
Office of Utilities Regulation

**Update of the Fixed Cost Model and
Assessment of Fixed Infrastructure
Sharing Costs – Principles and
Methodology**

Consultation Document



OFFICE OF UTILITIES REGULATION

2020 January 8

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Abstract

This Consultation Document has been prepared to facilitate discussion and consultation on the approach that the Office of Utilities Regulation (“OUR”/“Office”) will take in relation to two separate modelling exercises:

- The update of the existing cost model to calculate the cost of wholesale fixed interconnection services, in accordance with the requirements of the Telecommunications Act (the “Act”).
- The development of a cost model to assess the costs of fixed infrastructure sharing services, following the principles outlined in the Act and the OUR’s draft Infrastructure Sharing Rules.

After receiving and analysing responses to this Consultation Document, the OUR plans to undertake the appropriate modelling to determine interconnection rates for the period 2021 to 2025 and to obtain reference costs for the provision of fixed infrastructure sharing services. In a parallel process, data requests have been sent to telecommunications operators (the “operators”). The data requested therein will be necessary, regardless of the approach that is finally taken, in the update of the fixed cost model, as well as the development of the cost model to assess the costs of fixed infrastructure sharing services.

Consultation Process

COMMENTS FROM INTERESTED PARTIES

Persons who wish to express opinions on this Consultation Document are invited to submit their comments in writing to the Office of Utilities Regulation (“OUR”) by post, delivery, facsimile or e-mail addressed to:

**Office of Utilities Regulation
P.O. Box 593,
36 Trafalgar Road,
Kingston 10**

**Attention: Fay Samuels
Fax: (876) 929-3635
E-mail: FixedLRICConsultation@our.org.jm**

Responses are requested by 2020 February 6.

Any confidential information should be submitted separately and clearly identified as such. The submission of confidential information should be accompanied by a justification in keeping with section 7(6) of the Telecommunications Act.

Responses that are not confidential, pursuant to sections 7(6) and 7A of the Telecommunications Act, will be posted to the OUR’s website (<http://www.our.org.jm/>). Respondents are therefore requested, where possible, to supply their responses in electronic form to facilitate such postings.

COMMENTS ON RESPONSES

There will therefore be a specific period for respondents to view other responses (non-confidential) and to make comments on them. The comments may take the form of either correcting a factual error or putting forward counterarguments and/or providing data relating to the project. As in the case of the responses, comments which are not confidential pursuant to the Telecommunications Act will be posted to the OUR’s website.

Comments on responses are requested by 2020 February 20.

ARRANGEMENTS FOR VIEWING RESPONSES

This Consultation Document and responses and comments received by the OUR will also be made available to the public through the OUR's Information Centre ("OURIC"). Persons who wish to view the Consultation Document, responses and comments should make an appointment by contacting:

Ms. Colleen Mignott
Coordinator OURIC/Information Officer
Telephone: (876) 968-6053
Fax: (876) 929-3635
Email: colleen.mignott@our.org.jm

Individuals with appointments should visit the OUR's offices at:

3rd Floor, PCJ Resource Centre,
36 Trafalgar Road,
Kingston 10

Photocopies of selected responses and comments may be provided on request at a price which reflects the cost to the OUR.

CONSULTATIVE TIMETABLE

The timetable for the consultation is summarized in the table below:

Event	Date
Publish Consultation Document	2020 January 8
Response to the Consultation Document	By 2020 February 6
Comments on Responses	By 2020 February 20
Issue Determination Notice	By 2020 April 17

Chapter 1: Introduction

Update of the Existing Fixed Cost Model

- 1.1. On 2015 July 1, the OUR published the document titled "Determination Notice for Cost Model for Fixed Termination Rates - Principles and Methodology," Document No. 2015/TEL/006/DET.002 (hereinafter, "the Methodology") which outlined the methodology to be followed in the development of a fixed cost model.
- 1.2. The existing Fixed Cost Model and the Determination Notice entitled "Cost Model for Fixed Termination Rates - The Decision on Rates (Document No. 2017/TEL/003/DET.001 (Confidential Version) and Document No. 2017/TEL/004/DET.002 (Public Version)¹) (hereinafter "the Notice") were issued on 2017 June 7. The Confidential Version of the Notice and the final Model were issued to Cable & Wireless Jamaica Limited (C&WJ) as they contained proprietary information of that company.
- 1.3. In the Notice, the OUR noted that while C&WJ is currently the only operator which has been found dominant with respect to fixed call termination service, the model estimated the cost of interconnection services for a generic fixed operator such that the rates obtained can be applied to any fixed network operator. That is, the model did not calculate a cost specifically for C&WJ's fixed network. The OUR also indicated that rates established in the Notice were applicable for four (4) years, i.e. 2017-2020. In keeping with its express statutory powers to determine the charges for interconnection services, the OUR has initiated this consultation process to decide on the potential methodology changes, that may be required based on market evolutions, to update the existing Fixed Cost Model.

Development of a Fixed Infrastructure Sharing Model

- 1.4. Infrastructure sharing has been identified as a means by which developing countries and other emerging economies can extend and improve the

¹https://www.our.org.jm/ourweb/sites/default/files/documents/sector_documents/determination_notice_-_cost_model_for_fixed_termination_rates_-_public_version.pdf

quality of Internet access services, especially for those marginalized communities that remain excluded from pervasive and affordable broadband. Globally, operators are also embracing the principle of sharing, as the traditional ownership model where individual network operators owned and/or operated the entire infrastructure required to provide services to their customers has been increasingly challenged.

- 1.5. Section 29A of the Telecommunications Act ("the Act") empowers the Office to impose on operators the obligation to share infrastructure (tangibles and intangibles) and to determine the terms and conditions of a sharing arrangement. In keeping with the mandate established under section 29A, the OUR has developed and consulted on Infrastructure Sharing Rules ("the Draft Rules"). These Rules are currently awaiting promulgation. Once promulgated the Rules will be applicable to all telecommunications infrastructure that is amenable to sharing.
- 1.6. In order to have a reliable means by which to determine fixed infrastructure sharing charges, the OUR has decided that it will develop a set of tools to evaluate the costs of infrastructure sharing services. The first tool to be developed is a standalone fixed infrastructure sharing model. As such, included in this consultation exercise is a process to decide the main methodological aspects to follow in the development of such a model.

