Office of Utilities Regulation

Update of the Cost Model for Fixed Interconnection Rates - The Decision on Rates

Determination Notice

OFFICE OF UTILITIES REGULATION

2022 March 31

DOCUMENT TITLE AND APPROVAL PAGE

1. **DOCUMENT NUMBER: 2022/TEL/002/DET.001**

2. **DOCUMENT TITLE:** Update of the Cost Model for Fixed Interconnection Rates - The Decision on Rates **– Determination Notice**

3. **PURPOSE OF DOCUMENT**

This document sets out the main decisions of the Office of Utilities Regulation regarding the update of the cost model used to set wholesale fixed interconnection rates and the outputs of that model.

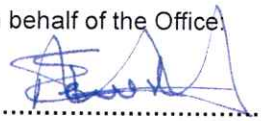
4. **ANTECEDENT PUBLICATIONS**

Publication Number	Publication Title	Publication Date
2020/TEL/019/CON.003	Update of the Cost Model for Fixed Termination Rates – Draft Model - Consultation Document [Public Version]	2020 December 9
2020/TEL/020/CON.004	Update of the Cost Model for Fixed Termination Rates – Draft Model - Consultation Document [Confidential Version]	2020 December 9
2020/TEL/010/DET.003	Update of Cost Model for Fixed Termination Rates – Principles and Methodology - Determination Notice	2020 June 30
2020/TEL/001/CON.001	Update of the Fixed Cost Model and Assessment of Fixed Infrastructure Sharing Costs - Principles and Methodology – Consultation Document	2020 January 8
2015/TEL/006/DET.002	Cost Model for Fixed Termination Rates – Principles and Methodology - Determination Notice	2015 July 1
2015/TEL001/CON.001	Cost Model for Fixed Termination Rates – Principles and Methodology - Consultation Document	2015 January 19

5. **Approval**

This document is approved by the Office of Utilities Regulation and the decisions therein become effective on 2022 March 31.

On behalf of the Office:



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Ansord E. Hewitt
Director-General

2022/03/30

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Date

Abstract

The Telecommunications Act (the "Act"), requires that all dominant public telecommunications carriers permit interconnection of their public network with the public network of other carriers for the purpose of the provision of telecommunications services. It further requires that the charges at which this interconnection is provided shall be guided by the principles set out in Section 33 of the Act. The Act also provides that the Office of Utilities Regulation ("OUR" or "the Office") shall have regard to the principle of cost orientation when making a determination of an operator's interconnection charges.

The Act stipulates that prices shall be established:

- Based on forward-looking long-run incremental cost ("LRIC") for fixed termination.
- Between the total long-run incremental cost ("TLRIC") and the stand-alone cost ("SAC") in the case of other interconnection services.

This Determination Notice sets out the OUR's response to issues raised by stakeholders who commented on the updated Draft Cost Model. Further, the Determination Notice indicates the resulting fixed interconnection rates extracted from the Cost Model and the Office's decision regarding the regulated wholesale tariffs.

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Abbreviations and Definitions

2017 Determination Notice	-	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)) both dated 2017 June 7
BULRIC	-	Bottom-up Long Run Incremental Costs
C&WJ	-	Cable & Wireless Jamaica Limited
CACU	-	Consumer Advisory Committee on Utilities
CapEx	-	Capital Expenditure
Columbus	-	Columbus Communications Jamaica Limited
Consultation Document	-	Update of the Cost Model for Fixed Termination Rates – Draft Model (Public Version), (Document No: 2020/TEL/019/CON.003) and Update of the Cost Model for Fixed Termination Rates – Draft Model (Confidential Version), (Document No: 2020/TEL/020/CON.004) both dated 2020 December 9

Digicel	-	Digicel Jamaica Limited
DSLAM	-	Digital subscriber line access multiplexer
DWDM	-	Dense wavelength-division multiplexing
DQ	-	Directory Enquiry
ECTEL	-	Eastern Caribbean Telecommunications Authority
Flow	-	Cable & Wireless Jamaica Limited and Columbus Communications Jamaica Limited
FTR	-	Fixed Termination Rate
Gbps	-	Gigabits per second
GPON	-	Gigabit Ethernet Passive Optical Network
HFC	-	Hybrid fibre-coaxial
J$	-	Jamaican Dollars
LRIC	-	Long-Run Incremental Cost

1.1.

Model	-	The fixed cost model
Methodology	-	Update of Cost Model for Fixed Termination Rates – Principles and Methodology – Determination Notice (Document No. 2020/TEL/010/DET.003) dated 2020 June 30
Mbps	-	Megabits per second
MSAN	-	Multi-Service Access Node
MTR	-	Mobile Termination Rate
N/A	-	Not Available
NGN	-	Next Generation Network
OpEx	-	Operational Expenditure
OTT	-	"Over-the-Top" referring to services provided over the internet.
OUR or Office	-	Office of Utilities Regulation
OUR Act	-	Office of Utilities Regulation Act
SAC	-	Stand Alone Costs

SMP	-	Significant Market Power
TLRIC	-	Total Long Run Incremental Costs
USD and US$	-	United States Dollars
WACC	-	Weighted Average Cost of Capital

Chapter 1: Introduction

Background

1.1. On 2015 July 1, the Office of Utilities Regulation (the "OUR" or the "Office") published the Determination Notice titled "Cost Model for Fixed Termination Rates - Principles and Methodology" (Document No. 2015/TEL/006/DET.002), which outlined the methodology to be followed in the development of a Fixed Cost Model. 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)) ("2017 Determination Notice"), were issued on 2017 June 7.[1]

1.2. On 2020 January 8, the OUR published the Consultation Document, "Update of the Fixed Cost Model and Assessment of Fixed Infrastructure Sharing Costs - Principles and Methodology" (Document No: 2020/TEL/001/CON.001). This document outlined the potential methodology changes that may be required based on market evolutions, to update the existing Fixed Cost Model.

1.3. On 2020 June 30, the OUR published the Determination Notice entitled "Update of Cost Model for Fixed Termination Rates – Principles and Methodology" (Document No. 2020/TEL/010/DET.003) (hereinafter "the Methodology"). The document presented the determinations regarding the changes to the methodological framework to be used in the update of the Cost Model used to set wholesale fixed interconnection rates. Annex B of the Methodology outlined all the principles and methodology applicable to the update of the Cost Model.

1.4. On 2020 December 9, the OUR launched a public and private consultation process for the update of the Fixed Cost Model ("the Model"). The Consultation

[1] 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.

Documents were entitled "Update of the Cost Model for Fixed Termination Rates – Draft Model – Public Version" (Document No: 2020/TEL/019/CON.003) and "Update of the Cost Model for Fixed Termination Rates – Draft Model - Confidential Version" (Document No: 2020/TEL/020/CON.004) [together referred to as ("the Consultation Document")].

1.5. The proprietary information of Cable & Wireless Jamaica Limited and Columbus Communications Jamaica Limited (together trading as "Flow") used in the draft Model, as well as other information which the OUR has classified as confidential in light of the provisions of the Telecommunications Act, were excluded from the public Consultation Document and the associated attachments. Simultaneously with the public consultation, the OUR also conducted a private consultation with Flow, on inputs and information used in the draft Model that were obtained from Flow directly.

1.6. Stakeholders were given a deadline of 2021 January 11 for submission of comments to facilitate any correction or improvement of the draft Model. Stakeholders were asked to submit relevant arguments and also data, analysis, benchmarking studies and any relevant information based on the national situation, or on the experience of other countries, in support of their comments.

1.7. The operators requested extensions of the deadline for the submission of responses. The OUR granted the extensions, setting a final deadline of 2021 January 27.

1.8. The OUR received responses to the Consultation Document from:

i. Cable & Wireless Jamaica ("C&WJ") and Columbus Communications Jamaica Limited ("Columbus"). Together, C&WJ and Columbus are referred to as "Flow";

ii. Digicel Jamaica Limited ("Digicel"); and

iii. The Consumer Advisory Committee on Utilities ("CACU").

