BROADBAND IN ST. KITTS AND NEVIS

STRENGTH IN DEPTH

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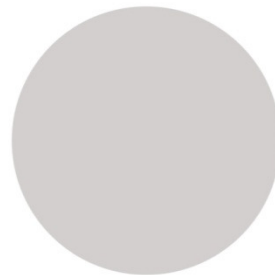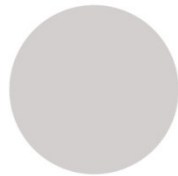
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ST. KITTS AND NEVIS:
STRENGTH IN DEPTH

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Access to affordable broadband has become a priority for many countries, which is perceived as important for social and economic development. The interaction of individuals, communities, and organizations with broadband has contributed to the development and enhancement of social networks, access to and generation of new knowledge, and the creation of diverse innovative processes.

The World Bank commissioned this study of the Information and Communication Technology (ICT) sector and specifically broadband within the Federation of Saint Christopher and Nevis. It forms part of a series of case studies carried out to analyze broadband in a representative sample of developing economies as background research for the World Bank Broadband Strategy Toolkit.

The study analyses the environment within the small island developing state that facilitated the uptake of broadband technologies and applications, to the extent that St. Kitts and Nevis has the highest fixed broadband subscription rate among all countries of the Latin America and Caribbean region, and even higher than some developed economies.

This achievement can be attributed in part to the small physical size of St. Kitts and Nevis that has enabled faster rollout of the physical infrastructure, facilitated more effective marketing, and promoted maximum impact for government-led ICT initiatives. Among the Caribbean islands however smallness is certainly not unique. The study therefore explores other factors that have contributed to high broadband penetration.

The phrase "strength in depth" is borrowed from the world of soccer, the most popular sport on the island. The phrase is used to underscore the point that the strength of the island's achievement in the broadband sector, lies in its commitment to nurturing the foundational components of the broadband ecosystem. Promotion of basic education and digital literacy, building technology awareness, facilitating access to ICT, and encouragement of a competitive telecommunications environment are but a few examples of the country's core strengths.

However, as in any ecosystem, sustainability and growth can be threatened by internal weaknesses. As of the date of this report, mobile broadband has yet to be launched and the lack of appropriate legislation is holding back the development of interactive e-commerce and e-government applications. Other challenges included the high cost of services, an unstable power supply and quality of service issues.

Chapter 1 of the report provides a socio-economic overview of St. Kitts and Nevis. Chapter 2 examines key policies and laws that govern the ICT sector, identifies key institutions and service providers and presents data on the size of the telecommunications market. Chapter 3 looks at the broadband market including penetration, pricing and quality. Chapter 4 reviews factors that have an impact on broadband demand. Chapter 5 summarizes the country's success factors as well as remaining challenges impeding the realization of a sustainable broadband ecosystem.

In order to provide regional context, the report provides comparative data for other Eastern Caribbean countries, specifically Dominica, Grenada, Saint Lucia, and Saint Vincent and the Grenadines.

Acknowledgments

Abbreviations and Acronyms

ADSL	-	Asymmetric Digital Subscriber Line
CARICOM	-	Caribbean Community
ECTEL	-	Eastern Caribbean Telecommunications Authority
GDP	-	Gross Domestic Product
GOSKN	-	Government of St. Kitts and Nevis
GPRS	-	General Packet Radio Service
ICT	-	Information and Communication Technologies
ISP	-	Internet Service Provider
Kbps	-	Kilobits per second
LIME	-	Landline, Internet, Mobile, Entertainment
Mbps	-	Megabits per second
NTRC	-	National Telecommunications Regulatory Commission
OECD	-	Organisation for Economic Co-operation and Development
OECS	-	Organisation of Eastern Caribbean States
SKN	-	St. Kitts and Nevis
UNDP		United Nations Development Programme
USF	-	Universal Service Fund
UWI	-	University of the West Indies
VoIP	-	Voice over Internet Protocol
Wi-Fi	-	Wireless Fidelity

1   Background

1.1   Geography

The twin island Federation of Saint Kitts and Nevis is located in the northern part of the Leeward Islands of the Caribbean (Figures 1-1 and 1-2).

Figure 1-1: Map of the Eastern Caribbean

Source: World Bank.

The country has a total landmass of 267 square kilometers making it the smallest independent country in the Western Hemisphere. St. Kitts, formally known as Saint Christopher, is the larger of the two islands. The island of Nevis is located southeast of St. Kitts across a two mile wide channel and can be reached by ferry in 15 minutes.

Administratively St. Kitts is divided into nine parishes, and the island of Nevis into five parishes.   The administrative capital for both islands is Basseterre located on St. Kitts with a population of around 13,000.   The capital and main town of Nevis is Charlestown.   Both St.

Kitts and Nevis are fairly easy to navigate with each island having one main road that passes through the major communities usually located on the coastline.

Figure 1-2: Map of St. Kitts and Nevis

Source: The World Factbook.

1.2   History

European settlement of St. Kitts and Nevis began in the early 17ᵗʰ century. In 1623 St. Kitts became the first British colony of the Caribbean region, and was nicknamed "the mother colony of the West Indies."[1]   The island repeatedly alternated between British and French rule.   The Treaty of Paris awarded both islands to the British in 1783. In 1967 Saint Christopher-Nevis-Anguilla became a self-governing associated state of Great Britain. In 1980 Anguilla seceded and became a separate

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[1] The island of St. Kitts was the first on which an English settlement was made, and served as the base for colonization of the other Caribbean islands. Some historical texts refer to St. Kitts as the "mother colony", see: J.O. Cutteridge. 1947. *Geography of the West Indies and Adjacent Lands.*   Other texts refer to the island as the "cradle" of the British West Indian colonies, see: Rev. C. Jesse. 1964. *Outlines of St. Lucia's History.*

territory. St. Kitts and Nevis, the only federation in the Caribbean, gained independence on 19 September 1983. In 1998, 62 per cent of Nevisians voted for secession but narrowly fell short of the required 67 per cent.

1.3   Population

The most recent estimated population was 51,970 in 2009.[2] Demographic statistics from the 2001 Census are shown in the table below:[3]

Table 1-1: Demographic statistics, 2001

	Total	St. Kitts	Nevis
Population	46,325	35,217	11,108
Households	15,680	11,848	3,832
Household size	3.0	3.0	2.9
Population distribution (%)	100	76	24
Population density (per km²)	174	202	119
Population under 20 years (%)	38	40	35

Source: Caricom. National Census Report: St. Kitts & Nevis.