Structure of Document

1.7. The remainder of this document is structured as follows:

- **Chapter 2** outlines the Legal Framework that underscores the remit of the OUR in regard to the setting of interconnection and infrastructure sharing rates.
- **Chapter 3** discusses the proposed changes to the methodological approach to update the existing framework used in setting wholesale fixed interconnection rates.
- **Chapter 4** proposes a new framework for the assessment of the cost of providing fixed telecommunications infrastructure sharing services.

Chapter 2: Legal and Regulatory Framework

2.1. As part of its overall functions to regulate specified services and facilities under section 4(1) of the Act, and in keeping with its express power to determine the rates which may be charged in respect of the provision of a prescribed utility service under section 4(4) of the Office of Utilities Regulation Act ("the OUR Act"), the OUR is authorised to determine the prices charged by telecommunications operators for the provision of services.

Section 4(1)(a) of the Act states:

“(1) The Office shall regulate telecommunications in accordance with this Act and for that purpose the Office shall -

(a) regulate specified services and facilities”

Section 4(4) of the OUR Act states:

“(4) The Office shall have power to determine, in accordance with the provisions of this Act, the rates or fares which may be charged in respect of the provisions of a prescribed utility service.”

2.2. A “specified service” is defined in section 2 of the Act to mean, inter alia, a telecommunications service, while a “prescribed utility service” is defined in section 2 and the First Schedule of the OUR Act to include the provision of telecommunications services.

2.3. The legal framework governing interconnection, which is a type of telecommunications service, can be found in Part V (sections 27-37A) of the Act.

2.4. The Act at Section 29 (1) states:

“Each carrier shall, upon request in accordance with this Part, permit interconnection of its public network with the public network of any other carrier for the provision of telecommunications services”.

2.5. The Act grants the OUR specific powers with regard to the determination of tariffs charged for interconnection services. Sections 29 (4)(a) and (5) state:

“(4) The Office may -

(a) on its own initiative, in assessing an interconnection agreement, make a determination of the terms and conditions, including charges;

...

“(5) When making a determination of an operator's interconnection charges, the Office shall have regard to -

(a) the principles of cost orientation or reciprocity;

(b) local or international benchmarks; or

(c) any other approach that is relevant to the determination of interconnection charges.”

2.6. The Act at section 30 requires that dominant public telecommunications carriers provide interconnection in accordance with various principles. In particular section 30 (1)(a)(iii) requires that charges for interconnection services “...shall be cost oriented and guided by the principles specified in section 33”.

2.7. These principles of cost orientation are stated in Section 33 as follows:

“(1) Where the Office is required to determine the charges for the provision of interconnection by a dominant carrier, it shall, in making that determination, be guided by the following principles -

(a) costs shall be borne by the carrier whose activities cause those costs to be incurred;

(b) non-recurring costs shall be recovered through non-recurring charges and recurring costs shall be recovered through recurring charges;

- (c) costs that do not vary with usage shall be recovered through flat charges and costs that vary with usage shall be recovered through charges that are based on usage;*
- (d) costs shall include attributable operating expenditure and depreciation and an amount estimated to achieve a reasonable rate of return;*
- (e) with the exception of interconnection charges for wholesale termination services, interconnection charges shall be established between the total long run incremental cost of providing the service and the stand alone cost of providing the service, so, however, that the prices shall be so calculated as to avoid placing a disproportionate burden of recovery of common costs on interconnection services;*
- (f) where appropriate, interconnection costs shall include provision for a supplementary charge, being a contribution towards the access deficit of the interconnection provider; and*
- (g) in the case of charges for wholesale termination services, charges shall be calculated on the basis of forward looking long run incremental cost, whereby the relevant increment is the wholesale termination service and which includes only avoidable costs.*

(2) Where the Office has been unable to obtain cost information that it is reasonably satisfied is relevant and reliable it may take into account local and international benchmarks, reciprocity and any other approach that in the opinion of the Office is relevant.”

2.8. Express provisions regarding the powers of the OUR to impose an infrastructure sharing obligation and to determine infrastructure sharing rates are set out in section 29A of the Act which reads as follows:

“(1) Subject to subsection (3), the Office may -

(a) impose an infrastructure sharing obligation on a licensee, where the Office considers it to be justified having regard to any of the following considerations –

(i) matters relating to public health or to the environment or town planning or other development considerations;

(ii) economic inefficiencies; or

(iii) physical or technical impracticability;

(b) determine the terms and conditions of any infrastructure sharing obligation pursuant to paragraph (a); and

(c) hear and determine complaints made by licensees and disputes in respect of charges and other terms and conditions of the infrastructure sharing arrangement.

(2) All infrastructure sharing arrangements made by the Office shall include the making of rules, after consultation with the Minister, for the apportionment of the costs of sharing infrastructure; and the rules shall be made in accordance with the principles set out in section 33.

(3) In determining whether to impose an infrastructure sharing obligation on a licensee, or in determining the terms and conditions of an infrastructure sharing obligation imposed under subsection (1), the Office shall consult with licensees, the relevant environmental and planning authorities and the Authority.

(4) In this section-

"infrastructure sharing" means the provision to licensees of access to tangibles used in connection with a public network or intangibles facilitating the utilization of a public network;

"intangibles" includes agreements, arrangements, leases, licences, franchises, rights of way, easements and other similar interests;

"tangibles" includes-

- a) *lines, cables and wires;*
- b) *equipment and apparatus;*
- c) *towers, risers and masts;*
- d) *conduits, tunnels and ducts;*
- e) *manholes and other holes and pits;*
- f) *poles and antennae;*
- g) *huts and landing stations; and*
- h) *land, building and other real property."*

2.9. In accordance with its powers under Section 29A of the Act, on 2017 March 30, the OUR published a Notice of Proposed Rule-Making on Infrastructure Sharing which included Proposed Infrastructure Sharing Rules - Document No. 2017/TEL/002/NPR.001 (the "Draft Rules"). The Draft Rules, which were developed in accordance with section 33 of the Act, are yet to be promulgated, but outlines the guidelines proposed by the OUR for, inter alia, the assessment of rates for shared infrastructure. While the Draft Rules are not yet in effect, the proposals in this consultation are consistent with the provisions of the Draft Rules, so as to ensure consistency in the regulatory framework when the Infrastructure Sharing Rules are put into operation.

