Office of Utilities Regulation

Toward Universal Service/Access Obligation for Telecommunication Services in Jamaica

Recommendation of the Office of Utilities Regulation to the Minister of Commerce, Science and Technology

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Toward Universal Service/Access Obligation for Telecommunication Services in Jamaica: A Recommendation
Document No: TEL. 2004/07
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Abstract

The Office of Utilities Regulations (OUR) has a duty to advise the Minister with responsibility for telecommunications on issues relating to the provision of telecommunication services. This is set in out in Section 4(1)(g) of the Telecommunications Act 2000:

> *The Office shall regulate telecommunications in accordance with this Act and for that purpose the Office shall –*
>
> *(g) advise the Minister on such matters relating to the provision of telecommunications services as it thinks fit or as may be requested by the Minister.*

Universal service/access is one such matter which the Office believes it should take the initiative in providing advice to the Minister. As such, the Office embarked on an extensive consultation process in an effort to garner as much relevant and current information on the subject at hand. Two consultative documents were produced focusing on issues such as the services to be provided; methodologies for selection of potential providers; funding; administration among others. The results of the consultation form the basis of this recommendation.

Executive Summary

As outlined in the Abstract, the OUR embarked on a wide consultation process in an effort to determine the most appropriate means of addressing the issue of universal service/access in Jamaica. This section outlines the specific recommendations that the OUR is presenting to the Minister with responsibility for telecommunications.

Recommendation 1: The Office recommends that the market efficiency and access gap concepts should be allowed to develop in the single line voice telephony market before any further assessment of that market is done. The Office believes that a reasonable time for any further assessment should be after the expiration date of the licence obligation of the mobile operators, March 2005.[1]

Recommendation 2: The prepaid option for mobile service is currently addressing issues of affordability with respect to single line voice telephony service and therefore the Office recommends no regulatory intervention in this market at this time.

Recommendation 3: The Office recommends that the provision of single line voice telephony services should be considered from a technology neutral perspective and therefore the fulfillment of the single line voice telephony objective should not be limited to any one technology. Hence, given recent development in the fixed and mobile voice markets since liberalization, the Office recommends that no regulatory intervention is required at this time with respect to single line voice telephony service objective.

Recommendation 4: The Office recommends that regulatory intervention might be necessary in the provision of public payphone services across the Island. However, before any installation is done, the Universal Service/Access Fund of Jamaica (USAFJ) should carefully assess the reasonableness of locating a payphone in an area, the decision being based on transparent and justifiable criteria.

Recommendation 5: The Office recommends no regulatory intervention in the provision of free access to emergency services at this time.

Recommendation 6: Unlike single line voice telephony services, the Office is of the view that there is a clear need for regulatory intervention in the provision of Internet access to public institutions. The recommendations are as follow:

a)   Priority should be given to schools at the primary and secondary levels;

b)   funds from the USAFJ should be made available, where necessary, to facilitate the provision of computer hardware and software;

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[1] It should be noted that Oceanic Digital Jamaica Limited licence was subsequently amended by the Minister to reflect 95% population coverage instead of the previous 95% geographic coverage.

c) broadband should be the level of connectivity to the public institutions. A minimum bandwidth of 1.5Mbs download and 384Kbs upload should be made available to all public institutions at this time with the option of upgrading as the demand for speed increases;

d) a flat tariff structure should be used in the pricing of the service to the public institutions and;

e) libraries and post offices should be able to recover their monthly charges from users; however, the USAFJ should cover the monthly expenses of schools.

Additionally, the relevant ministry(ies)/agencies should ensure that the facilities at public institutions are upgraded to accommodate the provision of internet access. Further, training should be made available to teachers and others who will be instrumental in the demonstration of use to users.

Recommendation 7: The Office recommends the use of competitive bidding approach in the selection of potential operators for the provision of universal service/access.

Recommendation 8: The Office recommends the establishment of a physical universal service/access fund. All operators (carriers and service providers) should contribute to the fund from their revenues, net of interconnection and/or lease line payments. Universal service/access charges should be obvious to the customer. For example, postpaid customers charges should appear as a line item on their bills.

Recommendation 9: The Office recommends the creation of an independent and transparent fund administration which would preferably operated as a separate agency/unit from the ministry and the regulator. The total cost of operating this agency should not exceed 5% of the total amount of money collected each year.

Recommendation 10: The Office recommends that special consideration be given to the disabled community; no need for regulatory intervention to address disconnection from a network given the widespread availability of prepaid mobile service and; the universal service/access programme requires effective monitoring and review.

Recommendation 11: The Office recommends a maximum of five percent (5%) revenue intake from the industry for the first two years. This should be used to cover capital infrastructure and equipment costs. However, if the universal service/access fund will not be used to cover equipment costs then the five percent (5%) would only be applicable to the first year. Additionally, assuming the fund will cover equipment costs, a maximum of three percent (3%) of industry revenue would be appropriate from year three (3) onwards. On the other hand, if equipment costs are excluded a maximum of 2% would be required.

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CHAPTER 1: INTRODUCTION

Public Consultation Conducted

1.0 The first and second consultation documents on universal service/access obligation were issued by the OUR in December 2002 and October 2003[2], respectively. The documents focused on the services prescribed in the Telecommunications Act 2000 (hereafter refers to as the Act) at Section 39(2) namely single line voice telephony, payphones, free calls to emergency services and Internet access. The first document addressed the issues from a general perspective while the second examined specific details and made initial conclusions where appropriate.

1.1 The Office consulted extensively on the subject of universal service/access in Jamaica. At the outset, the OUR acquired the services of McCarthy Tetrault LLP, a consulting firm from Toronto, Canada, to assist in the preparation of both documents. The firm brought along with it a wealth of experience in the telecommunications field and especially with regards to universal service/access in developing as well as developed countries.

1.2 The documents were circulated to a wide cross-section of the society including those listed below:[3]

> ➢ All Parish Councils and Mayors;
> ➢ The University of the West Indies;
> ➢ University of Technology;
> ➢ Telecommunication operators (including Cable and Wireless Jamaica, Mossel Jamaica Limited (Digicel), Oceanic Digital Jamaica Limited, Gotel Jamaica Limited, Infochannel Limited/Reliant Corporate Communications Limited among others);
> ➢ Members of Parliament;
> ➢ Ministry of Education, Youth and Culture;
> ➢ Postal Corporation of Jamaica;
> ➢ Jamaica Library Service;
> ➢ Ministry of Commerce, Science and Technology;
> ➢ The OUR's Consumer Advisory Committee;
> ➢ Consumer Affairs Commission;
> ➢ Fair Trading Commission and;
> ➢ Jamaica Investments Promotion (JAMPRO).

