Department will be charged with implementing the National ICT Strategy under the direction of the ICT Cabinet Committee chaired by the Minister of the Public Service. It will also work in tandem with a Chief Information Officer's Council comprised of GOB senior ICT officers, and private sector, civil society, academic institutions and international development partners. This Council will work with the Chief Information Technology Officer and his/her units to:

- Co-develop an Action Plan designed to implement the National ICT Strategy including program ownership, resourcing and prioritization;
- Advise on the progress of the implementation of the ICT Action Plan;
- Discuss policies and standards proposed by the Department and advise on implementation of agreed upon policies and standards;
- Raise and discuss ICT issues with cross government and national impact, as well as advising on the agenda for the ICT Department's policy making;
- Advising on resource mobilization efforts by the Department.

The new GOB ICT Department's core business activities consist of five units:

- National Programs Unit
- The Government ICT Service Center: Government Ops Center and Technology Unit
- E-Government (GOV/Apps) Unit;
- Manpower Development Unit;
- e-Procurement and Financing Unit.

THE NATIONAL PROGRAM UNIT

The National Program Unit will coordinate national level projects with other implementing agencies such as the implementation of cyberparks and telecenters in Belize. This unit will work with agencies such as Beltrade, the private sector, civil society and international development partners to initiate national programs designed to increase jobs and internet access for enhanced democratic governance, particularly to rural areas of the country.

THE GOVERNMENT OPS CENTER UNIT

The Government Ops Center will consist of multiple facilities designed to provide services to government entities. These services can be divided into two main categories:

Network Services - The Secure Government Network (SGN) is a government-wide network providing a controlled, secure and high-throughput service. All government entities will be connected to this service and SGN is the sole provider of connectivity between government departments. To manage the SGN, the ICT Department will operate a Network Government Ops Center (NOC) that closely monitors network performance and bandwidth utilization. Connectivity to the Internet is via the SGN. In order to meet the required security standards and achieve economy of scale benefits, connection via SGN is the sole source of Internet connectivity for government entities.

Data Center Services - Data centers are constructed specifically for large-scale data storage and information technology processing needed to operate government IT applications, email services and Web sites. They are designed to minimize hazards from electrical power failure, fire, water damage, acts of nature, and unauthorized access. Data is backed up regularly and the data center is provided with a mirrored fail-over facility that is able to take control of the government systems in the event of a disaster. The secure data centers are provided with high speed, dual connectivity communications links to the SGN, Internet, and fail-over facility.

The Objectives of the Government Ops Center are:

- To reduce costs by leveraging a common infrastructure across multiple applications and data content. This will drive down the need for infrastructure to support individual applications. This will in turn drive down the cost to deliver these capabilities;
- To increase quality of service. A single release-management infrastructure, with a common set of processes, procedures and tools, creates a more stable environment.
- To consolidate resources and skill sets. Concentrating the required competencies in one team, will reduce the cost of hiring, training and keeping scarce qualified IT staff;
- To enhance security. Using a shared infrastructure with common procedures across the applications and associated data will provide the ability to maintain a single government security policy;
- To decrease time to market by enabling government entities to introduce their information and services to their users in a faster manner, making use of the already existing services offered by the Government Ops Center.

- To increase compatibility. The use of common platforms, procedures and tools makes integration of new applications easier and also provides excellent scalability.

THE E-GOVERNMENT UNIT

The objectives of the e-Government Unit are summarized as follows

- Reduce the costs of government and associated business transactions by streamlining government processes and procedures;
- Increase the effectiveness of government in dealing with interactions with citizens and businesses.

The main concept of e-Government is to view government as a supplier of services and citizens/businesses as customers wanting to use those services. This involves a fundamental change in the culture and operating practices of government and the perception of government by both citizens and businesses.

In line with the above this department consists of two focus areas:

1. Services and processes
2. Infrastructure

The key functions of the e-Government unit are:

- Business processes redesign (BPR) of Government
- Services development defining which services are to be offered through e-Government and developing and launching these services
- Content Management including standards, forms, languages, look and feel, use of logos etc.; this also includes content management for the National Information System.
- Infrastructure - The following infrastructure building blocks are defined for e-Government services:

1. Access layer (PC's, mobile devices, internet kiosk)
2. Gateway layer (data conversion, messaging, transaction engine and workflow, authentication, Portal etc.)
3. Shared services layer: the Secure Government Network (SGN)

THE MANPOWER DEVELOPMENT UNIT

One of the most significant objectives the National ICT Strategy is to use ICT as a major contributor to the social and economic development of Belize. To accelerate the use of ICT the new ICT Department must act fast in implementing ICT development programs for its Belizeans and Belizean businesses. The ICT

Department must be used as a catalyst and accelerator towards this end.