The majority of the population is of African descent and the official language is English. Some Kittitians and Nevisians also speak an English-based creole.

The federation has historically had high rates of emigration. This has led to a large Diaspora residing in the United States, Canada, and the United Kingdom. There were around 20,000 people born in St. Kitts and Nevis living in those three countries in 2000-01 or almost 40% of the country's population.[4] It is therefore no surprise that remittances account for a significant portion of the economy. St. Kitts and Nevis accounted for 20% of all remittances among Eastern Caribbean Currency Union members during 1991-2009 and they contributed 7.1% of the country's GDP in 2009.[5]

1.4   Education

The literacy rate for the federation is 98%, highest in the Eastern Caribbean (Figure 1-3). The implementation of universal secondary school education in the 1970s—where all final grade primary school students, irrespective of ability, are transferred to a secondary school—has contributed to high literacy.

Figure 1-3: Adult literacy rate (% aged 15 and above), 2010
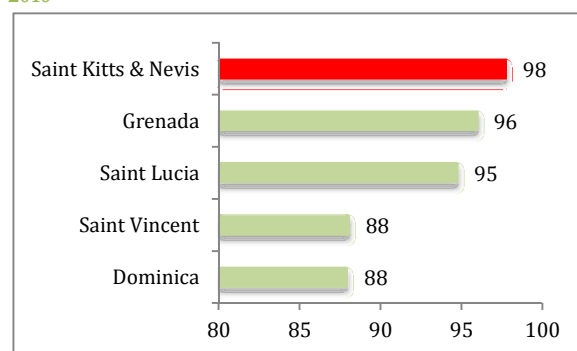
Source: United Nations Development Program.

There are twenty-four public primary schools and seven public secondary schools. St. Kitts and Nevis has the best teacher to student ratios in the Eastern Caribbean.

The Student Education Learning Fund (SELF) provides textbooks to students at no cost and also covers secondary school examination fees. Students may withdraw from secondary school in the fourth form (grade 11) and enroll in a program at the National Skills Training Programme (NSTP) or at the Advanced Vocational Centre (AVEC).

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[2] See the Caricom Regional Statistics at:
http://www.caricomstats.org/Files/Databases/Population/MP.htm
[3] Caricom. 2009. *National Census Report: St. Kitts and Nevis.* www.caricomstats.org
[4] Organisation for Economic Co-operation and Development. "Country-of-birth database." www.oecd.org/dataoecd/18/23/34792376.xls

[5] Benjamin-Mack, Seana. "Remittances Issues in the Eastern Caribbean Currency Union 1991 to 2009" presented at the *The World Bank, Canadian International Development Agency (CIDA) and University of the West Indies Knowledge Sharing Forum on Remittances*, March 24-25, 2010. University of the West Indies, Mona Campus, Jamaica. http://go.worldbank.org/2AYU03ZUF0.

Graduating secondary school students can pursue post-secondary studies at the Clarence Fitzroy Bryant College located in St. Kitts or the Sixth Form College in Nevis. The two-year program prepares students for the Caribbean Advanced Proficiency Exam..

The University of the West Indies (UWI) Open Campus provides distance education programs to students in St. Kitts and Nevis.[6] Approximately 130 students attend the Open Campus in St. Kitts and 30 on Nevis with video conferencing to other campus sites. The country is also home to several offshore higher educational institutions.

1.5 Economy

The economy has traditionally been agriculture-based and particularly the production of sugar. In July 2005, after successive losses in the sugar industry due to low global prices, high production costs, and changes in the European Union Sugar Protocol, the government shut down the St. Kitts Sugar Manufacturing Corporation and the production of sugar for export virtually halted.

The country has since diversified into other sectors such as light manufacturing, fishing, and non-sugar agricultural production and the services sector particularly tourism and financial services.

St. Kitts has the largest electronics assembly industry in the eastern Caribbean region. Five electronics manufacturing companies, most established in the Government Industrial Park, produce a range of electronic components for export.

St. Kitts and Nevis has a well-developed offshore banking and financial services sector. It is estimated that more than 15,000 offshore companies are registered in Nevis alone where they are free from taxation and privacy is protected under the 1985 Confidential Relationship Act.

There is no tax on personal income. A 17 per cent Value Added Tax (VAT) was introduced in November 2010.

The IMF estimated Gross Domestic Product (GDP) per capita at US$ 9,918 for 2011 (12,502 in purchasing power parity).[7]

The Federation is home to the Eastern Caribbean Central Bank (ECCB). Established in 1985, the ECCB is responsible for the common currency used on the region. Also located on St. Kitts is the Eastern Caribbean Stock Exchange (ECSE), a regional securities market established by the ECCB.

Almost 550,000 tourists visited St. Kitts and Nevis in 2009. Recent investment has fuelled growth of the tourism sector with a 57 per cent increase in visitors between 2006 and 2009.[8]

1.6 Government

The Federation of St. Kitts and Nevis has a unicameral National Assembly consisting of eleven elected members and three senators. The ruling Labour Party led by Dr Denzil Douglas, the longest-serving Prime Minister among the Eastern Caribbean islands, occupies six of the seats and has been in power since 1995.

The island of Nevis has its own administration, legislation and premier; three elected representatives from Nevis serve in the National Assembly. As a member of the Commonwealth, the Queen of England is the formal head of state of the federation.

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[6] The UWI Open Campus is an online campus with over 40 physical locations throughout the English-speaking Caribbean. See: http://www.open.uwi.edu.