2.10. Clauses 7.1 to 7.4 of the Draft Rules state:

7.1 An Infrastructure Provider shall set infrastructure sharing rates in accordance with the following principles:

- a. *Charges for infrastructure sharing shall be determined in a transparent manner - details as to how charges for infrastructure sharing have been determined, shall be disclosed to the Office upon request.*

- b. Infrastructure Providers shall unbundle distinct facilities and corresponding charges sufficiently so that the Infrastructure Seeker pays only for the specific elements required.*
- c. Charges for the provision of infrastructure shall be structured in such a manner so as to distinguish and separately price for the following aspects:
 - i. The implementation of sharing including testing;*
 - ii. Rental charges for use of the infrastructure; and*
 - iii. Variable charges for ancillary and supplementary services.**
- d. Costs shall be borne either by the Infrastructure Seeker or the Infrastructure Provider or both, based on whether their respective requests and compliance therewith cause those costs to be incurred. However, the Infrastructure Provider shall not seek to recover from the Infrastructure Seeker the costs associated with providing existing technical information about the site, including the Infrastructure Provider's review of such requests and technical analysis.*
- e. Infrastructure sharing charges shall be cost-based and shall be set to allow the Infrastructure Provider to recover a reasonable rate of return on its capital appropriately employed, all attributable operating expenditures, depreciation and a proportionate contribution towards the Infrastructure Provider's fixed and common costs. However, where the Infrastructure Provider and Infrastructure Seeker are providing each other with the same services the related infrastructure sharing charges can be reciprocal for the same service.*

- f. Infrastructure sharing charges shall not include compensation for loss of business as a result of providing infrastructure sharing services to the Infrastructure Seeker.*
- g. Infrastructure sharing charges should serve to promote the efficient use of assets and sustainable competition and maximize benefits for customers. The infrastructure sharing charge offered to the Infrastructure Seeker shall not be more than the cost of owning and operating similar infrastructure.*
- h. Infrastructure sharing charges must be impartial/non-discriminatory. This means that charges for infrastructure must be no less favourable than those the Infrastructure Provider offers its connected company or any other licensed operator.*
- i. The burden of proof that infrastructure sharing charges are based on costs shall lie with the Infrastructure Provider in all cases.*

7.2. In the setting of its charges an Infrastructure Provider shall utilize the fully distributed cost methodology, using current cost accounting and the annuities approach to depreciation.

7.3. Every Licensee shall develop a standard price list which shall provide guidance for determining the price for all sharing arrangements with other Infrastructure Seekers.

7.4. The standard price list shall be reasonable, non-discriminatory, and based on the costing methodology as mandated by the Office.

Section 29A(1)(c) of the Act outlines the OUR's powers to settle complaints and disputes in respect of, inter alia, charges for infrastructure sharing arrangements. Clauses 7.5 to 7.7 of the Draft Rules provide further details regarding this aspect. Specifically:

7.5 Where the Office has been asked to intervene in a dispute regarding infrastructure sharing charges, the Infrastructure Provider

shall, within ten (10) working days of a written request from the Office, supply the Office with such data as the Office may require, for the purpose of determining that the Infrastructure Provider's proposed charges are set in accordance with the principles set by the Office, unless the Office expressly extends this period in writing.

7.6. Where the Office has been unable to obtain cost information that it is reasonably satisfied is relevant and reliable from a Licensee it may take into account local and international benchmarks, reciprocity and other approaches that in the opinion of the Office is relevant to the setting of charges for infrastructure sharing.

7.7. The Office may in consultation with stakeholders, revise the costing methodology for infrastructure sharing.

Chapter 3: Main Changes Proposed to the Methodological Framework of the Existing Fixed Cost Model

3.1. The current fixed cost model is a bottom-up LRIC model that calculates the cost of fixed voice termination services. The methodological aspects followed in the development of the current version of the Model, are as follows:

Methodological aspects	Approach considered
Main Modelling Approach	Bottom-up model
Period of Time Modelled	The period modelled is 2013-2020. Interconnection rates were established for a five (5) year period (i.e. 2016-2020).
Data Sources	The Model uses information provided by operators as the primary source of data. Information from international benchmarks deemed appropriate for the Jamaican reality, represent the preferred alternative source of data.
Cost Standard	The Model estimates charges based on three (3) costs standards: Pure LRIC; TLRIC and SAC. The access network is not taken into account in these calculations.
	Network joint and common costs are allocated using the Shapley-Shubik approach.
	Non-network common costs are allocated using an EPMU approach.
Costs Elements Considered	The Model considers the following cost elements: <ul style="list-style-type: none"> ○ Network CapEx ○ Network OpEx ○ Licences, frequency usage fees and way fees ○ Retail costs ○ G&A costs
Treatment of OpEx	The OpEx is included in the cost model as the absolute yearly unit OpEx associated to each network element.
Assets Valuation Method	Asset valuation is implemented using the static CCA approach.

Methodological aspects	Approach considered
Consideration of Modern Equivalent Assets	The MEA approach is implemented in the Model, for some relevant assets, using a transition modelling approach.
Annualisation Method	Tilted annuity approach
Treatment of Working Capital	Network OpEx working capital is included in the Model as a percentage of Network OpEx, independent of its sign.
Definition of the Reference Operator	A reference operator with similar characteristics to the incumbent was modelled.
Network Details	The Model uses a yearly approach for network dimensioning and optimisation. (It estimates the number of assets for a given year without taking into consideration the network status in previous years)
Fixed Services and Increments	<p>The model includes the following list of services:</p> <p>Retail voice services</p> <ul style="list-style-type: none"> ○ Voice Outgoing On-net ○ Voice Outgoing Off-net to fixed ○ Voice Outgoing Off-net to mobile ○ Voice Outgoing Off-net to international ○ Voice Outgoing Calls ending in voicemail ○ Voice Outgoing Calls to voicemail retrieval ○ Voice Outgoing Calls to emergency services ○ Voice Outgoing Calls to weather warning service ○ Voice Outgoing Calls to home country direct collect service ○ Voice Outgoing Calls to national DQ service ○ Voice Outgoing Calls to international DQ service ○ Voice Outgoing Calls to national on-net freephone access service ○ Voice Outgoing Calls to national off-net freephone access service ○ Voice Outgoing Calls to own freephone access service ○ Voice Outgoing Calls to international freephone access service

