St. Vincent and the Grenadines: ICT Assessment

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St. Vincent and the Grenadines: ICT Assessment

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Abbreviations and Acronyms

ACS	Association of Caribbean States
ASP	Application Service Provider
ATM	Asynchronous Transport Mode
CAGR	Compound Annual Growth Rate
CANA	Caribbean News Agency
CANTO	Caribbean Association of National Telecommunications Organizations
CARICOM	Caribbean Community and Common Market
CDB	Caribbean Development Bank
CET	Common External Tariffs (CARICOM)
CIC	Community Information Center
CLAA	Caribbean Latin American Action
CPTM	Commonwealth Partnership for Technology Management
CSP	Council of Social Partners
CXC	Caribbean Examination Council
C&W	Cable and Wireless
DBMS	Data Base Management System
DEVCO	Development Corporation
DOC	U.S. Department of Commerce
DOT Force	Digital Opportunity Task Force
EC$	Eastern Caribbean Dollar
ECCB	Eastern Caribbean Central Bank
EC-ICT	Eastern Caribbean Information Communications Technology Initiative
ECLAC	United Nation's Economic Commission for Latin America and the Caribbean
ECTEL	Eastern Caribbean Telecommunications Regulatory Authority (St. Lucia, Grenada, St. Kitts/Nevis, St. Lucia, St.Vincent/Grenadines)
EDI	Electronic Data Interchange

EU	European Union
FATF	OECD Financial Action Task Force on Money Laundering
FDI	Foreign Direct Investment
FTAA	Free Trade Area of the Americas
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GNP	Gross National Product
IBC	International Business Company
ICT	Information and Communications Technologies
IDB	Inter-American Development Bank
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
IT	Information Technology
ITU	International Telecommunications Union (UN)
kbps	Kilobits per second
Km	Kilometers
LAN	Local Area Network
mbps	Megabits per second
MHz	Mega (million) Hertz (cycles/second)
MOC	Ministry of Commerce
MOP	Ministry of Planning, Development, Environment & Housing
NDC	National Development Corporation
NGO	Non-Government Organization
NIT	National Institute of Technology
NTRC	National Telecommunications Regulatory Authority
OECD	Organization for Economic Cooperation & Development
OECS	Organization of Eastern Caribbean States
OPSR	Office of Private Sector Relations
PC	Personal Computer
PM	Prime Minister
PPP	Purchasing Power Parity
PWC	PricewaterhouseCoopers

SME	Small and Medium-Sized Enterprise
SEDP	Small Enterprise Development Project
SEDU	Small Enterprise Development Unit
SVG	St. Vincent and the Grenadines
TA	Technical Assistance
UNCTAD	United Nations Commission on Trade and Development
UNDP	United Nations Development Program
UPS	Uninterruptible Power Supply
U.S.	United States
USAID	U.S. Agency for International Development
UWI	University of the West Indies
VAT	Value Added Tax
VOIP	Voice Over Internet Protocol
VSAT	Very Small Aperture Terminal
WAN	Wide Area Network
WB	World Bank
W.I.	West Indies
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

St. Vincent and the Grenadines: ICT Assessment

Management Summary

This Information & Communication Technology (ICT) Assessment was undertaken by Carana Corporation in close coordination with, and in support of, the Organization for Eastern Caribbean States (OECS) and the Eastern Caribbean Telecommunications Regulatory Authority (ECTEL). This work was performed under contract with the U.S. Agency for International Development (USAID) as part of its Eastern Caribbean Information Communications Technology (EC-ICT) initiative.

This Report serves as Phase I of a two-phase effort being coordinated by OECS. Phase II of this effort is being launched in March of 2002 and is being carried out by GOPA (under contract with the World Bank). Whereas this first phase is aimed at compiling and assessing ICT-related information for input and recommendations, GOPA's activities are aimed at developing regional policies and strategies based on this, as well as other, input to their initiative. This Phase I will also put forward to USAID considerations for possible future development initiatives as part of their Caribbean Regional Program (CRP).

The ICT Assessment was built around four key areas: (1) ***Public Sector***—an examination of the St. Vincent/Grenadines (SVG) Government's use of ICTs and its ICT policy and supporting legal/regulatory framework, (2) ***Pipes***—an examination of the current state of telecommunications infrastructure, (3) ***Private Sector***—an assessment of the current state of the ICT industry sector and the private sector's use of ICTs, with a focus on growth opportunities, and (4) ***People***—a review of the supporting educational systems within the country.

The ICT Assessment defines a number of key opportunities where targeted initiatives can be undertaken that would benefit SVG in each of the four areas. In summary, these are:

- **Public Sector**—The Government exercises vast influence in SVG, far in excess of that experienced in most developed economies. While this influence varies from issue to issue over time, the Government's different roles can complicate already complex economic issues. SVG's high priority needs and opportunities fall into roughly four classifications: (1) telecommunications policy and regulation remain critical issues for active, innovative Government management and intervention; (2) limited, focused general programs for ICT support are still needed; (3) many of SVG's laws need to be updated to conform to the networked environment, with a particular focus on e-commerce; and (4) there needs to be increased attention paid to Government use of ICTs, with an emphasis on e-government opportunities.
- **Pipes**—This area is already being addressed by market liberalization efforts underway via ECTEL and the NTRC. Two new ISPs have been licensed and two new mobile voice operators will be approved soon to offer cellular voice. A fixed (wire or wireless) service provider may be licensed at some as-yet undetermined point in the future. Current SVG telephone customers can choose from a standard menu of consumer and small business services at very high prices, especially international

calling charges. Over time, successful liberalization of the telecom market should result in a greater choice of services and carriers, more network investment, more efficient and innovative providers, customer responsiveness, and ultimately lower prices. Success is by no means guaranteed, and there is every reason to expect that the incumbent, Cable & Wireless (C&W), will vigorously fight to retain control of its monopoly market. Successful competition demands effective regulation of the market and constant regulatory vigilance. Even as this regulatory struggle continues, the NTRC and Ministry of Telecommunications will be expected to address complex public policy issues that involve.

- **Private Sector**—The private sector's use of ICTs is limited by (a) high telecommunications costs, (b) unavailability of qualified trained personnel to support basic services or complex operations such as LANs, (c) widespread lack of appreciation for high-value services and applications such as electronic commerce, and (d) the lack of close, effective coordination between the public and private sectors. In view of the Government's dominant role in setting public policy, improved public-private sector coordination is essential. Some of the private sector's concerns are being addressed by telecom liberalization and by the Government's stress on education as a long-term solution. The provision of online Government services and Government information could also stimulate business use of and investment in ICTs. There will be a continuing need to help the private sector with financing, as the availability of capital is insufficient to meet the country's economic needs, particularly with regards to small and medium-sized enterprises (SMEs) in leveraging ICTs beyond their internal administrative and "back office" operations and into their core business processes.

  In addition, there is the need to utilize ICTs to improve SVG's competitiveness in regional and international markets. This includes (a) building a national – and possibly, regional -- Caribbean product/service Web portal, (b) developing and promoting high value-added offshore operations such as data storage and managed and distribution services, and (c) helping to provide business development support to export-oriented businesses. Opportunities also exist to attract foreign direct investment (FDI) in ICT-enabled activities that do not require direct operational control, such as in call centers that provide telemarketing and other voice services. At present, high value-added services such as data storage, data bank development, managed data services, and Web services are not possible because of the high cost of data communications and network unreliability.

- **People**—The population of SVG is highly literate (estimated 90-95 percent). PCs are becoming more common, and school computer labs are being wired for Internet access. C&W estimates that there are almost 3,000 Internet users, although the distribution of PCs and Internet access varies greatly among the urban and rural areas and different income groups. The Government has made education in ICTs a crucial priority and aims to equip young students with basic skills and train employees to work in ICT businesses. This commitment is most noticeable in schools and educational planning. A National Institute of Technology (NIT) has been proposed to train students for an ICT career. This emphasis on education as the long-term

solution, however, does little to alleviate the current shortage of qualified ICT personnel.

The main body of this ICT Assessment report proposes recommendations for consideration by OECS. These are designed to provide direct input into the Phase II initiative being undertaken by WB/GOPA. In addition, a separate set of recommendations has been developed for consideration by USAID. These are preliminary and are published under a separate cover as their value is for USAID's internal use only and are not available to the general public.

The ICT Assessment Team was comprised of Kevin Hartmann of the Kenan Institute Washington and Eric Lee, head of Lee and Associates. The Team thanks Mr. Clement Ballah and Hortensia Brooks Miguel of the Development Corporation of St. Vincent and Apollo Knight, who assisted with the interviews and scheduling. In addition, the team wishes to thank those within the various Government Ministries, donor organizations, universities, NGOs, and private sector firms who were so generous with their time and patient during the course of our conversations. We trust this combined effort will lead toward meaningful ICT-related action that will bring about substantive improvements throughout the OECS region and St. Vincent and the Grenadines.

St. Vincent and the Grenadines: ICT Assessment

I. Background/Context

This Information & Communication Technology (ICT) Assessment was undertaken by Carana Corporation, under contract to the U.S. Agency for International Development (USAID). The Assessment is part of a larger initiative being undertaken by USAID/Carana in support of the Organization of Eastern Caribbean States (OECS), specifically to provide technical assistance to the Eastern Caribbean Telecommunications Regulatory Authority (ECTEL) and the five National Telecommunications Regulatory Commissions (NTRCs).

In summary, the technical assistance being provided to OECS, ECTEL, and the NTRCs, is primarily oriented toward telecommunications market liberalization in the region. However, this is in support of an even larger purpose--that of seeking to leverage ICTs for economic growth within the Eastern Caribbean region.

This ICT Assessment reaches beyond the telecommunications issues; it seeks to gain a broader understanding of the overall utilization of ICTs in St. Vincent and the Grenadines (SVG) and to analyze supporting educational and governmental considerations. The primary purpose of the Assessment is to identify current constraints to and opportunities for advancing ICTs in the region. The ICT Assessment is being coordinated closely with the OECS Secretariat and is considered Phase I of a two phase initiative. Phase II is a regional policy and strategy initiative being carried out by GOPA through World Bank (WB) funding. Thus, this ICT Assessment will serve as a precursor to the follow-on GOPA regional policy and strategy work.

This ICT Assessment for SVG is the fourth of five ICT Assessments to be carried out for each of the ECTEL countries during February and March 2002. Combined, these five ICT Assessments will provide direct input into the GOPA initiative that is scheduled from March-June 2002.

In addition to providing support to OECS/ECTEL, this ICT Assessment is being carried out in a manner consistent with USAID's focus on leveraging ICTs in developing and emerging economies. In recent years, USAID's increased attention on using ICTs for international development was reinforced by the G-8 Summit that took place in July 2000 in Okinawa, Japan, and the subsequent adoption of the Digital Opportunity Task Force (DOT Force) Agenda in Genoa, Switzerland in 2001.[1]

In large part, this increased global focus is predicated on the growing awareness of the impact that ICTs have had on the U.S. economy over this past decade. While the "dot-com bubble" has created some economic uncertainties, for the most part, the market has sorted out the excesses. The actual impact of ICTs has been captured and well documented in a series of

[1] *See* DOT Force official Web site at http://www.dotforce.org/about/.

annual reports prepared by the U.S. Department of Commerce, culminating with the June 2000 report, *Digital Economy 2000*.[2] A brief summary of this report is reflected in Appendix A.

ICT Assessment Structure/Approach

This ICT Assessment has been structured in such a manner as to provide not only a basic uniformity among the five ICT Assessments being carried out for ECTEL, but also a level of consistency with similar USAID-funded assessments. As such, it relies on a "4-Ps" template in an effort to capture and categorize information from a wide array of sources and to present it to the reader in a readily digestible format. The four "Ps" are as follows, with a section of this report devoted to each:

1) **Public Sector**—This section focuses primarily on (a) Government ICT policy and the supporting legal/regulatory framework and (b) the actual use of ICTs by the Government. The coverage of telecommunications policy is minimal due to parallel ECTEL/NTRC work in this area.

2) **Pipes**—The thrust of this section is on telecommunications infrastructure, access, and price. It relies upon a core set of information from the International Telecommunications Union (ITU) Development Indicators reports.

3) **Private Sector**—This section examines the state of development of the IT industry sector and the use of ICTs by traditional businesses.

4) **People**—This section analyzes the education systems relative to producing students and workers with ICT-related skills.

From a methodology perspective, this ICT Assessment was carried out in two parts: (1) research based on a number of prior ICT-related studies and reports produced over the past 2-3 years by various organizational entities, and (2) a one-week on-the-ground assessment during which time a number of interviews were undertaken with individuals from the public, private, and educational sectors. Naturally, with such an abbreviated approach, this ICT Assessment report will not capture all the details.

In this regard, the ICT Assessment is a survey intended to gather sufficient information across a broad array of ICT-related sectors, but it is not designed to be a comprehensive reporting of details (several others have done an excellent job of this in selected areas). This Assessment intends to support recommendations put forward to OECS and USAID regarding potential areas for future engagement. Its purpose is to be a catalyst, not a catalog.

[2] *Digital Economy 2000*, U.S. Department of Commerce, http://www.esa.doc.gov/de2k2.htm.

Prior ICT-Related Studies

The Bibliography, captured in Appendix C, reflects a number of information sources, including earlier studies, which have been taken into account in carrying out this ICT Assessment. Many of these proved to be invaluable resource materials in preparing this report. One of the more recent, and valuable, reports was undertaken in June-August of 2001 by Alwyn Didar Singh on behalf of the Commonwealth Fund for Technical Cooperation. The report, *A Rainbow Technology for a Rainbow People: E-Business Capacity Development for the CARICOM,*[3] incorporated the Harvard Center for International Development's "Readiness for the Networked World" assessment methodology as part of its analysis.[4] As such, the report reflects a country-by-country review of key ICT-related issues using the Readiness Guide's e-readiness framework of:

- Infrastructure Framework (Connectivity and Cost)
- Policy Framework (E-Leadership and Participation)
- Legal Framework (Security and Privacy)
- Human Capacity Framework (E-enabled Human Capital)
- E-Business Environment: Enabling Seamless E-Commerce
- The International and Regional Framework.