[7] International Monetary Fund (MF). *World Economic Outlook Database.* April 2011.
[8] See "Tourism Data" on the ECCB web site at: http://www.eccb-centralbank.org/Statistics/index.asp#tourismdata

2 ICT Sector

2.1 Policy and regulatory environment

The *National ICT Strategic Plan* was published in 2006 covering sector goals over the next five years.[9] The Plan outlines a road map for leveraging ICT for social and economic progress including the development of human resources, promoting the integration of technology within government, and facilitating public-private sector partnerships. Other policies are specific to key areas such as a ten-year strategic outlook for integrating ICT within the educational curriculum outlined in the 2009 *White Paper on Education Development and Policy.[10]*

Commitment extends to the highest level of government with the Prime Minister consistently emphasizing the use of ICTs for socio-economic development and to universal Internet access:

"…I want to emphasize the pledge of my Government that Internet access must become a human right for the people of St. Kitts and Nevis…every citizen of this country, every resident and every visitor of this country must have the right to access the Internet once they are here in St. Kitts and Nevis."[11]

A number of institutions are involved with ICT policy and regulation. Policy development and implementation rests with the ministry responsible for Information Technology and Telecommunications.[12]

The Eastern Caribbean Telecommunications Authority (ECTEL), established in 2000, is the joint regulatory authority for Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines. The three executive branches of the regional body are: (a) the Council of Ministers comprised of the five Ministers responsible for telecommunications in the respective territories; (b) the regional directorate headquartered in St. Lucia, acting in an advisory capacity to member states on regulatory issues; and (c) the National Telecommunications Regulatory Commissions (NTRCs) established in each member state.

The NTRC in St. Kitts and Nevis consists of five government-appointed Commissioners who are non-full time staff and the regulator's staff headed the Director. The NTRC is mandated to monitor compliance of telecommunication licensees, manage the universal service fund, monitor anti-competitive practices, provide support to the sector minister, approve interconnection agreements, and liaise with ECTEL on relevant telecommunications issues.

The *Telecommunications Act* of 2000 is the principal legislation governing the sector.[13] A key regulatory event was full liberalization of the telecommunications sector in 2001. This ended the exclusive rights of Cable & Wireless to operate telecommunications facilities and services in the ECTEL states.[14]

ECTEL has drafted a regional Electronic Communications Bill intended to reform legislation under the original Telecommunications Act such that all electronic communications will

[9] Government of St Kitts and Nevis. 2006. *National Information and Communications Technology (ICT) Strategic Plan.* http://unstats.un.org/unsd/dnss/docViewer.aspx?docID=2297.
[10] Available at: http://www.moeskn.org/index.php?option=com_docman&task=doc_download&gid=17&Itemid=138
[11] Office of the Prime Minister. St. Kitts Denzil Douglas at Universal Service Fund Launch. September 10, 2010. http://www.youtube.com/watch?v=kql-h9fjqWI&feature=youtube_gdata_player.
[12] Currently the Ministry of Youth Empowerment, Sports, Information Technology and Telecommunications and Post. http://www.gov.kn/ct.asp?xItem=1813&ctNode=62&mp=1.

[13] Saint Christopher and Nevis. 2000. *The Telecommunications Act.* The Act and other relevant legislation governing the telecom sector are available from the ECTEL web site at: http://www.ectel.int/actsandregulations.htm
[14] See the "Agreement" of April 7, 2001 between the ECTEL member states and Cable & Wireless available at: http://www.ectel.int/aboutectel_agreement.htm

be covered (excluding content regulation).[15] The draft Bill is currently undergoing public consultation throughout the region.

2.2 Service providers

The following service providers are present in the telecommunications market in St. Kitts and Nevis:

- **LIME (Landline, Internet, Mobile, Entertainment)**, formerly Cable & Wireless, is a regional telecommunications service provider offering mobile, fixed line, broadband, and cable television services in both St. Kitts and Nevis and throughout the Caribbean.[16] Cable & Wireless has a long history in the country. St. Kitts and Nevis Telecommunications Ltd. (SKANTEL) was formed in 1985 as a joint venture between Cable & Wireless and the government and rebranded as Cable & Wireless in 1999. In 2007, the government sold its shares and under an agreement made with Cable & Wireless, five per cent of the shares were sold via public offering to citizens, residents and domestic corporate entities of St. Kitts and Nevis. In 2001 Cable & Wireless was issued a 15-year non-exclusive license under the new Telecommunications Act terminating its existing 25-year exclusive license.
- **The Cable** offers broadband, cable television, and telephone services to consumers in St. Kitts.[17] Established In 1984, The Cable, is partly government-owned.
- **Caribbean Cable Communications** provides telephone, cable television and broadband Internet services on the island of Nevis. Established in 2006 the company is headquartered on the neighboring island of Anguilla.[18] In 2009, after contentious discussions over proposed rate increases, the Nevis Island Administration moved towards nationalization of the company. As of May 2011 the dispute has not been resolved.[19]

- **Wireless Ventures** (**Digicel),** a pan-Caribbean mobile operator, launched in 2005 and provides service in both islands.[20]
- **Winstreme** offers fixed wireless Internet services on the island of Nevis only. It is a privately owned company that launched in 2007.
- **UTS-Cariglobe (Chippie)** offers mobile telecommunication services in both islands.[21] It is a joint venture between UTS (Netherland Antilles) and CariGlobe (a local company) and launched services in 2005.
- **21st Century Telecoms** was issued a license to provide mobile services within the federation; however as of January 2011, the company has not as yet launched its network.

Table 2-1: Service providers in St. Kitts and Nevis

	Launched	Services provided	Ownership
LIME/C&W	1985	fixed, mobile, broadband	77% foreign; 23% public
The Cable	1984	broadband, cable tv	69% Government; 31% foreign
Caribbean Cable	2006	broadband, cable tv	(move to nationalization)
Digicel	2005	mobile	100% foreign
Winstreme	2007	broadband	100% local
UTS-Cariglobe	2005	mobile	60% foreign; 40% local

Note: The Cable operates in St. Kitts while Caribbean Cable and Winstreme operate in Nevis. All others operate on both islands.

2.3 ICT in the economy

The telecommunications services sector was worth EC$ 120 (US$44) million in the year ending March 2009 (ECTEL 2010). It contributed about 8% to GDP, a figure that has fluctuated between 7.7% and 9.4% over the last five years (Table 2-2). The telecommunications services sector directly

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[15] The draft Electronic Communications Bill is available at: http://www.ectel.int/elec_communication_bill_pr.html
[16] See company website at http://www.time4lime.com/kn.
[17] See company website at http://www.thecable.net
[18] See company website at http://ccc2.caribcable.com/nevis
[19] The case was taken before the Eastern Caribbean Supreme Court – see http://www.caribbeanlawonline.com/index.php?option=co

m_docman&task=doc_view&gid=811&Itemid=344&zoom_highlight=nevis
[20] See company website at http://www.digicelstkittsandnevis.com
[21] See company website at http://www.uts.an

employed 136 people in 2009, down sharply from the 178 in 2008 and an indication of the impact of the financial crisis. Likewise, investment in telecommunications declined dramatically between 2008 and 2009 from EC$ 23 to EC$ 8 million.