1.3 The documents along with responses were also placed on the OUR's website (www.our.org.jm). This method has produced fruit in that at least two individuals (one local and the other from overseas) participated consistently in

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[2] The documents and responses can be downloaded from the OUR's website at www.our.org.jm
[3] The documents were sent directly to these individuals/groups/organisations (via email, the regular postal system and/or the OUR driver/messenger) for their comments.

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the process. Apart from the Internet, the public was also made aware of the publications through advertisements in the local print media and announcements on local radio stations.

1.4   Further, the Office, through its Communication Services Department, conducted public meetings throughout the Island in an effort to solicit information from a wide cross-section of the society. The promotion of the process was also enhanced at these meetings through the use of "The Regulator"[4].

1.5   Written responses/comments were received from the following individuals/groups/organisations:

- Cable and Wireless Jamaica Limited;

- Mossel Jamaica Limited (Digicel);

- Infochannel Limited/Reliant Corporate Communications Limited;

- Georgia Gibson-Henlin;

- Stefan Wright and;

- Jamaica Library Service.

1.6   It should be noted that all views were taken into consideration in the preparation of the recommendations contained herein. Therefore, even though some views are not explicitly stated, the Office would like to assure all participants that they were given due consideration.

Legal Framework
1.7   Part VI of the Act deals specifically with universal service/access. It gives the Minister with responsibility for telecommunications the authority to develop and implement any universal service/access programme in Jamaica. The role of the OUR is limited to modification of an existing scheme, as requested by the Minister. This is outlined in Section 39(1)(a) and (b):

(1)   *Subject to this section the obligation to provide universal service shall be determined -*

        (a)   *by an agreement between the Minister and a licensee and;*

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[4] This is a magazine publish internally by the OUR. In one of the issues, the OUR included a summary of the issues raised in the first consultative document.

> (b) *on the recommendation of the Office, in accordance with Section 42.[5]*

1.8 Section 39(2) outlines the principles under which universal service/access obligation should be provided:

> *(a) to the extent technically feasible and economically reasonable, to promote access to single line voice telephone services throughout the Island to persons regardless of place of residence or work;*
>
> *(b) to ensure that payphone services are reasonably accessible to customers on an equitable basis;*
>
> *(c) to permit access to free calls to emergency services; and*
>
> *(d) to the extent technically feasible and in so far as the necessary resources are available, to promote internet access throughout the Island in schools, public libraries and post offices.*

1.9 With respect to the issue of universal service/access, the Office's involvement in the process at this stage is justified based on Section 4(1)(e) and (g) of the Act which gives the Office the authority to inform the public and advice the Minister on telecommunications matters.

1.10 Section 4(1) (e) and (g) read:

> *The Office shall regulate telecommunications in accordance with this Act and for that purpose the Office shall –*
>
> *(e) make available to the public, information concerning matters relating to the telecommunications industry;*
>
> *(g) advise the Minister on such matters relating to the provision of telecommunications services as it thinks fit or as may be requested by the Minister.*

Proposed E-learning Programme

1.11 The Government of Jamaica is in the process of establishing an e-learning programme in approximately two hundred (200) high schools across the Island. The programme will commence with a pilot programme in September 2004 which will see fifteen (15) schools in the Kingston Metropolitan Region getting broadband connection to the internet. In addition to internet connection, the facilities at each school are to be upgraded to accommodate

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[5] Section 42 of the Act deals with modification of an existing scheme.

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approximately one hundred (100) computers; curriculum revised and updated; teachers to undergo training to adjust to the new initiative; among others. After the establishment of the pilot project, the objective is to extend the e-learning programme to the other 185 high schools across the Island[6].

1.12   It is envisaged that the programme will be funded through multilateral and bilateral arrangements as well as through the universal service/access fund.

Purpose of Document

1.13   In this document the Office sets out its recommendations to the Minister with responsibility for telecommunications on issues relating to universal service/access in Jamaica. As noted above, the Office has consulted widely in an effort to acquire the latest information and opinions on universal service/access that might be relevant to Jamaica.

Structure of Document

1.14   The remainder of the document is organized as follows:

- Chapter two examines at telecommunications services to be provided;

- Chapter three outlines provisioning, funding and administration;

- Chapter four reports on other consultation issues and;

- The document concludes with three appendices.

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[6] The pilot programme is expected to be completed within two years and the programme extended to the other high schools commencing year three. All 200 high schools should be equipped within five (5) years.

CHAPTER 2: TELECOMMUNICATION SERVICES

Single Line Voice Telephony

Summary of Consultation Issues

2.0   Three issues were consulted on with respect to single line voice telephony – market efficiency and access gap, affordability and technology neutrality.

➢ **Market Efficiency Gap** refers to the difference between the level of telephone penetration under monopoly conditions and the level under optimal or competitive conditions. **Access Gap** refers to a state where the market for telecommunication services is competitive and fully developed but some consumers are still unable to access telecommunication services as a result of affordability constraints, operators' refusal to rollout service in uneconomic areas or some other reason. The Office proposed the view that the market efficiency gap should only be filled by the forces of demand and supply and regulatory or other means used to fill the access gap.

➢ **Affordability** – The Office highlighted a number of measures that could be used to address the affordability concerns of current and potential subscribers. These include call barring, limited minutes, prepaid service and low user package.

➢ **Technology Neutrality –** The Telecommunications Act 2000 speaks to provision of single line voice telephony services throughout the Island to persons irrespective of residence or work. The Office interprets this to mean that the provision of single line voice telephony service should be technology neutral, that is, any technology that can be used to provide the service at the least possible cost, based on specified requirements, should be the one of choice. Currently, both fixed and mobile technologies are being used to provide single line voice telephony services.

Comments from Interested Parties

2.1   The general view of respondents to the concepts of market efficiency and access gaps is similar to that put forward by the Office, that is, market forces should be the only means by which the market efficiency gap is filled while the access gap may have to be filled through regulatory interventions or other means.

2.2   The general view of the respondents is that a prepayment approach would be an ideal tool to use in addressing the issue of affordability since it gives customers the option of controlling the amount they spend on telecommunication services each month. However, one respondent argued

that the prepaid scheme is not ideal and an approach based on usage would be more appropriate.

2.3   All respondents except CWJ, who argued that the provision in the Act refers to the use of fixed line technology only, suggested that the provision of single line voice telephony services should be technology neutral and therefore not limited to any one technology.