This ICT Assessment in no way seeks to duplicate the excellent efforts of this study, but rather intends to help move an ICT agenda forward in key areas of interest to St Vincent and the Grenadines, OECS, and USAID.

The Country of St Vincent and the Grenadines

St. Vincent and the Grenadines (SVG) is one of the four independent nations that make up the Caribbean's Windward Islands. The main island of St. Vincent is home to the bulk of the population, while the Grenadines consist of 32 islands. SVG became self-governing in 1969 after many years as an English colony and, in 1979, became independent, the last of the Windward Islands to do so. They have a parliamentary democracy based on the British model. The total land mass is 390 square kilometers with a population of roughly 112,000 (2000). St. Vincent's capital and largest city is Kingstown.

The Government is a parliamentary democracy, with the Prime Minister serving as Head of Government and Queen Elizabeth as the Head of State. The 21 person House of Assembly is the elected parliament. There is also an appointed Senate, whose members are appointed on the advice of the Prime Minister and leader of the opposition.

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[3] Alwyn Didar Singh, *A Rainbow Technology for a Rainbow People: E-Business Capacity Development for the CARICOM (draft 15.0.01)*, Report of Diagnostic Mission, Commonwealth Fund for Technical Cooperation, Commonwealth Secretariat, London, June-August 2001 (hereinafter "*Rainbow Report*").

[4] "Readiness for the Networked World," http://www.readinessguide.org.

St. Vincent's GDP was US$332.9 million, with a per capita income of US$2,720 based on 2000 World Bank statistics. Recent economic growth has been moderate, fluctuating between 2.3% (2000) and 4.0% (1999). SVG's economy has suffered severe setbacks in recent years, with the banana industry in a particularly steep decline due to the end of preferential market treatment in Europe. As a result, the unemployment is punishingly high at about 25% officially, and perhaps closer to 40% unofficially. Economic diversification is being promoted but no industry has come close to absorbing the surplus labor created by the banana industry's decline. Tourism and informatics have been identified as having the best prospects, though the tourism industry has been in a slump following recent hurricanes and the September 11 attacks and subsequent U.S. recession.

SVG's per capita income is the lowest among the ECTEL members, running less than half of the comparable figure for St. Kitts and Nevis. Its fiscal situation explains both the reason for its continued diversification as well its limited ability to aggregate the human and financial resources to cure its persistent social and economic ills.

St. Vincent and the Grenadines: ICT Assessment

I. Public Sector

A first critical component of this ICT Assessment was an evaluation of the Government of St. Vincent and the Grenadine's (SVG) position relative to ICTs. Specifically, this focused on two key areas:

1) The Government's policy and legal framework pertaining to the areas that directly and indirectly impact the widespread deployment and utilization of ICTs within St. Vincent and the Grenadines (specifically with regard to telecommunications and e-commerce); and
2) The Government's actual use of ICTs to provide e-government services and benefits to citizens and to automate and streamline key Ministries and the functions/activities that they carry out.

Summary/Analysis

The Government of SVG does not have a comprehensive, integrated national ICT strategy for increasing the deployment of ICTs within its society or economy. Many of the elements of such a strategy exist, but are scattered within several Government agencies. These offer a good foundation for a national ICT plan. In particular, the Government has a detailed educational strategy and is strongly supportive of the Telecommunications Act of 2000. Indeed, there seems to be little disagreement, even among the Government critics, that the Prime Minister and his Ministers are committed to SVG's transformation into a modern, knowledge-driven economy. Particularly important to the Government's plans is the new Telecommunications Law, which it hopes will yield significant economic benefits, and a strong public and private sector commitment to ensuring better ICT-relevant education and training.

The absence of a national ICT strategy appears attributable more to the unavailability of human and financial resources than any disinterest on the part of the Government in developing a successful plan. The resource problem is unlikely to improve in the immediate future since the economic benefits of liberalization will appear only gradually. Moreover, this lack of resources is likely to impact the National Telecommunications Regulatory Commission (NTRC)'s implementation of new procedural requirements of the Telecommunications Act. Typically, implementing liberalization consumes more, rather than fewer, Government resources because the regulatory and policymaking bodies must adopt many new requirements, process and license new competitors, monitor enterprise conduct and performance, develop and enforce regulations and planning, and ensure network reliability and quality of service standards. Many of these activities were once handled by the former monopoly operator or simply did not previously exist.

There is no agreement as to who should take responsibility for coordinating development of a national ICT strategy. Some of the officials interviewed seemed to believe that such a

project is already underway, while others were indifferent to the prospect of a national strategy. Although the director of the NTRC has taken it upon himself to begin drafting a plan, it is clear that the process requires an authoritative mandate from the Cabinet, the allocation of Government resources, and the involvement of public and private sector stakeholders, including the general public. These are all requirements of an ICT strategy if it is to be considered a credible, authoritative document reflecting a social and political consensus and have legitimacy in a democratic society. To develop a national ICT plan, the Government has the option of waiting until it has sufficient resources and expertise or leveraging its existing resources to expedite a plan. Since a comprehensive ICT strategy is a guide rather than a detailed rulebook, it will undergo constant modification over its lifetime. It would be preferable to leverage existing resources for speed rather than continuing uncertainty and inaction. This would mean designating the director of the NTRC or the Ministry of Telecommunications as the official coordinator and constituting a Prime Minister-approved working group to begin preparations for the effort. Expert technical assistance in such an effort would be desirable.

ICTs, like the Internet, have unleashed fundamental challenges to existing legal and regulatory systems by raising questions regarding their continued relevance and adequacy. Even if one were to discount politically sensitive issues such as online sexual content, the need to update laws to protect commercial and personal rights and to facilitate new forms of economic and social activity grows daily. The best examples of this growing need to reconcile laws and economic activity occur in the e-commerce area. For example, laws that require paper documents need to be updated to accept electronic ones, and electronic signatures need to be legally equivalent to written ones. In his recent study on the readiness of Caribbean states to handle online commerce, Alwyn Singh found that virtually nothing has been done to improve SVG's e-readiness by creating a supportive legal environment or social infrastructure that would enable growth of e-commerce activities at the retail, wholesale, and enterprise levels.[5]

SVG's lag in legal reform results from several factors, the most important of which may be the lack of human and financial resources that could be dedicated to these concerns. In addition, Internet usage on SVG is still relatively low at 3,000, roughly the same the number of users as those on St. Kitts and Nevis, which is about one-third the size of SVG. However, the absence of a sense of urgency to address these issues among public officials is unlikely to last much longer. The economy is increasingly being opened to global economic forces, foremost among them online transactions and commerce. If significant legal reforms cannot be made at this time, it would still be helpful to develop a strategic vision that acknowledges the need for future legal reform and to commence a planning process.

The task of reforming the legal framework to make it comport with developments globally and accommodate new economic and technological environments is substantial. The SVG Government has taken some essential first steps but others are needed.

In recent years there have been several attempts to develop global treaties or conventions to deal with online activities, particularly as they relate to online criminal activity such as fraud,

[5] *Rainbow Report* at 222, 223.

cybercrime, and the like. These efforts to create international agreements on these legal issues are grounded in the realization that emerging problems involving the Internet, electronic commerce, and cybercrime can only be resolved or mitigated through international cooperation. Specifically, network security matters are now discussed in international fora encompassing private and public sector contributors. There is a growing need to find better, inexpensive ways to leverage and share security resources so that both large and smaller states benefit from multilateral conferences and discussions.

Telecommunications Liberalization: Ensuring Long-term Regulatory Effectiveness

SVG has been a regional leader in advocating liberalized telecommunications markets. It has in place a functioning NTRC. The Government has awarded licenses to two new ISPs and is scheduled soon to award licenses to new mobile voice carriers. The SVG Government is to select the providers of fixed (wireline and wireless) service at a later date. Enactment of the liberalization law was essential, but alone cannot guarantee success. Only effective implementation of the new telecom law, along with vigorous and vigilant regulation can keep the C&W from continuing to control the market and engaging in anticompetitive practices. An effort by C&W to thwart competition is very likely early on, when competition is beginning to emerge. Incumbents typically mount aggressive regulatory and legal challenges to the new laws and regulatory decisions that support competitive entry and create conditions conducive to competitive investment. It will be critical for regulators and policymakers to continue to give competitive matters their full and continuous attention during this early phase.

Of particular importance will be efficient coordination by the NTRC, ECTEL, and Ministry of Telecommunications, Science, Technology, and Industry to ensure that needed regulatory actions are not delayed due to bureaucratic or inefficient processes. Steps need to be taken to strengthen ECTEL and the individual NTRCs and eliminate any obstacles to competitive entry and development. These include helping the NTRC through staff training and the implementation of financial and information systems to facilitate the commission's day-to-day operations.

The greatest contention between C&W and new entrants is likely to arise over interconnection issues, specifically in the area of interconnection costs and fees. The Telecommunications Act gives the NTRC authority to determine such costs on a timely basis in the event of a dispute. However, because the Act's definition of "costs" and the methodology by which such costs should be calculated is vague, the NTRC's administrative proceedings will be vulnerable to legal challenge and judicial review. The availability of expert outside help will expedite the decision-making process and give NTRC decisions added weight and public legitimacy during the early period of competitive entry and development.

Market liberalization does not automatically mean that meaningful competition will develop and flourish. In the U.S. and Europe, incumbent local exchange companies routinely find ways to "game" the system and slight regulators. Even the prospect of large fines has proven to be a weak deterrent, as some incumbents now consider such fines to be the price of doing business. It is important, therefore, that a variety of effective enforcement tools be

available to the NTRC, including the power to levy large fines, timely injunctive relief, and a clearly understood competition policy designed to deter anti-competitive practices before they adversely affect competitive investment prospects and operations.

Government Use of ICTs

The current Government has decided to centralize Government-wide data processing activities under the IT services division, which is part of the Ministry of Telecommunications. This will leave the IT divisions of other Ministries with only minor functions to manage. The new data processing architecture will have at its heart a new Fujitsu/ICL mainframe computer that will be able to incorporate existing legacy applications and databases. New applications will be developed internally, as the division director believes he has the necessary in-house programming capability and that data processing can be done more cheaply within the centralized Government environment since the Government also trains its programmers. Expert technical assistance may be needed in this area, as independently developed applications take time, usually require frequent modifications, and have limited growth capacity.

The direction of the Government's data processing activities runs counter to two major trends in enterprise ICT: outsourcing and distributed processing. Both of these have their costs and benefits (including flexibility, greater efficiency and fewer jobs) that may motivate political and business enterprises differently. At this point in time, the Government's decisions may be appropriate because the country lacks a sufficiently skilled technical workforce to handle large-scale outsourcing and distributed processing. Nevertheless, these policies should be reviewed in the future as technical resources become more available and as the Government's needs change. Both distributed processing and outsourcing can provide substantial advantages to the client, and justify periodic re-evaluation of these policies.

According to the head of IT Services Division, one of the Government's concerns is the high cost of licensing. As a small country and emerging economy, SVG has difficulty in finding the funds necessary for Government-wide licensing of some programs and has had to forego using some of them for fiscal reasons. As licensing practices differ from company to company, further exploration is needed to determine what software programs the individual ministries require. At that time, companies could be approached to discuss modifications to license agreements or perhaps to aggregate similar needs of other governments in the region. Alternatively, governments have the option of using open source freeware for both operating systems and applications.

With one exception, little has been done to provide e-government services. Online services can be defined as activities ranging from posting Government information and documents to transactional services that can be downloaded, completed, and returned physically or online. Governments are increasingly finding that e-government applications are an attractive value proposition, as well as a form of outreach to its citizens and/or non-citizens. There is one major exception to the Government's lack of online services and information – the Ministry of Tourism's Web site. Unfortunately, however, the site offers little in the way of interactivity. Requests for information are handled physically rather than through the site. Nor does the site return to the client basic information such as daily hits, pages or hyperlinks of greatest interest,

etc. While the Ministry planner expressed an interest in the Web site, little sense of urgency was shown in aggressively pursuing online marketing efforts. Moreover, few hotels link to the site, suggesting limited commercial interest and confidence in its value as a marketing tool.

A national portal that centralizes Government and essential commercial information may help push slower-moving Government units onto the Web, while making it easy for Internet users to find consolidated SVG-related information. The country code domain name is not being widely used, and the ".sv" domain name can be effective in promoting the country only if it is used more widely. A national portal could also enable more efficient use of limited e-commerce and e-government funds.

There remains a need for leadership in the e-government area. As in every other jurisdiction in which e-government has been adopted, a case must be made to demonstrate its value to Government officials. The country's political leadership must be committed to this project. If the national portal concept is pursued, it must also include businesses in order to derive economic leverage from expenditures and to facilitate e-commerce activity. Logically, responsibility for the portal should rest in the Ministry of Telecommunications, Science, Technology, and Industry (Ministry of Telecom), which has jurisdiction over communications, the Internet, and related ICT areas. The Prime Minister needs to assign leadership for e-government to a Ministry and ensure that it receives a high Government priority.