Methodological aspects	Approach considered
	<p>Wholesale voice services</p> <ul style="list-style-type: none"> ○ Voice Transit Domestic transit ○ Voice Transit International transit ○ Voice Outgoing Originating to on-net ○ Voice Outgoing Originating to off-net ○ Voice Incoming Terminating to fixed local ○ Voice Incoming Terminating to fixed national ○ Voice Incoming Terminating from international direct to fixed ○ Voice Incoming Terminating to emergency services ○ Voice Incoming Terminating to weather warning service ○ Voice Incoming Terminating to national DQ ○ Voice Incoming Terminating to international DQ ○ Voice Incoming Terminating to national freephone access service ○ Voice Incoming Terminating to own freephone access service ○ Voice Incoming Terminating to international freephone access service ○ Voice Incoming Terminating to home country direct collect service <p>Non-voice services</p> <ul style="list-style-type: none"> ○ Retail broadband traffic ○ Retail Leased lines intra-parish ○ Retail Leased lines inter-parish ○ Retail Leased lines core node to international ○ Voice Call Centre Both Call Centre service
Fixed Network Design - Boundary Between Access and Core Networks	A modified scorched node approach is used to model the fixed network, without including the assets associated to the access network (below line card).
Fixed Network Design - Network Topology Design	A progressive increase of access nodes is considered for the implementation of the modified scorched node approach.
Fixed Network Design -	A modified scorched node approach is used to model the fixed network, without including the access network. In addition, migration profiles are used to

Methodological aspects	Approach considered
Technologies to be Modelled	model the core and transmission technologies of the network (from legacy to TDM).
Use of Gradients	The Model does not allow for peak/off-peak price gradients for fixed interconnection rates.
Charging Basis	The Office implemented fixed interconnection charges using only duration per minute billed on a per second basis.
Charges Structure	The Model defines two types of charges, which depend on the interconnection level (1 - local and 2 – National/regional).

Exhibit 3.1 Summary of the methodology implemented in the existing model [Source: Axon Consulting]

3.1. Based on developments in the Jamaican fixed telecommunication markets, the OUR believes that the following methodological aspects should be modified:

- Period of Time Modelled
- Definition of the Reference Operator

3.2. In the OUR's view, all other methodological aspects presented in the aforementioned Methodology, remain robust and up-to date.

Question 1: Do you believe that any other methodological aspect defined in the Methodology should be updated or changed? Please justify your position and provide supporting information and references.

Period of Time Modelled

3.3. As was stated earlier, the 2017 Determination Notice indicated that the current fixed model covers the period between 2013 and 2020, and was used to set interconnection charges for the 2017-2020 period. At the start of the project, it was intended that the rates would have been established for five years (2016-2020). However, due to significant delays in the data collection phases, the project was not completed until 2017.

- 3.4. The OUR now proposes that the updated Model be used to determine wholesale interconnection rates for a five-year period, specifically for the 2021-2025 period.
- 3.5. In order to be aligned with the current methodology, the OUR believes that the model should be properly calibrated with the reality of the telecommunications operations in Jamaica. Additionally, the OUR believes that one historical year should be sufficient to ensure proper calibration.
- 3.6. Therefore, the OUR considers that the period of time modelled should commence from the year 2018 (which is the last full financial year for which data is available). This would ensure the proper calibration of the model.
- 3.7. Based on the above, the OUR proposes that the model covers the 2018-2025 period.

Question 2: Do you agree with the decision to update the fixed cost model for the 2018-2025 period? If you do not agree, please justify your position and provide supporting information and references.

Definition of the Reference Operator

- 3.8. One of the most important methodological issues to be decided when developing a bottom-up long run incremental cost (BULRIC) model is the definition of the operator that will be modelled - the so-called reference operator.
- 3.9. The current methodology is based on a “*hypothetical, generic, existing operator*” which has similar characteristics to the incumbent, C&WJ (then t/a LIME). In particular, the reference operator has the same demand and network footprint as C&WJ.
- 3.10. In fact, in chapter 4 of the Methodology it is stated:

The Office will model a reference operator with similar characteristics to the Jamaican incumbent, LIME. This means that the Office will assume the same demand, taking into account

international best practices for BULRIC models, as well as the Jamaican reality.

Both LIME and Flow agreed that the reference operator should be a fixed operator with demand similar to LIME, as proposed in the Consultation Document.²

3.11. The OUR is of the opinion that a BULRIC model that represents a hypothetical, generic, existing operator is still the best option for the market. Further, as was done in the existing model, the most common international practice for fixed BULRIC Models is to assess the costs of a fixed operator with a demand and a network footprint similar to the incumbent.

3.12. Regarding the particular operator to use as a reference, it is important to highlight that Columbus Communications Jamaica Limited (formerly t/a Flow; hereinafter referred to as “Columbus”) was acquired by C&WJ’s parent company in 2015 January. While the companies still operate under separate licences, they market their products under a single brand, i.e. FLOW. Based on this market change, the “combined” operator should be considered as the reference operator to be included in the fixed model.

3.13. Therefore, from a regulatory perspective, it is the view of the OUR that presently, the incumbent can be considered as having the combined coverage and market share of C&WJ and Columbus.

3.14. In order to account for the characteristics of the “combined” operator the following aspects should be considered in the updated model:

- The demand should be equal to C&WJ’s demand plus Columbus’ demand.
- The coverage should consider the footprint covered by either C&WJ or Columbus.

²

https://www.our.org.jm/ourweb/sites/default/files/documents/sector_documents/cost_model_for_fixed_termination_rates_-_principles_and_methodology.pdf

- Any overlapping of coverage (i.e. areas covered by both C&WJ and Columbus) should be considered but potential inefficiencies associated with the overlapping networks should be removed. The removal of these inefficiencies will be informed by the operational plans of the “combined” operator.
- The cost base of the modelled operator will be reconciled with the “combined” operator’s costs (C&WJ’s costs including costs from Columbus), removing any identified inefficiency.

Question 3: Do you agree with the OUR that the updated BULRIC model for fixed interconnection should consider a reference operator based on the combination of C&WJ and Columbus as described above? If you do not agree, please justify your position and provide supporting information and references.

Chapter 4: Methodology for the Assessment of Fixed Infrastructure Sharing Costs

- 4.1. The main objective of the development of the fixed infrastructure sharing cost model is to provide the Office with a tool that will assist it in the determination of fixed infrastructure sharing charges where required.
- 4.2. When defining the methodology for the development of the fixed infrastructure sharing cost model, there are a number of aspects, which need to be carefully addressed. This section describes the list of proposed methodological principles for the infrastructure sharing cost model, namely:
- Period of Time Modelled
 - Definition of the Reference Operator
 - Data Sources
 - Cost Standard
 - Costs Elements to be Considered
 - Treatment of Capital-Related Costs
 - Services to be included in the fixed infrastructure sharing model

Period of Time Modelled

- 4.3. The period of time modelled will be relevant to the scope of the possible analyses of the model's results, in order to ensure regulatory certainty for the stakeholders.
- 4.4. Section 29A(1)(b) and (c) of the Act empowers the OUR to determine the terms and conditions of any infrastructure sharing obligation it imposes on a licensee, as well as determine complaints and disputes in respect of charges imposed in an infrastructure arrangement. In this regard, the Draft Rules at sections 7.4 and 7.5 require that prices for infrastructure sharing be based on the costing methodology mandated by the Office and that, in a dispute, the infrastructure provider should supply the Office with such data

it deems necessary to determine that the proposed charges conform with the principles set by the Office.