OUR's Conclusion(s)

2.4   **Market efficiency and access gaps** - The OUR believes that the application of the market efficiency and access gaps concepts is critical to the development of any universality programme in Jamaica. The single line voice telephony market (fixed and mobile) is still in its developmental stage and therefore more time is needed to make a complete assessment of any access gap that might occur. The intention should be to allow the market to develop to its full potential before any further assessment is done. The OUR is of the view that a more suitable time to conduct this assessment would be after the expiration date of the mobile operators' licence obligation. It is possible that by this time the market efficiency gap would have been realised and any remaining gap (access gap) would require regulatory intervention. At that time it might be necessary to undertake a detailed study to ascertain the number of households without access to single line voice telephony service. Additionally, such a study should also assess the cost of providing service to these households.

Recommendation 1: The Office recommends that the market efficiency and access gap concepts should be allowed to develop in the single line voice telephony market before any further assessment of that market is done. The Office believes that a reasonable time for any further assessment should be after the expiration date of the licence obligation of the mobile operators, March 2005.**[7]**

2.5   **Affordability** – Since the entrance of the first new operator in the mobile market in April 2001, the number of mobile subscribers have increased significantly, from approximately 0.33M to well over 1.5M up to March 2004[8]. Information received by the OUR reveals that over 90% of these subscribers are on a prepaid plan. In addition, these customers enjoy the benefit of staying connected to a mobile network for up to sixty (60) days before being disconnected without making and/or receiving a call. Further, the customer now has almost total control over his bill. Based on the current options offered

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[7] It should be noted that Oceanic Digital Jamaica Limited licence was subsequently amended by the Minister to reflect 95% population coverage instead of the previous 95% geographic coverage.
[8] During this period the number of fixed line customers has reduced by approximately 10%.

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by mobile operators, the customer can choose to spend as little as JA$120 over a two month period on a prepaid plan.

2.6   Data from the Planning Institute of Jamaica (2003) reveal that households in the poorest quintile are opting for mobile service and are spending less per month using this service compared to the fixed line where they have to pay a fixed monthly charge.[9] The monthly fixed charge serves as a deterrent to the take up of the service since customers have no control over paying this fixed amount. The OUR therefore, during the consultative process, urged CWJ to introduce a prepaid platform to its fixed line service thus affording subscribers the option of prepaid or postpaid packages.

Recommendation 2: The prepaid option for mobile service is currently addressing issues of affordability with respect to single line voice telephony service and therefore the Office recommends no regulatory intervention in this market at this time.

2.7   **Technology neutrality** – The Act does not place any limitation on the technology to be used in the provision of single line voice telephony service. To date, both fixed and mobile operators are providing this service. A recent study conducted by the OUR revealed that approximately 86%[10] of the households across the Island have at least one single line voice telephone (fixed or mobile) in their homes. Households with both fixed and mobile account for 38%; mobile only represents 55%; and fixed only 7%. These results demonstrate the need for the acceptance of technology neutrality in the provision of single line voice telephony services.

2.8   Further evidence of Jamaica's development in the single line voice telephony market, compared to the main regions of the world is shown in Table 1 below.

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[9] This charge is currently $500 for customers on the standard package and $340 for those on the low user package on the CWJ network.
[10] The study was released in February 2004.

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Table 1: Jamaica's/Regions'/World's Telephony Subscriptions

Country/Region/World	GDP per capita (US$) 2002	Fixed telephone lines per 100 inhabitants 2003	Cellular mobile subscribers per 100 inhabitants 2003	Cellular mobile subscribers as a % of total telephone subscribers 2003	Total (fixed and mobile) lines per 100 inhabitants 2003
Jamaica	3206	16.92	53.30	75.90	70.22
Africa	663	3.01	6.16	67.30	8.65
Americas	15,633	34.12	33.80	49.80	66.62
Asia	2,313	13.64	15.03	52.40	28.52
Europe	12,822	41.00	55.40	57.50	96.28
Oceania	15,174	40.76	54.45	57.20	94.85
World	5,383	18.76	21.91	53.90	40.32

Source: ITU (http://www.itu.int/ITU-D/ict/statistics/; May 13, 2004).

Recommendation 3: The Office recommends that the provision of single line voice telephony services should be considered from a technology neutral perspective and therefore the fulfillment of the single line voice telephony objective should not be limited to any one technology. Hence, given recent development in the fixed and mobile voice markets since liberalization, the Office recommends that no regulatory intervention is required at this time with respect to single line voice telephony service objective.

Payphone Services

Summary of Consultation Issues
2.9   The Office consulted on best practices of ensuring payphones are available Islandwide. The suggestion was that of installing a payphone in every community with population of ninety (90) or more persons as well as within walking distance from homes.

Comments from Interested Parties
2.10   The general view expressed by respondents concerning this issue is that before any decision is taken on the number of and location of payphones to

be installed, careful considerations should be given to the increase in mobile penetration and vandalism. It was also argued that the demand for payphone service has been significantly reduced as a result of the increase in mobile coverage and this trend is expected to continue in the future. It is also argued that it is becoming increasingly difficult to maintain payphones because of the high level of vandalism. One respondent suggested that payphones should be readily available to households in cases of emergency; therefore payphones should be placed in both economic and uneconomic areas. Further, suggestion was made that payphones should be installed only in areas where fixed and/or mobile service is unavailable and might never be made available due to economic reasons.

OUR's Conclusion(s)

2.11   The Office recognises the impact that increased mobile coverage is having on the demand for payphone services. It is also mindful of the high maintenance cost being experienced by CWJ as a result of vandalism. The OUR is also cognisant of the fact that some areas might never be served by fixed and/or mobile operators and therefore regulatory intervention will be required to ensure that households located in these areas have access to voice services in the form of payphones.

2.12   Additionally, payphones can provide needed support in cases of emergency. Further, there might be genuine situations where individuals cannot afford connection to a fixed and/or mobile network and would therefore have to resort to public payphones for voice services. Payphones provide flexibility in that customers do not have to own/purchase the instrument in order to make a call. Also, the customer only incurs charges when he makes a call. Another advantage of the payphone is that it can provide services to individuals who might choose not to acquire the services of a fixed and/or mobile phone.