The biggest ICT user in the Government is the Ministry of Telecom, which handles the Government's data processing needs and houses the NTRC, among its many activities. The Ministry of Education is another large user. As will be described at greater length in the "People" section of this report, this Ministry has developed a comprehensive ICT educational plan that deals with curriculum as well as with the training of teachers and administrators. Under the plan, all students will receive training in basic computer appreciation. More importantly, the plan envisions that teachers and administrators will constantly upgrade their skills, including some basic Management of Information Systems training sufficient to maintain school local area networks (LANs). The Ministry plans to increase its use of communications media, such as e-mail, to better link administrators and teachers. A major effort is being made to wire all 77 school computer labs to the Internet by the end of next year with the assistance of the Government of the Republic of China (Taiwan). As of the date of the Assessment, 27 computer labs had been wired with Internet access and local (classroom) LANs.

Another agency that has a role in ICT policy is the Development Corporation (DEVCO). It is responsible for encouraging FDI in SVG. DEVCO recently became the 100% owner and operator of the St. Vincent's Call Centre, which has 150 seats (positions). This arrangement came about as a result of a proposal from foreign investors. Before the startup date, the Government and investors had a disagreement that led to the Government's purchase of the entire project. DEVCO officials indicated they would prefer that the Government spin it off, since owning and operating a business is not the best use of Government funds. The bulk of the call center's business is outbound telemarketing over a VSAT connection. VSATs are not the best medium for voice service, but Cable & Wireless's high charges made use of its fiber-based leased circuits unaffordable. However, as a result of technical difficulty with the VSAT service, it is likely that the Call Centre will become a C&W customer.

The St. Vincent Call Centre experience illustrates graphically some of the fundamental issues involved in the large role played by Governments in emerging economies. There is often no other institution capable of accumulating sufficient investment capital, and hence the Government may be a vital component for economic development. At the same time, however, Government managers are often motivated by a different set of interests than private sector managers and may lack the skill set for managing a private business. St. Vincent's Government has welcomed foreign investment and has vigorously promoted the information economy as its model for the future. This commitment is apparently deeply felt personally and as well as expressed rhetorically. Some of the essential steps to achieve this end – better and more technically oriented education and a liberalized market-driven telecom market – are being championed by the SVG Government. In other areas, such as e-government, it has not been as vigorous in displaying leadership. Overall, the results of the Government's efforts have been uneven – due in large part to the lack of human and financial resources. The Government needs to retain its focus and commitment over the long-term, while receiving assistance in high priority areas for the short- and medium-term.

SVG has also begun tackling its domain name problem. There is minimal use of the country code domain name ".sv" in e-commerce and little recognition of SVG within the Internet space. The domain name should be used to promote the country's products and services and to increase use of country-specific e-mail. SVG's country code domain name (cc-TLD) problems are different from those in other OECS countries in that it received and retained control over its domain name from the organization that designates country code sponsors. However, there was little appreciation for the commercial potential or the process to use the domain name more effectively. According to Apollo Knight, the NTRC director, SVG has designated Tucows, a Canadian database operator, to act as the name registry and to begin registering such names for use. The registry (a database of approved names with IP addresses) will be located in Canada. Sponsoring and administering domain names is a complex business, entailing numerous policy decisions and time-consuming controversies such as "cybersquatting," dispute resolution, fee structure, marketing, name registrars (who deal with the end user customer), organization of the top level domain into second-level names (STLDs), etc. As dealing with such questions would divert the NTRC from more urgent issues, outsourcing it to specialists during this complex organizational period seems a sound decision. It remains to be seen, however, if the Canadian location proves to be a problem.

Identified Areas for Further Pursuit

The Government of St. Vincent and the Grenadines has taken some essential first steps in its effort to transform the country's economy into a more knowledge-based one. Long-term investment in ICT education and a liberalized market for telecommunications services should yield some early positive results, but the bulk of the "payoff" will materialize only in the future. The following represents a few priority "Public Sector" issues where additional attention is warranted.

A. **Support an Integrated National ICT Plan and Strategy.** The NTRC has undertaken some of the necessary preliminary steps to develop a comprehensive

national ICT plan and strategy. In addition, some other Ministries have, or are drafting, plans to help guide their own ICT activities. Taken together, these activities could form the foundation of a national ICT plan and strategy.

B. Focus on Effective Implementation of the Telecommunications Act of 2000. Implementation of the new Telecommunications Act can be expected to preoccupy the NTRC, Ministry of Telecom, and ECTEL for quite some time to come. The implementation issues, especially as they relate to interconnection are likely to be contentious and intra-industry disputes highly volatile. The NTRC should focus on dispute resolution, supplementing its regulations where necessary, and establishing its administrative procedures. The acquisition of additional technical resources, such as automated financial and accounting software, should mitigate some of these problems.

C. Improve Education and Training. The lack of trained personnel and availability of technical resources is universally cited as the major impediment to ICT development. The SVG Government has recognized education as the key to a knowledge economy and has assigned the highest priority to developing ICT-related education. However, there appears to be considerable uncertainty about the details of some Government initiatives, for example which schools are open after hours to accommodate evening and Saturday classes. One private sector representative stated that the school hours issue is before the Ministry of Education and could remain undecided for some time, even others stated that evening and Saturday hours were common. This difference between policy decisions and practice suggests that communications between the Government and communities still leaves much to be desired, even on simple issues. The Assessment team heard little about the two rural telecenters established by a U.S. Peace Corps volunteer after they were initially mentioned. It appears that the SVG Government has not fully evaluated their impact on and value to rural communities. Follow-up assistance is in order and could reveal valuable data useful to other telecenter projects.

D. Increase Government Use of ICT. There is general agreement within SVG about the value of e-government and online services. Nonetheless, progress in this area is scant. Basic agreement on or understanding of what an e-government strategy entails, its financial and administrative benefits, and how to move ahead with such a strategy has not been achieved. Fundamental decisions as to who should be in charge of developing and implementing a national e-government strategy have not been made. As the SVG Government proceeds with its reforms, the goal of modernizing the delivery of Government services through more effective use of ICTs can be expected to loom with more importance.

II. Pipes

One of the underlying components increasingly recognized as critical to the development of any nation is the communications infrastructure. In recent years, this has become even more important as globalization expands and nations increasingly rely upon ICTs to participate in the global marketplace (e.g., e-commerce and e-business).

This portion of the ICT Assessment examined the in-country telecommunications environment from several perspectives and levels, including:

3) Summary/findings of the communications infrastructure in St. Vincent/Grenadines (SVG); and
4) Key observations from 1999 International Telecommunications Union (ITU) data.

Summary/Findings

The incumbent provider, Cable & Wireless (C&W) (and previously, the only officially authorized telecommunications carrier), has a fiber optic and microwave network throughout the country. According to C&W, approximately 90 percent of the country has physical access to the telephone network, though far fewer households actually subscribe to telephone service. There was a major facilities upgrade in the mid-1990s. There is also a VSAT operator that provides the St. Vincent Call Centre with outbound voice over frame-relay. A local cable operator, Karib Kable, provides cable programming on St. Vincent, and there are a number of broadcasters, including a Government station, that transmit mainly Government-sponsored content and children's educational programming.

C&W provides international direct dial service, private leased lines, in-and-outbound toll-free 800, frame relay, and other leased circuits from 54 kbps (one voice circuit) to fractional and full T-1. C&W's international gateway is through St. Lucia. It furnishes metered dial-up and ADSL Internet access, which tends to be relatively expensive and hence, (in the latter case) only lightly used. C&W offers mobile voice but not other advanced wireless services. Only C&W will offer a full array of services after liberalization; a fact that will give it a distinct advantage over its competitors, especially if it can bundle prices to attract price sensitive customers who might otherwise select another network operator but for a price break.

Complaints regarding the incumbent carrier primarily involve the high prices and, secondarily, pertain to network reliability. Such complaints were universally expressed during interviews, whether solicited or not. In addition, there were concerns about the poor service quality, network reliability, lack of customer sensitivity (even to larger customers' needs), rigidity about service offerings, and poor maintenance. Service quality is a serious issue, particularly because advanced services like Voice over IP (VOIP) require minimal packet loss,

clean transmission lines, and steady, reliable high bandwidth. Similarly, streaming video, which might useful for distance learning and other applications, needs high quality international and local networks that can handle high bandwidth applications and storage. Existing services are inadequate. There are, for example, no asynchronous transport modes (ATMs) outside of Kingstown.

C&W has not been as aggressive in meeting the new competitive environment as one would have expected. It has in place an informatics leased circuit rate plus a special commercial rate equivalent to a 30 percent discount for a three-year contract. The qualifying terms for the two special rates were uncertain and unpublished prior to liberalization. The competitive danger in the long-term is that the incumbent may use contracts and discount plans to tie up the most attractive, profitable commercial customers while leaving less desirable niches to competitors. Realistically, there are probably only a limited number of high-volume customers on SVG, as the ICT community remains small in number, and there are relatively few substantial commercial users. The NTRC and Ministry of Telecom needs to be on guard for anti-competitive behavior in this regard.

To counter a widespread local antipathy, C&W has donated 100 free hours of dial-up Internet access/month to each wired school computer lab – a woefully inadequate amount. While it would be preferable for each school classroom to be wired, that is currently unrealistic because of limited financial and technical resources.

The two new Internet Service Providers (ISPs) will face serious competitive obstacles as long as they rely on the incumbent carrier for Internet backbone (international) service or local access. Even with extensive caching (i.e., local storage) of Internet content, they will be required to access most of their content in the U.S., Canada, and the U.K. That, in turn, will require them to lease expensive international circuits from C&W unless they find a means to bypass C&W's undersea fiber backbone. Karib Kable will be able to provide high-speed Internet access service over its local coaxial cable network. If CariAccess relies totally on C&W's lines for dial-up or ADSL access, their high local charges will be passed on to customers, and it will make it impossible to create a robust market for Internet services and online applications.

As noted earlier, the SVG Government also plans to issue two mobile wireless voice licenses and, at an undetermined later point, licenses for fixed services. Inasmuch as nothing is known about potential cellular competitors, it is not possible to comment on the prospects for mobile competition other than to note that in other Caribbean nations with mobile voice competition, competitors have won a substantial market share simply on the basis of the incumbent's high charges.

In the past, discussion about "Pipes" has focused on telecommunications networks that provide point-to-point services. In several countries, cable, which until recently simply provided one-way, point-to-multipoint video delivery, has emerged as the leading competitor to the traditional telecom monopoly in wired services. Third generation wireless service (3G) operators will also one day compete with local exchange companies in broadband and narrowband services. Attention should also be accorded to another traditional mass medium with the potential to complement ICT pipes and promote economic development - radio and television broadcasting. Broadcast programs do this by packaging content and providing a mass audience.

Radio and television programs constitute communications channels and affect markets for ideas, products, and services.

Broadcasting is, of course, an electronic technology that occupies valuable radio spectrum and, to that extent, deserves to be considered in conjunction with other communications technologies. Its spectrum, for example, can be used to provide mobile services and transmit content to local, regional, national or international audiences. Today, there are innumerable examples of educational and instructional programming. Broadcast also carries news and entertainment and creates commercial markets, most significantly for the recorded music industry. Two potential uses for broadcasting might be to disseminate local music and culture to foreign audiences and to generate more news about or affecting St. Vincent and the Grenadines. Like telecommunications, however, broadcasting depends on an infrastructure for transmitting and receiving, production and editing, and, at present, there is no uplink capability on any of the ECTEL islands.

As in many other countries, the Government owns a television station that carries Government-related programs and educational programs for children. More study needs to be devoted to broadcast-related issues and the potential for broadcasting technology to complement other ICT initiatives and economic development. These might include creating programs with ICT content that could complement the Government's educational initiatives and Web casting interesting local content to promote local culture and history. Of course, the cost of modernizing the broadcasting infrastructure must also be considered.

Both the ECTEL Model Legislation and the Telecommunications Act of 2000 (Part V) envision the establishment of a universal service fund to support reasonably priced basic telephone service. While the U.S. is usually regarded as the model for universal service, the concept in the U.S. has undergone transformation over time. Indeed, it has become a subject of considerable controversy because many feel that universal service subsidies now distort the competitive market. Under the early Bell system, universal service was interpreted to mean access to a telephone rather than inexpensive telephone service. The current concept incorporates a social service component that came later. Universal service in the U.S. was effectively achieved in the early 1970's. It consists of multiple subsidies for users – regardless of income – and for rural telephone companies. As a result, there are serious distortions built into the U.S.-style Universal Service Fund that SVG should avoid. For example, in the U.S., the current system favors incumbent carriers at the expense of new competitors and places higher burdens on the long-distance segment of the telecommunications industry than on local service.

Furthermore, some novel questions must be considered that were not part of the debate in the U.S. or many other countries which have a universal service mandate. Among these is whether universal service in SVG should include universal Internet access and, if so, what kind of access. The issue of system design is crucial and needs to be studied carefully. These issues must be debated publicly by all stakeholders before universal service is finally adopted.

ITU Telecommunications Information – 1999 Statistics

Each year the International Telecommunications Union (ITU) publishes a *World Telecommunications Development Report* (*Development Indicators Report*)[6] that provides statistical data for all countries. Its most recent comprehensive report, issued in March 2001, included an expanded set of data that, for the first time, included data on mobile cellular. In addition to this worldwide report, the ITU periodically publishes regional-specific reports with more detailed discussions on a given geographical region. In April 2000, an *Americas Telecommunications Indicators 2000* report was published that provided useful data for this Assessment.[7]

The ITU-compiled data serves as a rich resource that is helpful in understanding the dynamics taking place in telecommunications. While there are several acknowledged weaknesses in the reports (such as timing, accuracy, and incompleteness), they still remain the best set of normalized data from which trends can be identified and macro-level regional/country comparisons can be made. For purposes of this ICT Assessment, selective 1999 data (the most recent available from the ITU) has been extracted from the 2000-2001 *Development Indicators Report* for the ECTEL countries, plus a few other Caribbean Islands (Barbados, Jamaica, and Trinidad/Tobago). Combined, this provides a basis for grasping the current telecommunications situation in the ECTEL countries, including SVG.