The underlying objectives of the Manpower Development Unit are threefold:

1. Developing the skills of the nation (citizens and businesses) through programs using ICT and/ or teaching ICT;
2. Developing the ICT skills of government employees;
3. Developing and continuously improving the skills of the ICT Department staff

The Manpower Development Unit will actively focus on the latter two objectives. In addition it will support the various National Programs in achieving the first objective.

This department will not employ actual trainers but will set up training programs based on the various needs and job requirements within government; the actual training will be done by private sector companies.

THE E-PROCUREMENT AND FINANCING UNIT

The objectives of the e-Procurement and Financing Unit are fourfold:

1. Advise GOB on large ICT procurement contracts from a technical and financial perspective;
2. Develop and recommend e-Procurement policies and procedures to GOB;
3. Work with international development partners, investors and the local private sector to maximize resource mobilization for the implementation of the strategy;
4. Develop guidelines for and manage the Universal Access Fund.

Finally, key elements of the GOB ICT governance model should be mirrored in ministries and departments. In particular, ministries, departments and external agencies should ensure their internal governance arrangements support the more coordinated GOB approach to ICT. They need to establish effective mechanisms to align business and ICT strategies and plans, and to establish ministries/department positions in relation to GOB wide ICT related issues.

CRITICAL SUCCESS FACTORS

The following must be in place (critical success factors) for the National ICT Strategy to be successful:

- Senior Government sponsorship at the CEO and Ministerial level;
- Viewed and positioned as a National Development Initiative – not only as a Government IT Initiative;
- Broad national engagement involving government, industry, academia, NGO's and civil society;
- Understanding that Education and HR Development (with a special focus on Youth) are as much the keys to sustainable ICT development and growth as ICT infrastructure;
- Telecommunications affordability and maximum available bandwidth;
- Identifying true breakthrough opportunities in the e-Marketplace in Belize;
- e-Government as a catalyst – "early adopter, model user";
- A solid governance structure led by expert stakeholders from government, civil society and the private sector.

APPENDIX

APPENDIX A - ACKNOWLEDGEMENTS

E-Data Limited and the Ministry of the Public Service, Governance Improvement, Elections and Boundaries and Sports would like to acknowledge the following stakeholders who actively participated and contributed to the development of the National ICT Strategy.