2.13   The long-term objective therefore is to encourage basic public payphone build out in all areas. However, the short-term goal would be to commence installation in areas where fixed and/or mobile services are not available. In an effort to reduce vandalism, possible installation sites could include police stations, schools, post offices, community centres, major community shops etc. The Regional Broadband Network (RBN)[11] operators would be responsible for the installation of payphones on the request of the USAFJ. Additionally, no funding should be provided for the maintenance of existing payphones.

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[11] See Appendix B for more information on Regional Broadband Networks.

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> **Recommendation 4:** The Office recommends that regulatory intervention might be necessary in the provision of public payphone services across the Island. However, before any installation is done, the Universal Service/Access Fund of Jamaica (USAFJ) should carefully assess the reasonableness of locating a payphone in an area, the decision being based on transparent and justifiable criteria.

Emergency Services

OUR's Conclusion(s)

2.14 Based on observations, all single line voice telephony operators are providing customers with free access to emergency services as stipulated by the Act. Therefore, it is reasonable to assume that as voice coverage expands (fixed, mobile and/or payphones) more citizens will be able to get free access to emergency services. The Office is therefore of the view that the emergency access service objective is being substantially fulfilled or will be substantially met in the near future in Jamaica. Hence, no universal access/service regulatory intervention is required in this respect at this time.

> **Recommendation 5:** The Office recommends that no regulatory intervention is required in the provision of free access to emergency services at this time.

Internet Access

Summary of Consultation Issues

2.15 Five issues were consulted on with regards to Internet access in public institutions – Concentration of Internet access; provision of computer hardware and software; level of connectivity; and tariff packages and payment of monthly bills.

   ➢ **Concentration of Internet Access** – Due to the huge difference in internet access levels in primary and secondary schools vis-à-vis tertiary institutions, the Office proposed that greater emphasis should be placed on the provision of Internet access in schools at the primary and secondary levels.

   ➢ **Provision of Computer Hardware and Software** – The Office proposed two methods of funding the provision of equipment to public institutions – direct funding from the universal service/access fund of Jamaica (USAFJ) and funding through other government programmes.

- ➢ **Level of connectivity** – The Office proposed the use of broadband connectivity to the Internet rather than dial-up.

- ➢ **Tariff Packages and Payment of Monthly Bills** – The Office proposed a flat rate package for public institutions. Three payments methods were proposed for public institutions – firstly, full funding from the USAFJ; secondly, part funding from the USAFJ; and thirdly, no funding from the USAFJ.

Comments from Interested Parties

- ➢ **Concentration of Internet Access** – All respondents supported the Office's proposal that the Government of Jamaica (GoJ) should concentrate more resources to the provision of Internet access to schools at the primary and secondary levels compared to those at the tertiary level.

- ➢ **Provision of Computer Hardware and Software** – The general view of respondents is that the USAFJ should not be used to provide the equipment needed to access the Internet. However, they suggested that the GoJ should seek funding from other sources such as computer and hardware/software producers, international donor agencies as well as local companies.

- ➢ **Level of connectivity** – All respondents, except one, suggested that broadband access to the Internet should be the level of connectivity instituted in public institutions. The respondent who stated otherwise argued that it might be too expensive at this time instead the GoJ should commence with the provision of dial up thus giving itself sufficient time to explore the issue of broadband.

- ➢ **Tariff Packages and Payment of Monthly Bills** – There were mixed views from respondents regarding these issues. One view expressed is that Internet access should be provided to schools free of charge while libraries and post offices cover their monthly charges from monies collected from users. Another view suggested is that all public institutions should be responsible for the payment of their monthly charges and therefore subsidy should only be made available where necessary. In addition, the Jamaica Library Service (JLS) suggested that service to the library should be free, that is, the users of the libraries should not be asked to pay to access the Internet. However, the JLS did not identify how the cost will be met.

OUR's Conclusion(s)

- ➢ **Concentration of Internet Access** – The Office maintains the view that the GoJ should concentrate more resources to the provision of Internet access in schools at the primary and secondary levels compared to those at the tertiary level.

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➢ **Provision of Computer Hardware and Software** – As stated above, the general view of respondents is that the provision of hardware and software to public institutions should be out-sourced. However, while the Office generally supports this view, it believes that provision should be made available for the USAFJ to use funds collected to purchase hardware and software in cases where the out-sourcing approach fails or does not provide the required number of equipment within a specified period of time.

Evidence of Jamaica's Internet and personal computer (PC) penetration compared to the main regions of the world is shown in Table 2 below. It is obvious that PC penetration in Jamaica is low compared to three of the regions and the world. This should add further justification for the provision of computer hardware and software to public institutions from the USAFJ, if required.

Table 2: Jamaica's/Regions'/World's Internet and PC Penetration

Country/Region/World	GDP per capita (US$) 2002	Internet users per 100 inhabitants 2003	Estimated PCs per 100 inhabitants 2003
Jamaica	3,206	22.64	5.37
Africa	663	1.47	1.38
Americas	15,633	25.64	28.95
Asia	2,313	6.72	4.45
Europe	12,822	23.77	21.44
Oceania	15,174	37.06	42.40
World	5,383	11.02	9.91

Source: ITU (http://www.itu.int/ITU-D/ict/statistics/; May 13, 2004).

➢ **Level of connectivity** – The Office maintains the view that broadband connectivity should be chosen over dial up. A minimum bandwidth of 1.5Mbs download and 384Kbs upload to all public institutions would be ideal at this time to facilitate applications such as distance learning, video conferencing among others. However, the fund administrator should be prepared to make adjustments as the demand for speed increases.

➢ **Tariff Packages and Payment of Monthly Bills** – The Office is of the view that a flat tariff structure should be the preferred choice for public institutions. The USAFJ should cover the monthly charges for all schools;

however, libraries and post offices should be given the freedom to sell the service to its users. The revenue so obtained should be enough to maintain the continued provision of service to the public.

Unlike schools where more supervision is available to reduce abuse of the facilities, the Office is not convinced that a similar situation exists at libraries. Therefore, one approach towards reducing/eliminating the level of abuse at libraries would be to charge users for the service being provided. Also, one might argue that the library is a source for information and that the Internet is just an extension of that source therefore access should be provided free of charge to its users. However, unlike schools where access is just limited primarily to students and staff, the libraries are open to the general public and essentially they can compete with other public providers of Internet, to some extent. Not allowing users to pay the cost of using the service may result in some level of distortion in the market. In addition, there might be limited availability of funds and the Office believes priority should be given to schools.