Table 2-2: Telecom services sector, St. Kitts and Nevis

	Years ending March				
	2005	**2006**	**2007**	**2008**	**2009**
Telecom revenues EC$ million	98	91	123	125	120
Telecom revenues US$ million	$36	$33	$45	$46	$44
Telecom revenues as % of GDP	9.1%	7.7%	9.4%	9.0%	7.8%
Investment EC$ million	38	23	22	23	8
Investment US$ million	$14	$8	$8	$9	$3
Direct employment	140	159	157	178	136

Note: GDP data from IMF. Converted to US$ using exchange rate of EC $2.7169 = US $1.00.
Source: Adapted from ECTEL.

3 Broadband market

3.1 Retail services

Four service providers offer broadband services: LIME, The Cable, Caribbean Cable Communications, and Winstreme. The latter two companies operate solely in Nevis, The Cable offers service on St. Kitts and LIME provides service on both islands.

LIME is the only Internet service provider serving both islands. It introduced dial-up access in the 1990s. In 2001, Asymmetric Digital Subscriber Line (ADSL) service was launched. Around one percent of businesses still subscribe for dial-up Internet access primarily for the purpose of retaining prior email addresses. LIME also offers Wi-Fi through several hotspots and has installed WiMAX for rural locations in Nevis.

In 2003, **The Cable** launched cable broadband Internet services to subscribers in St. Kitts. The company has seen a gradual increase in the number of broadband subscribers to almost 4,000 as at the end of December 2010 (Table 3-1). The Cable is installing a fiber-to-the-home network in a new property development at Christophe Harbor, the first of its kind in St. Kitts. The project is due for completion at the end of 2011.

Source: The Cable.

Caribbean Cable Communications, the sole cable television service provider on the island of Nevis, provides broadband Internet services using cable modem technology.

Winstreme provides fixed wireless broadband service for residents of Nevis. The subscriber base is less than 200 customers (including a significant number of medical students who reside on the island). The company has installed three towers on the island where the customer premise equipment consists of an outdoor directional antenna to the base station.

As of March 2010, the number of fixed Internet subscribers in St. Kitts and Nevis was 14,577 of which 99% were broadband connections. This puts the fixed broadband subscription rate at 28 per cent. In 2009, St. Kitts and Nevis had the highest fixed broadband penetration in the Latin America and Caribbean region and even surpassed the OECD average (Figure 3-1).

Table 3-1: The Cable subscriber data

	Cable TV basic subscribers	Cable TV Tier subscribers	Broadband subscribers
1999	8,304	6,517	-
2000	8,599	7,449	-
2001	8,912	8,456	-
2002	9,076	8,728	-
2003	9,721	10,158	1,562
2004	10,016	10,586	1,805
2005	10,275	11,037	2,213
2006	10,545	11,789	2,089
2007	10,485	13,194	2,220
2008	11,238	14,942	2,906
2009	11,871	17,028	3,429
2010	11,974	17,196	3,761

Figure 3-1: Fixed broadband subscriptions, per 100 people, 2009

Bermuda	62
Sweden	41
Canada	30
United States	28
St. Kitts and Nevis	26
Japan	25
Australia	25
Malta	24
OECD	24
New Zealand	23
Singapore	23
Barbados	22
Dominica	22
Grenada	13
St. Vincent	11
Chile	10
Mexico	9
St. Lucia*	9
LAC	7
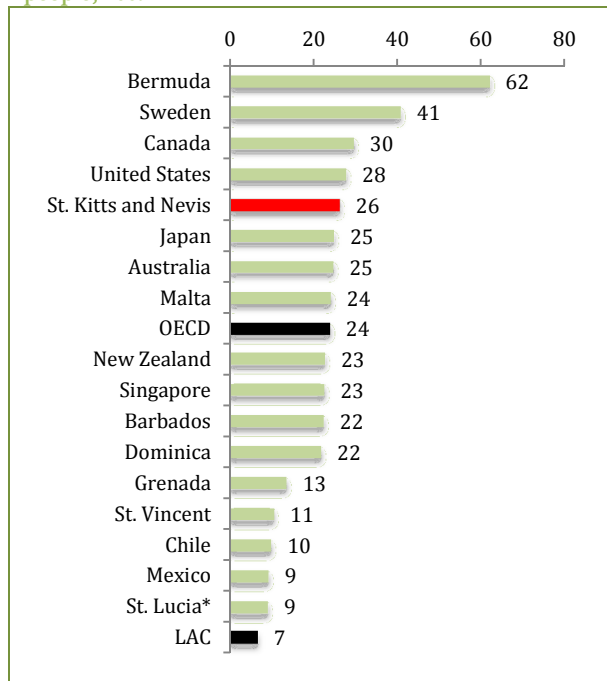
Note: * 2009. *Source*: World Bank.

Three mobile operators, LIME, Digicel, and UTS-Cariglobe (Chippie) provide mobile service. LIME has the largest market share at just under 50%.

In March 2009, St. Kitts and Nevis registered a mobile penetration rate of 148 per cent, the highest rate among the ECTEL member states. This is up from 60% in March 2005. Prepaid service far surpasses the number of post-paid mobile subscriptions.

Despite the high cellular penetration, mobile broadband services have not been launched with mobile data service provided through EDGE and GPRS technologies. LIME is in the process of upgrading to Enhanced Data for GSM Evolution (EDGE). Both Digicel and Chippie have deployed General Packet Radio Services (GPRS) networks.

According to Digicel, approximately 22 per cent of its subscriber base use Internet services. This is typically through mobile handsets that are data enabled. The company also estimates that almost 80 per cent of Blackberry users utilize data services. Blackberry users account for approximately 30 per cent of the subscriber base. In January 2011, Digicel launched its "Data Bundle of Joy" package which gives non-BlackBerry prepaid customers with a data compatible handset the opportunity to purchase weekly, fortnightly, or monthly data packages.