1.9. Stakeholders were then given until 2021 February 10 to comment on the responses received from other stakeholders. Comments on responses were received from Flow and Digicel.

1.10. In the documents from Flow, the respondent was referred to as C&WJ and Flow interchangeably. Therefore, going forward the feedback from those documents will be referred to as the feedback of the combined C&WJ and Columbus, i.e. Flow.

Purpose of this Determination Notice

1.11. This Determination Notice details the Office's views on the responses provided by industry stakeholders regarding the update of the Cost Model for fixed termination rates and the comments on responses.

1.12. This Determination Notice also details the changes implemented in the Model due to the comments and responses received, in order to produce the final updated version of the Model.

Structure of Determination Notice

1.13. The remainder of this Determination Notice is structured around the topics of special relevance in the following manner:

- **Chapter 2** outlines the Legal Framework that describes the remit of the OUR in regard to the setting of interconnection rates.
- **Chapter 3** addresses general comments and main considerations, including major updates carried out after receiving comments from stakeholders.
- **Chapter 4** discusses the significant aspects of the Updated Draft Fixed Cost Model and presents details and conclusions reached.
- **Chapter 5** shows the updated results of the services, obtained after considering the relevant comments and observations made by industry stakeholders.
- **Annex A:** List of Determinations

- **Annex B:** Summary of Changes

Chapter 2: Legislative Framework

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

Section 4(1)(a) of the Telecommunications 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 Telecommunications 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 to 37A) of the Telecommunications Act.

2.4. Section 29 of the Telecommunications Act, states:

"29. - (1) 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. ...

(4) The Office may, either on its own initiative in assessing an interconnection agreement, or in resolving a dispute between operators, make a determination of the terms and conditions of call termination, including charges.

(5) When making a determination of an operator's call termination charges, the Office shall have regard to the principle of cost orientation, so, however, that if the operator is non-dominant then the Office may also consider reciprocity and other approaches."

2.5. Further, section 30 of the Telecommunications Act 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*".

2.6. The abovementioned section 33 outlines, among other things, the principle of cost orientation for interconnection and infrastructure services. More specifically, section 33(1)(g) of the Telecommunications Act provides that "in the case of 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."*

Chapter 3: General Comments

Introduction

3.1. As was noted earlier, responses to the Consultation Document were received from Flow, Digicel, and CACU and comments on responses from Flow and Digicel. Some of the feedback from the stakeholders were of a general nature and not directed towards a particular aspect of the proposed methodology.

3.2. The OUR has considered these general comments made by stakeholders and now provides a summary of the stakeholders' comments and its response.

Timing of the Update of the Fixed and Mobile Cost Models

Stakeholders' Comments

3.3. Digicel began its general comments by acknowledging "*that the Mobile Termination Cost Model is also being updated*". In addition, given the position of Flow as both a mobile operator and the dominant fixed operator, Digicel emphasised "*the risks of competitive distortions should the Determinations in respect of updating both the Fixed and Mobile Termination Rates become unsynchronised*".

3.4. To this end, Flow disagreed to some extent with Digicel in its comments on responses, and stated that "*any misalignment of MTRs with their costs is a far more significant distortion in the market than that of FTRs*". Flow further indicated that "*the OUR would do the market a disservice by holding back its MTR determination...*".

OUR's Response

3.5. The OUR notes Digicel's comments and the concern regarding the un-synchronized publication of both the FTR and MTR models and how this could

hinder the level of competitiveness in the Jamaican market. However, in the OUR's view, there is a limited relationship in the competition consideration between the MTR and the FTR. Furthermore, we observe that the misalignment in the publication timings between MTRs and FTRs is a common situation in most countries around the world, and oftentimes does not lead to relevant market distortions.

Chapter 4: Relevant Aspects of the Updated Draft Fixed Cost Model

Introduction

4.1. This Chapter discusses the comments submitted by the operators concerning the topics of special relevance highlighted in the Consultation Document.

4.2. The topics of special relevance highlighted in the Consultation Document with potential for great impact are:

- Market Demand Considered in the Model
- Access Nodes Considered in the Model
- Unitary Costs and Cost Trends
- Technical Parameters and Modelled Network
- Cost Allocation to Services
- WACC
- Cost Structure

4.3. As determined in the Methodology, the reference operator is a fixed operator with demand and network characteristics based on the combination of C&WJ and Columbus. The combined entity is hereafter referred to as Flow.

4.4. In order to account for the characteristics of the "combined" operator and inputs in the 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 (taking into consideration overlaps); and the cost of the modelled operator should include C&WJ's and Columbus' costs.

4.5. In general terms, the approach followed in the current computations is consistent with the one approved by the Office in the 2017 Determination Notice. Methods based on international best practice have also been utilised to estimate some of the parameters presented in this document.

4.6. Having considered the feedback provided by stakeholders, the OUR has updated the Model. Justifications for the update of each of these parameters are presented in subsequent sections. A summary of these changes is listed in Annex B. All other parameters remain as presented in the Consultation Document.

4.7. The OUR has considered comments made by stakeholders on the topics of special relevance and now provides a summary of the stakeholders' comments, its responses, and subsequent determinations below.

Market Demand Considered in the Model

4.8. In the Consultation Document the OUR presented forecasts for five voice traffic services (Incoming Others, Incoming to Local, Incoming to National, Outgoing, Transit) and for four data traffic services (Broadband, Leased lines – Intra Parish, Leased lines – Inter Parish, TV).

Voice Traffic

OUR's Proposal

4.9. The voice traffic volumes presented in the Consultation Document are shown in Table 1 below.

Voice traffic (millions of minutes)	2018	2019	2020	2021	2022	2023	2024	2025
Incoming Others	117.85	110.81	104.19	97.98	92.14	86.66	81.51	76.68
Incoming to Local	20.30	18.94	17.67	16.49	15.38	14.35	13.39	12.49
Incoming to National	130.46	121.72	113.57	105.96	98.86	92.24	86.06	80.29
Outgoing	885.46	782.55	696.66	622.26	557.55	501.05	451.55	407.49
Transit	504.37	565.49	627.75	690.28	753.07	816.10	879.33	942.77

Table 1: Total market voice traffic [Source: Updated Fixed Cost Model]

Stakeholders' Comments

4.10. CACU agreed with the general trend of a decline in voice traffic.

4.11. Flow in its response to the Consultation Document, was of the opinion that the voice traffic projections generally appear reasonable but that the outgoing voice traffic should exhibit roughly the same rate of decline as the other incoming voice traffic in the forecast period. Flow therefore requested that the OUR reduce the incoming traffic growth in line with its data submission or "*explain why the outgoing and incoming traffic trends should be so divergent, and give parties the opportunity to comment on that explanation*".

4.12. In its response to the Consultation Document, Digicel questioned the reason for the predicted doubling of the "transit" category over the modelled period in a scenario where all other traffic types are expected to decrease significantly, noting that *"[t]he transit category is projected to move from 30% of all demand to over 60% of all demand over the period*". In its comment on Digicel's response, Flow agreed with Digicel's comment that the OUR should clarify why transit traffic should increase in light of the decreasing values for other types of voice traffic.

4.13. Digicel also remarked that transit traffic will arise where other networks do not directly interconnect and instead use the Flow fixed network as an intermediary, with current projected volumes highlighting a clear business case for direct connection of the source and sink networks, where a transit charge is being levied. Digicel further stated, "*[i]f Flow is not offering direct connection to its mobile network but is instead using its fixed network as a gateway switch for its mobile network then the costs associated with this traffic should be assigned to mobile termination and not fixed termination*". In its comment on Digicel's response, Flow noted *"this issue was [sic] been raised and resolved years ago, and the resolution was not burying fixed network costs in the mobile termination cost base".*

4.14. In its comments on responses, Digicel also noted and agreed with CACU's response that overall voice volumes are likely to decline over time. The company also noted Flow's suggestion that the OUR should set out the reasoning behind the projections and allow for comments.