Preparedness of Public Institutions

2.16   In addition to the issues discussed above for Internet service provision, the Office believes that there are other critical issues the GoJ should consider before the implementation of the universal service/access programme. The GoJ should ensure that the public institutions are physically prepared to accommodate the equipment (computers, servers etc.) necessary to provide services. For example, a number of schools might not currently have the services of a computer lab or even if they do, they might not be accommodating. Another issue is that of security at the public institutions – it would be a wasteful use of scarce resources to install the facilities without providing for adequate security and maintenance.

2.17   Further, there should be a complementary programme instituted to provide training for personnel who will be directly involved in the administering of the programme at the institutional level. Therefore, teachers and lab technicians should be equipped to provide the necessary guidance to the students. Librarians and post office workers should also be trained in order to impart useful information to the public on the use of the Internet.

Recommendation 6: Unlike single line voice telephony services, the Office is of the view that there is a clear need for regulatory intervention in the provision of Internet access to public institutions. The recommendations are as follow:

f)   Priority should be given to schools at the primary and secondary levels;

g)   funds from the USAFJ should be made available, where necessary, to facilitate the provision of computer hardware and software;

h)   broadband should be the level of connectivity to the public institutions. A minimum bandwidth of 1.5Mbs download and 384Kbs upload should be made available to all public institutions at this time with the option of upgrading as the demand for speed increases;

i)   a flat tariff structure should be used in the pricing of the service to the public institutions and;

j)   libraries and post offices should be able to recover their monthly charges from users; however, the USAFJ should cover the monthly expenses of schools.

Additionally, the relevant ministry(ies)/agencies should ensure that the facilities at public institutions are upgraded to accommodate the provision of internet access. Further, training should be made available to teachers and others who will be instrumental in the demonstration of use to users.

CHAPTER 3: PROVISIONING, FUNDING AND ADMINISTRATION

Provisioning

Summary of Consultation Issues

3.0   The Office outlined two approaches that could be used in selecting potential providers of universal service/access: Competitive Bidding and "Pay or Play".

Comments from Interested Parties

3.1   The general view of respondents is that the competitive bidding approach would be more appropriate in selecting potential operators. However, CWJ does not fully endorse this view. CWJ's suggestion is that in areas where it has network presence, designation should be compulsory; however, the competitive bidding approach should be applied in all other area and CWJ should be allowed to bid.

OUR's Conclusion(s)

3.2   The OUR is of the opinion that before an operator can be designated a universal service/access provider a number of issues will have to be addressed. Firstly, the selection process must conform to the World Trade Organisation Agreement on Basic Telecommunications which speaks to non-discriminatory and competitively neutral provision of services. Secondly, the Office is also of view that competition should be introduced in the process so as to ensure efficient allocation of universal service/access fund.

3.3   The Office believes that the competitive bidding approach allows for the two issues addressed in paragraph 3.2. This approach has been successfully applied in a number of countries including Peru and Chile.

> **Recommendation 7:** The Office recommends the use of competitive bidding approach in the selection of potential operators for the provision of universal service/access.

Funding

Summary of Consultation Issues

3.4   The Office consulted on a number of issues regarding the funding of universal service/access. These include the mechanism to be used – general taxation, interconnect charges, cross subsidies and universal service fund; which operators should contribute and how much; the measure for contribution – revenues, profits and/or minutes; and recovery of universal service/access charges.

Comments from Interested Parties

3.5 The general view expressed by respondents regarding the funding mechanism is that a physical universal service/access fund would be more appropriate. However, CWJ does not entirely support this view. They argued that a physical fund would be more ideal for new projects but not necessarily existing programmes. CWJ believes that a virtual funding mechanism should also be established to address current and on going affordability issues on its fixed network. Respondents also believe that revenue should be the basis of contribution to the fund and the recovery of universal service/access charges should be a line item on customers' bills.

OUR's Conclusion(s)

3.6 **Mechanism** – The Office is of the view that a physical fund should be established to address universal service/access.

3.7 **Contribution (Means and Amount)** - An expanded telecommunications system will benefit all users and therefore every one should contribute. The levy should be applicable to all operators (carriers and service providers), whether they have network presence in Jamaica or not, who have been granted a licence or licences under the Act. The levy should be charged on all revenues net of any interconnection and/or leased line payments.

3.8 Operators should be required to submit audited financial statements to the fund administrator. This is necessary in order to verify the specific amount each would be required pay on an annual basis. Sections 39(5)(a) and 42 (2)(a) of the Act stipulate that operators' contributions to the universal service/access fund should not exceed five percent (5%) of their revenues. As such, the amount that operators actually pay will depend on the requirements of the universal service/access programme in any given year which of course must adhere to the requirement of the Act.

3.9 **Recovery of Charges** - The OUR is of the view that the recovery of universal service/access charges should be clearly visible to the customer. Therefore, it should appear as a line item on the customer's bill. For those customers who use prepaid services, the charge(s) should be included in the cost of the calling cards similar to the approach used for the collection of General Consumption Tax (GCT). The operators would then have the responsibility to collect these charges and pay over to the fund administrator. These processes are deemed transparent since they afford customers the opportunity to identify the amounts being contributed to the fund.

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Recommendation 8: The Office recommends the establishment of a physical universal service/access fund. All operators (carriers and service providers) should contribute to the fund from their revenues, net of interconnection and/or lease line payments. Universal service/access charges should be obvious to the customer. For example, postpaid customers charges should appear as a line item on their bills.

Administration

Summary of Consultation Issues
3.10   The Office proposed an independent fund administration which would come under the control of the OUR.

Comments from Interested Parties
3.11   One respondent suggested that the USAFJ should be an independent agency attached to the relevant ministry to which it reports. Another respondent commented that the USAFJ would not necessarily be autonomous and independent if operated as a division within the OUR.

OUR's Conclusion(s)
3.12   The OUR acknowledges the views of the respondents on the issue of administration of the fund. The general trend for the location of the universal service/access administration worldwide is somewhat mixed. In some countries it is located within the national regulatory agency (NRA); in others it's operated as a division/unit in the relevant ministry; and still in other countries an independent agency is established. However, despite the location of the fund, whether within the ministry, the regulator or some other body, the characteristics of independence and transparency should be obvious. See Appendix A for more detail on the administration of the proposed USAFJ.

Recommendation 9: The Office recommends the creation of an independent and transparent fund administration which would preferably operated as a separate agency/unit from the ministry and the regulator. The total cost of operating this agency should not exceed 5% of the total amount of money collected each year.

CHAPTER 4: OTHER ISSUES

Summary of Consultation Issues

4.0　The Office consulted on the following issues in this section: Service to the disabled community; disconnection and monitoring and review.