3.2 National and international backbones

Both The Cable and LIME have deployed fiber rings around the island of St. Kitts. Nevis is connected to St. Kitts via microwave. According to service providers the establishment of a wireless link presented a more cost effective option than laying fiber between the two islands. In 2011 LIME applied for a license to implement a second microwave link between the two islands due to limited capacity. Towers are located on the southeast peninsula of St. Kitts offering direct line-of-sight to an antenna on the north end of Nevis at the narrowest point separating the two islands (approximately one mile). Attenuation from factors such as the effects of severe weather and mist (due to the mountainous topography of the island) and the passage of a cruise ship impacts service quality.

Cable & Wireless (along with France Telecom and AT&T) installed the Eastern Caribbean Fiber System (ECFS) in 1995, an undersea system that connects all of the islands of the Eastern Caribbean including St. Kitts and Nevis.

In 2007 Global Caribbean Network (GCN), was awarded a contract to build an undersea fiber optic cable network between Guadeloupe and Puerto Rico supported by financing from the European Union. Total overall network capacity of the cable is 1.2 Tbps. The Cable leases an STM-1 (155 Mbps) from GCN.

Both the ECFS and GCN cables land at the same site at Lime Kiln in St. Kitts.

3.3 Pricing

An entry-level ADSL subscription from LIME costs US$ 37 per month for a 2 Mbps download/512 Kbps upload connection (Table 3-2). Cable modem prices are higher; for example Caribbean Cable charges US$40 for a 512 kbps download subscription.

Table 3-2: ADSL broadband monthly subscription, St. Kitts and Nevis, April 2011

	EC$	US$	Down-load Mbps	US$ per Mbps	Up-load kbps
MEGA	99	$37	2	$19	512
MEGA PLUS	149	$56	3	$19	512
MEGA MAX	249	$93	6	$16	768
MEGA EXTREME	309	$116	8	$14	1,024

Source: LIME.

Fixed broadband prices are more affordable in St. Kitts and Nevis compared to other East Caribbean nations (Figure 3-2). However prices are relatively high by international standards especially when adjusted for purchasing power parity (PPP). For example the average monthly subscription price for connections below 2.5 Mbps advertised download speed was USD PPP 27 in the OECD in September 2010 compared to USD PPP 46 in St. Kitts and Nevis. [22]

Figure 3-2: Fixed broadband subscription as % of per capita income, 2009
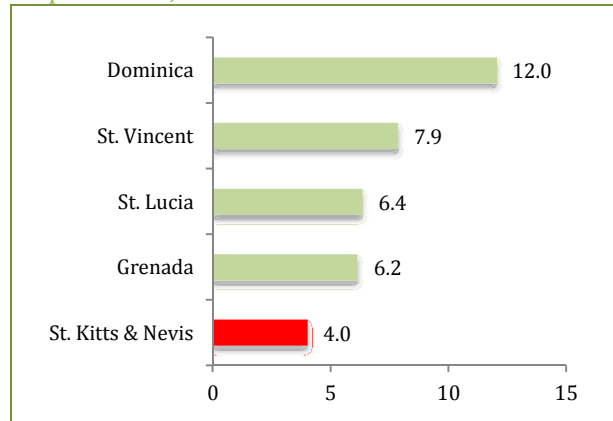
Source: ITU.

Consumers can also access the Internet through Wi-Fi enabled laptops or handsets. Data packages are offered through service providers Consumers typically pay about US$ 20 per month for 25 MB daily usage, and US$ 0.10 for each additional 1 MB used over this base amount.

3.4 Quality

Tests are not carried out by the NTRC to measure the quality of broadband services. OOKLA reported that the average download speed for St. Kitts and Nevis was 2.2 Mbps in December 2010[23] only average when compared to other East Caribbean countries (Figure 3-3).

Figure 3-3: Average broadband download speeds, Mbps, December 2010

Source: OOKLA Net Index.

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[22] See: "4f. Average monthly subscription price for connections below 2.5 Mbps advertised download speed" on the OECD Broadband statistics portal at: www.oecd.org/ sti/ict/broadband. The 2011 PPP exchange rate for St. Kitts and Nevis is from the IMF World Economic Outlook database.

[23] http://www.netindex.com/
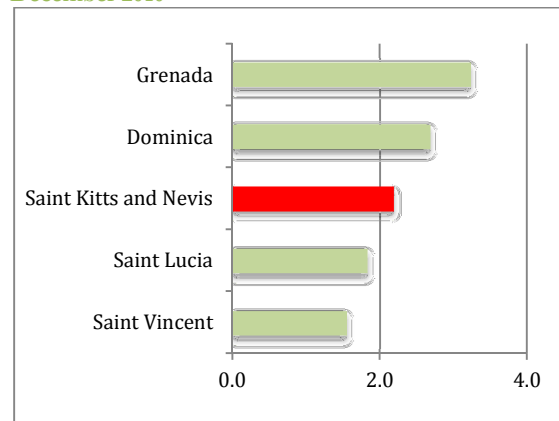
4 Demand

4.1 Current demand

St. Kitts and Nevis has a relatively high degree of Internet penetration. There are an estimated 38,000 Internet users or almost three quarters of the population at March 2009.[24] Penetration has more than doubled since March 2002.

4.2 Computers

As far back as 2001, (the latest year for which data is available), a relatively high proportion of households already had computers – 20 per cent on the island of Nevis and 18 per cent in St. Kitts.

In 2001 Cable & Wireless launched a bundled PC package for consumers in order to make it easier for individuals to get onto the Internet. As part of the package computers (with high-speed Internet access at discounted prices) could be acquired from the company on hire purchase. This led to an upswing in computer penetration and according to Cable & Wireless, resulted in an almost 30 per cent increase in the number of Internet subscriptions.

Another factor impacting computer ownership is the exemption of customs duties on data processing equipment.

4.3 Education

In 1998, the government embarked on a program to implement computer labs in every school. The program was initially targeted at secondary school students preparing for the school-leaving examinations, but was subsequently extended to all levels. Both LIME and The Cable offer free Internet access to primary and secondary schools. One of the challenges to the project remains on-going maintenance and upgrade of the equipment.[25]

In line with the Prime Minister's call for the provision of a computer to every student of high school age in order to promote digital literacy[26], the government launched the *I-literacy one-2-one laptop* initiative in 2010. During the first phase of the project (scheduled for completion in 2011), Hewlett Packard devices will be provided to fifth form secondary school students. The government has partnered with Microsoft to provide low cost software on the specially designed touch-screen laptops. The government has also received proposals from service providers for the implementation of a community wireless (Wi-Fi) network where students would have access to broadband Internet from their respective homes on a 'pay-as-you-go' basis.

