



Summary

Convened by the Commonwealth Telecommunications Organisation, the **Caribbean Broadband Forum 2016** was held on 14 - 15 July 2016 in Port of Spain, Trinidad and Tobago, under the theme '*Broadband: supporting life in the 21st century*'.

The Broadband Caribbean Forum 2016 opened on 14 July 2016 at the Hyatt Regency Trinidad to examine the importance of broadband to 21st Century life in the Caribbean and discuss how broadband can be rolled out to make connectivity available and affordable for all in the region.

It considered the possibilities for social and economic development by exploring the role of broadband in such areas as finance, education, broadcasting, entrepreneurship and social inclusion. The Forum also looked at the policy, regulatory and consumer issues impacting on Broadband rollout and utilisation as well as innovative technologies.

The Open Forum gave a platform for ministers, policymakers, regulators and industry to share views in areas such as policy and regulation, technology evolution, operations, investment and multilateral cooperation.

Over the two days the event was attended by 170 delegates from 16 countries. 39 institutions from outside Trinidad and Tobago were represented, listed in the table in Annex 1. This report summarises the outcomes of the Forum.



Session 1: Broadband in the Caribbean: Challenges and Opportunities

- Freedom of expression is a basic human right, the right to Internet access in the Caribbean must be seen as essential as water and electricity.
- There is a need for political and economic convergence in relation to the Caribbean Single ICT Space. Roaming charges should be removed. No Caribbean country has the critical mass to survive globalization by itself, therefore alliances are needed, especially in the area of broadband development.
- Broadband is necessary for socio-economic development and is central to the United Nations Agenda for Sustainable Development and is crucial to ending poverty by 2030. ICTs are important in achieving 15 of the 17 Sustainable Development Goals.
- The World Bank focuses on the Internet as a development tool and supports affordable broadband access, including mobile access for everyone.
- There is still a digital divide and efforts must be made to connect the unconnected. Internet access should be universal, accessible and safe. The World Bank is launching a Digital Development Partnership to help operationalize the 2016 World Development Report on Digital Dividends and to offer a platform for digital innovation and development financing.
- Broadband is a moving target and not a number. The download speed in Trinidad and Tobago was 5Mb/s. More bandwidth is needed and there is a need to define broadband, taking into consideration throughput and other factors.
- Broadband was significant in achieving the Single ICT Space and its achievement was a complex matter. Implementation strategies including spectrum harmonization, development of Internet Exchange Points (IXPs) and building a culture of shared values, among other factors.
- There is a need for accelerated broadband development. Universal access at an affordable price is therefore important. He suggested that Caribbean governments should show Caribbean citizens the benefits of getting online and facilitate the acquisition of equipment at affordable cost, thereby eliminating barriers to access. More government services should be provided over the Internet, therefore encouraging citizens to get online.
- Given the globally competitive environment, Caribbean countries need to work together to ensure that they possess the scale and scope to compete.
- Governments need to establish rules to govern the implementation of the Single ICT Space. There is a need to identify persons, businesses and organizations which can help to create the SICTS. Privacy and security are two of the most important components as well as facilitating access.
- The Internet is not being used to its full potential. Governments need to become major users and provide government services online, especially ones that make lives better and more convenient.
- Caribbean countries rely heavily on financial services and Caribbean citizens should be sensitized to possibilities that will exist with the Single ICT Space (SICTS).