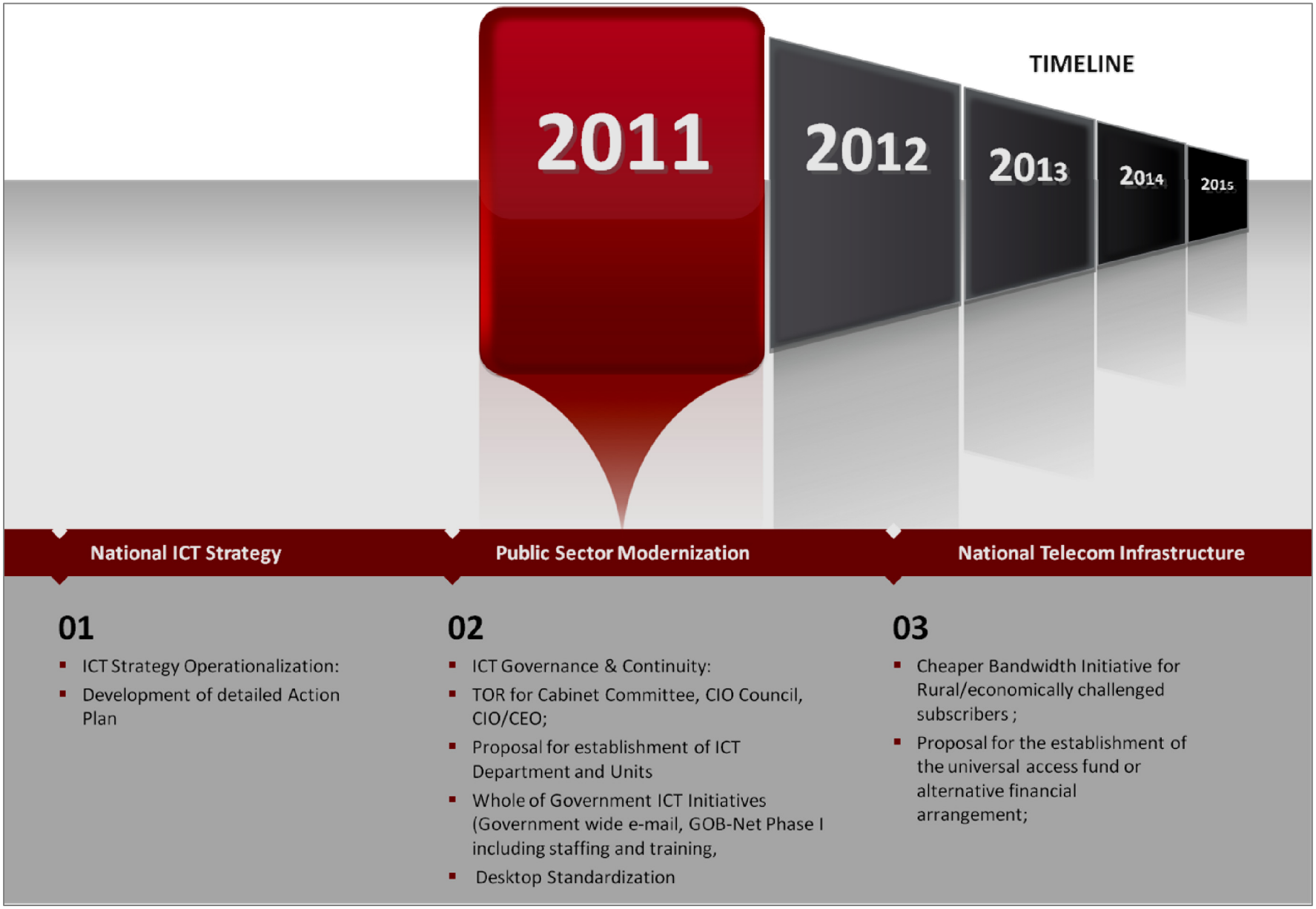
Number	Person	Organization
1	Pedro Alonzo	Atlantic Bank Ltd.
2	Elvis Saravia	Auditor General's Office
3	Dr. Carla Barnett	Barnett and Company
4	Jose Cardona	Belize Bank Ltd.
5	Clinton Williams	Belize Chamber of Commerce & Industry
6	Alyssa R. Carnegie	Belize Information Service
7	Lucisla Castillo	Belize Library Service
8	Harry Noble	Belize Police Department
9	Inaldi Cardona	Belize Police Department
10	Mario Alcozer	Belize Police Department
11	Jose Riverol	Belize Telemedia Limited
12	Moshea Smith	Belize Telemedia Limited
13	Rafael Marin	Belize Telemedia Limited
14	Winston Aspinal	Belize Telemedia Limited
15	Harrison Cooper	Belize Trade and Investment Development (BELTRAIDE)
16	Michael Singh	Belize Trade and Investment Development (BELTRAIDE)
17	Lourdes Smith	Business Computer Systems
18	Rabey Cruz	Central Bank of Belize
19	Chao-Kuei Hung	Chaoyang University of Technology
20	Eddie Webster	Clerk of the National Assembly
21	K. Mustafa Toure	Consultant
22	Therese Martinez	Customs Department
23	Emil Matute	Department of Civil Aviation
24	Edgar Eck	Department of the Environment
25	Edmund Zuniga	Elections and Boundaries Department