Comments from Interested Parties

4.1　There are mixed reactions as to the treatment of the disabled community under the universal service/access programme. One view is that they should be given special considerations while another is that since the Act does not mention special treatment for people with disability, no extra provisions should be made.

4.2　CWJ points out that it has introduced several programmes to reduce the level of disconnections from its fixed network. Some of these programmes include a bill payment plan for customers experiencing affordability problems. In addition, the CWJ makes reference to its Low User Package which it believes has been assisting customers immensely with controlling their monthly bills. Also, the operator mentioned that it is currently reviewing other options such as a prepayment scheme for its fixed line customers.

4.3　Infochannel supports the OUR's view that disconnection should be minimised, if not eliminated, but also pointed out that customers' inability to pay their bills has resulted in high bad debts for the incumbent. The operator argued that one of the main reasons for this is the monthly access fee which customers are required to pay on the fixed network. It is believed that if this is removed and a prepaid scheme introduced the level of disconnection would be significantly reduced.

4.4　All respondents share the view that effective monitoring and review is necessary to the success of the programme.

OUR's Conclusion(s)

4.5　The OUR maintains the view that special consideration ought to be given to the disabled community to ensure/promote equality for every citizen.

4.6　As was discussed in the Chapter 2, the prepaid option currently being offered to customers by the mobile operators has significantly increased the number of customers connected to a network and has therefore effectively reduced the overall level of disconnection from networks.

4.7　The OUR also maintains the view that there should be effective and constant monitoring and review by the USAFJ to ensure the maximisation of welfare to citizens.

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Recommendation 10: The Office recommends that special consideration be given to the disabled community; no need for regulatory intervention to address disconnection from a network given the widespread availability of prepaid mobile service and; the universal service/access programme requires effective monitoring and review.

APPENDIX A: Universal Service/Access Administration

Introduction

A.0   In this Appendix the Office sets out some proposals with regard to the structure of the USAFJ. The Office is not suggesting or recommending that all the issues discuss below should form part of the USAFJ. However, there are certain fundamental principles - independence, transparency and accountability which must be practised.

A.1   The structure and size of the fund would therefore reflect the actual objectives of the USAFJ. According to a report by OVUM[12], world best practice indicates that administration costs represent a maximum of 1% of universal service/access fund. The report identified three main reasons for the low cost of administration:

> ❖ Limited number of employees – Fund administrators usually employ only a few employees. For example, in Peru only 8 persons were employed.

> ❖ Little or no need for new infrastructure – The regulatory body or the relevant ministry can take control of the administration of the fund.

> ❖ Technology – the use of technology can be used to reduce the cost of operating the fund.

Indicative Structure of the Universal Service/Access Fund

> **Establishment**
> This organisation should preferably be a statutory body under the direction of a Board of Directors. The Board could consist of the Attorney General, the Regulator, a member of industry etc. It should be neutral of political interest and operate transparently, independently and have full control over all its legal, financial and administrative activities/resources. It would be desirable that the amount of funds to be used for administrative purposes be capped at 5%, by law. As mentioned earlier, world best practice suggests that the cost of administering the fund should not exceed 1% of the amount collected per year. However, given Jamaica's estimated industry revenue, this rate might not be appropriate. A more realistic figure would be 5%.

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[12] "Universal Service/Access Funding Strategies: World Best Practices", published in 1999.

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The agency should be afforded statutory relief such as taxes and import duties among others. These could be viewed as part of the government's contribution to the programme.

Organization:

(1) The Board of Directors provides guidance and would:

- ➢ Be responsible for setting the overall policy for the implementation of the Fund;
- ➢ Approve the annual budget and operation plans, as well as Annual Reports and audits;
- ➢ Appoint the Fund Director and members of the Advisory Committee and;
- ➢ Approve disbursement of funds.

(2) An Advisory Committee should be set up to provide ideas to the Fund management concerning project priorities, operational plans, target objectives etc. Persons comprising this group would volunteer and would be appointed representatives from the industry, user groups including consumers, the Government and public institutions.

(3) The organisation could liaise with the OUR and the Fair Trading Commission on issues of pricing and competition.

Staffing

- ➢ *A Director/Administrator* who oversees all the day-to-day activities of the Fund, reports directly to the Board of Directors. Prepares annual operating, budget and project plans.

- ➢ *A Project Management Unit* which conduct research on market conditions, develop proposed project plans and liaises with USAFJ recipients in the implementation and evaluation of approved projects.

- ➢ *Accounting Unit* – Accountant responsible for ensuring the proper operation of the USAFJ and maintain its accounting records.

- ➢ *Legal Unit* - Lawyers will execute the necessary contracts and other legal documents.

Independent Budget and Accounting:

The agency must establish clear accounting standards at the outset that are consistent with national public accounting practices and the Fund's mandates.

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Further, since this agency would be autonomous, an independent bank account and accounting records would be established for the collection and disbursement of funds. An annual public report of all Fund contributions and expenditures and an annual independent audit should be carried out.

Review and Revision of USAFJ's Activities
The operation and objectives of the agency should be subject to periodic internal and external review and revision. External review would consist of public and government consultation. An Annual Report would be prepared by the agency with information on:

> ➢ Financial reports: collections, expenditures, reserves, etc.;
> ➢ Descriptions of projects funded, goals, tasks, budgets, achievements;
> ➢ Review of previously funded projects;
> ➢ Revisions to target objectives, estimates of progress.

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APPENDIX B: Universal Service/Access Delivery

Delivery

Regional Broadband Network (RBN)

B.0   As mentioned in Chapter 2, the OUR is recommending the provision of broadband connectivity, rather than dial up, to the Internet in the designated public institutions across the Island. The delivery of the service is expected to be accomplished through the creation of what the Office refers to as Regional Broadband Networks (RBNs). Essentially, the Island would be subdivided by counties (referred to as regions) and operators bid[13] to provide the institutions in the various regions with broadband Internet connections.

B.1   The RBNs should consist of both domestic as well as international components. The domestic portion would deal with all the local transmission, switching and access functions of the network. The international facility would provide international connectivity to the rest of the world.

B.2   The provision of service should be technology neutral therefore the RBN operators can choose any technology (whether fibre optic cables, satellite, wireless etc.) providing they adhere to the requirements set by the ministry and/or the fund administrator. The networks should also be designed such that upgrading can be carried out without major changes.