- 4.5. In line with the proposed updated fixed line cost model, the infrastructure sharing model should be able to calculate figures until 2025.
- 4.6. The OUR believes that, in order to calculate the figures until 2025, demand and resources unit cost forecasts should be considered for inclusion in the model. Other parameters shall be kept constant.
- 4.7. Therefore, the OUR proposes that the infrastructure sharing model covers the period 2018-2025.

Question 4: Do you agree with the decision of covering the period 2018-2025? If you do not agree, please justify your position and provide supporting information and references.

Definition of the Reference Operator

- 4.8. One of the key methodological issues for a fixed infrastructure sharing model is the definition of the operator that will be modelled - the so-called reference operator.
- 4.9. Based on international best practice, the reference operator to be considered for this type of model is a generic operator based on the incumbent.
- 4.10. As stated earlier in the “Definition of the Reference Operator” section of Chapter 3, the OUR is of the view that the incumbent can be considered as the “combined” operator resulting from the operation between C&WJ and Columbus.

Question 5: Do you agree with the OUR that the fixed infrastructure sharing cost model should consider a reference operator based on the combination of C&WJ and Columbus as described above? If you do not agree, please justify your position and provide supporting information and references.

Data Sources

- 4.11. Based on our experience, cost models require a significant number of inputs to be able to model the network accurately and to reliably represent the specificities of the Jamaican market.
- 4.12. In order to populate the fixed infrastructure sharing model, data such as unit costs and utilisation factors, among others, will be required.
- 4.13. The information provided by operators will be employed as a primary and preferential source to populate and calibrate the fixed infrastructure sharing model. In this regard, the OUR has sent a data request to the operators and will engage with them to facilitate the exchange of information. The OUR expects that all operators concerned, will cooperate in order to ensure the completeness and accuracy of the data gathered.
- 4.14. It should be noted that based on the ensuing determination notice, a second data request may be issued to the operators at a later date.
- 4.15. Data provided in this process that are classified as confidential, pursuant to the procedures set out in section 7(6) of the Act, shall be treated as secret and confidential. Note that information, which is already in the public domain, will not be considered as confidential.
- 4.16. In cases where data is not available, not provided by the operators, or when the data provided is not considered to be reasonable and/or sufficiently reliable, the OUR will resort to the use of international benchmarks as the preferred alternative data source.
- 4.17. Data provided by operators will be carefully reviewed to ensure its reliability. The following exhibit presents the data review process:

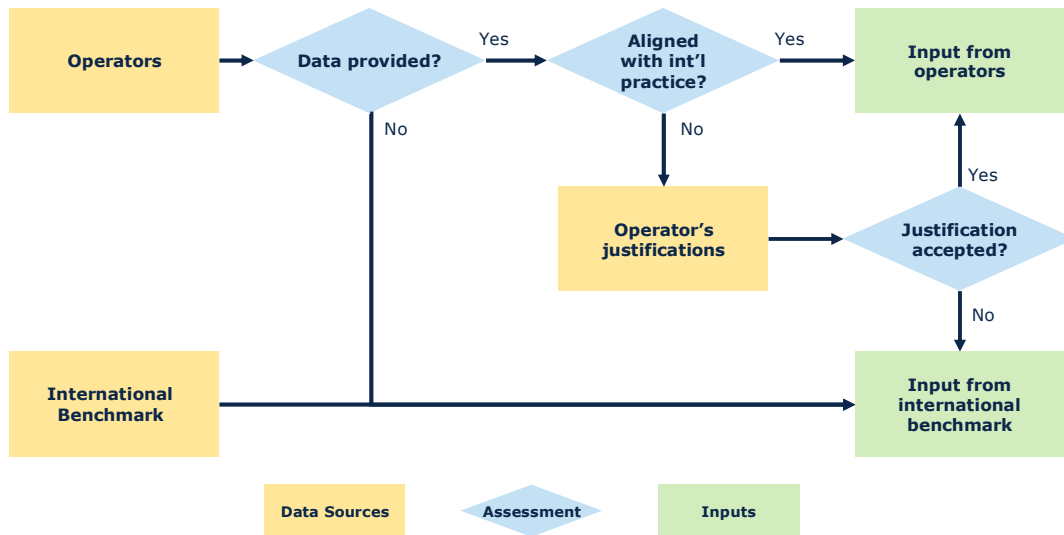


Exhibit 4.1 Diagram of OUR's data revision process. [Source: Axon Consulting]

4.18. As the exhibit above shows, the following steps will be performed:

- If the information provided by the operators is reasonably aligned with values usually registered in the industry and in models published by other National Regulatory Agencies (NRAs), it will be used in the cost model.
- If, on the contrary, the information provided is not considered to be reasonable and/or reliable, clarifications will be requested from operators to validate it. If clarifications are provided with sufficient supporting evidence and thus can be accepted, or if new adjusted and reasonable inputs are provided and properly justified with evidence, these will be used in the model.
- When operators do not provide the requested information or when the data provided is not considered to be reasonable and/or sufficiently reliable after the clarification process, it will be extracted from other publicly available cost models developed by other NRAs.

Question 6: Do you agree with the proposed data sources to be used for the fixed infrastructure sharing model? If you do not agree, please justify your position and provide supporting information and references.

Cost Standard

4.19. As described in Chapter 2 of this document, section 7.2 of the Draft Rules proposes the basis of the infrastructure sharing charges to be as follows:

7.2. In the setting of its charges an Infrastructure Provider shall utilize the fully distributed cost methodology, using current cost accounting and the annuities approach to depreciation.

4.20. Based on this, in order to ensure consistency with the Draft Rules, the fixed infrastructure sharing model will follow a fully distributed cost (FDC) methodology.

4.21. The methodological aspects to be followed to implement the FDC methodology are covered in subsequent subsections.

Costs Elements to be Considered

4.22. Bottom-up cost models may include a number of cost elements, which can typically be classified within the following groups:

- Network CapEx
- Network OpEx
- G&A costs

4.23. The categories listed above are analysed in the following sections:

Network CapEx

4.24. Network CapEx refers to the investments made by the operators for deploying the network, (for example, ducts, and subducts), installation costs and other one-off fees.