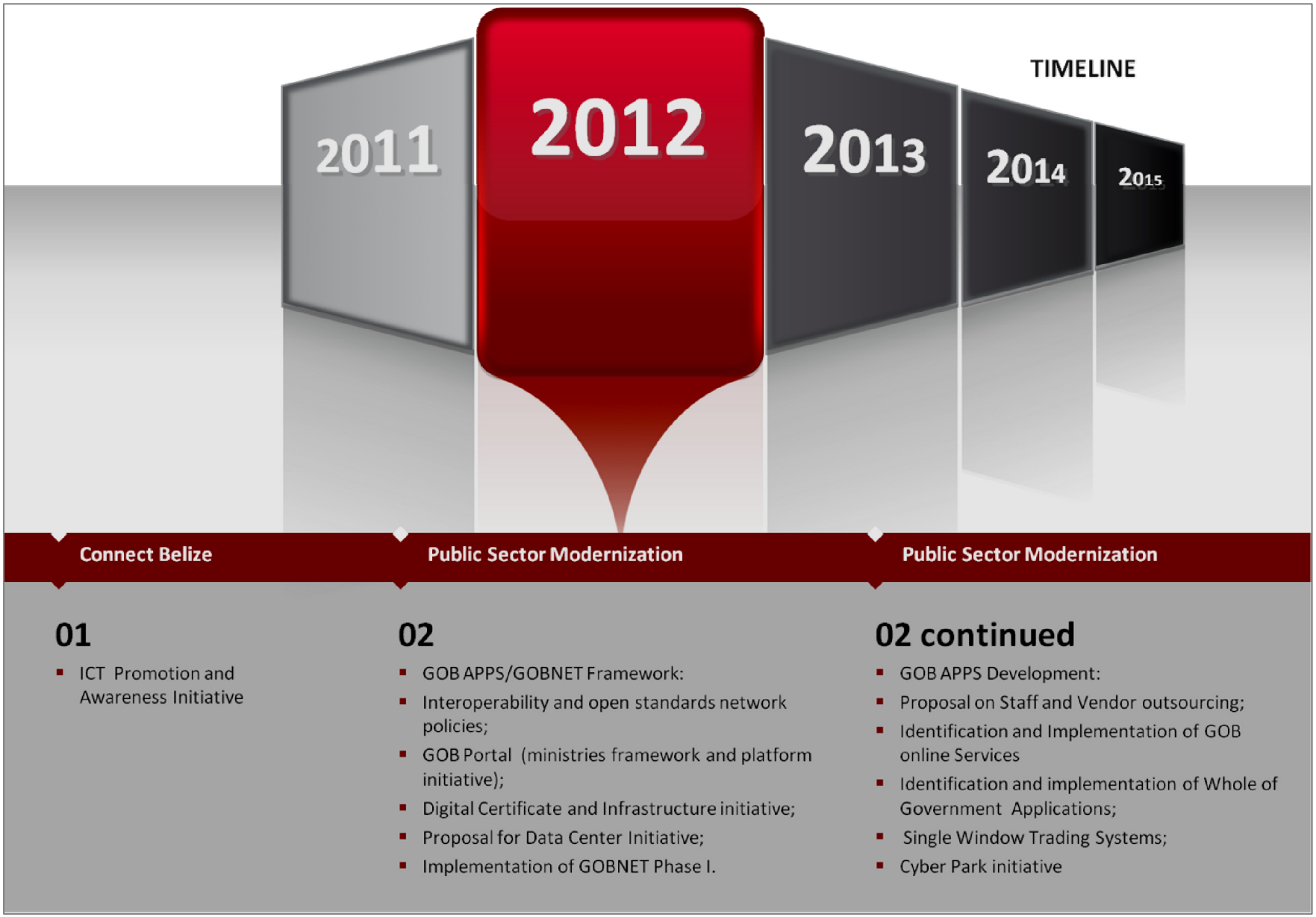
Number	Person	Organization
26	John Chang	Embassy of Taiwan
27	Barry Cuthbertson	Embassy of the United States of America
28	Judene Tingling	Forestry Department
29	Grace Brown	Fultec Systems
30	Shannia Wade	General Post Office
31	Cecelia Thompson	General Sales Tax Department
32	Andre Cho	Geology and Petroleum Department
33	George Sosa	GS-Com
32	Roger Pena	GV Source Inc.
33	Anthony Andrews	Housing Department
34	Antonio Madrid	ICT National Center
35	Rodolfo Bol	Immigration Department
36	Harold Arzu	Inter-American Development Bank
37	Aniki Palacio	Labor Department
38	Catherine Cumerbatch	Meteorology Department
39	Michelle Longsworth	Ministry of Finance
40	Gabino Canto	Ministry of Agriculture and Fisheries
41	Justine Swift	Ministry of Defense
42	Allen Whylie	Ministry of Defense and Immigration
43	Emory Suazo	Ministry of Economic Development
44	Felix Girad	Ministry of Economic Development
45	Lincon Blake	Ministry of Economic Development
46	Yvonne Hyde	Ministry of Economic Development
47	David Leacock	Ministry of Education
48	Kevin Harris	Ministry of Education
48	Joseph Waight	Ministry of Finance
49	Louis Ayuso	Ministry of Finance
50	Pablo Cawich	Ministry of Finance
51	Alexis Rosado	Ministry of Foreign Affairs
52	Miguel Cowo	Ministry of Foreign Affairs
53	Patrick Menzies	Ministry of Foreign Affairs
54	Ian Smith	Ministry of Health
55	Pearl Ellis	Ministry of Health