RBN Services

B.3   The RBN operators should be licensed to provide both mandatory as well as optional services. Mandatory services are those that the RBN operators are expected to provide to the public institutions. These should include broadband internet access at a minimum speed of 1.5Mbs download and 384Kbs upload; a fixed voice line, for institutions that are currently without this service, (or institutions that might require more lines), that is capable of making and receiving calls to and from local and international PSTNs and mobile lines. In addition, the line should be capable of providing fax services and other data services. Optional services could include the ones referred to above as well as any other services the RBN operators may which to provide to the wider public.

RBN Regions

B.4   The Office is recommending that the GoJ divides the Island into three regions. These regions would follow the boundaries of the three counties in the Island. Therefore region one, referred to as Surrey, would comprise the parishes of Kingston and St. Andrew, Portland and St. Thomas; region two, referred to as Middlesex, would include the parishes of St. Catherine, St.

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[13] The bidding process should not be limited to only local operators but should include international bidders as well.

Mary, Clarendon, St. Ann and Manchester and region three, referred to as Cornwall, would consist of the parishes of St. Elizabeth, Westmoreland, Hanover, St. James and Trelawny. However, in an effort to accomplish this task, the Ministry should give due consideration to the proposed design, structure and build out of the RBNs.

Proposed Pilot Programme

B.5   The Office believes that before any large-scale programme is introduced, the GoJ should carry out a pilot programme.[14] In an effort to determine the region or parish the pilot programme could apply to, the OUR has built a numerical model of Jamaica in which a wide array of geographic, community, population, demographic, economic (household income), social and physical infrastructure data are assembled on a parish-by-parish basis. The objectives of the model are to provide a comparison of parishes to identify physical, population and socio-economic differences across the Island, as an aid to qualitative study and analysis. In particular, the model is used to compare parish rankings on socio-infrastructure and income.

B.6   The indicators were combined into a "socio-infrastructure indicator" in such a way as to reflect their deviation from the national average, with the higher scores indicating least well-endowed parishes. Note that some parts of all parishes will be relatively well endowed compared to the majority of their land areas. Tables A1 and A2 below show the "needs" ranking, with the least endowed parish and county having the highest scores:

Table A1: Rankings by Parish

Rank	Parish	Score
1	St. Ann	132
2	Hanover	128
3	Westmoreland	124
4	Portland	122
5	St. Elizabeth	118
6	Trelawny	118
7	St. Mary	115
8	Manchester	114
9	Clarendon	113
10	St. Thomas	110
11	St. James	92
12	St. Catherine	79
13	Kingston	66
14	St. Andrew	62

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[14] However, as mentioned in paragraph B.4, due consideration should be given to the design, structure and build out of the proposed RBNs.

Table A2: Rankings by County

Rank	County	Score
1	Cornwall	116
2	Middlesex	110.6
3	Surrey	90

B.7   From the tables above it is obvious that the least endowed parish and county are St. Ann and Cornwall, respectively. The decision as to where to apply the pilot programme, whether in one or two parishes or an entire county, is clearly the responsibility of the GoJ; however, it should taken into consideration the design, structure and build of the network(s) that will be employed as well as the cost.

APPENDIX C: Statistics for Schools, Libraries and Post Offices by Parish

Kingston and Saint Andrew

	Primary	Primary and Junior High	All-Age	High	Total	% of Schools
Number of Schools	54	19	29	43	145	
Population	49045	4221	7039	52884	113189	
Number With Electricity Service	53	19	28	43	143	98.6
Number With Telephone Service	50	15	18	43	126	86.9
Number With Internet Service	5	0	3	11	19	13.1
Number in Urban Areas	48	15	6	41	110	75.9
Number in Rural areas	6	4	23	2	35	24.1

Saint Thomas

	Primary	Primary and Junior High	Junior High	All-Age	High	Total	% of Schools
Number of Schools	30	3	1	9	5	48	
Population	9835	2045	464	1408	6058	19810	
Number With Electricity Service	29	3	1	7	5	45	93.8
Number With Telephone Service	22	3	1	3	5	34	70.8
Number With Internet Service	1	0	0	0	2	3	6.3
Number Urban Areas	5	2	1	0	2	10	20.8

Number in Rural Areas	25	1	0	9	3	38	79.2

Portland

	Primary	Primary and Junior High	All-Age	High	Total	% of Schools
Number of Schools	19	6	20	5	50	
Population	10809	1506	3857	5589	21761	
Number With Electricity Service	17	6	19	5	47	94.0
Number With Telephone Service	12	1	10	5	28	56.0
Number With Internet Service	0	0	0	2	2	4.0
Number in Urban Areas	5	0	0	3	8	16.0
Number in Rural Areas	14	6	20	2	42	84.0

Saint Mary

	Primary	Primary and Junior High	All-Age	High	Total	% of Schools
Number of Schools	28	7	24	9	68	
Population	8285	4338	4366	7200	24189	
Number With Electricity Service	28	7	23	9	67	98.5
Number With Telephone Service	16	4	4	8	32	47.1

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	Primary	Primary and Junior High	All-Age	High	Total	% of Schools
Number With Internet Service	1	0	1	7	9	13.2
Number in Urban Areas	3	1	4	5	13	19.1
Number in Rural Areas	25	6	20	4	55	80.9

Saint Ann

	Primary	Primary and Junior High	All-Age	High	Total	% of Schools
Number of Schools	17	6	45	8	76	
Population	10117	3638	11167	9117	34039	
Number With Electricity Service	15	6	43	8	72	94.7
Number With Telephone Service	10	1	12	8	31	40.8
Number With Internet Service	1	1	0	5	7	9.2
Number in Urban Areas	6	0	6	7	19	25.0
Number in Rural Areas	11	6	39	1	57	75.0

Trelawny

	Primary	Primary and Junior High	All-Age	High	Total	% of Schools
Number of Schools	13	2	16	5	36	
Population	4288	1352	6113	6056	17809	

Number With Electricity Service	12	2	16	5	35	97.2
Number With Telephone Service	9	0	6	5	20	55.6
Number With Internet Service	0	0	1	2	3	8.0
Number in Urban Areas	2	0	2	3	7	19.4
Number in Rural Areas	11	2	14	2	29	80.6

Saint James

	Primary	Primary and Junior High	All-Age	High	Total	% of Schools
Number of Schools	13	7	21	8	49	
Population	11069	8313	6911	13778	40071	
Number With Electricity Service	13	7	19	8	47	95.6
Number With Telephone Service	9	6	10	8	33	67.3
Number With Internet Service	3	0	1	2	6	12.2
Number in Urban Areas	5	5	4	5	19	38.8
Number in Rural Areas	8	2	17	3	30	61.2