Session 2: Regulatory Initiatives



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- Flexible and responsible rules and regulations need to be developed which would facilitate the implementation of the SICTS.
- Broadband should be accessible and broadband should be affordable. With regard to Net Neutrality and Over-the-Top operators, the Caribbean was different from the US and therefore should not simply adopt policies from the US since conditions (regulatory and economic) are quite different.
- Governments, regulators and operators should be on the same page in respect of the development and use of broadband in the Caribbean. In this regard, Universal Service Fund (USF) should play an important role in broadband development.
- ICTs are a key enabler of productivity and a creator of jobs. Virtually every facet of modern life depends on ICTs. Much progress had been made in the field of ICTs since the publication of the 1985 Missing Link Report.
- The importance of ICT regulation in respect of policy-making, sector development and actual regulation of the sector is significant. The regulator should act as resource manager, market manager and consumer protector.
- There are a vast number of activities that take place in an Internet minute in 2016. Increasing bandwidth is crucial to increasing Internet speeds.
- Regulators should stick to their task, facilitate faster connections, be flexible in their approach, consult with stakeholders and ensure that they are not bullied by those who they regulate.
- ECTEL, which consists of five Eastern Caribbean countries – Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines. These countries have their own National Telecommunications Regulatory Commissions, which also work together as a region under the auspices of ECTEL. They have developed a harmonized regulatory framework and through ECTEL open entry, competition and increased penetration are promoted. Concerted efforts are being made to identify and implement measures to overcome barriers to greater connectivity in ECTEL countries.
- One of the important activities today is connecting the connected, although there is a problem in identifying the unconnected. There are studies have been conducted to identify barriers to connectivity and these include availability, affordability, relevance and readiness.
- Caribbean countries should give careful consideration on whether to implement Net Neutrality, especially since the environment in the Caribbean is different from that in countries with Net Neutrality regulations such as the USA. Some Caribbean countries are considering the implementation of Net Neutrality regulations.
- The effects of OTTs on Caribbean networks are not clear, but there is a reduction in operator bandwidth and operators say there is a loss of revenue due to OTTs.

Session 3: Strategic Approach to Broadband Rollout

- The importance of developing national broadband strategies in the Caribbean is evident. ITU statistics show the importance of broadband to economic development and the importance of developing broadband strategies.
- The ITU and the CTO have been involved in the development of a broadband strategy in the Commonwealth of Dominica. In this regard, the approach used included five main areas – policy, legal and regulatory, infrastructure connectivity and devices, capacity building and



awareness, current applications and innovation and finance and investment. The strategy has now been finalized and stakeholders will be allowed to make inputs, following which a final version of the strategy will be submitted to government for review and approval.

- The Caribbean Regional Communications Infrastructure Program (CARCIP), is a joint project between the World Bank and Grenada, St. Lucia and St. Vincent and the Grenadines. One of the main objectives is to increase access to broadband in the participating countries. In Grenada assessments were undertaken in Grenada, gaps were identified and various solutions were implemented. Solutions include the implementation of Government Wide Area Networks in participating countries, as well as an undersea fibre system for the Grenadine islands. Schools, government locations, libraries and commercial schools are targeted for the project. Quality of Service is an important consideration and build-out as well as coverage requirements are included. The next steps include the submission, evaluation and award of bids, followed by the project implementation from January 2017 to August 2018.
- When considering Broadband development in St. Vincent and the Grenadines affordability and cost of access devices are important considerations. In a recent survey, 25% of households did not see a need for Internet access. Government has placed strong emphasis on providing connectivity for schools. The strategy of the government involved providing connectivity at the community level (police stations, schools, clinics, etc.) and then move to homes. Approximately half of the population now uses the Internet. Household penetration has increased from 30.7% in 2008 to 50.4% in 2015. A draft broadband plan has been prepared and the next phase will be its implementation. New USF regulations have been developed and there will be further development of Internet Exchange Points (IXPs).
- There is a need for an education programme in St. Vincent and the Grenadines to show the importance of the Internet and there will be more government usage of the Internet which will encourage persons to use the Internet.
- There should be a minimum access speed below which a service could not be considered as broadband.
- Cybercrime is a major Internet problem. Cybercrime legislation has been developed through the Enhancing Competitiveness in the Caribbean through the Harmonization of ICT Policies, Legislation and Regulatory Procedures (HIPCAR (ITU)) and E-Government for Regional Integration Program (EGRIP) projects and this will assist and dealing with cybercrime problems.

Session 4: Financing Broadband Rollout

- World Bank supports broadband deployment in the Caribbean, where network investment is needed. A significant broadband gap exists in many developing countries. In 2015, broadband penetration in developed countries was near 90%, in developing countries it was close to 40% and in Least Developed Countries it was closer to 10%. There is a clear need for infrastructure development and in this regard the private sector should be involved, especially since it is the private sector that drives investment. Public Private Partnerships should be developed between governments and the private sector to develop, operate and maintain broadband networks. The World Bank has approved ICT connectivity programs amounting to approximately US \$ 1.2 billion since 2007.