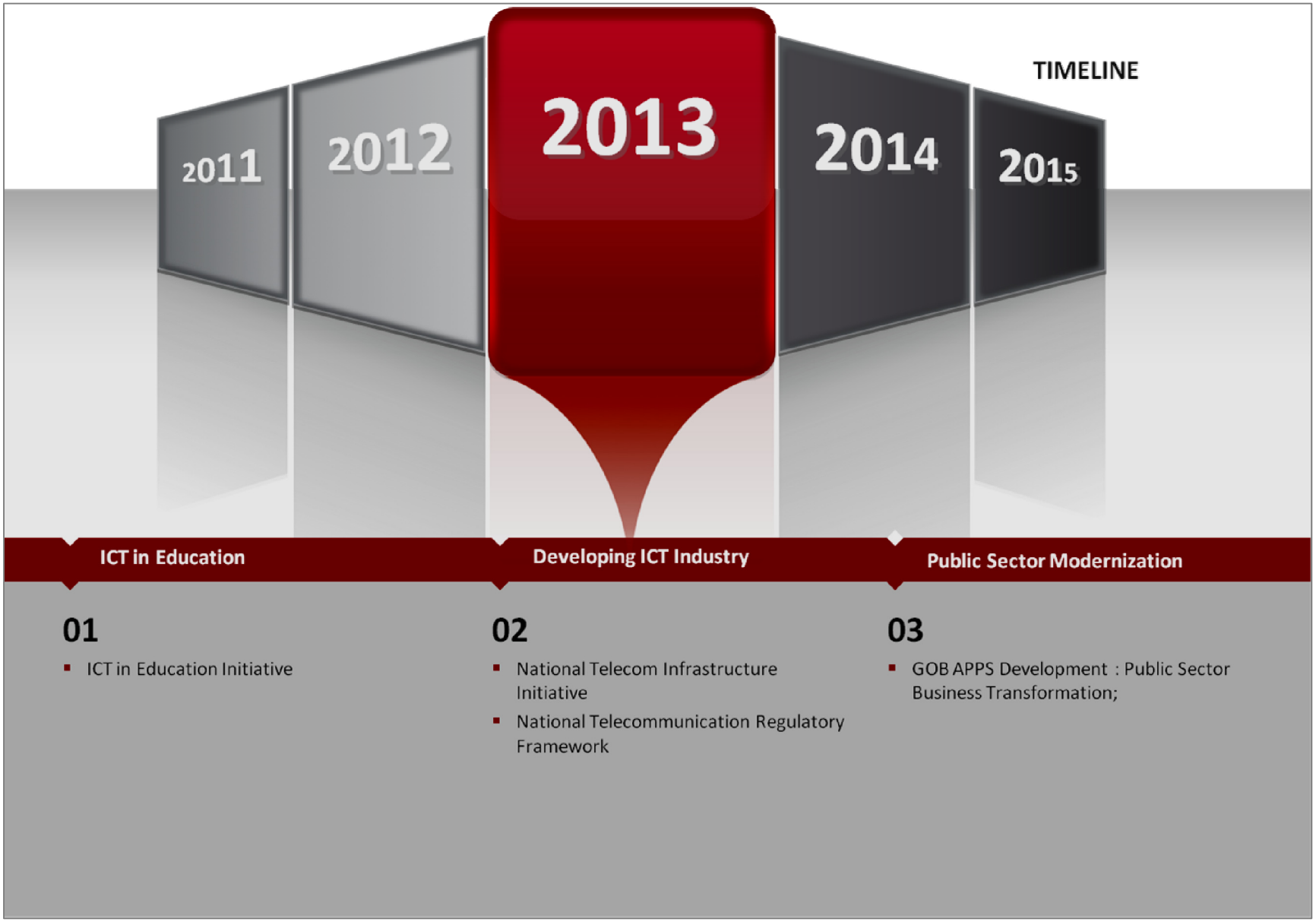
Number	Person	Organization
56	Rufino Tami	Ministry of Health
57	Lawrence Sylvester	Ministry of Housing and Urban Development
58	Ana Williams	Ministry of Human Development
59	Judith Alpuche	Ministry of Human Development
60	Marion McNab	Ministry of Labor
62	Beverly Castillo	Ministry of Natural Resources
63	Charles Gibson	Ministry of Natural Resources
64	George Lovell	Ministry of Police and Public Safety
65	Rosalie Gentle	Ministry of Public Utilities
66	Byron Tesecum	Ministry of the Public Service
67	Dwight Gillett	Ministry of the Public Service
68	Francis Crawford	Ministry of the Public Service
69	Freya Parham August	Ministry of the Public Service
70	Justin Palacio	Ministry of the Public Service
71	Ian Tzib	Ministry of Tourism
72	Candelara Morter	Ministry of Transport and Communications
71	Gerson Ramarace	Ministry of Works
72	Dr. Herman Byrd	National Archives Department
73	Noreen Fairweather	National Emergency Management Organization (NEMO)
74	Diana Hendy	Office of the Chief Magistrate
75	Kim Osborne	Organization of American States
76	John Pinelo	PC-Com
77	Audrey Wallace	Prime Minister's Office
78	Marvin Blades	Public Service Union
79	John Avery	Public Utilities Commission
80	Kingsley Smith	Public Utilities Commission
81	Kieran Ryan	Sacred Heart Junior College
82	Narda Garcia	SMART
83	Reynaldo Magana	SMART
84	Sean Duncan	SMART
85	Merlene Bailey Martinez	Social Security Board
86	Naysan Ahmadiyeh	Social Security Board
87	Keene Williams	Society for the Promotion of Education and Research (SPEAR)