OUR's Response

4.15. The OUR takes note of the comments from CACU, Digicel and Flow.

4.16. For the difference in the declining rate of traffic between outgoing and incoming traffic, the OUR notes that the proposed traffic forecasts for outgoing and incoming traffic were based on values provided by Flow in the data request phase of this consultation. In this regard, the OUR would like to point out that, during the review and validation process of the forecasts provided by Flow in the data request stage, the OUR requested additional information on the forecasts for outgoing traffic. This was because the data provided by Flow presented a sharper decline in traffic compared to the existing forecasts included in the 2017 version of the Model. In Flow's response to this request, the operator explained that the forecasts presented in its latest submission represented a more realistic outlook than what was previously reported, and that the forecasts were justified by the expected *"intensification of competition from OTT voice apps"*. The OUR considered this justification as reasonable and proceeded to include the forecasts provided by the operator in the Model. Moreover, the OUR also observed a similar trend in the historical data reported by Flow, with outgoing traffic to the fixed network declining much more rapidly than incoming traffic, consistent with the figures included in the draft Model. For these reasons, the OUR will retain the figures included in the draft Model for incoming and outgoing traffic.

4.17. Given that the OUR has not found any relevant reason to change the forecasts used in the model, it is our opinion that an additional consultation round on this matter is not necessary, as it is unlikely to significantly benefit the process.

4.18. Regarding the apparent doubling of transit traffic, the OUR would like to clarify that the forecast of transit services has been generated using a regression with parameters taken from the historical period 2014 to 2018. In this period, an increasing trend was observed, and the OUR considers it unlikely that such a trend would reverse over the modelled time period. The regression used for the estimation of this traffic is depicted in Table 2 below.

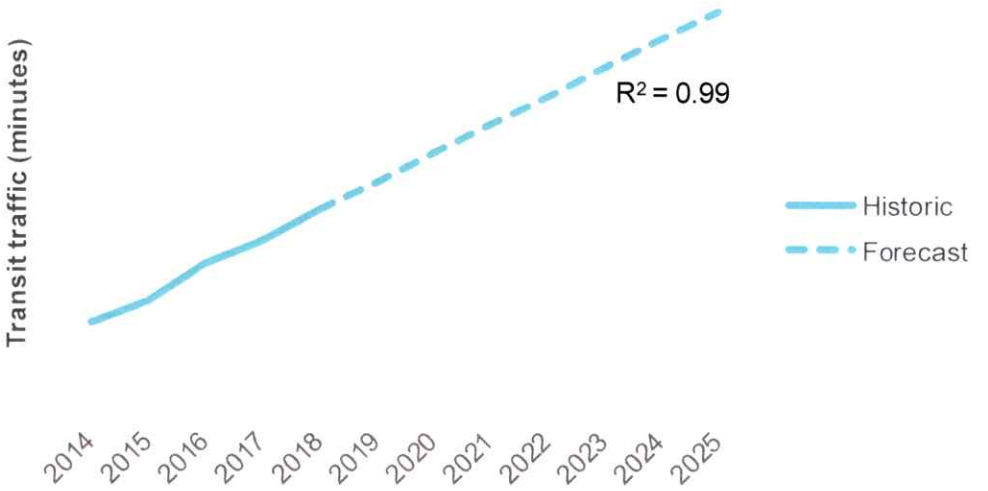

Table 2: Transit traffic (Historic and forecast) [Source: Updated Fixed Cost Model]

4.19. The OUR notes Digicel's comments regarding Flow offering direct connection to its mobile network. However, the OUR considers that all traffic borne by the fixed network – including transit for mobile or other fixed networks - should be considered in the Model to ensure the final costs calculated are representative of the scale of the modelled operator. This is actually the case in the Model, as mobile transit volumes are indeed considered, and their costs are not allocated to fixed termination services. The Model considers a pure-LRIC approach to estimate costs for wholesale termination services, which means that common costs shared with other services are not included in the termination results.

4.20. Finally, the OUR refers Digicel to Determination 32 of the 2017 Determination Notice (Document No. 2017/TEL/004/DET.002 (Public Version)), which prohibits C&WJ from charging an interconnecting carrier transit charges once there are no technical reasons on the part of the interconnecting carrier preventing it from obtaining direct interconnection with C&WJ's mobile switch. In summary, CWJ is not allowed to charge for transit if it refuses direct mobile to mobile interconnection.

Determination 1: The Office will maintain the market demand for voice traffic used in the draft Model.

Data Traffic

OUR's Proposal

4.21. The data traffic volumes proposed in the Consultation Document are presented in Table 3 below.

Data traffic (Gbps)	2018	2019	2020	2021	2022	2023	2024	2025
Broadband	111.14	134.47	162.71	196.88	238.23	288.26	348.79	422.04
Leased lines - Intra Parish	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Leased lines - Inter Parish	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
TV	221.00	221.00	221.00	221.00	221.00	221.00	221.00	221.00

Table 3: Total market non-voice traffic [Source: Updated Fixed Cost Model]

Stakeholders' Comments

4.22. CACU agreed with the general trend of an increase in data traffic.

4.23. In its response to the Consultation Document, Flow pointed out that the broadband and leased line traffic data are reasonable and consistent with previous trends used in the original Model.

4.24. Digicel in its response to the Consultation Document, stated in respect to non-voice traffic, "*Flow's self-supply of transmission for its mobile business should be included as a separate network demand and this should be reflected in the routing factors related to transmission systems, site costs, tower costs etc.*". In its comment on Digicel's response, Flow indicated that the approach suggested by Digicel would be inconsistent with the principles and methodology determined for the existing fixed Model.

OUR's Response

4.25. The OUR would like to reiterate the position laid out in the 2017 Determination Notice on the issue of self-supplied capacity. In the OUR's view, ensuring that the self-supplied capacity to Flow's mobile business is recognized in the fixed model is highly relevant to ensure it represents the actual economies of scale

of the modelled operator. For this reason, this traffic is accounted for in the appropriate leased line services included in the updated Model.

4.26. The OUR acknowledges the limitations with regards to performing an accurate estimation of the self-supplied traffic from Flow's mobile network, especially considering the lack of data provided by Flow on this matter in the data request process. However, the OUR considers Digicel's concerns as reasonable, given the likely increase in mobile data traffic in the coming years. For this reason, the OUR has decided to update the forecasts related to leased lines to include the additional traffic that might originate from these services. To this end, due to the lack of data available from the operators, the OUR has extracted the expected increase in mobile data traffic (inclusive of 4G and 5G technology) from the Ericsson Mobility Report 2021[2], which provides an estimate on the expected growth for the Latin America and Caribbean region, which the OUR considers to be applicable to Jamaica. This source estimates a yearly growth for mobile data traffic of 35.6% in the 2020 to 2025 period.

4.27. Based on the adjustments mentioned, the updated volumes for data services are presented in Table 4 below.

[2] Available at: https://www.ericsson.com/4a03c2/assets/local/mobility-report/documents/2021/june-2021-ericsson-mobility-report.pdf

Data traffic (Gbps)	2018	2019	2020	2021	2022	2023	2024	2025
Broadband	111.14	134.47	162.71	196.88	238.23	288.26	348.79	422.04
Leased lines - Intra Parish	0.58	0.79	1.07	1.45	1.96	2.66	3.61	4.89
Leased lines - Inter Parish	1.50	2.03	2.76	3.74	5.07	6.88	9.33	12.65
TV	221.00	221.00	221.00	221.00	221.00	221.00	221.00	221.00

Table 4: Total market non-voice traffic [Source: Updated Fixed Cost Model]

Determination 2: The Office reaffirms the forecasted data traffic figures used in the draft Model, with the exception of Leased Line services, which have been adjusted to account for the expected growth in mobile data traffic for coming years.