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- There has been significant investment in ICT infrastructure and investors should receive financial returns on their investments. A Caribbean broadband definition is necessary and in the case of the USA it was 25 Mb/s, while in the UK it was 16 Mb/s.
- Caribbean operators are losing revenue on their networks mainly due to OTTs, SIM bank fraud and Voice over Internet Protocol (VoIP) applications. OTT services do not comply with ITU Regulations and make no contribution to USFs. There is an overabundance of OTTs that are present on operators' networks as there are many different types of fraud that exist. Caribbean governments, regulators and operators should seek solutions to these problems. Internet Service Providers should be licensed and operators should look closely and the traffic on their networks.
- Net Neutrality and OTTs are important issues for Caribbean operators, regulators and operators. Consideration should be given to taxing OTTs and also to obtaining information on the amount of business done by them in the region.
- Broadband should be treated as a point of access and end user services should not be taxed. Broadband is very important for the financial sector. Taxing the end user is not very good policy. OTT operators pay nothing to operators in the Caribbean and they make no contributions to USFs. Caribbean regulators should examine this matter closely and solutions need to be found.
- Some operators offer OTT services which are taxed. Global OTTs make no payments, therefore the playing field is not level.
- OTTs affect universal service. ECTEL has recently launched a consultation in which they are seeking additional universal service payments from operators, which would go towards funding broadband development.

Session 5: Maximising Spectrum Utilisation

- ITU statistics to show the development of mobile networks and the importance of spectrum. The Digital Dividend is hugely important, which is the spectrum that will be released with the transition of television from analogue to digital format. This is mainly in the 698 MHz to 806 MHz frequency range. There should be a coordinated use of spectrum in the Caribbean. This spectrum band will facilitate current technologies such as Long Term Evolution (LTE). Spectrum has been identified for wireless access technologies, in accordance with the Trinidad and Tobago's broadband agenda. They are now in the process of auctioning spectrum for various wireless services.
- Following the liberalization of the telecommunication sector, the Spectrum Management Authority (SMA) of Jamaica was established as a dedicated spectrum management agency. This was in addition to the establishment of the Office of Utilities Regulations (OUR), which is a multi-sector regulatory agency with responsibility for ICTs. The SMA has undertaken, in conjunction with Microsoft, technical trials using television white spaces to obtain connectivity in rural areas. The agency is also making use of licensed and unlicensed spectrum.
- Barbados was interested in using the digital dividend, especially to facilitate new entrants in the ICT sector. There has been 100 % implementation of fibre to the home in Barbados.
- The CTU has completed a significant amount of work in the area of spectrum management since 2006, following a mandate by governments for the organization to undertake a spectrum management reform project. In this regard, a Caribbean spectrum management framework has



been developed. The first phase encouraged the proper use of spectrum resources and the second phase involved the development of a regional frequency management table, based on the ITU Radio Regulations. Other aspects of the CTU's work include developing solutions for interference problems, use of tv white spaces, and spectrum pricing. A Spectrum Management Strategic Plan has been prepared and that document will be discussed by Caribbean Ministers.

- Spectrum auctions may be considered when there is a revenue consideration. National goals must be considered.
- Regarding the 700 MHz band, there appears to be more demand than supply. Different services can be rolled out in different bands. Allocations in the 700 MHz band usually involve 2 x 12 MHz slots. If that is not sufficient, then other bands can be used to provide additional spectrum.
- Significant work has been done by the CTU in terms of spectrum management. This work must be continued, especially in relation to Caribbean requirements at WRC 2019. Cooperation is needed between public and private sectors in respect of the digital dividend.