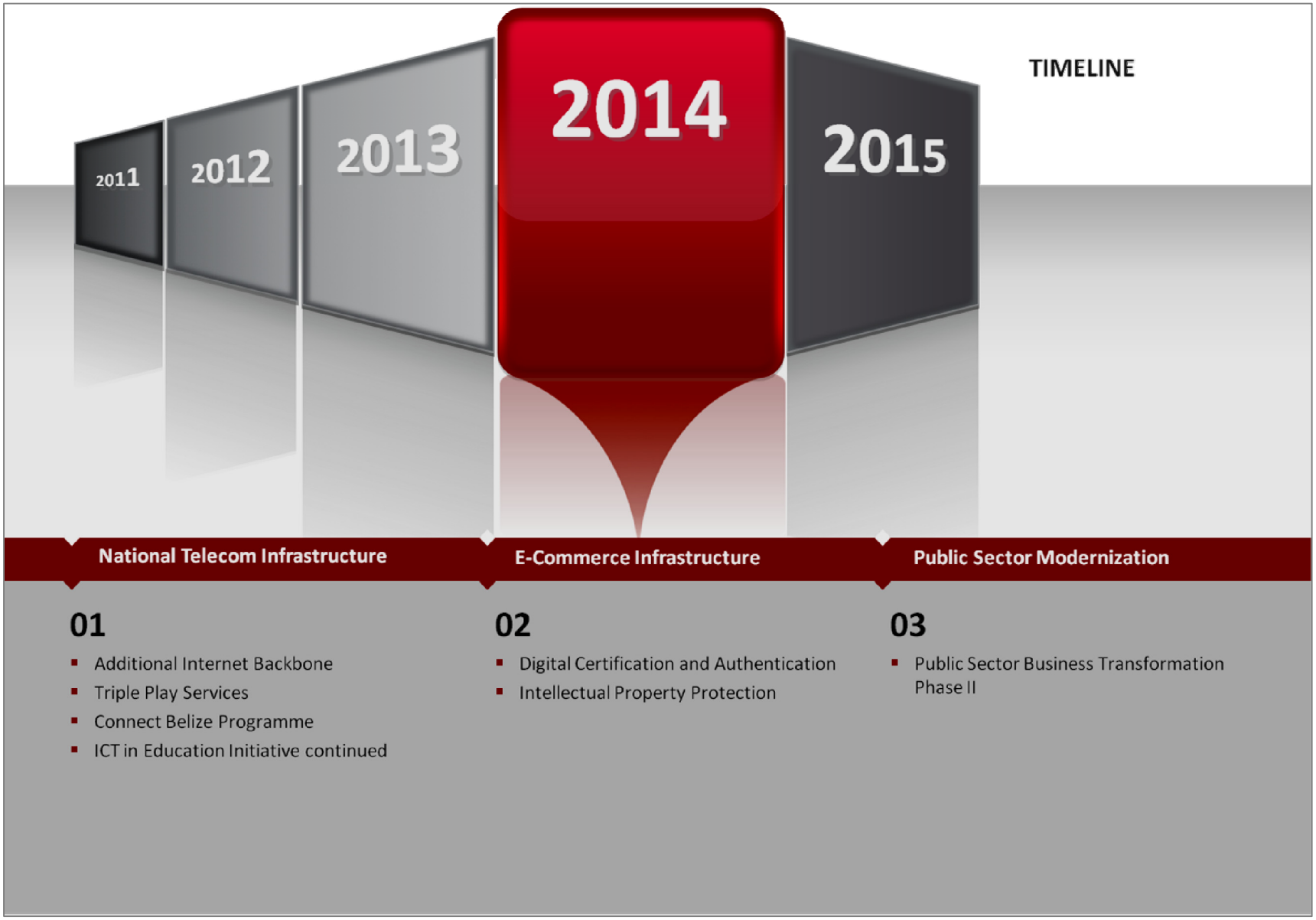
Number	Person	Organization
88	Etienne Sharp	Southern Cable Network
89	Glenn Avilez	Statistical Institute of Belize
90	Hugo Vasquez	Stella Links Limited
91	Jerry Wang	Taiwan ICDF
92	Max Chung	Taiwan ICDF
93	Shun Jung Tu	Taiwan ICDF
94	Wen Kai Ou	Taiwan ICDF
95	Te-Chao Liang	Tamkang University
96	Loretta Garcia	Total Business Solutions
97	Felix Enriquez	Treasury Department
98	Dr. David Brown	UNESCO
99	Christine Norton	UNICEF
100	Shirlene Tablada	UNICEF
101	Francisco Roquette	United Nations Development Program
102	Omar Gale	United Nations Development Program
103	Dr. Vincent Palacio	University of Belize
104	Ruel Cima	University of Belize
105	Sylvia Cattouse	University of Belize