4.25. In section 7.1 of the “Draft Rules”, it is stated that:

d. Costs shall be borne either by the Infrastructure Seeker or the Infrastructure Provider or both, based on whether their respective requests and compliance therewith cause those costs to be incurred. However, the Infrastructure Provider shall not seek to recover from the Infrastructure Seeker the costs

associated with providing existing technical information about the site, including the Infrastructure Provider's review of such requests and technical analysis.

e. Infrastructure sharing charges shall be cost-based and shall be set to allow the Infrastructure Provider to recover a reasonable rate of return on its capital appropriately employed, all attributable operating expenditures, depreciation and a proportionate contribution towards the Infrastructure Provider's fixed and common costs. However, where the Infrastructure Provider and Infrastructure Seeker are providing each other with the same services the related infrastructure sharing charges can be reciprocal for the same service.

4.26. The OUR considers that there is a relationship between the costs of deployment of infrastructure that is shared and the provision of infrastructure sharing services.

4.27. Therefore, the OUR believes that all relevant network CapEx elements (investments made by operators for deploying the network such as, ducts, subducts etc.), installation costs and other one-off fees should be included in the infrastructure sharing model.

4.28. The upcoming section titled ***Treatment of Capital-Related Costs*** addresses the annualisation method that is to be applied to CapEx. This is the way in which the network CapEx will be recovered along the useful life of the asset.

Question 7: Do you agree that Network CapEx included in the fixed infrastructure sharing model should include costs of deployment, installation and other one-off fees? If you do not agree, please justify your position and provide supporting information and references.

Network OpEx

4.29. Network OpEx includes the recurrent costs associated with operating the network. This includes network personnel, outsourced maintenance

services, recurrent charges for subcontracted network services, network elements rentals and other administrative fees or taxes.

4.30. As stated in the previous section, in Section 7.1 of the “*Draft Rules*”, it is stated that:

d. Costs shall be borne either by the Infrastructure Seeker or the Infrastructure Provider or both, based on whether their respective requests and compliance therewith cause those costs to be incurred. However, the Infrastructure Provider shall not seek to recover from the Infrastructure Seeker the costs associated with providing existing technical information about the site, including the Infrastructure Provider’s review of such requests and technical analysis.

e. Infrastructure sharing charges shall be cost-based and shall be set to allow the Infrastructure Provider to recover a reasonable rate of return on its capital appropriately employed, all attributable operating expenditures, depreciation and a proportionate contribution towards the Infrastructure Provider's fixed and common costs. However, where the Infrastructure Provider and Infrastructure Seeker are providing each other with the same services the related infrastructure sharing charges can be reciprocal for the same service

4.31. In this case, similar to the explanation presented for network CapEx, the OUR considers that there is a relationship between the costs of operating and maintaining the infrastructure that is shared and the provision of infrastructure sharing services.

4.32. However, it should be clarified that only the relevant proportion of the costs related to the operation and maintenance of the assets that are shared will be considered in the calculation of the costs for infrastructure sharing services.

4.33. The OUR proposes that OpEx is included in the cost model as the absolute yearly unit OpEx associated to each network element. In the case that

absolute yearly unit costs are not available from the operators, alternative methodologies such as the calculation of unit OpEx as a percentage of unit CapEx may be applied.

Question 8: Do you agree that Network OpEx should be included in the infrastructure sharing model as the absolute yearly unit OpEx (or percentage over unit CapEx) for each network element? If you do not agree, please justify your position and provide supporting information and references.

General & Administrative (G&A) Costs

4.34. G&A costs are associated with management activities and are common for network and commercial activities (human resources, finance, management, etc.). It is common practice to include G&A costs in cost models based on a mark-up on top of network costs.

4.35. The OUR proposes to include G&A costs in the fixed infrastructure sharing model based on a mark-up percentage on top of costs, aligned with the methodology of the fixed model. This approach is robust given that the same reference operator is considered in both models.

Question 9: Do you agree that G&A expenses should be included in the infrastructure sharing model? If you do not agree, please justify your position and provide supporting information and references.

Cost of Capital

4.36. The costing of services needs to take into account a reasonable amount of return on the invested capital an operator would be able to earn in a truly competitive market.

4.37. In Section 7.1 of the "Draft Rules", specifically in the rule 7.1.e is stated that:

Infrastructure sharing charges shall be cost-based and shall be set to allow the Infrastructure Provider to recover a reasonable rate of return on its capital appropriately employed, all attributable

operating expenditures, depreciation and a proportionate contribution towards the Infrastructure Provider's fixed and common costs. However, where the Infrastructure Provider and Infrastructure Seeker are providing each other with the same services the related infrastructure sharing charges can be reciprocal for the same service.

4.38. Based on the rule 7.1.e of the "Draft Rules", the OUR proposes the use of **Weighted Average Cost of Capital (WACC)**, which is defined as the sum of the weighted cost of equity and debt. These weights are based on the market value of debt and equity, respectively. This approach is the preferred mechanism in the telecommunications industry and in the implementation of telecommunication cost models.

4.39. The forthcoming section on **Treatment of Capital-Related Costs** addresses the annualisation method to be applied to CapEx, which incorporates the impact of the cost of capital, based on the WACC value.

Question 10: Do you agree with the use of the Weighted Average Cost of Capital (WACC) for the calculation of the reasonable rate of return on the capital of the operator? If you do not agree, please justify your position and provide supporting information and references.

4.40. In the "Determination Notice for Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers" which was published on 2016 November 15, WACCs were determined for fixed carriers and mobile carriers. Paragraph 1.3 of that Determination Notice stated that:

"The estimate of the WACC will be needed as an input into any pricing model to be developed or approved by the OUR as it serves as a measure of the return on capital which telecommunications companies are allowed to earn."

4.41. The OUR plans to update the WACC for fixed carriers approved in 2016. The updated WACC calculation and methodology will be consulted on during the consultation process for the draft fixed cost model and the draft fixed infrastructure sharing model (scheduled for 2020).

Treatment of Capital-Related Costs

Assets Valuation Method

4.42. The determination of the value of assets is generally performed according to one of the following approaches:

- **Historical Cost Accounting (HCA)** is the average price paid historically by the company to acquire an asset, based on the operator's book.
- **Current Cost Accounting (CCA)** reflects the investments a new operator would currently face to deploy equivalent assets.