Session 6: Creating a Digital Caribbean

- CARICOM's activities relate to the transformation of the Caribbean into a digitally empowered knowledge economy. The gender divide must be addressed and there is a need to empower women through ICTs.
- Based on UN studies and reports, empowerment of women has a positive effect on families. Increasing education of women and girls contributes to higher economic growth.
- The International Center for Research on Women's report entitled Bridging the Gender Divide shows how technology can advance women economically.
- The importance of radio is significant in providing information for women.
- Women should be consulted and should be involved in different aspects of technological development.
- There is a lot of ignorance regarding how society deals with persons with disabilities. There are applications and equipment for persons with disabilities, but there are also mainstream apps which can be used by them. In the Caribbean, there is a significant amount of discrimination against persons with disabilities. Caribbean countries should look at the example of Barbados where more persons with disabilities are integrated into the society. In fact, the President of the Senate in Barbados is totally blind. A person with a disability should be seen as a person, like everyone else.
- Governments, organizations and Consultations involved in establishing programmes to assist disabled persons should first consult with disabled persons, rather than trying to do things for them without their inputs.
- E-government services could be used as the catalyst for a digital Caribbean. A digital Caribbean can be achieved and a digital Caribbean would consist of e-government services, harmonized laws, policies and regulations, regionally connected government networks and harmonized cybersecurity policies. Higher broadband connectivity will be required and that will foster greater e-government usage. An action plan for a digital Caribbean is required.
- Women may have better education, but they do not own as many businesses, not many are in CIO positions and they do not occupy the top private sector positions.



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- In Guyana it appears as if some women lack interest in ICTs. There is still a stigma attached to women in technical positions in Guyana. There is also a lack of confidence by women. The existing mindset needs to be changed and there should be more respect for women.

Session 7: Broadband Technologies

- A definition of broadband is required in the Caribbean. The ITU definition refers to speeds above 2 Mb/s, the OECD uses 786 kb/s and the FCC uses 25 Mb/s.
- TV white spaces are gaps left between broadcast channels and they can be used to provide accessible broadband access. This technology is cheap, uses low power, is quickly deployed and is able to penetrate trees and buildings. There are many examples of white space technology being used in disaster management, health and education applications in some countries. Regulation is the most critical aspect for this technology to work.
- 5G technology should be used for island states and developing countries. The Wireless World Research Forum (WWRF) have been far-sighted in developing a vision of the future wireless world. By 2020 there will be 7 trillion wireless devices serving 7 billion people. 5G technology will be developed sometime after 2020, both the ITU's 5G Vision as well as the EU's 5G Vision offer guidance and information. 5G will enable mobile broadband and the Internet of Things (IoT) and will facilitate the convergence between telecommunications and IoT. Developing countries should become more involved in activities of the WWRF.
- The development of alternative energy sources and the role of ICTs should garner more attention. Tide Wind Energy, Trinidad Limited, has undertaken a pilot project with the government of Trinidad and Tobago which utilizes white spot technology. This technology is now being employed in Trinidad and Tobago and in the Philippines. TV white spots technology can be used in broadband development. Decision-makers should become more familiar and start planning for the early adoption of TV white spots technology. An invitation should be extended to them for collaboration with Microsoft, especially in relation to last mile technologies. Smartphones, tablets, computers, etc. can operate with white space technology. Economic models need to be developed for deployment of the technology.
- Caribbean countries should become users and become more involved in related global discussions, especially in relation to standards.
- There are regulatory challenges with regards to TV white space spectrum since regulations do not exist. The technology can be deployed in the Caribbean. It is a national asset and national regulations are needed.

Session 8: Internet Exchange Points (IXPs)

- Consumers are not only demanding increased Internet access, but also faster speeds, affordable prices and greater reliability. IXPs keep local Internet traffic local, within local Internet infrastructure. This helps to reduce the cost of traffic exchange and provides greater security. In this regard, local traffic does not have to travel through other countries to reach its local destination, which reduces security and other problems. There are now 12 IXPs in the Caribbean and in addition to providing improved quality, they also allow local traffic to remain within local jurisdictions. IXPs are a starting point for a better Internet experience. However,



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more local bandwidth should be made available, more local content is needed and more businesses should be online. With IXPs, countries are able to build local and reach global.

- Getting operators to become involved in the process is a major challenge related to the establishment of IXPs. Without IXPs, operators use Internet models which are usually built around inefficiencies. This is changed by establishing IXPs, but not all operators embrace IXPs.
- There has been some reluctance by the two major operators in the Caribbean to get involved in the establishment of IXPs, but there has been some positive movement recently.
- IXPs provide a telecommunications hub for entrepreneurs and local traffic remains local and becomes cheaper to transport. In addition, local traffic does not pass through other countries thereby creating possibilities for additional financial and regulatory problems.