Access Nodes Considered in the Model

Number of Access Nodes

OUR's Proposal

4.28. Due to the lack of updated information provided by Flow in the data request phase, pertaining to location of the nodes, the nodes in the draft Model remained as they were in the 2017 Model, which were based on the inputs included in that Model.

4.29. However, it should be noted that in the Consultation Document the OUR expressed its willingness to reconsider this approach, as long as Flow provided comprehensive data that detailed the actual strategy followed by the operator.

4.30. Table 5 below presents the number of access nodes obtained from the 2017 Model for each geotype.

Access nodes	Number of nodes
URBAN_DENSE	92
URBAN	143
SUBURBAN_DENSE	15
SUBURBAN	45
RURAL	14
RURAL_SPREAD	152

Table 5: Number of nodes of the modelled operator for 2019 [Source: Updated Draft Fixed Cost Model]

Stakeholders' Comments

4.31. CACU indicated that given the time elapsed since the update of these figures (2019), there could be an inconsistency considering the date for the responses to this consultation (2021). However, CACU expressed that while they did not expect the numbers would be the same, the ratio may remain the same, therefore it would be sufficient to use the available data.

4.32. Digicel in its response to the Consultation Document, indicated that given the lack of information available to the OUR regarding the location of access nodes, it is not unreasonable to use the same number of nodes as included in the 2017 Model. Digicel noted the lack of actual information about assets which are by nature at a fixed location. According to Digicel "*this raises the question as to whether the actual number and locations of nodes would result in a lower FTR*".

4.33. Digicel also agreed with the OUR's approach where the C&WJ and Columbus networks are effectively considered as a single network, stating, *"[o]therwise, Flow as an SMP [Significant Market Power] operator, would be compensated for inefficient management of its network resources*". Digicel also indicated that even if Flow were to provide information that both networks will be maintained separately, this should not be reflected in the Model unless it can be demonstrated that such an approach will give rise to cost efficiencies.

4.34. Flow in its response to the Consultation Document, noted the inherent difficulty in estimating a reasonable number of access nodes for the Model, based on complications arising from an overlap of the C&WJ and Columbus networks and the migration from legacy to NGN technology. Nonetheless, Flow has stated that the number of nodes proposed by the OUR is much too low given the number of households and the population density in Jamaica. Flow then went on to discuss Jamaica's implied household to node ratio, arising from the Model, as well as typical NGN model design assumptions in support of their argument.

4.35. Flow also offered some comparators that use the same methodological approach as that employed by the OUR, notably Norway's model and five ECTEL models. Flow argues that a regression analysis of data from these models, would result in an estimated node count per household being much higher than that obtained by the OUR, implying the Model's node count is excessively low. Flow then proposed that the OUR make reasonable adjustments to its assumptions or correct any errors in order to achieve a value closer to the value arising from Flow's implied node count.

4.36. In its comments on Flow's response to the Consultation Document, Digicel stated that it is of the view that the comparators that Flow used to support its position are not appropriate. Digicel indicated that "*for the ECTEL markets the fixed penetration is up to twice the fixed penetration in Jamaica therefore the volume of served households per node is radically different to the comparator proposed*". The company also indicated that the geotype distribution in ECTEL markets is also likely to be different than that in Jamaica which would further undermine any probative value from the comparisons provided. Digicel further stated that in the case of Norway, the structural market differences would also reduce the relevance of the comparison offered.

4.37. In its comments on responses to the Consultation Document, Flow referenced the current number of nodes and their types for both the C&WJ and Columbus networks independently. Specifically, the number of network nodes by technology (including MSAN and DSLAM) were provided by Flow. Flow then

justified that "*even if we were to shut down either of the two networks entirely [referring to the C&WJ and Columbus networks independently] there would still be significantly more nodes than are in the model presently*". Flow also noted that the underestimation by the OUR was predictable as Flow's proposed migration factors in the 2016 Model were modified to lower factors with little or no justification and that the OUR continues to use flawed migration factors and underestimate the node counts. In this context, Flow proposed that "*the OUR has enough evidence to revise the migration factors upward—indeed practice shows that they should be higher than what CW&J originally proposed*".

OUR's Responses

4.38. The OUR acknowledges the length of time for the update, as noted by CACU. However, it should be highlighted that the Model considers trends in order to account for differences over time periods.

4.39. The OUR also notes both Flow's and Digicel's responses regarding the estimated node count. In the OUR's view, the differences observed between Flow's nodes and the figures included in the draft Model are derived from the lack of information provided by the operator in the data request stage of the update of the Model.

4.40. In updating the Model, the OUR agrees with Digicel that the comparators utilised by Flow to support its position on the number of nodes are not appropriate. This is because the evaluation of households per node is not fully comparable since it depends on other factors such as the fixed penetration. Therefore, Flow's suggestion to utilise a regression analysis of the presented non-Jamaican data, to determine the number of nodes, would also be faulty.

4.41. It is the OUR's view that utilising metrics from other countries (as suggested by Flow), is not something supported in international practice due to the *inter-country* differences on this subject matter. The best practice in this regard is to follow a so-called modified scorched node approach, which is based on the actual nodes from the operator being modelled. In this regard, the OUR appreciates the additional information provided by Flow (which the OUR has

classified as confidential information) regarding the references to the actual network nodes in its comments on responses to the draft Model consultation. As a result of this information, the final version of the Model has been updated to take account of the additional data provided by Flow. Specifically, the updated Model includes for the year 2019 the number of network nodes (MSAN and DSLAM) provided by Flow for the C&WJ network. GPON and HFC network nodes have been excluded from the input, as Flow has not provided the necessary evidence to demonstrate that these do not represent duplicated network node locations.

4.42. Regarding the migration factors, the figures used in the 2017 Model were based on the actual number of nodes already migrated, as provided by Flow. Whilst Flow had confidentially proposed alternative migration factors for this Model in 2016, these were rejected by the OUR then, as Flow had not provided any evidence supporting its proposed values, therefore it was not possible for the OUR to assess the reasonableness of the proposed information. Further details on the migration pattern will be provided in the next section.

Determination 3: The number of access nodes considered in the draft Model has been updated to include the number of access nodes (MSAN and DSLAM) provided by Flow in its comments on the draft Model.

Migration Pattern

OUR's Proposal

4.43. Following the lack of updated data provided by Flow for the migration pattern, the draft Model submitted for consultation, utilized the same NGN migration pattern as that in the 2017 Model which contemplated full NGN migration starting in the year 2020.

Stakeholders' Comments

4.44. Digicel, in its response to the Consultation Document agreed with the approach to consider the network to be fully migrated to NGN by 2020. The company indicated that this was in keeping with the OUR's previous Determination on the matter.

4.45. Flow, in its response to the Consultation Document indicated that although the existing Model assumes that NGN migration is completed by the end of 2020, this is not the case in reality. Flow stated "*it would be more realistic for the OUR [to] bring forward its schedule two years, so that its migrated percentages for 2018 are applied to 2020, for 2019 are applied to 2021, etc. In this scenario, migration is completed in 2023, this approach would reflect the reality that the migration as of 2021 is not yet finished*".

4.46. In its comments on responses, Flow noted that Digicel supported the proposed migration pattern, which contemplates full migration by 2020. Flow admitted that while in 2016 it thought its NGN migration would be close to completion in 2020, this was not the case in reality. The company also provided information on its actual migration rates (which the OUR has classified as confidential information) in terms of nodes and subscribers. Flow then reiterated the proposal from its initial response for the OUR to bring forward the migration schedule by two years. The company noted that this approach "*provides for a reasonable compromise reflecting the reality of the lack of completion but imposing a hypothetical achievement by 2023*".