Secondary school students typically use the labs as part of the educational curriculum, particularly in preparation for the secondary school leaving examination in Information technology. However the full integration of ICT into the teaching curriculum remains unfulfilled. The Ministry of Education has indicated that a curriculum is being developed which in part aims to integrate computers as teaching tools.

4.4 Training

Community residents have access to ICT training through several initiatives. One focuses on adult training at community centers or schools (typically after school hours) throughout the islands. The centers are typically outfitted through public private partnerships. The government typically

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[24] The number of estimated Internet users is based on multiplying the number of subscribers by three.

[25] There is a central Support Unit within the Ministry of Education for basic maintenance and troubleshooting of computer issues. However staff at the unit is limited.
[26] See the Labour Party Manifesto available at http://progressnotpromises.com/pdf/2010_Manifesto_Final_Spreads_lo_res.pdf

develops the physical infrastructure, local businesses provide the needed hardware and software (or provide financial support), and service providers such as The Cable and LIME provide free broadband access. The programs are designed to improve digital literacy of participants particularly adults and seniors within rural communities.

Training is usually provided by community development officers and/or facilitated by the National Skills Training Programme (NSTP).[27] Computer training ranges from a general introduction course to instruction in business application software such as QuickBooks. According to the NSTP, demand for computer training with the organization was particularly high during the period 1998 – 2004. A subsequent downturn in computer training classes is partly attributed to the provision of training by other entities.

The International Computer Driving License (ICDL) is a widely used standard for assessing individuals in various computer skills including word processing, spreadsheets and databases. The courses, typically four to six weeks long, are designed to provide end-users with the skills necessary for "proficient use of information and communication technology."[28] In St. Kitts, ICDL training is offered by a number of organizations including the National ICT Centre, private companies, the Clarence Fitzroy Bryant College, and community access centers. The National ICT Centre estimates that on average more than 50 users complete ICDL training per month.

The government has promoted the training of government employees for achievement of the ICDL certification as a complement to further

development of e-Government services. Students of the Government Youth Empowerment through Skills (YES) programme have also received certification training.

4.5 Universal access

The Universal Service Fund (USF) was established by ECTEL in order to promote access to affordable telecommunications services "including voice telephony and Internet access, as well as broadband connectivity at the community, household and individual levels."[29] The fund is financed by contributions from telecommunications service providers.[30] A pilot USF project for the disadvantaged community of Dieppe Bay is expected to upgrade access to ICTs in the area's community center (located within a school).

Individuals have access to computers at community centers where service providers provide broadband access at no cost. Computer and Internet facilities are also provided in public areas such as the Charles A. Halbert Public Library where broadband access is available to the public at a price of about US$ 6 (fixed) and US$ 2 (Wi-Fi) per day.

LIME has five Wi-Fi hotspots within St. Kitts with three in the Basseterre region including one at Port Zanté offering free service primarily targeted to arriving cruise ship passengers. Other hotspots can be found at the local airport (free service), the general post office located near Port Zanté (housing three computers and a paid service of US$4 per hour) and at most hotels (for a fee of, an average, US10 per day).

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[27] The NSTP was launched in 1986 through a regional OECS project. The Programme was institutionalised in 1992 and falls under the Ministry of Education. See website at: http://ministryofeducartionstkittsnevis.web.officelive.com/default.aspx
[28] See the certification authority website at http://www.ecdl.org.

[29] See the "Council Approved USF Regulations." November 13, 2007. http://www.ectel.int/pdf/USF%20APPROVED%20regulations.pdf
[30] Contributions are as follows: (a) in the first year of license, 0.25% of gross annual revenue; (b) in the second year of license, 0.5% of gross annual revenue; and (c) from the third year of license onwards, 1.0% of gross annual revenue. See: *Telecommunications (Universal Service Fund Contribution) Order, 2008.* http://www.ectel.int/Telecoms%20Regulations/ St.%20Kitts/Universal_Service_Fund_Order_4_of_2008.pdf.

4.6   IT Business

According to a 2008 ECTEL survey of 82 businesses in St. Kitts and Nevis (ECTEL 2009), 93 per cent used the Internet. Although broadband providers have installed fiber in high-density areas such as Basseterre, most small businesses indicated that an ADSL or cable modem connection is used as it was adequate for their processes and the cost of subscribing to fiber was too high.

Young entrepreneurs have launched ICT-based companies offering a range of services as resellers of hardware equipment to providers of more advanced software services such as online payment systems.

The Small Business Development Act was passed in 2009 to provide support to small and medium size enterprises including exemption from or reduction in customs duties on imported equipment or machinery such as computers. One priority activity identified under the Act involves support for small businesses engaged in ICT services.

Business process outsourcing is not extensive. There is one call center, Clear Harbor, located on the island of Nevis.[31]

With little exception businesses host their servers outside of St. Kitts and Nevis. This is primarily attributed to: (a) high costs for local dedicated access for business and (b) the perception that the quality of service for advanced services is not adequate, and (c) an unreliable electricity infrastructure exists.

4.7   Services and content

St. Kitts and Nevis has a high level of international communications due to the large Diaspora and tourism. This has generated high demand for computers and broadband applications such as VoIP, instant messaging and social networking.

"…One of the things which I think prompted this (high uptake of computers) is the large Diaspora so persons took advantage of tools such as MSN Messenger which was cheaper than making a call..."[32]

Voice over Internet Protocol (VoIP) is used extensively throughout the country as a cheap alternative to fixed telephone international calling. Over a fifth of SMEs use VoIP for international calls, the highest rate in the region (along with St. Vincent and the Grenadines) (Figure 4-1). Many small businesses also use low cost Internet Protocol private branch exchanges.

Figure 4-1: Percentage of SME's using VoIP for international calls, 2008
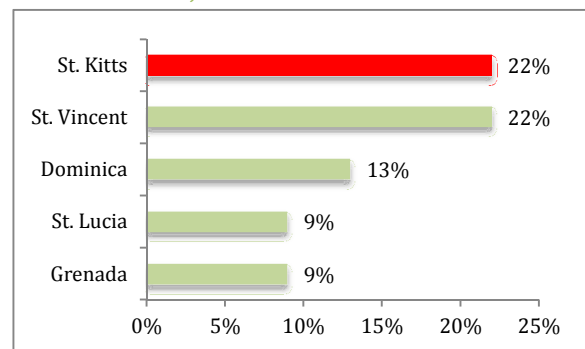
Source: ECTEL, "Use of ICT by SMEs".