Session 9: Big Data

- There are now 52 countries which have Open Data initiatives, including some in the Caribbean. Big Data covers a wide area and Big Data cannot be equated with Open Data or Open Government. Big Data can be used for data-informed policy-making. Open Data has economic value and makes governments more efficient and more transparent. The World Bank has undertaken Open Data readiness assessments and diagnosis in 21 countries, as of June 2016 and the next step will be the establishment of Open Data portals.
- Open Data refers to data or content that is free to use, re-use and distribute. Open Data can be regarded as open if it is technically open or legally open. The largest sources of data are government-based, although there are several private sector sources. Open Data helps to provide transparency and accountability.
- With respect to Open Data policies, regulation can be effected through policies which define which data should be stored and maintained as public, as well as the method in which the data should be made public. One important consideration is that there is a global concern that Open Data can be used for privacy invasion. There is now a drive by local developers and researchers to use Open Data in the development of applications.
- There should be more public awareness of Open data and Big Data and the industry should sensitize the public and policymakers on the benefits of Open data. Countries in the Organisation of Eastern Caribbean States (OECS) have targeted Open Data initiatives in various sectors including agriculture, education and tourism. Local use of Open Data should be encouraged. There is now an Open Data initiative which involves the Caribbean Court of Justice (CCJ) and it involves examining the manner and the timeliness of justice administration and delivery by the court system in the region, including the CCJ itself.
- The World Bank Open data readiness survey identifies the critical elements for Open Data. OD requires leadership at the highest level, regionally and nationally.

Session 10: App Showcase: Caribbean Creativity

- STAY is a resource for people considering suicide. STAY is a digital talk-down app which provides coping possibilities for persons considering suicide. Suicide is not chosen and it



happens when pain exceeds resources for coping with pain. The app has been generally accepted and it will soon be implemented.

- There are technologies that are revolutionizing banking and these should be considered. Bitt, provides a Bitt Mobile Wallet which can be used for financial transactions – send or receive money and check balances. A Bitt mobile wallet can be loaded with dollars or bitcoins. It uses the blockchain technology which runs Bitcoin. This actually makes banking cheaper. By introducing this new technology for banking, the Caribbean finds itself at the forefront of the new economy and new technological developments. Bitt has digitized the Barbadian dollar and the resulting currency can be sent to persons in the Bitt network. Target markets are, at the moment, in the Caribbean. Licenses have to be obtained in some countries. Broadband technology would assist his business in reaching more persons in the region.
- Directory.gy, is an app that provides comprehensive information on activities in Guyana. It was developed in Guyana and was declared the official app for Guyana's 50th Anniversary celebrations by Minister with responsibility for telecommunications, Hon. Cathy Hughes. At present the app has over 34,000 users and new features are being added on a regular basis. It uses location to provide information on various subjects including tourism, commercial, culinary and other activities. The CTO Strategic Plan made reference to the need for inclusion of youth speakers at CTO events. The Caribbean one should look within for native solutions, thereby making the Caribbean fertile ground for entrepreneurship.

Session 11: Digital Entertainment

- The Caribbean Broadcasting Union (CBU) was established in 1970, has 45 members, is represented in 23 countries and reaches various language groups in the Caribbean. Broadband is important for the broadcaster, especially the new broadcaster. The CBU consists of stand-alone broadcasters as well as vertically and horizontally integrated companies. These include broadcast entities with telecoms companies, broadcasting companies linked to print media and regional groupings. The organization and its members are interested in the digital transition, spectrum issues (including tv white spaces), social media and Internet-based services.
- The potential of the creative sector gives the Caribbean region a competitive advantage. The potential of the region should be unleashed using the latest technology. The creative players are missing from the technological debate and the music sector has continued to be successful through the integration of the region.
- There must be more interaction between the different aspects of Caribbean media. In this regard cooperation and collaboration is required from media practitioners. It was difficult to have new broadcasters, but there are many narrowcasters. Broadcasters were not able to gather the small data required for assisting with their operations, therefore, it will be difficult for them to gather Big Data.
- The youth should be asked to participate in related broadcasting related activities and discussions should be held between regulators, operators and consumers.
- Content creators exist all over the region and their work should be recognized. These include persons involved in music, fashion, films, sports and cultural activities.
- The CBU has recognized the changes taking place and has now modified requirements for membership making it easier for more entities to join the organization. The CBU also believes that there is an artificial barrier between content and distribution.