The following key observations were derived from reviewing and analyzing these sets of data. The actual data from which these were prepared are contained in Appendix B of this report.

<u>Basic Indicators</u>

- The populations of the ECTEL islands are small (typically less than 100,000), but relatively concentrated (with between 100 to nearly 300 people per square kilometer), due to the small size of the islands; SVG has 291 people per square kilometer).
- The economies of the ECTEL islands are relatively small (between US$300-600 million annual GDP), but on a per capita basis, they are relatively high (between US$2,400-6,000 per capita GDP), placing most ECTEL countries in what is considered the Upper-Middle income band. SVG, however, is in the Lower-Middle income band, with a GDP of US$300 million and US$2,395 GDP per capita.
- Relative to the world average for Upper-Middle income countries, the ECTEL countries have a higher than average teledensity (ranging from 28-52 whereas the average is 20); Grenada's teledensity is 31.51. St. Vincent/Grenadines is a Lower-Middle income country, but here too, it is above the average of similar countries (teledensity of 21 versus an average of 12).

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[6] *World Telecommunications Development Report 2000-2001-- World Telecommunications Indicators*, ITU, Geneva, March 2001.

[7] *Americas Telecommunications Indicators 2000*, ITU, Geneva, April 2000.

Main Telephone Lines

- With the exception of St. Kitts/Nevis and St. Lucia, growth in main lines and teledensity between 1995 and 1999 is less than the world averages for similar income level countries; Grenada's compound annual growth rate (CAGR) in main lines was 6.1 percent compared to 9.1 percent for Upper-Middle income countries, but close to the world average CAGR of 7.0 percent. SVG's CAGR was 6.7 percent compared to an average of 7.9 percent for Lower-Middle income countries.

Local Telephone Network

- Used switching capacity across all the ECTEL countries is 61-83 percent (Grenada is 83 percent). The world average is 81.4 percent and the average for Upper-Middle income countries is 84.4 percent. Dominica and St. Vincent/Grenadines fall significantly below this rate, with only about 61 percent of switching capacity used.
- All the switching capacity for the main telephone lines is 100 percent automatic and digital.
- The percentage of main telephone lines that are residential is higher than countries with comparable income levels (76-85 percent versus an average of 75 percent for Upper-Middle income countries). SVG has 78 percent residential lines, which almost meets the Lower-Middle income average of 79 percent.
- While the data is not available for all ECTEL countries, the faults per 100 main lines appears significantly less than other Lower-Middle and Upper-Middle income countries (no doubt due in part to digital switching and a more concentrated user base). Grenada has only 1.1 faults per 100 main lines per year, compared to an average of 19.8 for Upper-Middle income countries. SVG has 9.4 faults per 100 lines, compared to an average of 31.9 faults her 100 main lines per year for Lower-Middle income countries.

Teleaccessibility

- The percentage of households with phones throughout the ECTEL countries is considerably higher than the world averages for the Lower-Middle and Upper-Middle income countries (70->100 percent compared to 38-58 percent; SVG has 73.7 percent residential main lines per 100 households).
- The ECTEL countries' number of public telephones per 1000 inhabitants is quite close to the world average for their respective income level, however, as a percentage of main telephone lines, they are somewhat lower than the world average (likely due to the high level of phone lines that exist in households). SVG has 1.87 public telephones per 1000 inhabitants compared to a Lower-Middle income average of 1.15.

Largest City Main Lines

- With the exception of Dominica and St. Vincent/Grenadines, the percentage of the population of the ECTEL countries living in the largest city is considerably higher than comparable income level countries, but likely consistent with small island

nations. SVG has only 14.3 percent of its population living in its largest city, making rural connections all the more important – and costly.

- Teledensity of the largest ECTEL cities appears to be quite high (53-82 compared to 28 for Upper-Middle income countries) but, again, this is likely due to the nature of island nations. However, some data is missing for several of the islands. SVG's largest city teledensity is 26.28 compared to an average of 25.06 for Lower-Middle income countries.
- Except for SVG, there is a significant disparity between the teledensity of the largest city and the rest of the country (e.g., for Dominica, the largest city which contains only 13.5 percent of country's population has a teledensity of 82.22, whereas the rest of the country has a teledensity of 17.37). This is an extreme situation, but reflects the disparity, even though in most cases this is not as exaggerated. SVG's teledensity for its largest city is 26.28 compared to an overall country teledensity of 20.88.

Telephone Tariffs

- Connection rates for linking up telephone service are typically less in ECTEL countries than in countries with similar income levels (for both residential and businesses). For SVG, the connection charge for residential and business service was less than the average for Lower-Middle income countries (US$37 versus an average of US$107 for residential and US$37 versus an average of US$163 for business).
- Monthly subscription rates in other ECTEL countries ranged from Dominica's US$2.70 to Grenada's US$14.10. For business service, rates ranged from St. Kitts' US$3.70 to Grenada's US$40.70. SVG residential subscription rates are US$6.30 per month and business rates are US$14.80. It should be noted that this is 1999 data.
- Grenada's Telephone Tariffs as a percentage of GDP are very high compared to other Upper-Middle income countries (4.6 percent compared to an average of 1.8 percent). SVG's tariffs run 3.2 percent of GDP compared to an average of 3.5 percent for Lower-Middle Income countries.

Cellular Subscribers

- Cellular/Mobile data for ECTEL countries is sketchy and, therefore, its use is limited for drawing conclusions.
- It is clear that the entry of Cellular/Mobil has been late in coming to the ECTEL countries, and that, across the board, the growth rate between 1995 and 1999 has been considerably less than the growth in countries of similar income levels (24-60 percent on a very small base, whereas the average growth rate for the Upper-Middle income level is nearly 85 percent for this same period while Lower-Middle income countries have an average growth rate of 64 percent). SVG's compound annual growth rate for 1995-1999 was the highest of the ECTEL countries at 60.3 percent.
- Teledensity of Cellular/Mobile as of 1999 is considerably less than countries with comparable income levels (teledensity of Cellular/Mobil of ECTEL being between 1 and 2 whereas the average for Lower-Middle is over 2, and for Upper-Middle income countries it is over 13). SVG's teledensity of Cellular/Mobile subscribers is 1.25.

- Cellular/Mobile as a percentage of the total teledensity is considerably less than averages for comparable countries (3-6.5 percent compared to 16-40 percent). This is due to a late start, but also likely influenced to some degree by the relatively high main line telephone teledensity. The total teledensity for Cellular/ Mobile subscribers in SVG is 5.7 percent, with the average for Lower-Middle income countries at 16 percent.

International Telephone Traffic

- The outgoing international traffic from the ECTEL islands on a per inhabitant basis is completely "off the charts" relative to comparable income level countries (88-333 minutes per inhabitant for ECTEL countries compared to an average of 16 minutes per inhabitant for Upper-Middle income countries and an average of 6.6 minutes for Lower-Middle income countries). SVG's outgoing international minutes per inhabitant is 102.5.
- On a per subscriber basis, this comparison is equally significant (333-652 minutes compared to 79 minutes for Upper-Middle income countries). SVG has 491.1 outgoing international minutes per subscriber.
- These disparities are most likely due to the nature of a tourist-based economy, but are also likely to be partially due to island Diaspora and family members living in the U.S., U.K., and Canada.
- The extremely high outgoing international traffic is a real "cash cow" for the incumbent telecommunications provider and will require serious attention during market liberalization. While the report does not provide much data on the cost of outbound calls, such rates for SVG and other ECTEL members far exceed charges for incoming calls, which were provided by multiple competitive operators.

Telecommunications Staff

- Across the ECTEL countries, it is quite clear that between 1995 to 1999, the current telecommunications provider (C&W) has been undergoing cost-reduction efforts, including dropping staff (0.3 – 7.2 reduction in staffing for this period).
- The number of main lines per telecommunications employee has naturally grown over this same period, but for the Upper-Middle income countries, ECTEL countries are still considerably below the world averages (107-130 lines per employee compared to an average of 179 for Upper-Middle income countries and a world average of 154). For St. Vincent/Grenadines, the comparison is favorable (142 compared to an average for Lower-Middle income countries of 92).

Telecommunications Revenue

- While information is sketchy for the ECTEL countries, on a per inhabitant basis, telecommunications revenue is considerably higher than the average for similar income countries (US$219 compared to US$31 for Lower-Middle income and US$175-713 compared to US$146 for Upper-Middle income countries). SVG has US$219.30 telecommunications revenue per inhabitant.

- There is also considerably higher revenue for the ECTEL countries on a per line basis as well as a per employee basis (US$628-1,512 compared to US$733 for Upper-Middle income countries and US$256 for Lower-Middle income countries). SVG has US$1,050 telecommunications revenue per main line.
- Telecommunications revenue as a percentage of GDP is also very high for the ECTEL countries (5.1-10.4 percent compared to an average of 2.1 percent for Lower-Middle and 2.9 percent for Upper-Middle income countries). For SVG, telecommunications revenue accounts for 9 percent of GDP.

Telecommunications Investment

- The ITU report does not provide sufficient information on the ECTEL countries to detect much in the way of telecommunications investments other than to say it appears to be within the averages relative to population, but lower than average relative to telecommunications revenue.

Information Technology

- Overall, the number of Internet hosts in the ECTEL countries is considerably below the averages for similar income countries. Dominica, while still under the average, is at least close (excluding Dominica, the range is .3-2 hosts per 10,000 population whereas the average for Upper-Middle income countries is 37; Dominica is 24). Grenada has .32 hosts per 10,000 inhabitants. Figures were not available for SVG.
- The number of Internet users in 1999 is very low, with 2,000-3,000 per country. The number of Internet users per 10,000 population ranges between 195-516 in ECTEL countries compared to the average for Upper-Middle income countries of 461 and 79 for Lower-Middle income countries; SVG has 265 users per 10,000 population.
- There is a high percentage of PCs per 100 population compared to other countries of similar income levels (6.5-15.5 per 100 population compared to 2.6 for Lower-Middle and 5.8 for Upper-Middle income countries). SVG has 9.72 PCs per 100 population.
- The relatively high availability of PCs and the comparatively low use of the Internet is likely a direct result of limited access and costs (but mostly costs, since there are a high number of main lines per household across the ECTEL countries).

Network Growth

- Growth in the number of main lines taking place between 1998-1999 in the ECTEL countries is close to the averages for similar income countries, with Dominica and Grenada being slightly less (Dominica's compound annual growth rate (CAGR) is 6.3, and Grenada's is 7.1); the average for Upper-Middle income countries is 9.4. SVG's CAGR is 12.3 percent compared to an average for Lower-Middle income countries of 7.0.
- With the exception of St. Vincent/Grenadines, the growth in Cellular/Mobile for ECTEL countries is well below the growth rates for countries with comparable income levels (43-60 percent compared to 85 percent for Upper-Middle income countries; St. Vincent/Grenadines had an 89 percent growth in 1999 and Grenada's

growth rate was 42.7 percent). The average for Lower-Middle income countries is 75.6.

- Growth in Internet hosts throughout the ECTEL countries is also well below comparable averages, but data is insufficient to make any additional observations.

Identified Areas for Further Pursuit

The foregoing paints a picture of "Pipes" that is on the verge of significant dynamics due to near-term telecommunications market liberalization, which will have a profound impact over the next few months and extending for several years. The following, however, are a few "Pipes" issues where additional attention is warranted now:

A. Narrowing the Digital Divide. As SVG commences telecom liberalization, it is important to be aware of the "digital divide" within the country. As originally conceived, the term refers to the disparity between developed urban areas and those that are rural or underserved and between economic groups with divergent ICT education, training, achievements, and interests and, most importantly, economic prospects. Liberalization cannot solve long-standing socio-economic issues that result from multiple causes such as geography, cultural values, economics, etc. Universal service provisions can help bridge the "digital divide" and ICTs can help address social and economic problems. There is a need for thoughtful national debate about the scope and nature of the problem, goals of universal service programs, cost, inclusiveness, and program design, and administration. As it addresses the digital divide problem, SVG must focus on narrow, flexible proposals that directly address the problems at hand and do not lock the public and private sectors into long-term commitments.

At present, there are two rural telecenters – one in Layou and one in Troumaka that were established with the assistance of a U.S. Peace Corps volunteer. In addition, some schools are kept open late so that students and adults can use these facilities for basic course work and computer appreciation. The attractiveness of this concept should grow as more school computer labs go online. A clear policy is needed to end confusion over increasing access to public facilities after hours for ICT training and related purposes. The telecenter concept seems to have worked within its limitations, and, following proper planning, the use of shared ICT facilities should be expanded. Other types of rural and urban outreach facilities might include Internet kiosks, wired public libraries and post offices, and other public facilities. In essence, all public gathering places should be considered as possible sites to extend educational and learning opportunities.

With specific reference to rural areas, satellite Internet access technology is improving swiftly and is severing the Internet's reliance on the telephone infrastructure. Such satellite systems can be deployed to provide Internet access in remote areas. Although there are some technical limitations to Internet access via satellite, e.g., bandwidth is limited to 512 kbps, such constraints are not fatal impediments to expanding Internet access nationally.