Facebook is popular with some 21,000 users at March 2011 or almost 40% of the population. St. Kitts and Nevis has the highest Facebook penetration in the Eastern Caribbean (Figure 4-2).

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[31] The Clear Harbor call center (with two other centers in Dominica and Grenada) provides service to external companies and employs in excess of 100 individuals on the island of Nevis.

[32] Interview with Glen Phillip, Minister of Information Technology and Telecommunications.

Figure 4-2: Percentage of the population using Facebook, March 2011

St. Kitts & Nevis: 38.5
Grenada: 33.5
St. Vincent: 32.7
Dominica: 26.9
St. Lucia: 26.7
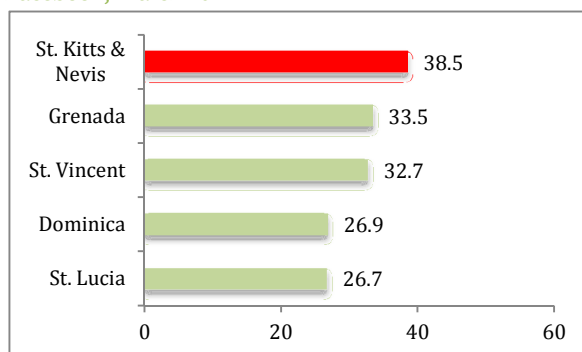
Source: ictDATA.org.

Video conferencing facilities are used by several organizations and businesses. For example the Eastern Caribbean Institute of Banking (ECIB) provides professional development courses via video conferencing for persons in the financial sector within the region. The Government National ICT Centre also offers video conferencing services at reasonable rates to the general public.

One of the most popular local sites is SKNVibes.com, launched by a group of six Kittitians in 2002. The site serves as a community portal targeted to local residents as well as Nevisians and Kittitians of the Diaspora. A host of residential, community, and government information on St. Kitts and Nevis is accessible from the portal including news, music, classified ads, streaming videos, as well as services such as email. In 2003, the company signed up with the St. Kitts and Nevis National Bank as its merchant bank for online payment services such as top-up payments for mobile phones and community services such as online obituary notices. According to Greg Gilbert, the company's CEO, the site registers more than two million visitors per month and its popularity has led some government agencies to block access to it by employees. The company employs nine people.

The St. Kitts and Nevis Visitor Channel launched in 2008 and offers residents and visitors information on local events, shopping, nightlife, accommodation and more. The one-hour program has been made available online.[33]

4.8 E-commerce

Lack of requisite legislation governing electronic transactions and consumer protection serve as an impediment to electronic commerce. As a result, there are hardly any local sites offering e-commerce and the general population purchases products online from nearby markets such as the United States rather than locally. Likewise, people abroad cannot purchase from local sites since services such as electronic hotel reservations systems are typically outsourced to external companies.

There has been an uptake of online banking services including bill payment as most financial institutions do not provide physical locations outside of the central Basseterre or Charlestown areas.

Box 4-1: PayKN

Kittitian entrepreneur Dion Benjamin started PayKN, the first centralized online payment service in St. Kitts and Nevis. The company formally launched services in November 2009. In addition to online bill payment services (e.g., electricity, water, and phone), the company also provides services such as an online loan payment mechanism for students attending university outside of St. Kitts to make loan repayments at local banks. On average more than 50 payment transactions are processed per week.
According to Benjamin: "Unfortunately we have not been able to convince banks of the necessity of the service…(in the case of one bank) we physically have to cross the street to the bank in order to make a loan payment for students who have made their online payment through us."

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[33] http://www.stkittsvisitorchannel.com/

4.9 E-Government

Most government departments are connected to a wide area network via a fiber optic network installed by The Cable. The establishment of the National Information and Communication Technology (ICT) Centre has centralized a number of services including hardware maintenance and hosting of government applications such as the email system. The Centre is also home to a small business incubator for start-up ICT-based businesses.

The government has several computerized back office applications. The Health Information System provides health providers online access to patient records at the primary hospital. It is expected that the system will be rolled out to other healthcare facilities such as community health centers. Other services include the Vehicle Registration System and the Human Resources application. These applications are accessible by the relevant government departments to facilitate service delivery.

The web site of the office of the Prime Minister[34] has a wide range of resources including access to audio files of the weekly "Ask the Prime Minister" radio program, downloadable government application forms, and video files of events/speeches of the Prime Minister (also available on the Office's YouTube channel). The Prime Minister has also committed to strengthening links to Kittitians in the Diaspora and utilizes technology through bi-monthly postings of his "Video Messages for the Diaspora" that are also available on the official Facebook page of the Office of the Prime Minister.

Transactional e-Government services are not widely available for the public. The central government portal (www.gov.kn) is primarily informational in nature, with some application forms available for download from individual agency sites. The lack of requisite legislation (such as an Electronic Transactions Act), low demand by the general public, and perceived costs for online payment services are factors that contribute to the lack of online transactional services. The government has placed emphasis on improved service delivery by providing training to employees to enhance their ICT capabilities.

The United Nations e-Government framework measures the delivery of online services.[35] The rank of St. Kitts and Nevis is below other ECTEL members, ranking only above Dominica, (Figure 4-5). This reflects the lack of interactive e-Government services in St. Kitts and Nevis.

Figure 4-3: UN e-government Online Service Index, 2010
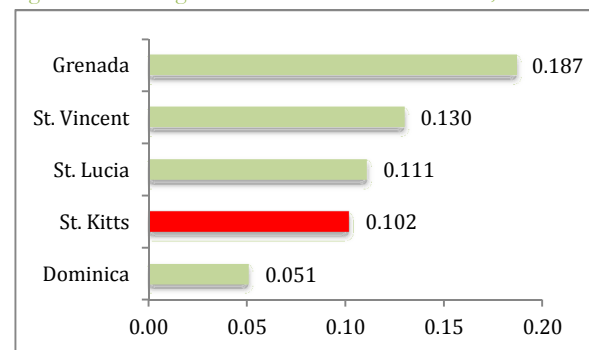
Source: UN E-Government Development Database.