4.47. In its comments on Flow's response, Digicel noted that it is of the view that factoring delays in migration into the Model would have the effect of rewarding inefficiencies in the operation of an SMP operator. Digicel noted that if migration to NGN results in lower costs, then allowing the incumbent to recover higher costs based on largely or wholly depreciated assets will result in windfall gains. Regarding Flow's suggestion of rolling forward figures from 2018 to 2020 and so on, Digicel stated that *"CW&J knew the basis for its costing and pricing at the time and either explicitly or by omission made commercial decisions not*

to align its network evolution with the regulated basis for costs". Digicel further stated that Flow should not now be rewarded for these decisions.

OUR's Response

4.48. The OUR acknowledges the comments from Digicel.

4.49. The OUR notes Flow's response regarding the migration pattern presented in the draft Model. However, in the OUR's view, and as pointed out by Digicel, Flow took the commercial decision not to carry out the NGN migration as planned. Moreover, Flow has not provided any detailed justification that would lead the OUR to rethink the approach followed in the Model. For this reason, the OUR is of the view that the migration pattern in the Model should not be changed to suit Flow's commercial decisions. The OUR has therefore maintained the migration pattern presented in the Model, with 2020 remaining as the year of full migration.

Determination 4: The migration pattern considered in the draft Model will be maintained.

Unitary Costs and Cost Trends

OUR's Proposal

4.50. The OUR included in the draft Model, updated inputs for the unit costs associated with some of the assets included in the Model. The updated inputs were reported by Flow during the data request phase and were validated against international practice. In addition, the OUR included updated figures for the costs of fuel and electricity from reputable sources. For those assets where Flow did not provide further inputs, the inputs remained the same as those included in the 2017 Model.

Stakeholders' Comments

4.51. CACU indicated that it *"does not disagree with the data being used"* as inputs for the Model.

4.52. Flow in its response to the Consultation Document, pointed out that the values for the unitary costs appear to be reasonable.

4.53. However, with respect to cost trends, Flow indicated that "*there is a bias with respect to cost when one compares the assumptions in the OUR's mobile cost model with that in its fixed cost model*". According to Flow, in both Models the positive or negative trends are as expected, however, "almost systematically, *both positive and negative cost trends are lower in the fixed cost model than in the mobile model*". Flow further states, "*there is no logical reason why the cost trend for similar capex [CapEx] items should be different between the two models".* Flow concluded by stating that "*the OUR is taken [sic] an unjustifiably aggressive view on costs for the fixed model relative to those of the mobile model*" and proposed that the OUR revise the cost trends for the fixed Model to ensure consistency with the assumptions used in the Mobile Cost Model.

4.54. Digicel in its response to the Consultation Document, noted that the "*unitary costs are based on information from Flow which has been validated against international benchmarks or, in the absence of new information, is based on the current model inputs*". However, Digicel also highlighted the discrepancies between the presented fixed unitary costs and those from the Mobile Cost Model. Digicel suggested that, "*where relevant, a consistency check is carried out between the fixed and mobile cost models to ensure that similar unitary costs are aligned*", given the commonalities that exist between fixed and mobile networks.

4.55. In addition, Digicel noted conformance between the 2020 outputs from the updated Model and the forecast for 2020 generated by the 2017 model. According to Digicel, "*the most significant divergence appears to be on the transmission side with much higher levels of transmission and ethernet ports being forecast by the updated model*". Digicel also noted the different forecasts

in 2016 for the volume of ethernet ports required from NGN nodes in the transmission network when compared with identical volume forecasts in the 2020 draft Model.

4.56. Flow in its response to Digicel's comments, indicated that they do not believe the lack of consistency between the cost assumptions for similar CapEx items in the Fixed and Mobile Models resides in the cost of equipment themselves, "*but rather in the different cost trends assumed for similar types of equipment*".

4.57. Flow also reiterated its belief that the lack of consistency and other identified issues contribute to the growing disparity between MTRs and FTRs, and the results obtained from network models in Jamaica and similar models elsewhere. Flow then provided a comparison of the MTR/FTR ratio evolution in Jamaica and Europe, which showed the ratio in Jamaica increasing from 11.66 in 2018 to 11.83 in 2020, compared to the decline from 9.99 to 9.59 in Europe over the same period.

OUR's Response

4.58. The OUR acknowledges the comment from CACU.

4.59. The OUR acknowledges the responses from Flow and Digicel and agrees to update the cost trends in the Model in order to ensure alignment for assets which are equivalent in both the fixed and mobile models. For this purpose, the same cost trends identified in the Mobile Cost Model have been applied for equivalent assets in the Fixed Cost Model. Table 6 below presents the cost trends considered in the updated Model.

Category of network elements	Unit cost trend (%)	Examples of network elements
Network Equipment	-2.56%	Active network equipment, including network nodes, routers and core platform hardware and software.
Network Sites	5.40%	Physical infrastructure, including sites and towers.
Transmission Equipment	-2.56%	Transmission equipment, including optical fibre and active equipment (e.g. DWDM).

Table 6: Updated cost trends for network assets in the Model, based on the updated Mobile Cost Model [Source: Updated Fixed Cost Model]

4.60. With regard to the evolution of the number of ethernet ports mentioned by Digicel, this aspect is detailed in the subsequent "Cost Structure" section of this document (see paragraph 4.83).

4.61. The OUR notes Flow's comments on responses, in which it provided a comparison of the MTR/FTR ratio evolution in Jamaica and in Europe. The OUR wishes to note that based on the changes implemented in the Fixed Cost Model, and considering the latest MTRs implemented by the OUR for the 2021-2025 period in the "Update of the Mobile Cost Model -The Decision on Rates - Determination Notice", (Document No: 2021ITEL/011/DET.003), the MTR/FTR ratio for the 2021-2025 period in Jamaica would be 10.27, representing a decrease from the 11.66 suggested by Flow. This effectively indicates signs of convergence between both rates, as is the case in the European example shared by Flow.

Determination 5: The unit cost trends considered in the draft Fixed Model have been updated to ensure alignment to the cost trends for equivalent assets in the Mobile Cost Model.

Technical Parameters and Modelled Network

OUR's Proposal

4.62. Based on technical parameters for modelling the network, demand inputs and technical algorithms, the draft Model allocated a number of main resources (i.e.

Legacy nodes, NGN nodes, Transmission, Core) to satisfy market demand. These are shown in Table 7 below.

Resource	2020
Legacy nodes	
Remotes Chassis	-
DSLAM Chassis	-
Aggregation Chassis	-
Local Chassis	-
Tandem Chassis	-
Legacy ports	-
NGN nodes	
MSAN Chassis	1.617
Aggregation Chassis	461
Edge Chassis	55
Distribution Chassis	24
Core Chassis	6
Ethernet ports	4.308
Transmission	
Fibre (km)	3.586
Ethernet Chassis	558
TDM Chassis	-
DWDM Chassis	79
Lambdas	592
Legacy ports	-
Ethernet ports	4.308
MW hops	642
Towers	127
Core	
CSCF	2
AS	2
NMS	2

Table 7: Draft number of network elements modelled [Source: Updated Draft Fixed Cost Model]

Stakeholders' Comments

4.63. CACU noted that the information presented by the OUR did not juxtapose the resources against the corresponding demand. However, according to CACU,

the additional input sheet in the draft Model, indicated that the information was obtained from empirical data, therefore, "*CACU does not disagree with this*".

4.64. Flow has stated in its response to the Consultation Document that based on the description of the BULRIC Model, it does not believe that *certain "main resources volumes"* covered in the draft Model are reasonable to satisfy modelled demand. Flow pointed out that *"the ultimate number of NGN access nodes are significantly underestimated, which will impact the volume of MSAN chassis*" but added that its earlier proposal to adjust the derivation of NGN access nodes would solve this problem. In addition, Flow believed that "*the legacy nodes should not be zero",* but that a revision of the migration schedule for nodes as per its earlier proposal would solve this problem. Flow also proposed that the OUR review the approach to setting the number of nodes, which should have an impact on fibre kilometre values and other aspects of transmission network.