APPENDIX B – ROAD MAP

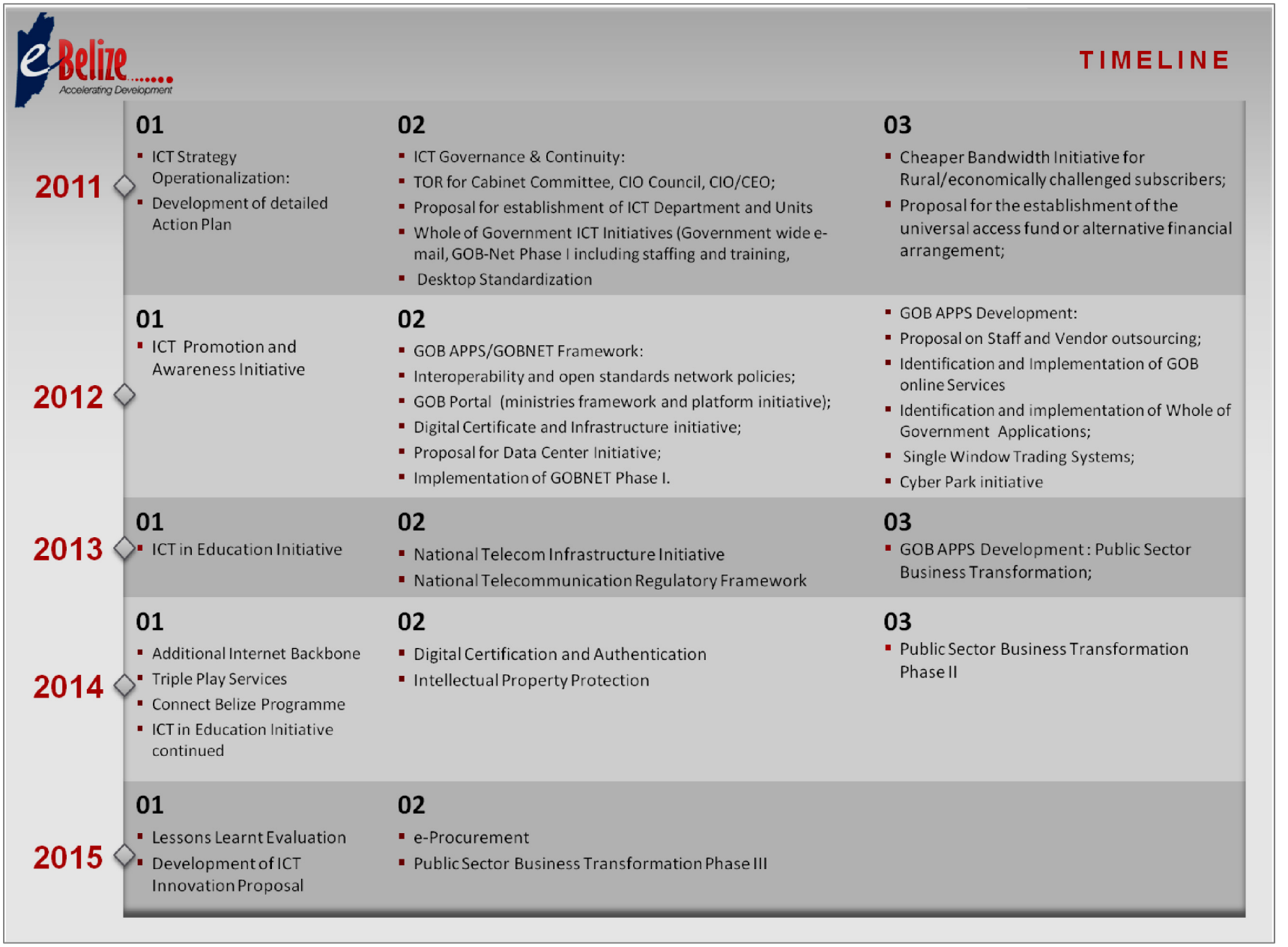

TIMELINE
2011
2012
2013
2014
2015
National ICT Strategy
Public Sector Modernization
National Telecom Infrastructure
01
ICT Strategy Operationalization:
Development of detailed Action Plan
02
ICT Governance & Continuity:
TOR for Cabinet Committee, CIO Council, CIO/CEO;
Proposal for establishment of ICT Department and Units
Whole of Government ICT Initiatives (Government wide e-mail, GOB-Net Phase I including staffing and training,
Desktop Standardization
03
Cheaper Bandwidth Initiative for Rural/economically challenged subscribers ;
Proposal for the establishment of the universal access fund or alternative financial arrangement;


TIMELINE
2011
2012
2013
2014
2015
Connect Belize
Public Sector Modernization
Public Sector Modernization
01
ICT Promotion and Awareness Initiative
02
GOB APPS/GOBNET Framework:
Interoperability and open standards network policies;
GOB Portal (ministries framework and platform initiative);
Digital Certificate and Infrastructure initiative;
Proposal for Data Center Initiative;
Implementation of GOBNET Phase I.
02 continued
GOB APPS Development:
Proposal on Staff and Vendor outsourcing;
Identification and Implementation of GOB online Services
Identification and implementation of Whole of Government Applications;
Single Window Trading Systems;
Cyber Park initiative


TIMELINE
2011
2012
2013
2014
2015
ICT in Education
Developing ICT Industry
Public Sector Modernization
01
ICT in Education Initiative
02
National Telecom Infrastructure Initiative
National Telecommunication Regulatory Framework
03
GOB APPS Development : Public Sector Business Transformation;


TIMELINE
2011
2012
2013
2014
2015
National Telecom Infrastructure
E-Commerce Infrastructure
Public Sector Modernization
01
Additional Internet Backbone
Triple Play Services
Connect Belize Programme
ICT in Education Initiative continued
02
Digital Certification and Authentication
Intellectual Property Protection