Session 12: Broadband and Educational Access for all

- Technology is re-defining life and innovations should be encouraged since this will contribute to a new class of entrepreneurs and innovators. The advent of IXPs in the Caribbean has contributed to an increase of Internet traffic in the Caribbean. Local digital content should be encouraged and cybersecurity measures need to be put in place. There are four important elements of the digital economy which are critical infrastructure, content and applications, enabling environment and human capacity/creativity. For the Caribbean it is important to educate, innovate and promote.
- Digital skills development is not being taught widely in schools. The main areas are creativity, problem solving and collaboration. Problem solving involves ways of solving Caribbean problems. Kids should be allowed to undertake tasks themselves with adults supervising their activities.
- There are persons with ideas and passion in the Caribbean, but they have not learnt the ICT ecosystem. The highest form of learning is to create something new. In this regard the school system has not changed since it does not teach how to think and how to create a new and valuable product

Annex One

Participating countries and organisations.

Country	Organisation
Anguilla	Public Utilities Commission
Antigua	Caribbean Telecommunications Union (CTU)
Barbados	Bitt
	Caribbean Broadcasting Union
	Caribbean Centre for Development Administration
	Government of Barbados
	Northpoint Consulting Inc
Bermuda	CCS Group Ltd, Bermuda
Canada	Vinodrai & Associates Inc.
	Wireless World Research Forum
Curaçao	Latin America & The Caribbean Bureau, Internet Society
Dominica	Cable & Wireless Communication/C&W Business
Grenada	Caribbean Telecommunications Union (CTU)
	Ministry of Communication, Works, Physical Development, Public Utilities & ICT, Grenada
	National Telecommunications Regulatory Commission
Guyana	Caribbean Community (CARICOM) Secretariat
	IntellectStorm, Guyana
	Ministry of Public Telecommunications
	Public Utilities Commission



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Jamaica	Caribbean Association of National Telecommunications Organisations
	Digicel (Group) Limited
	Spectrum Management Authority
	Techsmart Consulting Inc.
Mexico	The University of the West Indies
	Facebook
Saint Lucia	Cable & Wireless Communication/C&W Business
	Eastern Caribbean Telecommunications Authority (ECTEL)
	Ministry of the Public Service
St Vincent and the Grenadines	Organization of Eastern Caribbean States
	Ministry of Finance and Economic Planning
Suriname	Telesur
Trinidad & Tobago	CARICOM Implementation Agency for Crime and Security (IMPACS)
	Central Bank of Trinidad and Tobago
	Central Statistical Office
	Communications Media Network
	Covela Foundation
	DIRECTV Caribbean
	Ernst & Young Caribbean
	Flow Trinidad
	Huawei
	I CAN LEARN Programme, ICLP Centre
	InfoLink Services Limited
	Microsoft
	Ministry of Public Administration and Communications
	Miribai Communications, Trinidad and Tobago
	Mobile Survey Inc.
	Multistakeholder Advisory Group of Trinidad & Tobago
	Packet Clearing House
	Statistics and Social Development Unit, Economic Commission for Latin America and the Caribbean
	STAY A Coping Resource
	Telecommunications Authority of Trinidad and Tobago
	Telecommunications Services of Trinidad and Tobago
	The National Institute of Higher Education, Research, Science and Technology (NIHERST)
	The University of the West Indies
	Tide Wind Energy (Trinidad) Limited
	Trinidad & Tobago Publishers & Broadcasters Association
	Trinidad and Tobago Network Information Centre



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14 - 15 JULY 2016, PORT OF SPAIN, TRINIDAD & TOBAGO

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United Kingdom	Trinidad and Tobago Police Service
	Bitek Group of Companies
United States of America	Facebook
	Microsoft
International delegates	Packet Clearing House
	ICANN
	Caribbean Telecommunications Union
	Commonwealth Telecommunications Organisation
	ITU Area Office for the Caribbean
	World Bank Group