4.65. Digicel in its response to the Consultation Document, expressed concern that the Fixed Model is predicting the need for and including the cost of elements already in place and primarily used for mobile services. Digicel then outlined reasons for its belief and concluded by stating that "*the volumes of towers and microwave links generated by the model as being required for fixed should have a small or zero cost attributed to them*".

4.66. Digicel also expressed concern with the length of fibre predicted by the Model, given that *"[t]he incremental cost of a single fibre pair or a DWDM wavelength to support voice services will be very low where the sizing and cost of the cable itself is driven primarily by non-voice or mobile services*". In addition, Digicel expressed that the *"modularity of cable size being used as an input to the model was not clear".*

4.67. Flow in its response to comments disagreed with Digicel's concern that the Fixed Model is predicting the need for and including the cost of elements already in place and primarily used for mobile services. The company noted that *"the bottom-up model designs a network for fixed services, nothing more",*

and that the additional use of such equipment for mobile networks "*is not relevant*". Flow also proposed that the OUR reject Digicel's comment.

4.68. Flow in its response to Digicel, also disagreed with Digicel's comments on fibre capacity and indicated *"we understand that all the facilities that carry voice and data are appropriately dimensioned by voice and data volumes carried to and from the fixed access network"*. Flow further stated that Digicel's view would also be inconsistent with established concepts and the previously accepted methodology, *"[t]hus, Digicel's concern about fib[re] costs appears misplaced"*.

OUR's Response

4.69. The OUR acknowledges the comment from CACU.

4.70. The OUR acknowledges Flow's comment regarding the underestimation of NGN access nodes and its correlation with the issue about the number of access nodes and migration pattern mentioned earlier in this Determination Notice. In this regard, the OUR notes that this aspect has been addressed, by the adjustment of the number of access nodes included in the Model to reflect the latest information provided by Flow. This aspect is further detailed in the section "Access Nodes Considered in the Model" and specifically reflected in Determination 3.

4.71. The OUR acknowledges Digicel's and Flow's comments regarding the volume of towers and microwave links. In the OUR's view, Digicel's comment on the Fixed Model including elements primarily used for mobile services is generally true with regards to the fact that microwave towers are shared in the provision of fixed and mobile services, a common practice in other regions of the world. The OUR however, disagrees with Digicel's comment that these elements are not incremental to mobile networks, and reminds Digicel that the incremental elements should be looked at, at the service level (i.e. termination) and not at the network level. In this context, with regards to Flow's response, the OUR would also like to mention that the Model should reflect a fixed network, but at the same time consider any efficiencies that may arise in the provision of the services in the network of the modelled operator. For this reason, the Fixed

Model developed by the OUR takes into account the additional traffic that originated in mobile access networks but transits the fixed transmission network (please see section "Data Traffic" above, for further details on this matter). Ultimately, the approach taken by the OUR ensures that any requirements that mobile access networks might have on fixed transmission networks (including from microwave links) are accurately reflected and the costs are allocated to the services that originate them.

4.72. Regarding the length of the fibre predicted in the Model and the related incremental cost, the OUR agrees with Digicel that fibre cable is not expected to be significantly incremental to voice services. Regarding modularity, an average configuration of 12 strands is considered.

Determination 6: The technical parameters and modelled network will remain the same, with the exception of the changes implemented to the number of access nodes presented in Determination 3, to ensure alignment with the network of the modelled operator.

WACC

4.73. In the draft Model submitted for consultation, the OUR utilised the estimated Weighted Average Cost of Capital (WACC) for fixed carriers which was included in the "Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers – Consultation Document", (Document No. 2020/TEL/011/CON.002). The pre-tax WACC (in USD) included in the draft Model amounted to 10.75% in US$ terms and 14.16% in J$ terms.

4.74. On 2021 September 1, the OUR published the "Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers – Determination Notice", (Document No. 2021/TEL/010/DET.002), its Determination Notice on the WACCs for fixed and mobile telecommunications carriers providing services in Jamaica. The WACCs became effective on 2021 November 28. In

light of this, the WACC in the Model has been updated to reflect that which is included in the new WACC Determination Notice.

4.75. The Model will therefore utilise a nominal pre-tax WACC for fixed telecommunication markets of 10.70% in US$ terms and 14.96% in J$ terms.

Determination 7: The nominal pre-tax WACC in the Model has been updated to 10.70% in US$ terms and 14.96% in J$ terms.

Cost Structure

OUR's Proposal

4.76. In the Consultation Document, the OUR outlined a cost structure based on the total number of network elements and their costs for the reference operator. This structure is shown in Table 8 below.

Cost category (% of costs)	2018	2019	2020	2021	2022	2023	2024	2025
OpEx	18.9%	19.4%	19.0%	19.7%	20.5%	21.6%	22.6%	23.7%
Depreciation	27.5%	27.3%	28.2%	27.9%	27.4%	26.9%	26.3%	25.3%
Cost of Capital	20.2%	19.7%	18.9%	18.3%	17.7%	16.8%	16.0%	15.8%
Retail Costs	27.4%	27.6%	27.9%	28.1%	28.3%	28.6%	28.9%	28.9%
G&A	5.9%	5.9%	6.0%	6.0%	6.1%	6.2%	6.2%	6.3%

Table 8: Draft cost structure of the modelled operator [Source: Updated Fixed Cost Model]

Stakeholders' Comments

4.77. CACU indicated that it does not disagree with the cost structure "*to the extent that the modelled operator has provided the representative data of their operations*".

4.78. Digicel in its response to the Consultation Document pointed out that the proportion of costs attributed to OpEx "*are in excess of what was forecast by the 2016 iteration and are trending upwards*". Digicel also requested that the OUR "*outlines in more detail the drivers of this increase*".

4.79. Flow in its response to the Consultation Document, noted that having identified areas in which the CapEx is underestimated, and given that generally network OpEx is tied to CapEx in the Model, it "*would expect that the share of Cost of Capital, depreciation and OpEx should be higher*".

4.80. Digicel in its comments on responses indicated that it is of the view that the underestimation of CapEx referenced by Flow relates primarily to the volume of nodes issue which Flow raised in response to the OUR's proposal on access

nodes. The company also referred the OUR to its earlier observations made on the arguments presented by Flow on this issue.

4.81. Flow in its comments on responses summarized the issues that both Flow and Digicel presented in their initial responses to the cost structure presented by the OUR. Flow also requested that the OUR "*provide further explanation for the trends and distribution in due course*".

OUR's Response

4.82. The OUR acknowledges the comment from CACU.

4.83. The OUR acknowledges the comments from Digicel and Flow regarding CapEx and OpEx. The OUR also notes that this comment is related to Digicel's comment regarding the increase in ethernet ports in the Model, (mentioned in paragraph 4.60). The OUR considers that the cost structure of the modelled operator is as a result of the different inputs and calculations performed in the Model. In this context, the OUR notes that the increase in the share of OpEx costs is derived from the increase of the forecasted capacity for data services compared to the previous version of the Model, which involves the deployment of network elements in the transmission network (e.g. lambda inserters and DWDM equipment). This brings additional operational costs and electricity expenses. Moreover, the OUR notes that the decrease of the WACC in the updated version of the Model results in an increased share of operational costs and a lower share in Cost of Capital.

4.84. The cost base estimated in the updated Model is approximately 18% higher than the one forecasted in the previous 2017 version of the Model. Additionally, the changes presented in previous sections (such as the number of access nodes) have resulted in differences in the cost structure of the modelled operator. The updated cost structure of the modelled operator is presented in Table 9 below.