4.43. Rule 7.2 of the Draft Rules defines the asset valuation methodology that should be followed:

7.2. In the setting of its charges an Infrastructure Provider shall utilize the fully distributed cost methodology, using current cost accounting and the annuities approach to depreciation.

4.44. Therefore, in order to be consistent with the approach set out in the Draft Rules, the OUR will follow a current cost accounting approach (CCA Approach).

4.45. Further, it should be noted that this methodology is aligned with the methodology followed in the fixed model.

4.46. Regarding the current cost accounting approach (CCA), there are different methods of calculating asset values based on this approach. They include:

- **Absolute Valuation:** The absolute valuation methodology requires using the current market unitary price for an asset. This methodology is the most common one in international practice in the case of bottom-up cost models.
- **Modern Equivalent Asset (MEA):** The MEA methodology requires assets to be evaluated according to the current price of an equivalent asset in terms of capacity and functionality.

- **Indexation:** This methodology reevaluates historical costs based on a price index, showing the evolution in the price of the asset over time.

4.47. In order to be aligned with international practice, and considering the assets to be included in the infrastructure model (ducts, subducts, poles, etc.), the OUR believes that the most appropriate methodology to implement the CCA option is the absolute valuation methodology.

4.48. It should be noted that the absolute valuation approach is also the methodology considered for infrastructure elements reflected in the current fixed model.

Question 11: Do you agree with the OUR's view that the model should utilize the absolute valuation methodology in its evaluation of assets on a current cost accounting (CCA) basis? If you do not agree, please justify your position and provide supporting information and references.

Annualisation Method

4.49. The pattern of cost recovery over time is critically dependent on the depreciation methodology selected. When calculating the annualised costs, the Financial Capital Maintenance (FCM) principle should be respected. The concern of FCM is to maintain the financial capital of the company. This maintenance is achieved when the value of shareholder funds is the same in real terms at the start and at the end of the period. In practical terms, the FCM principle ensures that costs incurred for the provision of services are recovered, including an appropriate level of profit.

4.50. The annualisation methods that are compatible with the FCM are the following:

- **Straight line depreciation** – this is the method most commonly used in financial accounting. It simply spreads the original cost of an asset evenly across its economic lifetime.
- **Standard Annuity** also spreads the cost of an asset over its economic life, but in addition considers the opportunity cost of

capital, i.e. the interest forgone, which would have been earned had the cash been invested elsewhere. In a standard annuity, the annual charge remains constant over the life of the asset.

- **Tilted Annuity** is an equivalent methodology to the standard annuity but relaxes the assumption of constant prices. This is relevant in telecommunications networks, as equipment prices tend to fall over time, whereas infrastructure costs (digging trenches, for example) tend to rise over time.
- **Economic depreciation** is defined as the period-by-period change in the market value of an asset. In practice, given the difficulty of objectively determining the economic depreciation, this is approximated by an **adjusted tilted annuity**, in which the tilt in the amount of depreciation each year incorporates, in addition to the variation in the asset price, the amount of output produced by the asset.

4.51. As described in Chapter 2, rule 7.2 of the Draft Rules outlines costing methodology to be used in the setting of infrastructure sharing charges, including the depreciation methodology:

7.2. In the setting of its charges an Infrastructure Provider shall utilize the fully distributed cost methodology, using current cost accounting and the annuities approach to depreciation.

4.52. Based on this, the OUR considers the tilted annuity approach as the preferred annualisation methodology, since:

- The methodology is aligned with the current fixed cost model and international practice.
- It offers the best equilibrium between economic accuracy and ease of implementation.

4.53. The useful lives of each asset class will be determined based on the data provided by the operators. In cases where the data provided shows material

deviations from internationally accepted useful lives, the safeguards described in the Data Sources section will be utilised.

Services to be included in the fixed infrastructure sharing model

4.54. Cost models used in the calculation of fixed infrastructure sharing costs include those services that are shared with other operators, or those that shall be provided for sharing in the foreseeable future, by the operators. The services should also be provided at a level of disaggregation that allows the accurate modelling of the networks and their costs. It is important to highlight that the inclusion of a service in the proposed fixed infrastructure sharing cost model should not be viewed as an indication that it is going to be regulated nor should the non-inclusion of a service be viewed as an indication that a sharing obligation cannot be imposed on such a service.

4.55. As stated in the Chapter 2, rule 7.1 of the Draft Rules states in part:

7.1 An Infrastructure Provider shall set infrastructure sharing rates in accordance with the following principles:

[...]

c. Charges for the provision of infrastructure shall be structured in such a manner so as to distinguish and separately price for the following aspects:

i. The implementation of sharing including testing;

ii. Rental charges for use of the infrastructure; and

iii. Variable charges for ancillary and supplementary services.

d. Costs shall be borne either by the Infrastructure Seeker or the Infrastructure Provider or both, based on whether their respective requests and compliance therewith cause those costs to be incurred. However, the Infrastructure Provider shall not seek to recover from the Infrastructure Seeker the costs associated with providing existing technical information about the site, including the

Infrastructure Provider's review of such requests and technical analysis.

4.56. Based on rule 7.1 of the Draft Rules, the OUR believes that it could be relevant to include services related to each of the categories listed in section 7.1.c (as stated above) while taking account of section 7.1.d. In the following paragraphs, the services proposed to be included in the initial version of the fixed infrastructure sharing cost model are described.

Infrastructure sharing implementation and testing services

4.57. As described in rule 7.1, the infrastructure sharing services should include implementation and testing services.

4.58. Based on that, and considering international practice, the following services should be included:

- **Feasibility study.** This entails performing a new analysis of the infrastructure elements associated to a route in order to identify those elements that could be shared between the infrastructure seeker and the infrastructure provider.
- **Service registration.** The infrastructure seeker must complete a form requesting the registration of the service and the infrastructure provider shall make available the infrastructure element to be shared.
- **Accompaniment.** Provision of a technician's support during any task developed by the infrastructure seeker (e.g. during the installation of the seeker's equipment within the shared infrastructure).

Question 12: Do you agree with the proposed list of implementation and testing services for the fixed infrastructure sharing model? If you do not agree, please justify your position and provide supporting information and references.

Rental charges for use of the infrastructure

4.59. As described in rule 7.1, the infrastructure sharing services should include rental charges for use of the infrastructure.

4.60. Based on the above, the OUR believes that according to the current status of the Jamaican telecommunication market and in line with the definition of infrastructure in the Act, services related to the following should be included in the initial version of the sharing model.