B. On-line Education and Health Facilities. SVG, like many of its Eastern Caribbean neighbors, has a non-campus University of West Indies (UWI) distance education program. Some certification courses are available, but distance education is currently limited to two-way voice, largely due to the cost of video links. Two areas of expansion in distance education appear increasingly practical: (a) expanded ICT course offerings, and (b) greater use of online education employing streaming video, PC-based videoconferencing, and other emerging technologies. Successful online educational advances will depend on both lower network costs and a sound educational strategy to guide educational initiatives. Only now are business enterprises adopting online education to take advantage of its efficiency and reach. SVG does not yet have a comprehensive online education strategy, or the supporting physical infrastructure of networked servers, but officials should begin giving serious consideration to moving more education and training online and maximizing the benefits of new applications. Deployment of online education and training could help private firms and the Government leverage their limited resources and even improve their access to foreign ICT experts. The lessons gained from evaluating the benefits of online education and developing a basic strategy should be applicable to other teaching and health environments. The success of any efforts in this area, however, still depends on the ability to procure cheaper, higher bandwidth network services than are currently available.

C. More Effective Use of Broadcast Technologies as Part of ICT Initiatives and Deployment. Broadcast technologies have been given short shrift because they are considered traditional mass media. However, they need to be evaluated in conjunction with newer ICTs to find potential new uses and synergies between the two. An analysis of the two sectors might include an examination of content and programming for ICTs and new uses of the technology such as Web casting. With limited resources, governments should be creative as they consider how broadcasting can help achieve their broad policy goals. Potential commercial opportunities should be part of any evaluation of the broadcast sector's economic potential, its relationship to ICTs, and its potential to promote economic development.

III. Private Sector

Ultimately, it is the private sector that must generate the business activity that establishes and maintains economic growth and improves the living standards of citizens. This third area of the ICT Assessment focused on two key areas relative to leveraging ICTs in St. Vincent and the Grenadines (SVG).

1) Determining the strength and potential of the ICT-related sector in domestic and international markets; and
2) The utilization of ICTs by the local business community in an effort to improve the productivity and efficiency of their operations and, where appropriate, to potentially become more competitive in the regional and global marketplace.

Summary/Analysis

With the continuing decline in traditional forms of revenue (bananas and tourism), SVG has turned to other industries in hope of diversifying their private sector activity. Specifically, this shift – influenced by both intended and unintended market forces – has led into services, (chiefly offshore financial services), diversified ("eco") tourism, and ICT-based services. It is no surprise, therefore, that a recent drought, U.S. recession, and the impact of the September 11 terrorist attacks have had dramatic consequences for the economy of SVG. A cursory overview of recent years shows that the rate of economic growth in SVG dropped to two percent in 2000 following a four percent average during the preceding three years (1997-99). Growth is projected to fall further. The already high unemployment (22% as of 1997) is unofficially estimated by some officials to now be as high as 40%.

Overall, ICT activity in SVG is sparse, with growing pockets of productive usage, primarily in large businesses, financial services, and the tourist-related enterprises. To extent that small businesses use ICTs, it is generally restricted to word processing, spreadsheets, and other administrative functions. E-mail and databases are becoming more common at places of work and software applications are being utilized more frequently. There are only a few large ICT companies in SVG, with anywhere between 100-150 people each. Two of them carry out mostly large-scale data processing and storage services. The remaining businesses centered in informatics are left to small IT professional services, such as network administrators, Web development, and Internet "cafes." Other sophisticated users are offshore and large commercial banks, such as Barclays and the National Commercial Bank (NCB). They are fully networked, using VSATs or leased-lines between branches and off-island data centers.

The preceding analysis is not uncharacteristic of a second-tier economy in the early stages of ICT integration, nor does it offer a great deal of insight into SVG's ICT development experience. More instructive, perhaps, is an examination of situations where there is foreign

direct investment (FDI) in large ICT operations. Often, these entities simultaneously face multiple challenges. One of the more common hurdles is the implementation of new paradigms in work structure and productivity and new structural limitations that are both institutional and physical. This is especially true for the Caribbean countries, whose economies benefited very little from the lessons of industrialization, but which are now seeking to transform themselves into post-industrial knowledge economies. The conceptual leap from bananas to networked computers may help explain SVG's lingering agricultural industry and persistent unemployment. The Information Services of SVG (ISSVG) Call Center at Arnos Vale provides a useful frame of reference to examine the integration ICTs into SVG, particularly the elasticity of labor, cultural, and public institutions.

This SVG Call Center was originally initiated in cooperation with foreign investors until relationships soured after numerous violations in service agreements and discrepancies in management methods. This was the general explanation given to the public. More in-depth discussions with officials associated with the Call Center conveyed a better understanding of the causes that lie beneath the disillusionment. A summary of these various points of view, along with other information sources, suggests the problems may have more to do with underlying structural complications that have broader implications, such as an unaccommodating business environment (e.g. poor building facilities, lack of competent ICT professionals, etc.) and a lack of expected administrative transparencies that help protect investments. An article in SVG's Searchlight newspaper also made reference to some of the same revealing outcomes, including overcharges, non-performance management, and failures of network administration and reliability.

In the meantime, the Government – through the Development Corporation (DEVCO) – has the unpopular responsibility of sustaining the Call Center's operations until such time it can be transferred to private ownership. The Center is offering only outbound telemarketing sales services at this time and operating at about 30 percent of its capacity. DEVCO says it is committed to maintaining the Government's investment and has started to remedy some of the recent network and financial management difficulties, including entering into an agreement with C&W to provide half of their network needs. Other officials are also taking steps to avert development of local opinion that ICT industries are inherently unsuitable for economic diversification, or that technology itself is to blame.

Despite a tumultuous start, the first few months of operations established the Center as an attraction for foreign direct investment (FDI) in ICTs. There has been continued interest by other investors with a range of business interests and a willingness to conduct operations in SVG, outside the target North American markets. Moreover, labor responded favorably to the new employment opportunities, filling up to 150 openings at times. The Center's experience also illustrated the need to establish a responsive, multi-level skills training force that transfers knowledge.

The knowledge gained from the Center's recent trials should be used as a guide. Many SVG officials fear that the initial high expectations followed by subsequent disappointments may have placed the Call Center business – and by extension the ICT industry – in jeopardy. Not

unlike SVG's approach to tourism, the history of the Center suggests an insufficient institutional response to an otherwise potent economic opportunity. One encouraging development, however, is the plan to use the proceeds from the sale of the Call Center to fund related ICT activities, particularly the anticipated National Institute of Technology (NIT).

The potential role of C&W in providing needed infrastructure is not well articulated. The local phone company appears to be unprepared to meet the increasing demand for value-added services or the eminent competitive telecom environment. There is little indication that C&W intends to lower rates; nor does it seem to be preparing any marketing plans to ensure customers are retained during the transition. C&W does claim, however, that it is getting ready to offer some new data services to businesses, including financial settlements, credit card clearance, and possibly Web-related services later on. That they are not already offering value-add services is not entirely surprising given SVG's serious shortage of skilled technical professionals. On the other hand, with C&W's extensive international business customers, it would seem natural for them to provide these services. As for the future state of ICTs on the islands, C&W's management believes that companies that pay special attention to creating Web services and that target discrete markets segments would do well. In response to criticism over the past years, especially from their commercial customers, C&W believes they are simply misunderstood. "We probably could do a better job at telling our side of story," explained a customer service manager.

With respect to the institutions and administrative agencies that help establish businesses, SVG has some non-technical resources available. The most influential of these is probably the Development Corporation (DEVCO) that stimulates investments in productive sectors of the economy and helps businesses network within SGV. Two current projects include managing the affairs of the Call Center and dedicating part of the Diamond Industrial Park for ICT companies. The Park's primary focus is to address the problem of limited or structurally inadequate commercial space – a shared concern among companies intent on protecting expensive ICT equipment from the elements.

DEVCO is also considering establishing a proposed National Institute of Technology (NIT) in the park that will act as an IT "employment agency." DEVCO is also a central force in furthering investments in the ICTs industry in hopes that it will be the primary substitute for the declining agriculture and tourism sectors. For instance, they estimate an employment potential of 3,000 – 5,000 jobs from offshore ICT operations alone, mostly in new call center operations. At this time, there are efforts underway by investors to establish two additional call centers in SVG. According to DEVCO, the investors' concerns moving forward concern their ability to obtain (1) technically qualified, employable and productive labor, and (2) reasonable rates for communications. These both require near-term attention. DEVCO confirmed that these are by far the most common complaints, with financing and new investment incentives being discussed more frequently.

Another significant organization is the Sustainable Economic Development Unit (SEDU), a technical assistance program in its second of a three-year operation funded by the EU. SEDU's mission is to help SME's with finance, management, networks, business plans, marketing, and legal and regulatory needs. Their informatics initiatives consist of plans to build marketing data

systems that can be accessed to conduct research and to provide Web-based business management tools, such as models for product development and tutorials on project management. As for ICTs, SEDU's executive director observed a lack of general technical capacity in SVG (more specifically, competent IT professionals) for both management and network administration. He also recommended that the Call Center and proposed NIT be operated mostly – if not entirely – as private facilities and stressed there should be a strategy for graduated skill development that facilitates workers' rise up the value-chain.

The unfavorable labor situation in SVG has fundamental implications for ICT development. The remarkably high unemployment could be seen as either an indication of an unresponsive work culture or of persistent labor market defects. On the other hand, it may be seen as an asset for ICT companies seeking to hire significant numbers of workers who are literate and trainable. The problem of unemployment in SVG is sometimes explained in terms of the "unemployable" vs. "employable." That is, a certain percentage of the unemployed may chose not to work. The reasons for this are not readily known, but one plausible one seems to stem from the tradition of labor practices in which intermittent, cash-based employment in the agricultural sector is widespread, in addition to a general resistance to opportunities in the emerging service sector. Marijuana crops are widely reported as being farmed in the mountainous regions. The labor and crop systems in these regions indicate marijuana cultivation is a significant force in the economy. This may, in part, explain the curiously high official jobless rates.

The remaining non-working individuals are those who can't find suitable work based on their qualifications or because of a general lack of opportunity. The experience of the SVG Call Center is, once again, telling of the community's response to ICT activity. Many unemployed in SVG sought work at the Center during the first three months of operation. Nearly 150 people worked through their full terms or were terminated for various reasons by the management.

For ICT development, the critical shortage of qualified and/or accredited network and computer technicians in SVG cannot be ignored. It was frequently noted in interviews that an immediate need exists for experts to perform basic, yet vital mission-critical, IT services, such as LAN installation and maintenance, network upgrades, computer repair, and troubleshooting software. There are rare situations that require custom software development, network design or other highly specialized skills. The absence of a sufficient ICT skilled labor pool has been reported to virtually paralyze business operations for extended periods of time. Since fundamental problems cannot be long neglected, business managers are forced then to import ICT professionals from off-island at great cost. As can be expected, this situation also has discouraged the entry of new ICT-dependent businesses, and the use of ICTs generally.

Identified Areas for Further Pursuit

The above paints a very brief picture of the "Private Sector" in St. Vincent and the Grenadines. Its focus has been on leveraging of ICTs, primarily in an effort to identify possible opportunities for utilizing ICTs for economic development. With the market liberalization of telecommunications that is currently in process, lower international telecommunications costs

can be expected. The following however are a few isolated "Private Sector" issues where attention is warranted:

A. **Enhance Online Tourism Capacity**. The Ministry of Tourism's ICT initiatives appear somewhat piecemeal, under-resourced and out-maneuvered by the competition. The tourism portal, for example, is in need of fundamental improvements if it is to be competitive with Caribbean counterparts or even to play an effective marketing role. The Ministry may wish to pay special attention to important features such as real-time interactivity, enhanced imaging, refined editorial content and adding the hotels not yet linked (about 70 percent). In addition, a portal "development center" program could be considered to provide essential technical and creative resources to individual hotels, restaurants, and tour operators that would like to establish or improve their Web presence. A number of low-cost Web management "tools" are now available (for instance design templates) that permit content owners (e.g. hotel) to make unassisted updates at their convenience. Some components of an online Destination Management Strategy may include: a centralized online marketing and management information system for tourism operators, business performance mechanisms for SME's (such as reservation systems), multimedia-enhanced content for niche tourism (eco-tourism), and an awareness-building strategy for Web systems using traditional industry relationships and innovative online trading "exchanges."

B. **Public and Private National or Regional Online Gateway.** A comprehensive national or regional Web portal that represents both public and private communities can offer a "cross-merchandising" advantage in addition to functioning as a marketing tool for building awareness of SVG and regional commercial strengths. The tourism sector is a natural candidate for a national or regional portal that would enable smaller companies to enjoy economies of scale suitable to broad-based portal development. National portals can also convey a national identity that present the country as accessible, modern and responsive to changing conditions in commercial activity. Over time, an integrated public/private portal can improve accountability, openness, inclusiveness and efficiency. For immediate purposes, however, the value of the portal concept is to stimulate innovative marketing and to extend ICTs into traditional industry sectors.

C. **Develop ICT Capabilities for the Caribbean Music Community.** The music industry in the Caribbean is substantial and is a prevailing cultural influence. Music festivals assume an important role in the economy and everyday life. Moreover, with recent market data showing Cuban, Caribbean, and Latin music as some of the fastest growing sectors in the music industry, there appear to be market opportunities for exploiting ICTs in further developing the industry. Beyond its proven distribution advantages, ICTs could also enable the Caribbean to establish itself as an alternative market for Caribbean, U.S., and European musicians. For years, however, the music industry in the Caribbean has been plagued by problems of institutional capacity, human resource development, income generation, and intellectual property rights violations. In order for an alternative Caribbean market to gain credibility, the public and private sectors will have to work together to address these lingering issues.