Cost category (% of costs)	2018	2019	2020	2021	2022	2023	2024	2025
OpEx	18.8%	19.1%	18.5%	18.9%	19.5%	20.1%	20.8%	21.5%
Depreciation	27.6%	27.6%	28.6%	28.4%	28.4%	28.1%	27.8%	27.2%
Cost of Capital	20.4%	19.8%	19.3%	18.6%	17.8%	17.1%	16.4%	16.3%
Retail Costs	27.4%	27.6%	27.7%	28.0%	28.3%	28.5%	28.7%	28.8%
G&A	5.9%	5.9%	6.0%	6.0%	6.1%	6.1%	6.2%	6.2%

Table 9: Updated cost structure of the modelled operator [Source: Updated Fixed Cost Model]

4.85. The OUR observes that the revised figures entail a higher weight of the depreciation and cost of capital expenses, slightly reducing OpEx. However, this was expected based on the nature of the changes implemented in the Model.

Determination 8: The cost structure included in the Model has been updated considering the different changes implemented, in terms of access nodes, WACC and cost trends.

Cost Allocation to Services

OUR's Proposal

4.86. Costs are allocated to the services based on the routing factors. These factors have remained unchanged in the updated version of the Model with the exception of additional routing factors (i.e. TV services).

Stakeholders' Comments

4.87. CACU stated that it "*does not disagree with the routing factors used*".

4.88. Flow in its response to the Consultation Document, stated, "*the routing factors appear to be reasonable*".

4.89. Digicel in its response to the Consultation Document, indicated that in its view "*there are a number of errors in the routing factors for non-voice services as a number of these have routing factors of 600, 1,000 or 2,000*".

4.90. Additionally, Digicel pointed out that "*a separate non-voice demand for self-supplied mobile transmission should be added to the model*" and that it "*can be readily obtained from the mobile cost model*".

4.91. Flow in response to Digicel's comment on the errors in the routing factors, stated *"[w]e believe that the factors that appear anomalous to Digicel are not so, but are rather the result of the unit conversion factor*" but conceded that the OUR should review the factors.

4.92. In regard to Digicel's proposal for the addition of *a* separate non-voice demand for self-supplied mobile transmission, Flow indicated that the approach suggested by Digicel would be inconsistent with the principles and methodology determined and applied to the previous and this updated Model.

OUR's Response

4.93. The OUR acknowledges the comments from CACU, Flow and Digicel.

4.94. The OUR confirms that, after thorough review of the routing factors used in the Model, they are free of errors. Since the traffic for non-voice services is expressed in Gbps, the routing factors are multiplied by a unit conversion factor of 1,000 to obtain the traffic in Mbps. This is the cause of the impact on non-voice routing factors, highlighted by Digicel.

4.95. The OUR notes Digicel's and Flow's comments regarding non-voice demand for self-supplied mobile transmission. However, the Office's position is that this demand element from the mobile environment is already included in the Model through the use of the appropriate self-supplied leased line capacity included in the Updated Fixed Cost Model.

Determination 9: The Office will maintain the routing factors considered in the draft Model.

Chapter 5: Services Results

Introduction

5.1. One of the objectives of this Determination Notice is to present the resulting fixed interconnection rates extracted from the updated Model and the Office's decision regarding the rates on regulated wholesale tariffs. This chapter of the Determination Notice presents the results of the Model after all the updates discussed in the previous sections and establishes the new wholesale fixed interconnection rates in accordance with those results.

OUR's Proposal

5.2. In the Consultation Document, the OUR proposed the unit costs of the services in the LRIC, LRIC+ and SAC cost standards for the draft Fixed Cost Model.

Stakeholders' Comments

5.3. CACU stated, *"[t]he trend shows that the unit[s] costs increase over time with some factors remaining steady"* but it would seem logical that the unit costs would decrease over time.

5.4. Flow, in its response to the Consultation Document indicated that it does not find the services' unit costs to be reasonable and that it cannot do so until the model is adjusted to reflect the "*reasonable modifications*", proposed in its responses to earlier consultation questions.

5.5. Digicel in its response to the Consultation Document noted that the updated Model outputs for 2020 are below the forecast outputs from the 2017 model and explained its belief that the primary driver "*is likely to be the relative increase[d] baseline in non-voice demand for 2020*". Digicel further explained that the trend in unitary costs over the period was unexpected, given the forecasted increase in non-voice demand and so sought the Office's view on this matter.

5.6. Flow in response to Digicel's comment, indicated that the stability of termination unit costs in light of increasing non-voice demand is normal and expected given the pure LRIC approach. Flow submits that the changes would be more relevant in the case that a LRIC+ approach was followed. Flow then concludes that "*we do not believe Digicel's observation is relevant*", suggesting that the error is elsewhere in the Model and that the unit costs obtained are in fact underestimated.

OUR's Response

5.7. The OUR has comprehensively addressed all of the issues raised by stakeholders in the appropriate section of this Determination Notice. As such, the OUR will now present the Model results after all the updates discussed in previous sections.

Cost of Services

5.8. As mandated by the Telecommunications Act, the interconnection rates shall be cost oriented; specifically, termination rates shall be based on the avoidable cost (i.e., pure LRIC cost) and other interconnection rates shall be between the TLRIC and the SAC costs. Accordingly, the Model developed by the Office calculated three sets of results (under pure LRIC, TLRIC and SAC standards). These results are summarized in Tables 10, 11 and 12 below.

Termination services (JMDcent / min)	2021	2022	2023	2024	2025
PSTN Terminating Access Service – Local level	6.80	6.71	6.68	6.67	6.75
PSTN Terminating Access Service – National level	6.80	6.71	6.68	6.67	6.75
Incoming International Call Termination Service on PSTN	6.80	6.71	6.68	6.67	6.75
Terminating to emergency services[3]	6.80	6.71	6.68	6.67	6.75
Terminating to weather warning service	13.87	13.77	13.74	13.73	13.82
Terminating to national DQ[3]	6.80	6.71	6.68	6.67	6.75
Terminating to international DQ[3]	6.80	6.71	6.68	6.67	6.75
Terminating to national freephone access service	6.80	6.71	6.68	6.67	6.75
Terminating to own freephone access service	6.80	6.71	6.68	6.67	6.75
Terminating to international freephone access service	6.80	6.71	6.68	6.67	6.75
Terminating to home country direct collect service	4.71	4.62	4.58	4.56	4.63

Table 10: Unit costs obtained for voice termination services under Pure LRIC Standard [Source: Updated Fixed Cost Model]

Other voice services (JMDcent / min)	2021	2022	2023	2024	2025
PSTN Transit service	0.38	0.46	0.35	0.55	0.56
International Transit to Third Party Fixed Network	0.38	0.46	0.35	0.55	0.56
Use of call centre for DQ and Emergency Services	13.18	13.61	14.07	14.55	15.06

Table 11: Unit costs obtained for wholesale voice services under TLRIC Standard [Source: Updated Fixed Cost Model]

Other voice services (JMDcent / min)	2021	2022	2023	2024	2025
PSTN Transit service	1.50	1.53	1.55	1.56	1.58
International Transit to Third Party Fixed Network	2.13	2.23	2.34	2.44	2.54
Use of call centre for DQ and Emergency Services	13.18	13.61	14.07	14.55	15.06

Table 12: Unit costs obtained for wholesale voice services under SAC Standard [Source: Updated Fixed Cost Model]

[3] This service only includes the termination costs. The costs associated to the call centre are included within the service "Use of call centre for DQ and Emergency Services", seen in subsequent tables.

Fixed Termination Rates

5.9. Table 13 below compares existing fixed termination rates with the results obtained from the Model.

Termination services (JMDcent / min)	Existing 2020 FTR	Average 2021-2025	Difference
Terminating to fixed local	9.39	6.72	-28%
Terminating to fixed national	9.58	6.72	-30%
Terminating from international direct to fixed	10.04	6.72	-33%

Table 13: Comparison of existing fixed termination rates (FTRs) with estimated cost of services in the period under analysis (2021-2025) [Source: Axon]

5.10. In keeping with the statutory requirement for fixed termination rates to be set based on the pure LRIC standard, the Office has determined that the FTRs applicable from 2021 to 2025 are those listed in Table 14 below. The rates will become effective on 2022 May 1.