03
Public Sector Business Transformation Phase II

TIMELINE
2011
2012
2013
2014
2015
National ICT Strategy
Public Sector Modernization
01
Lessons Learnt Evaluation
Development of ICT Innovation Proposal
02
e-Procurement
Public Sector Business Transformation Phase III


eBelize
Accelerating Development
TIMELINE
2011
01
ICT Strategy Operationalization:
Development of detailed Action Plan
02
ICT Governance & Continuity:
TOR for Cabinet Committee, CIO Council, CIO/CEO;
Proposal for establishment of ICT Department and Units
Whole of Government ICT Initiatives (Government wide e-mail, GOB-Net Phase I including staffing and training,
Desktop Standardization
03
Cheaper Bandwidth Initiative for Rural/economically challenged subscribers;
Proposal for the establishment of the universal access fund or alternative financial arrangement;
2012
01
ICT Promotion and Awareness Initiative
02
GOB APPS/GOBNET Framework:
Interoperability and open standards network policies;
GOB Portal (ministries framework and platform initiative);
Digital Certificate and Infrastructure initiative;
Proposal for Data Center Initiative;
Implementation of GOBNET Phase I.
GOB APPS Development:
Proposal on Staff and Vendor outsourcing;
Identification and Implementation of GOB online Services
Identification and implementation of Whole of Government Applications;
Single Window Trading Systems;
Cyber Park initiative
2013
01
ICT in Education Initiative
02
National Telecom Infrastructure Initiative
National Telecommunication Regulatory Framework
03
GOB APPS Development : Public Sector Business Transformation;
2014
01
Additional Internet Backbone
Triple Play Services
Connect Belize Programme
ICT in Education Initiative continued
02
Digital Certification and Authentication
Intellectual Property Protection
03
Public Sector Business Transformation Phase II
2015
01
Lessons Learnt Evaluation
Development of ICT Innovation Proposal
02
e-Procurement
Public Sector Business Transformation Phase III