The music industry needs technical assistance to explore online alternatives or initiatives for production, promotion, and distribution of music produced by local artists. Initial efforts might also experiment with using satellite, radio, and the Internet to target regional markets, build on existing industry relationships, and test innovative network distribution services, such as compressed programming products and distance studio or professional music services. Market awareness of Caribbean music may be raised by featuring music programs and samples on a regional portal. A key component is an integrated Web site for public dissemination that, in turn, could be linked to the national site. NBC Radio of SVG is the local broadcasting facility which offers local news, weather, sports, programming guide and the very popular "audio center" through its Web site. The site makes a compelling case for ICT-assisted music and community development.

D. **Expand Offshore "Contact" Operations.** The increase in offshore outsourced services in the Caribbean is reducing unemployment and indicating promise as a long-term industry. Offshore ICT companies are typically used to support domestic and multinational corporations and institutions, primarily in the financial, insurance, telecommunications, healthcare, information technology, media and hospitality industries. The market is estimated to grow 20 percent annually with the potential to generate significant employment, ranging from 200 to 800 employees per center in some cases. However, the future growth prospects of these service areas depend on the success of present efforts to liberalize telecommunications. SVG is in a good position for further development of these businesses due to its English speaking population, 90 percent literacy rate, low labor costs, location proximate to the Eastern time zone, and an available workforce of 20 percent or more. Moreover, if DEVCO transfers the Call Center facility to the private sector and proceeds with establishing the proposed NIT, SVG will have a competitive edge in attracting foreign and domestic investors in the ICT industry.

IV. People

The widespread deployment and utilization of ICTs is directly dependent upon the ability of a population to become ICT proficient. Whereas the public sector can set ICT strategy and policy, and the private sector can bring together opportunities and needed financial resources, both are dependent upon the intellectual capital of a nation and the ability of its people to provide the requisite skills and human capabilities. In the end, the ultimate change agent is a nation's citizens.

This section explores the intellectual resources of the people of St. Vincent and the Grenadines (SVG), their educational background, their capabilities and potential from an ICT-related perspective, and their desire and willingness to develop an ICT industry sector and use ICTs. There are a few countries that serve as development models of success and useful case studies for countries to emulate. Ireland and India are two of the more prominent. Ireland used about a third of its EU infusion money to develop education and human resources that in turn developed knowledge industries, like IT.[8] This section examines SVG's school systems, private training institutions, and employer training initiatives that are each in their own way critical to supporting the country's potential for increased utilization of ICTs.

Summary/Analysis

Recent graduates of the secondary school system can read and write English and possess the ability to acquire new skills; however, they graduate with only a modest background in computers. Moreover, the community has endured a fair amount of "brain drain" of young adults who have gone abroad to universities for advanced degrees or to find better economic opportunities in Europe or North America and do not return.

There are 61 Government primary schools providing free, but not compulsory, primary education in SVG. Less than one-half of the country's children attend secondary school–an issue of great concern, given the high rate of youth unemployment and the country's desire to become a knowledge economy. By the end of next year, all Government primary and secondary schools are expected to have computer labs wired for Internet access. At this time, 20 out of 61 primary and 21 secondary schools already have networked computer laboratories. In response to frequent public appeals for rate concessions, Cable and Wireless (C&W) has started to offer "free" Internet access to schools that have computers. Connection is free for the first 100 hours, after which an hourly rate is applied. There have been complaints from students, however, that they are not getting access to the computers and do not consume the free time allotment. It is unclear if this is the result of overcrowding by staff, or administrators' concern about undesirable online content, or some other reason. In any event, all schools are scheduled to have Internet access and, by the close of next year, they hope to introduce high-speed Internet access service.

[8] *Business Central Europe*, September 2000, p. 19.

After high school, students can attend a two-year community college that offers a technical college, a nursing school, or a teacher training college affiliated with the University of the West Indies. The teacher training college offers some basic computer classes, but no degree of certification. A significant effort is underway to train teachers. According to a manager from the Ministry of Education, the OECS has initiated a teachers training model to be implemented across the region. Beyond just wiring school labs, the program will set forth standards and best practices in online teacher management and administration. Specific examples include:

- Doing joint training of educational software
- Evaluating management practices, e.g., greater use of e-mail to send meeting notices, etc.
- Establishing databases of teachers and administrators, including skill profiles.

Web-based curricula are a possibility, but, for now, school officials are looking at Web-based materials for teacher training dealing with functional IT skills. The UWI and OECS are looking for relevant content for student curricula before encouraging its use by Member States.

As noted earlier, SVG has a critical skills shortage for higher value-added ICT services in software conversion, large-scale systems integration, and software development. The UWI and various tertiary level colleges provide training courses, but are only able to supply a small fraction of the informatics skills required by the market and do not offer professional certifications. For that reason, operators of information services companies likely would be required to provide substantial training for new employees working in high-end services.

To address this shortage, a National Institute of Technology (NIT) has been proposed in order to provide workforce training in new ICT skills. As part of DEVCO's Diamond Industrial Park, NIT's goal is to prepare 3,000 – 5,000 trained individuals in the areas of general computer technology, job specific skills, and specialized high-end support services. As conditions change, more accelerated courses in software development, Internet commerce, and other ICT aptitudes will be offered. A draft proposal for NIT states this objective:

> "To respond to the human resources of the information technology sector and other emerging industries and to stimulate growth within those sectors that have the potential to contribute significantly to the economic development of St. Vincent and the Grenadines."

It goes on to state that the purpose of the Institute will be to act as an "employment agency" to enable private companies to draw on custom-trained labor, as needed. NIT will also coordinate other satellite training facilities throughout SVG. Financial support would come from a mix of Government assistance, small tuition fees, and private stakeholder contributions. Overall, the proposal is comprehensive and offers very pragmatic ideas, such as its scheme to differentiate SVG's competitive advantages from other favorable destinations in the region. The proposal also suggests ongoing projects and donors should be coordinated and lists the various implementation activities, such as infrastructure development, procurement of equipment, selection of staff, and development of curricula. It includes a plan for managing the training of trainers and lays out aspects of marketing and communications. NIT's total cost is estimated just

under EC$3 million. This includes capital costs, operating costs, and implementation projected over a three-year period.

Labor is a central issue for economic progress in SVG. The cost of labor is very low, running at about US$10 per day. The information processing industry would provide slightly higher wages, maybe US$1.10-2.10 per hour. This is extremely competitive in comparison to North American and European wages for similar positions. According to officials from DEVCO, there is a very small niche market in SVG in terms of informatics labor. Although unofficial reports place unemployment at close to 40%, the type of labor needed for the informatics industry is skilled and literate and, therefore, there would be a much smaller available pool of labor to choose from. DEVCO estimates that the present size of the labor pool in SVG is approximately 40,000 people and thinks that, of that number, approximately 3,000 – 5,000 could be used in the ICT industry. This leads them to believe that SVG has enough capacity to satisfy the needs of approximately 10 to 12 small companies. The preferred evolution in the informatics labor force is that low-level skilled workers graduate to intermediate level positions, including built-in incentive programs to keep them from relocating off-island.

Identified Areas for Further Pursuit

The above paints a very brief picture of the environment in St. Vincent and the Grenadines relative to education and to a degree, the culture. The following however are a few "People" issues where additional attention is warranted:

A. **Support SVG's National Institute of Technology (NIT).** The shortage of skilled ICT professionals of any type is a major liability for organizations using ICTs, both small and large. SVG should proceed with establishing the NIT in order to address this critical need. Additional ongoing funds could be collected, with possible built-in reciprocity agreements with employers. For example, in taking the NIT's funding proposal a step further, companies benefiting from NIT's trained workforce would agree to reinvest in NIT, through various scholarships and on-site training programs. Support could also include direct financial contributions based on various business-labor success factors.

B. **After-School Multimedia Workshops.** Given the unfavorable computer-to-student ratio and limited Internet access in secondary schools, SVG might consider new ways of maximizing ICT resources, including their use in smaller group teaching settings. For instance, students who are over-achievers, or who have an interest in supplementing their learning in a multimedia environment, could participate in after-school "digital clubs" consisting of regularly scheduled interactive workshops that employ a variety of multimedia equipment – networked computers, audio/visual, broadcasting, online interactive learning games, and so on. The aim would be to engage students in working creatively with ICTs and to enable them to use this equipment to pursue interests in other subject areas, such as anthropology, astrology, language, art, and music.

Appendix A – Digital Economy 2000

On June 5, 2000, the U.S. Department of Commerce (DOC) issued its third annual report on the information technology revolution and its impact on the U.S. economy, titled "Digital Economy 2000."[9] This series of reports has been critical to providing a more comprehensive understanding on the direct and indirect role/impact of the information technology (IT) sector within the U.S. In introducing the report, then-Vice President Gore presented several key highlights from the report:

- IT accounts for half or more of the gains in U.S. productivity since 1995. The U.S. enjoyed a 2.8 percent productivity growth from 1995 to 1999–double the 1.4 percent rate of 1973 to 1995. Improved productivity has lowered inflation and raised real wages.

- IT is lowering inflation. Falling IT prices have directly pulled down overall average inflation by 0.5 percentage points a year. In addition, by raising productivity, IT lowered inflation of other industry sectors.

- The IT sector is rapidly creating jobs at high wages. IT jobs average $58,000 a year, 85 percent higher than the average for the private sector. Between 1994 and 1998, employment in IT industries expanded by 30 percent, from 4.0 million to 5.2 million jobs. IT occupations that pay the best and require the most education have been growing most rapidly.

Former Secretary of Commerce, William M. Daly, writes in the Report's preface:

> *"What we can see clearly are expanding opportunities. To meet these opportunities, we will have to ensure a stable and conducive economic and legal environment for continuing innovation in information technology and e-commerce. We need to encourage the building of a broadband infrastructure that allows all Americans to have access to the advanced services that support the Internet, and take the steps necessary with respect to privacy, consumer protection, security, reliability, and intellectual property rights that will inspire confidence in the Internet. To realize the full potential of this digital economy, every person and every business must be able to participate fully and make their own unique contribution to its development."*

The Executive Summary of the Report provides a strong message regarding the impact of ICTs on the U.S. economy. In addition to the above highlights, these include:

[9] *Digital Economy 2000*, U.S. Department of Commerce, http://www.esa.doc.gov/de2k2.htm.
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- The Internet in particular is helping to level the playing field among large and small firms in business-to-business e-commerce.

- There is growing evidence that firms are moving their supply networks and sales channels online and participating in the new online marketplaces.

- Advances in information technologies and the spread of the Internet are also providing significant benefits to individuals.

- The vitality of the digital economy is grounded in the IT-producing industries–the firms that supply the goods and services that support IT-enabled business processes, the Internet, and e-commerce.

- Although IT industries still account for a relatively small share of the economy's total output–an estimated 8.3 percent in 2000–they contributed nearly a third of real U.S. economic growth between 1995 and 1999.

- IT industries have also been a major source of new R&D investments.

- New investments in IT are helping to generate higher rates of U.S. labor productivity growth.

- Growth in the IT workforce accelerated in the mid-1990s, with the most rapid increases coming in industries and job categories associated with the development and use of IT applications.

- Analysis of the computer and communications industries in particular suggest that the pace of technological innovation and rapidly falling prices should continue well into the future.

- Businesses outside the IT sector almost daily announce IT-based organizational and operating changes that reflect their solid confidence in the benefit of further substantial investments in IT goods and services.

While the above reflects dynamics taking place in the U.S. economy relative to the ICT sector and its broader impact on the economy, it also reflects the potential value of ICTs in other economies–including developing and transitioning economies. This is of specific relevance the OECS/ECTEL countries as they seek to grow their economies, not so much by their reliance on traditional agricultural and tourism base, but by expanding their reliance on ICTs for growing their service, information, and knowledge-based sectors.

Appendix B – 1999 ITU Statistics

Each year, the International Telecommunications Union (ITU) publishes a *World Telecommunications Development Report*[10] that provides statistical data for all countries. Its March 2001 report included an expanded set of data that, for the first time, included data on mobile cellular. In addition to this worldwide report, the ITU periodically publishes regional-specific reports with more detailed discussions on a given geographical region. In April 2000, an *Americas Telecommunications Indicators 2000* report was published.[11]

The ITU-compiled data serves as rich resource material for understanding the dynamics taking place in telecommunications. While there are several acknowledged weaknesses in the reports (such as timing, accuracy, and incompleteness), they are still the best set of normalized data whereby trends can be identified and macro-level regional/country comparisons made.

For purposes of this ICT Assessment, selective 1999 data (the most recent available from the ITU) has been extracted from the *World Telecommunications Development Report 2000-2001* for the ECTEL countries and a few other Caribbean Islands (Barbados, Jamaica, and Trinidad/Tobago), along with selected income-level data. Combined, this data provides a quick snapshot of the current telecommunications situation in the ECTEL countries, including St. Vincent and the Grenadines (SVG).

The following tables provide more details of the situation in SVG. Following each table are keynotes clarifying some of the data on the tables, as well as short comments with respect to what one may conclude from the data.

[10] *World Telecommunications Development Report 2000-2001-- World Telecommunications Indicators*, ITU, Geneva, March 2001.
[11] *Americas Telecommunications Indicators 2000*, ITU, Geneva, April 2000.