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Hanover

	Primary	Primary and Junior High	All-Age	High	Total	% of Schools
Number of Schools	12	3	19	4	38	
Population	4505	2311	3650	5152	15618	
Number With Electricity Service	12	3	19	4	38	100
Number With Telephone Service	9	2	4	4	19	50.0
Number With Internet Service	1	0	0	1	2	5.3
Number in Urban Areas	4	2	1	2	9	23.7
Number in Rural Areas	8	1	18	2	29	76.3

Westmoreland

	Primary	Primary and Junior High	All-Age	High	Total	% of School
Number of Schools	23	5	29	7	64	
Population	11988	2524	6694	8768	29974	
Number With Electricity Service	22	4	26	6	58	90.6
Number With Telephone Service	12	2	8	7	29	45.3
Number With Internet Service	1	0	1	0	2	3.1

Number in Urban Areas	9	1	3	4	17	26.6
Number in Rural Areas	14	4	26	3	47	73.4

Saint Elizabeth

	Primary	Primary and Junior High	All-Age	High	Total	% of School
Number of Schools	35	5	35	10	85	
Population	9863	3408	8307	11974	33552	
Number With Electricity Service	33	5	33	10	81	95.3
Number With Telephone Service	14	3	8	9	34	40.0
Number With Internet Service	0	0	2	5	7	8.2
Number in Urban Areas	6	1	2	4	13	15.3
Number in Rural Areas	29	4	33	6	72	84.7

Manchester

	Primary	Primary and junior high	All-Age	High	Total	% of School
Number of Schools	20	6	32	11	69	
Population	8587	6179	7721	11354	33841	
Number With Electricity Service	19	5	32	11	67	97.1

Number With Telephone Service	7	6	7	9	29	42.0
Number With Internet Service	1	0	1	4	6	8.7
Number in Urban Areas	5	4	2	7	18	26.1
Number in Rural Areas	15	2	30	4	51	73.9

Clarendon

	Primary	Primary and Junior High	All-Age	High	Total	% of School
Number of Schools	40	11	35	16	102	
Population	20105	8070	10920	20723	59818	
Number With Electricity Service	38	11	33	16	98	96.1
Number With Telephone Service	15	6	8	14	43	42.2
Number With internet Service	2	0	3	10	15	14.7
Number in Urban Areas	15	5	5	13	38	37.3
Number in Rural Areas	25	6	30	3	64	62.7

Saint Catherine

	Primary	Primary and Junior High	All-Age	High	Total	% of School
Number of Schools	49	8	36	22	115	
Population	38632	11831	9234	29158	88855	
Number With Electricity Service	49	8	36	22	115	100
Number With Telephone Service	41	6	13	22	82	71.3
Number With Internet Service	4	0	0	6	10	8.7
Number in Urban Areas	33	6	4	19	62	53.9
Number in Rural Areas	16	2	32	3	53	46.1

Kingston and Saint Andrew

	Libraries	Post Offices	% of Libraries	% of Post Offices
Total	11	29		
Number With Electricity Service	11	N/A	100	N/A
Number With Telephone Service	9	21	81.8	72.4
Number With Internet Service	3	11	27.3	37.9

Saint Catherine

	Libraries	Post offices	% of Libraries	% of Post Offices
Total	12	28		
Number With Electricity Service	12	N/A	100	N/A
Number With Telephone Service	11	12	91.7	42.9

Number With Internet Service	4	3	33.3	10.7

Saint Thomas

	Libraries	Post offices	% of Libraries	% of Post Offices
Total	6	17		
Number With Electricity Service	6	N/A	100	N/A
Number With Telephone Service	2	1	33.3	5.9
Number With Internet Service	2	1	33.3	5.9

Portland

	Libraries	Post Offices	% of Libraries	% of Post Offices
Total	7	21		
Number With Electricity Service	7	N/A	100	N/A
Number With Telephone Service	6	1	85.7	4.8
Number With Internet Service	3	1	42.9	4.8

Saint Mary

	Libraries	Post offices	% of Libraries	% of Post Offices
Total	11	26		
Number With Electricity Service	11	N/A	100	N/A
Number With Telephone Service	7	4	63.6	15.4
Number With Internet Service	4	4	36.4	15.4

Clarendon

	Libraries	Post Offices	% of Libraries	% of Post Offices
Total	10	29		
Number With Electricity Service	10	N/A	100	N/A
Number With Telephone Service	8	6	80.0	20.7

| Number With Internet Service | 8 | 1 | 80.0 | 3.4 |

Saint Ann

	Libraries	Post Offices	% of Libraries	% of Post Offices
Total	13	26		
Number With Electricity Service	13	N/A	100	N/A
Number With Telephone Service	6	7	46.2	26.9
Number With Internet Service	3	1	23.1	3.8

Manchester

	Libraries	Post Offices	% of Libraries	% of Post Offices
Total	13	28		
Number With Electricity Service	10	N/A	76.9	N/A
Number With Telephone Service	5	3	38.5	10.7
Number With Internet Service	4	1	30.8	3.6

Trelawny

	Libraries	Post Offices	% of Libraries	% of Post Offices
Total	9	19		
Number With Electricity Service	9	N/A	100	N/A
Number With Telephone Service	3	1	33.3	5.3
Number With Internet Service	2	1	22.2	5.3

Saint James

	Libraries	Post Offices	% of Libraries	% of Post Offices
Total	11	23		
Number With Electricity Service	11	N/A	100	N/A
Number With Telephone Service	7	4	63.6	17.4

	Libraries	Post Offices	% of Libraries	% of Post Offices
Number With Internet Service	1	1	9.1	4.3

Saint Elizabeth

	Libraries	Post Offices	% of Libraries	% of Post Offices
Total	12	28		
Number With Electricity Service	12	N/A	100	N/A
Number With Telephone Service	6	4	50.0	14.3
Number With Internet Service	5	0	41.7	0.0

Hanover

	Libraries	Post Offices	% of Libraries	% of Post Offices
Total	8	16		
Number With Electricity Service	7	N/A	87.5	N/A
Number With Telephone Service	4	1	50.0	6.3
Number With Internet Service	1	1	12.5	6.3

Westmoreland

	Libraries	Post Offices	% of Libraries	% of Post Offices
Total	8	20		
Number With Electricity Service	8	N/A	100	N/A
Number With Telephone Service	4	2	50.0	12.5
Number With Internet Service	4	2	50.0	12.5

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