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[34] http://www.cuopm.org

[35] The Online Service Index is based upon a four-stage model, which is ascending in nature and builds upon the previous level of sophistication of a state's online presence. The model defines four stages of E-Government Development according to scale of progressively sophisticated citizen services. As countries progress, they are ranked higher in the Model according to a numerical classification corresponding to the four stages. See: http://www2.unpan.org/egovkb/

5   Lessons learned

The success of St. Kitts and Nevis in the uptake of fixed broadband serves as an example for other developing countries and small island developing states. Some of this success can be attributed to geography: the small land area and population of the islands contributed to faster rollout of infrastructure, wider reach for marketing, and maximum impact of ICT policy initiatives. In addition broadband is more affordable than other countries in the Caribbean due to high per capita income coupled with lower broadband prices.

However geography and income alone do not explain the broadband success of St. Kitts and Nevis. This chapter reviews various supportive factors stimulating broadband growth in the country. It also identifies bottlenecks impeding the realization of a sustainable broadband ecosystem.

5.1   Success factors

Competition

Unlike other islands, more than one service provider existed in the market prior to full telecommunications liberalization giving the country a head start over other Caribbean countries.   After liberalization in 2001, new entrants in the broadband market provided yet additional alternatives to the incumbent.

Regional Coordination

As a member of the regional regulatory agency, ECTEL, St. Kitts and Nevis has benefitted from mutual efforts for reform of the telecommunications sector. Examples include development of harmonized policies which ushered in liberalization of the sector in 2002, joint agreements with the incumbent service provider Cable & Wireless which ended its exclusivity in the market and negotiations with foreign investors which has led to the introduction of a second submarine cable system.

Education

At 98%, St. Kitts and Nevis has one of the highest literacy rates in the region. Universal secondary education has contributed to this achievement. The availability of computers at all primary and secondary schools and initiatives for teaching adults how to use ICTs have boosted digital literacy, raising awareness and driving broadband demand.

Diaspora

The large number of Kittitians and Nevisians abroad contributes to demand for international communications. This has stimulated usage of broadband services such as VoIP, instant messaging and social networking.

Access

Even prior to the advent of high speed Internet, citizens had access to other ICTs to the extent that the creation of a Universal Service Fund more than a decade later served to enhance existing informal universal access policies already in place. This included ongoing development of community centers outfitted with computer labs to provide access and training to rural communities and equipping every primary and secondary school with computers.

The Government of St. Kitts and Nevis promoted and secured funding for initiatives such as the construction of community access centers and installation of computer labs within schools. The goal of the recently launched *I-literacy* is to facilitate access to laptops by students within the school and home environment; it is anticipated that the presence of the technology within the home will promote awareness by other members of the household. Exemption of customs duties on computer equipment has also been a boost to the sector. The Government National ICT Centre

houses a small business incubator providing facilities such as access to computers and broadband for small start-up enterprises.

Government as leader

The Prime Minister of St. Kitts and Nevis has continuously emphasized the role of the Internet in supporting the economic development goals of the country. The government has promoted demand for services both by residents and the Diaspora through a range of multimedia content available for download from the government's site, as well as availability of content on social networks such as Facebook and YouTube. The government has also invested in ICT training for its employees.

Public-private partnerships

Partnerships between the government and private sectors have gone a long way in developing computer literacy levels among the general population and in ensuring that persons even from a very young age had access to the Internet. Nearly every government-led ICT initiative has received support from the private sector. For example, service providers have ensured every school and public community center receive free Internet access. In training initiatives the private sector has provided equipment at little or no cost to government.

5.2 Challenges

While St. Kitts and Nevis has been successful in boosting fixed broadband penetration, this accomplishment is riddled by contradictions. The country has the highest fixed broadband penetration in Latin America and the Caribbean but has yet to launch mobile broadband. St. Kitts and Nevis has the highest Facebook penetration in the Eastern Caribbean but the UN ranks its online e-government level as the second lowest in that region. These contradictions serve as impediments to effective broadband growth. The

following challenges need to be overcome to ensure a sustainable broadband ecosystem.

Broadband prices are a concern. Competition among service providers has reduced the cost of broadband. However, they are more than one and half times greater on a purchasing power basis than broadband prices in the OECD.

Political uncertainty impacts network investment affecting service quality and the competitive environment. Government ownership of The Cable and the ongoing dispute over Caribbean Cable Communications are but two examples.

Quality of service requirements for mass-market broadband has not been addressed. Greater confidence in the reliability of the network would enhance the types of services offered by businesses. In the case of Nevis, the use of radio links for backbone connectivity impacts service quality.

The **regulatory agency** (NTRC) suffers from a lack of resources, impeding its capability. For example it lacks a website and is unable to fulfill its mandate of administering the .KN domain. Perceived weaknesses of the agency may serve as a deterrent to investors.

The **policy and regulatory framework** needs continuous review as the environment changes. Legislation currently lags market developments. Laws covering data protection, privacy and electronic transactions are yet to be implemented. This is impeding the development of **e-commerce** and **e-government** applications.

Implementation of national policy by a central agency responsible for its execution is necessary for the government to achieve its long-term broadband strategies. Strengthening oversight is necessary in order to bring about change, particularly for monitoring quality of service, and ensuring that costs for Internet access are

reasonable. A balance between sector regulation and stimulating broadband development is crucial.

Policies concerning innovation are needed in order to facilitate greater demand for new and advanced services; this includes facilitating support for sectors that are dependent on broadband such as "software-as-a-service" companies. The enhancement of public private partnerships to involve higher education or tertiary institutions may encourage wider research and development activities. Implementation of education policies that serve to promote the use of the Internet as a tool for educational delivery and for fostering innovation can also support more advanced activities.

The **country domain name (.KN)** is important in branding St. Kitts and Nevis. The resource is currently under utilized as a marketing tool that would stimulate additional demand for new and advanced services at the local level.

The establishment of an **Internet Exchange point (IXP)** would facilitate better optimization of international bandwidth usage since most local Internet traffic is routed to North America. Discussions at the national level concerning the establishment of a domestic IXP have so far not been fruitful.

Mobile broadband has yet to be deployed. One reason is that most of the island of St. Kitts is well served by fixed line connections. However the availability of mobile broadband can serve to expand inter-modal competition, provide more convenience for consumers and increase the types of services offered by local businesses.

Reliability of the supporting infrastructure, particularly electricity has limited exploitation of the network for advanced services such as the provision of hosting facilities.

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