Basic Indicators

Country	Population – 1999		GDP – 1998		Main Phone Lines	
	Total (Millions)	Density (per km)	Total (US$ B)	Per Capita (US$)	Totals (000s)	Teledensity (per 100)
ECTEL Countries						
Dominica (U-M)	0.08	102	0.3	3,391	21.3	27.88
Grenada (U-M)	0.09	271	0.3	3,635	29.4	31.51
St. Kitts/Nevis (U-M)	0.04	148	0.3	6,840	20.1	51.76
St. Lucia (U-M)	0.15	250	0.6	3,815	44.5	28.93
St. Vincent/Gr (L-M)	0.11	291	0.3	2,395	23.6	20.88
Barbados (U-M)	0.27	626	2.3	8,731	115.0	42.71
Jamaica (L-M)	2.56	224	6.9	2,707	509.6	19.91
Trinidad/Tobago (U-M)	1.29	252	6.1	4,726	278.9	21.58
Lower-Middle Income Total/Avg.	861.83	24	1,341.0	1,621	103,294.4	11.99
Upper-Middle Income Tot/Avg.	634.96	27	2,945.1	4,705	126,649.4	19.95
High Income Tot/Avg.	891.52	26	23,263.6	26,288	521,516.1	58.50
Americas Tot/Avg.	814.62	20	11,413.4	14,207	271,006.1	33.27
WORLD	5,980.91	44	29,686.5	5,111	906,713.6	15.16

NOTES:

1. Calculations for GDP vary considerably based on source and calculations used. Here, GDP figures are presented utilizing ITU's methodology and normalized across all countries in a consistent manner.
2. Teledensity is the number of phones per 100 inhabitants.

Observations:

- The populations of the ECTEL islands are small (typically less than 100,000), but relatively concentrated (with between 100 to nearly 300 people per square kilometer), due to the small size of the islands; SVG has 291 people per square kilometer.

- The economies of the ECTEL islands are relatively small (between US$300-600 million annual GDP), but on a per capita basis, they are relatively high (between US$2,400-6,000 per capita GDP), placing most ECTEL countries in what is considered the Upper-Middle income band. SVG, however, is in the Lower-Middle income band, with a GDP of US$300 million and US$2,395 per capita.

- Relative to the world average for Upper-Middle income countries, the ECTEL countries have a higher than average teledensity (ranging from 28-52 whereas the average is 20); Grenada's teledensity is 31.51. St. Vincent/Grenadines is a Lower-Middle income country, but here too, it is above the average of similar countries (teledensity of 21 versus an average of 12).

Main Telephone Lines

Country	Main Telephone Lines			Teledensity		
	1995 (000)	1999 (000)	CAGR % 1995-1999	1995	1999	CAGR % 1995-1999
ECTEL Countries						
Dominica (U-M)	17.8	21.3	4.6	24.13	27.88	3.7
Grenada (U-M)	23.2	29.4	6.1	26.02	31.51	4.9
St. Kitts/Nevis (U-M)	14.4	20.1	8.6	36.32	51.76	9.3
St. Lucia (U-M)	30.6	44.5	9.8	21.02	28.93	8.3
St. Vincent/Gr (L-M)	18.2	23.6	6.7	16.46	20.88	6.1
Barbados (U-M)	90.1	115.0	6.3	34.53	42.71	5.5
Jamaica (L-M)	291.8	509.6	15.0	11.67	19.91	14.3
Trinidad/Tobago (U-M)	209.3	278.9	7.4	16.78	21.58	6.5
Lower-Middle Income Total/Avg.	76,081.5	103,294.4	7.9	9.94	11.99	6.7
Upper-Middle Income Tot/Avg.	89,505.5	126,649.6	9.1	14.90	19.95	7.6
High Income Tot/Avg.	460,053.5	521,516.1	3.2	52.81	58.50	2.6
Americas	221,402.5	271,006.1	5.2	28.71	33.27	3.7
WORLD	691,601.0	906,713.6	7.0	12.15	15.16	5.7

NOTES:

1. CAGR = Compound Annual Growth Rate

Observations:

- With the exception of St. Kitts/Nevis and St. Lucia, growth in main lines and teledensity between 1995 and 1999 is less than the world averages for similar income level countries; Grenada's compound annual growth rate (CAGR) in main lines was 6.1 percent compared to 9.1 percent for Upper-Middle income countries, but close to the world average CAGR of 7.0 percent. SVG's CAGR was 6.7 percent compared to an average of 7.9 percent for Lower-Middle income countries.

Local Telephone Network

Country	Main Telephone Lines – 1999				Faults per 100 Main Lines/year 1999
	Capacity Used (%)	Automatic	Digital (%)	Residential (%)	
ECTEL Countries					
Dominica (U-M)	61.1	100.0	100.0	85.0	9.0
Grenada (U-M)	83.0	100.0	100.0	81.0	1.1
St. Kitts/Nevis (U-M)	---	100.0	100.0	77.0	---
St. Lucia (U-M)	---	100.0	100.0	76.0	---
St. Vincent/Gr (L-M)	61.6	100.0	100.0	78.0	9.4
Barbados (U-M)	---	100.0	100.0	67.0	---
Jamaica (L-M)	---	100.0	100.0	---	---
Trinidad/Tobago (U-M)	72.1	100.0	100.0	82.3	75.0
Lower-Middle Income Total/Avg.	82.5	99.2	51.7	79.0	31.9
Upper-Middle Income Tot/Avg.	84.4	99.5	84.2	75.3	19.8
High Income Tot/Avg.	89.5	100.0	95.9	69.6	10.6
Americas	87.8	99.8	91.9	67.8	14.1
WORLD	81.4	99.8	89.6	73.1	24.8

NOTES:

Observations:

- Used switching capacity across all the ECTEL countries is 61-83 percent (Grenada is 83 percent). The world average is 81.4 percent and the average for Upper-Middle income countries is 84.4 percent. Dominica and St. Vincent/Grenadines fall significantly below this rate, with only about 61 percent of switching capacity used.
- All the switching capacity for the main telephone lines is 100 percent automatic and digital.
- The percentage of main telephone lines that are residential is higher than countries with comparable income levels (76-85 percent versus an average of 75 percent for Upper-Middle income countries). SVG has 78 percent residential lines, which almost meets the Lower-Middle income average of 79 percent.
- While the data is not available for all ECTEL countries, the faults per 100 main lines appears significantly less than other Lower-Middle and Upper-Middle income countries (no doubt due in part to digital switching and a more concentrated user base). Grenada has only 1.1 faults per 100 main lines per year, compared to an average of 19.8 for Upper-Middle income countries. SVG has 9.4 faults per 100 lines, compared to an average of 31.9 faults per 100 main lines per year for Lower-Middle income countries.

Teleaccessibility – 1999

Country	Residential Main Lines		Public Telephones		
	Total (000s)	Per 100 Households	Total (000s)	Per 1000 Inhabitants	As % of Main lines
ECTEL Countries					
Dominica (U-M)	15.9	77.5	0.31	4.20	1.67
Grenada (U-M)	23.8	76.9	0.20	2.17	0.69
St. Kitts/Nevis (U-M)	12.0	>100.0	0.17	4.23	1.07
St. Lucia (U-M)	30.7	69.7	0.42	2.88	1.26
St. Vincent/Gr (L-M)	18.4	73.7	0.21	1.87	0.90
Barbados (U-M)	77.0	81.1	0.87	2.13	0.50
Jamaica (L-M)	---	---	2.07	0.82	0.59
Trinidad/Tobago (U-M)	229.5	66.5	2.15	1.66	0.77
Lower-Middle Income Total/Avg.	76,538.6	38.3	943.04	1.15	0.93
Upper-Middle Income Tot/Avg.	93,147.3	58.5	2,662.24	4.22	2.13
High Income Tot/Avg.	348,714.4	106.1	4,282.43	4.85	0.83
Americas	182,027.6	78.5	3,644.01	4.54	1.35
WORLD	618,042.5	51.2	11,577.02	2.02	1.31

Observations:

- The percentage of households with phones throughout the ECTEL countries is considerably higher than the world averages for the Lower-Middle and Upper-Middle income countries (70->100 percent compared to 38-58 percent; SVG has 73.7 percent residential main lines per 100 households).
- The ECTEL countries' number of public telephones per 1000 inhabitants is quite close to the world average for their respective income level, however, as a percentage of main telephone lines, they are somewhat lower than the world average (likely due to the high level of phone lines that exist in households). SVG has 1.87 public telephones per 1000 inhabitants compared to a Lower-Middle income average of 1.15.

Largest City Main Lines – 1999

Country	Largest City				Rest Of Country	Overall Country Teledensity
	Population as % of Total	Main Lines		Teledensity		
		(000s)	% of Total			
ECTEL Countries						
Dominica (U-M)	13.5	7.4	39.5	82.22	17.37	25.23
Grenada (U-M)	21.4	10.7	36.2	53.30	25.58	31.51
St. Kitts/Nevis (U-M)	54.2	---	---	---	---	---
St. Lucia (U-M)	35.2	---	---	---	---	---
St. Vincent/Gr (L-M)	14.3	4.3	18.0	26.28	19.98	20.88
Barbados (U-M)	43.0	---	---	---	---	---
Jamaica (L-M)	29.7	---	---	---	---	---
Trinidad/Tobago (U-M)	26.0	6.27.2	24.1	19.95	22.15	21.58
Lower-Middle Income Total/Avg.	13.2	26,618.2	27.3	25.06	9.17	11.71
Upper-Middle Income Tot/Avg.	16.0	27,558.3	24.9	27.87	16.15	18.04
High Income Tot/Avg.	10.4	29,676.1	15.2	60.97	52.23	53.40
Americas	13.4	17,537.8	33.1	20.01	9.29	11.29
WORLD	7.8	96,758.1	18.1	24.56	9.00	10.16

NOTES:

Observations:

- With the exception of Dominica and St. Vincent/Grenadines, the percentage of the population of the ECTEL countries living in the largest city is considerably higher than comparable income level countries, but likely consistent with small island nations. SVG has only 14.3 percent of its population living in its largest city, making rural connections all the more important – and costly.
- Teledensity of the largest ECTEL cities appears to be quite high (53-82 compared to 28 for Upper-Middle income countries) but, again, this is likely due to the nature of island nations. However, some data is missing for several of the islands. SVG's largest city teledensity is 26.28 compared to an average of 25.06 for Lower-Middle income countries.
- Except for SVG, there is a significant disparity between the teledensity of the largest city and the rest of the country (e.g., for Dominica, the largest city which contains only 13.5 percent of country's population has a teledensity of 82.22, whereas the rest of the country has a teledensity of17.37). This is an extreme situation, but reflects the disparity, even though in most cases this is not as exaggerated. SVG's teledensity for its largest city is 26.28 compared to an overall country teledensity of 20.88.

Telephone Tariffs - 1999

Country	Residential (US$)		Business (US$)		Local Calls US$	% GDP per Capita
	Connection	Monthly Subscription	Connection	Monthly Subscription		
ECTEL Countries						
Dominica (U-M)	20	2.7	20	7.5	---	1.0
Grenada (U-M)	85	14.1	85	40.7	---	4.6
St. Kitts/Nevis (U-M)	2	3.0	27	3.7	0.02	0.6
St. Lucia (U-M)	---	---	---	---	---	---
St. Vincent/Gr (L-M)	37	6.3	37	14.8	0.09	3.2
Barbados (U-M)	49	15.5	49	42.4	---	2.1
Jamaica (L-M)	16	2.7	23	5.8	0.06	1.5
Trinidad/Tobago (U-M)	11	4.6	22	27.8	0.04	1.2
Lower-Middle Income Total/Avg.	107	4.0	163	7.6	0.05	3.5
Upper-Middle Income Tot/Avg.	82	8.1	129	15.6	0.07	1.8
High Income Tot/Avg.	106	11.5	116	16.6	0.10	0.7
Americas	100	7.9	134	16.3	0.06	3.3
WORLD	94	6.5	128	10.4	0.08	5.6

NOTES:

- The **% GDP per capita** column is the subscription cost as a percentage of GDP per capita and is calculated based on 1998 GDP and population data.

Observations:

- Connection rates for linking up telephone service are typically less in ECTEL countries than in countries with similar income levels (for both residential and businesses). For SVG, the connection charge for residential and business service was less than the average for Lower-Middle income countries (US$37 versus an average of US$107 for residential and US$37 versus an average of US$163 for business.
- Monthly residential subscription costs in other ECTEL countries ranged from Dominica's US$2.70 to Grenada's US$14.10. For business service, rates ranged from St. Kitts' US$3.70 to Grenada's US$40.70. SVG residential subscription rates are US$6.30 per month and business rates are US$14.80. It should be noted that this is 1999 data.
- Grenada's Telephone Tariffs as a percentage of GDP are very high compared to other Upper-Middle income countries (4.6 percent compared to an average of 1.8 percent). SVG's tariffs run 3.2 percent of GDP compared to an average of 3.5 percent for Lower-Middle income countries.

Cellular Subscribers

Country	Cellular Mobile Subscribers					As % of Total Telephone
	Subscribers (000s)		CAGR % 1995-1999	Teledensity 1999	% Digital 1999	
	1995	1999				
ECTEL Countries						
Dominica (U-M)	---	0.7	---	0.86	100.0	3.1
Grenada (U-M)	0.4	2.0	49.8	2.15	---	6.4
St. Kitts/Nevis (U-M)	---	0.7	---	1.81	---	3.4
St. Lucia (U-M)	1.0	1.9	23.9	1.25	---	4.5
St. Vincent/Gr (L-M)	0.2	1.4	60.3	1.25	7.0	5.7
Barbados (U-M)	4.6	30.0	59.7	11.14	90.0	20.7
Jamaica (L-M)	45.2	144.4	33.7	5.64	---	22.1
Trinidad/Tobago (U-M)	6.4	38.7	57.1	2.99	---	12.2
Lower-Middle Income Total/Avg.	2,719.3	19,670.2	64.0	2.28	25.6	16.0
Upper-Middle Income Tot/Avg.	7,526.5	85,097.6	83.4	13.4	66.1	40.2
High Income Tot/Avg.	76,404.0	36,904.8	44.9	37.79	70.6	39.2
Americas	40,257.2	135,128.8	35.3	16.59	10.8	33.3
WORLD	90,719.8	491,342.5	52.6	8.22	70.2	35.2

Observations:

- Cellular/Mobile data for ECTEL countries is sketchy and, therefore, its use is limited for drawing conclusions.
- It is clear that the entry of Cellular/Mobil has been late in coming to the ECTEL countries, and that, across the board, the growth rate between 1995 and 1999 has been considerably less than the growth in countries of similar income levels (24-60 percent on a very small base, whereas the average growth rate for the Upper-Middle income level is nearly 85 percent for this same period). SVG's compound annual growth rate for 1995-1999 was the highest of the ECTEL countries at 60.3 percent.
- Teledensity of Cellular/Mobile as of 1999 is considerably less than countries with comparable income levels (teledensity of Cellular/Mobil of ECTEL being between 1 and 2 whereas the average for Lower-Middle is over 2, and for Upper-Middle income countries it is over 13). SVG's teledensity of Cellular/Mobile subscribers is 1.25.
- Cellular/Mobile as a percentage of the total teledensity is considerably less than averages for comparable countries (3-6.5 percent compared to 16-40 percent). This is due to a late start, but also likely influenced to some degree by the relatively high main line telephone teledensity. The total teledensity for Cellular/Mobile subscribers in SVG is 5.7 percent, with an average for Lower-Middle income countries at 16 percent.