- **Duct rental.** This service will include the costs related to trenches, manholes and the duct itself. This service will be measured in JMD per km and per month. The OUR believes that it is relevant to disaggregate the cost of this service in the following categories:
 - **Urban:** This category corresponds with sharing of infrastructure that is located within a city or town.
 - **Inter-urban:** This category corresponds with the sharing of infrastructure that is located outside a city or town (e.g. in a road between cities/towns).
- **Sub-duct rental.** The subduct corresponds to a pipe that generally has a smaller diameter compared to ducts whose main purpose is to carry and protect fibre cables. The subducts are introduced into the ducts. This service will include the costs related to trenches, manholes, ducts and the subduct itself. This service will be measured in JMD per km and per month. The OUR believes that it is relevant to disaggregate the cost of this service in the following categories:
 - **Urban:** This category corresponds with sharing of infrastructure that is located within a city or town.
 - **Inter-urban:** This category corresponds with sharing of infrastructure that is located outside a city or town (e.g. in a road between cities/towns).
- **Pole rental:** This will include the cost of the poles and it will be measured in JMD per pole, per cable and per month. Costs will be

disaggregated depending on the type of pole (e.g. wood or concrete).

- **Dark fibre:** In the deployment of fibre networks, it is common that operators deploy excess fibre capacity for future use. These additional fibres are often not used and thus denominated “dark fibre”. This dark fibre can be shared with alternative operators that desire to “light” them. In such a case, the alternative operator uses its own active equipment to light the fibre. This service will include the costs related to trenches, manholes, ducts, subducts and dark fibre itself. This service will be measured in JMD per km and per month. The OUR believes that it is relevant to disaggregate the cost of this service in the following categories:
 - **Urban:** This category corresponds with the dark fibre cost in the same city/town, i.e. the dark fibre cost from one point to the other in the same city/town.
 - **Inter-urban:** This category corresponds with the dark fibre cost between cities/towns, i.e. the dark fibre cost from one point (in a city/town A) to the ending point (in city/town B).
- **Collocation in Submarine Cable Landing Stations (SCLS).** This service will include, among others, the costs related to the space available in Submarine Cable Landing Stations (SCLS), maintenance cost of the space (e.g. security, cleaning, etc.), costs related to the energy and air conditioning as well as any other operational costs involved in the provision of the service. This service will be measured in JMD per square metre per month. The OUR may disaggregate the costs of this service for each of the different SCLSs available.

Question 13: Do you agree with the proposed list of rental services for the fixed infrastructure sharing model? If you do not agree, please justify your position and provide supporting information and references.

Ancillary and supplementary services

4.61. As described in rule 7.1 of the Draft Rules, the infrastructure sharing services should include variable charges for ancillary and supplementary services.

4.62. After the consideration of these additional services, the OUR considers that no additional services (beyond those presented in the sections above) should be considered in the infrastructure sharing model.

Question 14: Do you agree that no additional ancillary service should be considered in the infrastructure sharing model? If you do not agree, please justify your position and provide supporting information and references.

Annex A: Summary of Questions

Question 1: Do you believe that any other methodological aspect defined in the Methodology should be updated or changed? Please justify your position and provide supporting information and references.

Question 2: Do you agree with the decision to update the fixed cost model for the 2018-2025 period? If you do not agree, please justify your position and provide supporting information and references.

Question 3: Do you agree with the OUR that the updated BULRIC model for fixed interconnection should consider a reference operator based on the combination of C&WJ and Columbus as described above? If you do not agree, please justify your position and provide supporting information and references.

Question 4: Do you agree with the decision of covering the period 2018-2025? If you do not agree, please justify your position and provide supporting information and references.

Question 5: Do you agree with the OUR that the fixed infrastructure sharing cost model should consider a reference operator based on the combination of C&WJ and Columbus as described above? If you do not agree, please justify your position and provide supporting information and references.

Question 6: Do you agree with the proposed data sources to be used for the fixed infrastructure sharing model? If you do not agree, please justify your position and provide supporting information and references.

Question 7: Do you agree that Network CapEx included in the fixed infrastructure sharing model should include costs of deployment, installation and other one-off fees? If you do not agree, please justify your position and provide supporting information and references.

Question 8: Do you agree that Network OpEx should be included in the infrastructure sharing model as the absolute yearly unit OpEx (or percentage over unit CapEx) for each network element? If you do not agree, please justify your position and provide supporting information and references.

Question 9: Do you agree that G&A expenses should be included in the infrastructure sharing model? If you do not agree, please justify your position and provide supporting information and references.

Question 10: Do you agree with the use of the Weighted Average Cost of Capital (WACC) for the calculation of the reasonable rate of return on the capital of the operator? If you do not agree, please justify your position and provide supporting information and references.

Question 11: Do you agree with the OUR's view that the model should utilize the absolute valuation methodology in its evaluation of assets on a current cost accounting (CCA) basis? If you do not agree, please justify your position and provide supporting information and references.

Question 12: Do you agree with the proposed list of implementation and testing services for the fixed infrastructure sharing model? If you do not agree, please justify your position and provide supporting information and references.

Question 13: Do you agree with the proposed list of rental services for the fixed infrastructure sharing model? If you do not agree, please justify your position and provide supporting information and references.

Question 14: Do you agree that no additional ancillary service should be considered in the infrastructure sharing model? If you do not agree, please justify your position and provide supporting information and references.

Annex B: Glossary

BULRIC	Bottom-up Long Run Incremental Costs
C&WJ	Cable & Wireless Jamaica Limited
CapEx	Capital Expenditure
CCA	Current Cost Accounting
FCM	Financial Capital Maintenance
FDC	Fully Distributed Costs
Flow	Trading name of Columbus Communications Limited prior to its acquisition by the parent company of Cable & Wireless Jamaica Limited in 2015 January.
FLOW	Combined trading name of Cable & Wireless Jamaica Limited and Columbus Communications Limited after the acquisition of Columbus Communications Limited by the parent company of Cable & Wireless Jamaica Limited in 2015 January.
HCA	Historic Cost Accounting
JMD	Jamaican Dollars
LIME	Trading name of Cable & Wireless Jamaica Limited prior to the acquisition of Columbus Communications Limited by the parent company of Cable & Wireless Jamaica Limited in 2015 January.
LRIC	Long Run Incremental Cost

MEA	Modern Equivalent Asset
NRA	National Regulatory Agency
OpEx	Operational Expenditure
SCLS	Submarine Cable Landing Stations