International Telephone Traffic – 1999

Country	Outgoing Telephone Traffic					International Circuits (000)
	Million Minutes		CAGR % 1995-1999	Minutes Per Inhabitant	Minutes Per Subscriber	
	1995	1999				
ECTEL Countries						
Dominica (U-M)	7.5	7.3	-0.8	94.8	340.1	0.4
Grenada (U-M)	7.8	10.3	7.4	110.5	350.7	0.6
St. Kitts/Nevis (U-M)	8.0	13.1	12.9	337.3	651.7	---
St. Lucia (U-M)	12.7	13.4	1.9	88.3	332.5	---
St. Vincent/Gr (L-M)	---	11.6	---	102.5	491.1	0.4
Barbados (U-M)	32.0	45.0	8.9	167.1	391.3	---
Jamaica (L-M)	62.0	70.1	3.1	27.4	137.5	---
Trinidad/Tobago (U-M)	58.6	67.8	3.7	53.5	243.2	1.9
Lower-Middle Income Total/Avg.	4,149.4	5,558.2	7.2	6.6	54.2	141.0
Upper-Middle Income Tot/Avg.	6,313.3	10,005.1	12.1	15.8	79.0	150.5
High Income Tot/Avg.	50,164.3	81.451.7	12.9	91.4	156.3	599.3
Americas	22,343.8	39,319.9	15.1	48.3	145.1	256.0
WORLD	63,416.6	100,805.4	12.2	17.2	111.4	1,014.8

NOTES:

Observations:

- The outgoing international traffic from the ECTEL islands on a per inhabitant basis is completely "off the charts" relative to comparable income level countries (88-333 minutes per inhabitant for ECTEL countries compared to an average for Upper-Middle income countries of 16). SVG's outgoing international minutes per inhabitant is 102.5.
- On a per subscriber basis, this comparison is equally significant (333-652 minutes compared to 79 minutes for Upper-Middle income countries). SVG has 491.1 outgoing international minutes per subscriber.
- These disparities are most likely due to the nature of a tourist-based economy, but are also likely to be partially due to island Diaspora and family members living in the U.S., U.K., and Canada.
- The extremely high outgoing international traffic is a real "cash cow" for the incumbent telecommunications provider and will require serious attention during market liberalization. While the report does not provide much data on the cost of outbound calls, such rates for SVG and other ECTEL members far exceed charges for incoming calls, which were provided by multiple competitive operators.

Telecommunications Staff – 1999

Country	Telecommunications Staff (000s) 1995	Telecommunications Staff (000s) 1999	CAGR % 1995-1999	Main Lines per Employee 1995	Main Lines per Employee 1999	CAGR % 1995-99
ECTEL Countries						
Dominica (U-M)	0.2	0.2	-7.2	81	130	12.7
Grenada (U-M)	0.3	0.3	-0.3	85	109	6.4
St. Kitts/Nevis (U-M)	0.2	0.2	-5.0	70	119	14.3
St. Lucia (U-M)	0.4	0.4	-0.9	79	107	10.7
St. Vincent/Gr (L-M)	0.2	0.2	-5.7	87	142	13.2
Barbados (U-M)	1.0	1.1	2.2	90	105	4.0
Jamaica (L-M)	4.3	3.2	-7.4	67	160	24.1
Trinidad/Tobago (U-M)	2.7	2.8	0.4	77	100	7.0
Lower-Middle Income Total/Avg.	1,112.1	1,114.7	0.1	68	92	7.9
Upper-Middle Income Tot/Avg.	642.9	700.9	2.2	139	179	6.5
High Income Tot/Avg.	2,359.5	2,550.5	2.0	195	2.4	1.2
Americas	1,316.9	1,574.1	4.6	168	172	0.6
WORLD	5,357.4	5,843.3	2.2	129	154	4.7

NOTES:

Observations:

- Across the ECTEL countries, it is quite clear that between 1995 to 1999, the current telecommunications provider (C&W) has been undergoing cost-reduction efforts, including dropping staff (0.3 – 7.2 reduction in staffing for this period).
- The number of main lines per telecommunications employee has naturally grown over this same period, but for the Upper-Middle income countries, ECTEL countries are still considerably below the world averages (107-130 lines per employee compared to an average of 179 for Upper-Middle income countries and a world average of 154). For St. Vincent/Grenadines, the comparison is favorable (142 compared to an average for Lower-Middle income countries of 92).

Telecommunications Revenue

Country	Telecommunication Revenue – 1999				
	Total (M US$)	Per Inhabitant (US$)	Per Main Line (US$)	Per Employee (US$)	As a % of GDP
ECTEL Countries					
Dominica (U-M)	13.4	175.0	628	81,650	5.1
Grenada (U-M)	---	---	---	---	---
St. Kitts/Nevis (U-M)	27.8	712.6	1,512	168,350	10.4
St. Lucia (U-M)	---	---	---	---	---
St. Vincent/Gr (L-M)	24.8	219.3	1,050	149,487	9.0
Barbados (U-M)	191.9	712.6	1,669	174,453	8.1
Jamaica (L-M)	462.6	180.7	908	145,066	6.6
Trinidad/Tobago (U-M)	226.9	175.6	814	81,679	3.1
Lower-Middle Income Total/Avg.	25,590.9	31.1	256	23,030	2.1
Upper-Middle Income Tot/Avg.	92,6045	145.9	733	138,086	2.9
High Income Tot/Avg.	682,740.4	766.1	1,310	268,690	2.7
Americas	344,154.7	427.8	1,276	220,233	2.8
WORLD	841,921.1	144.5	934	147,222	2.6

NOTES:

Observations:

- While information is sketchy for the ECTEL countries, on a per inhabitant basis, telecommunications revenue is considerably higher than the average for similar income countries (US$219 compared to US$31 for Lower-Middle income and US$175-713 compared to US$146 for Upper-Middle income countries). SVG has US$219.30 telecommunications revenue per inhabitant.
- There is also considerably higher revenue for the ECTEL countries on a per line basis as well as a per employee basis (US$628-1,512 compared to US$733 for Upper-Middle income countries and US$256 for Lower-Middle income countries). SVG has US$1,050 telecommunications revenue per main line.
- Telecommunications revenue as a percentage of GDP is also very high for the ECTEL countries (5.1-10.4 percent compared to an average of 2.1 percent for Lower-Middle and 2.9 percent for Upper-Middle income countries). For SVG, telecommunications revenue accounts for 9 percent of GDP.

Telecommunications Investment

Country	Telecommunication Investment – 1999				
	Total (M US$)	Per Inhabitant (US$)	Per Main Line (US$)	As % of Revenue	As a % of GFCF
ECTEL Countries					
Dominica (U-M)	---	---	---	---	---
Grenada (U-M)	---	---	---	---	---
St. Kitts/Nevis (U-M)	3.1	79.5	200	12.6	4.8
St. Lucia (U-M)	---	---	---	---	---
St. Vincent/Gr (L-M)	4.1	36.0	172	16.4	5.5
Barbados (U-M)	28.1	104.3	244	14.6	5.5
Jamaica (L-M)	135.8	53.0	266	29.4	6.6
Trinidad/Tobago (U-M)	69.7	54.3	264	32.8	4.5
Lower-Middle Income Total/Avg.	7,557.5	9.5	77	30.3	3.0
Upper-Middle Income Tot/Avg.	28,087.5	46.0	229	32.1	4.8
High Income Tot/Avg.	127,612.9	143.4	245	18.7	2.5
Americas	47,807.6	61.0	178	14.0	5.1
WORLD	188,486.6	33.0	210	22.6	2.9

NOTES:

- GFCF = Gross Fixed Capital Formation

Observations:

- The ITU report does not provide sufficient information on the ECTEL countries to detect much in the way of telecommunications investments other than to say it appears to be within the averages relative to population, but lower than average relative to telecommunications revenue.

Information Technology

Country	Internet – 1999				Estimated PCs	
	Hosts		Users		Total (000)	Per 100 Pop
	Total	Per 10K Pop	Total	Per 10K Pop		
ECTEL Countries						
Dominica (U-M)	181	23.66	2.0	261.44	5	6.54
Grenada (U-M)	3	0.32	2.5	267.70	11	11.78
St. Kitts/Nevis (U-M)	8	2.06	2.0	516.10	6	15.48
St. Lucia (U-M)	13	0.85	3.0	195.18	21	13.66
St. Vincent/Gr (L-M)	---	---	3.0	265.09	11	9.72
Barbados (U-M)	68	2.53	6.0	222.82	21	7.80
Jamaica (L-M)	367	1.43	60.0	234.35	110	4.30
Trinidad/Tobago (U-M)	4,852	37.54	30.0	232.14	70	5.42
Lower-Middle Income Total/Avg.	376,585	4.28	6,593.6	78.84	19,516	2.57
Upper-Middle Income Tot/Avg.	2,347,283	36.97	29,297.5	461.50	36,291	5.80
High Income Tot/Avg.	69,150,849	775.65	186,099.3	2,088.05	309,641	34.80
Americas	56,005,148	687.50	94,407.6	1,158,92	170,532	21.50
WORLD	72,005,852	120.46	235,449.42	398.44	389,890	6.84

NOTES:

Observations:

- Overall, the number of Internet hosts in the ECTEL countries is considerably below the averages for similar income countries. Dominica, while still under the average, is at least close (excluding Dominica, the range is .3-2 hosts per 10,000 population whereas the average for Upper-Middle income countries is 37; Dominica is 24). Grenada has .32 hosts per 10,000 population. Figures were not available for SVG.
- The number of Internet users in 1999 is very low, with 2,000-3,000 per country. The number of Internet users per 10,000 population ranges between 195-516 in ECTEL countries compared to the average for Upper-Middle income countries of 461 and 79 for Lower-Middle income countries; SVG has 265 users per 10,000 population.
- There is a high percentage of PCs per 100 population compared to other countries of similar income levels (6.5-15.5 per 100 population compared to 2.6 for Lower-Middle and 5.8 for Upper-Middle income countries). SVG has 9.72 PCs per 100 population.
- The relatively high availability of PCs and the comparatively low use of the Internet is likely a direct result of limited access and costs (but mostly costs, since there are a high number of main lines per household across the ECTEL countries).

Network Growth

Country	New Telephone Lines Added (1998-1999)		New Mobil Subscribers Added (1998-1999)		New Internet Hosts Added (1998-1999)	
	Total (000)	CAGR %	Total (000)	CAGR %	Total (000)	CAGR %
ECTEL Countries						
Dominica (U-M)	1.3	6.3	---	---	---	22.3
Grenada (U-M)	1.9	7.1	0.6	42.7	35.8	41.4
St. Kitts/Nevis (U-M)	1.7	9.2	0.3	59.1	---	60.0
St. Lucia (U-M)	4.1	10.1	---	---	---	-43.5
St. Vincent/Gr (L-M)	2.6	12.3	0.7	89.3	---	---
Barbados (U-M)	2.0	1.7	18.0	150.0	---	54.5
Jamaica (L-M)	39.3	8.4	65.8	83.6	---	14.0
Trinidad/Tobago (U-M)	14.8	5.6	12.4	47.0	2.9	147.6
Lower-Middle Income Total/Avg.	6,729.7	7.0	8,453.7	75.6	17.4	5.0
Upper-Middle Income Tot/Avg.	10,883.9	9.4	39,033.5	84.9	1,078.1	84.9
High Income Tot/Avg.	13,213.6	2.6	102,211.4	43.6	27,283.8	65.2
Americas	11,686.4	4.5	38,894.7	40.5	23,905.9	74.5
WORLD	58,626.8	6.9	172,045.8	53.9	28,460.4	65.4

NOTES:

Observations:

- Growth in the number of main lines taking place between 1998-1999 in the ECTEL countries is close to the averages for similar income countries, with Dominica and Grenada being slightly less (Dominica's compound annual growth rate (CAGR) is 6.3, and Grenada's is 7.1); the average for Upper-Middle income countries is 9.4. SVG's CAGR is 12.3 percent compared to an average for Lower-Middle income countries of 7.0.
- With the exception of St. Vincent/Grenadines, the growth in Cellular/Mobile for ECTEL countries is well below the growth rates for countries with comparable income levels (43-60 percent compared to 85 percent for Upper-Middle income countries; St. Vincent/Grenadines had an 89 percent growth in 1999 and Grenada's growth rate was 42.7 percent). The average for Lower-Middle income countries is 75.6.
- Growth in Internet hosts throughout the ECTEL countries is also well below comparable averages, but data is insufficient to make any additional observations.

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