Termination services (JMDcent / min)	2021-2025
Terminating to fixed local	6.72
Terminating to fixed national	6.72
Terminating from international direct to fixed	6.72

Table 14: Fixed termination rates applicable from 2021 to 2025 [Source: Axon]

Determination 10: The charges for fixed termination shall be those listed in Table 14. The FTRs shall be charged on a per-second basis. These rates shall remain in effect for a period of five (5) years unless they are reviewed earlier.

Special Services Rates

5.11. In addition to the services (local, national and international direct to fixed terminating services) associated to terminating traffic to Flow's customers, there are a number of services which are related to terminating calls on special

services. Table 15 below compares existing termination rates for those services with the results obtained from the Model[4].

Termination services (JMDcent / min)		Units	Existing 2020 term. rates	Average 2021-2025	Difference
Terminating to weather warning service		JMDcent / min	18.62	13.79	-26%
Terminating to national freephone access service		JMDcent / min	9.58	6.72	-30%
Terminating to own freephone access service		JMDcent / min	9.11	6.72	-26%
Terminating to international freephone access service		JMDcent / min	9.57	6.72	-30%
Terminating to home country direct collect service		JMDcent / min	7.29	4.62	-37%
Terminating to emergency services	Call Termination	JMD / min	0.09	0.07	-25%
	Call Centre	JMD / min	12.18	14.10	16%
Terminating to national DQ	Call Termination	JMD / min	0.10	0.07	-33%
	Call Centre	JMD / min	12.18	14.10	16%
Terminating to international DQ	Call Termination	JMD / min	0.10	0.07	-33%
	Call Centre	JMD / min	12.18	14.10	16%

Table 15: Comparison of existing termination rates on special services with estimated costs of services in the period under analysis (2021-2025) [Source: Axon]

5.12. The Office has determined that the rates for termination on special services applicable from 2021 to 2025 are those listed in Table 16 below. The rates will become effective on 2022 May 1.

[4] Termination services are calculated through the Pure LRIC standard, whereas the cost associated with the call centres is calculated through the TLRIC standard.

Termination services (JMDcent / min)	2021-2025
Terminating to weather warning service	13.79
Terminating to national freephone access service	6.72
Terminating to own freephone access service	6.72
Terminating to international freephone access service	6.72
Terminating to home country direct collect service	4.62
Terminating to emergency services[5]	0.07
Terminating to national DQ[5]	0.07
Terminating to international DQ[5]	0.07

Table 16: Rates for termination to special services applicable from 2021 to 2025 [Source: Axon]

5.13. Call Centre service cost represents the fee that should be added on top of the termination component in the case that Flow's call centre is used for the provision of Emergency, National DQ or International DQ services. Contrary to termination rates discussed above, costs for the Call Centre service (measured on a TLRIC basis), are above the existing rate. Considering this, the OUR has decided to increase the rate for Call Centre service that should be added on top of the termination component accordingly. Similar to the determination on termination services, the new rate, which is shown in Table 17, shall be effective on 2022 May 1.

Services (JMD / min)	2021-2025
Use of Flow's call centre	14.10

Table 17: Rates for using Flow's call centre applicable from 2021 to 2025 [Source: Axon]

[5] In the case that the call is ended in Flow's call centre, an additional fee should be paid for the use of such facilities, as described in this section.

Determination 11: The charges for terminating traffic to special services shall be those listed in Table 16 and Table 17. The fees shall be charged on a per-second basis. These rates shall remain in effect for a period of five (5) years unless they are reviewed earlier.

Transit Rates

5.14. As mandated by the Telecommunications Act, interconnection rates other than termination rates, shall be between the TLRIC and SAC.

5.15. After comparing the Model's results with the existing transit rates, the OUR observes that existing transit rates are already between the TLRIC and SAC results obtained from the Model. Table 18 below shows the comparison of existing transit rates against the TLRIC and SAC Model results for the period under analysis (2021-2025).

Transit services (JMDcent / min)	Existing 2020 transit rates	2021-2025 TLRIC	2021-2025 SAC
Domestic transit	0.76	0.46	1.54
International transit	0.80	0.46	2.34

Table 18: Comparison of existing fixed transit rates with estimated cost of services in the period under analysis (2021-2025) [Source: Axon]

5.16. As seen in Table 18 above, there is a relevant gap between the TLRIC cost of the service and the existing transit rates. For this reason, it is the OUR's view that the transit rates should be reviewed, in order to align them with the true costs faced by Flow. For this reason, and to ensure consistency with the remaining changes implemented into wholesale rates in this Determination Notice, the OUR has decided to reduce transit rates following the same percentage decrease observed for termination rates (i.e. 30%), as shown in Table 19 below. The rates will become effective on 2022 May 1.

Transit services (JMDcent / min)	2021-2025
Domestic transit	0.53
International transit	0.56

Table 19: Fixed transit rates applicable from 2021 to 2025 [Source: Axon]

Determination 12: The charges for transit shall be those listed in Table 19. The transit rates shall be charged on a per-second basis. These rates shall remain in effect for a period of five (5) years unless they are reviewed earlier.

Determination 13: In instances where the interconnecting operator is a licensed domestic carrier with customers on its network, once there are no technical reasons on the part of the interconnecting operator preventing it from obtaining direct interconnection with C&WJ's mobile switch, C&WJ is obligated to offer direct interconnection to its mobile switch. In such cases, there shall be no transit or other costs of connection for the interconnecting operator other than the tariffs listed in the approved Tariff Schedule for mobile termination rates or as separately determined by the Office. Where the interconnecting operator is not a licensed domestic carrier, C&WJ is not obligated to offer direct interconnection to its mobile switch pending the agreement of commercial terms with the interconnecting operator, regardless of whether or not there is agreement on technical terms. In any event, disputes regarding commercial issues relating to interconnection to C&WJ's mobile switch should be referred to the Office for resolution.

Determination 14: Flow will have ten (10) working days from the effective date of this Determination Notice within which to submit a revised RIO Tariff schedule reflecting the rates established in this Determination Notice to the Office.

Determination 15: Except in the case of an early review, the Office will begin the process of data collection to update the model one (1) year in advance of when a rate review becomes due. In the case of the next five (5) year review, if the Office is unable to complete its review by 2025 December 31, the interconnection rates existing in the market at the time will remain in force until the review is completed.

Annex A. List of Determinations

Determination 1: The Office will maintain the market demand for voice traffic used in the draft Model.

Determination 2: The Office reaffirms the forecasted data traffic figures used in the draft Model, with the exception of Leased Lines services, which have been adjusted to account for the expected growth in mobile data traffic for coming years.

Determination 3: The number of access nodes considered in the draft Model has been updated to include the number of access nodes (MSAN and DSLAM) provided by Flow in its comments on the draft Model.

Determination 4: The migration pattern considered in the draft Model will be maintained.

Determination 5: The unit cost trends considered in the draft Model have been updated to ensure alignment to the cost trends for equivalent assets in the Mobile Cost Model.

Determination 6: The technical parameters and modelled network will remain the same, with the exception of the changes implemented to the number of access nodes presented in Determination 3, to ensure alignment with the network of the modelled operator.

Determination 7: The nominal pre-tax WACC in the Model has been updated to 10.70% in US$ terms and 14.96% in J$ terms.

Determination 8: The cost structure included in the Model has been updated considering the different changes implemented, in terms of access nodes, WACC and cost trends.

Determination 9: The Office will maintain the routing factors considered in the draft Model.

Determination 10: The charges for fixed termination shall be those listed in Table 14. The FTRs shall be charged on a per-second basis. These rates shall remain in effect for a period of five (5) years unless they are reviewed earlier.

Termination services (JMDcent / min)	2021-2025
Terminating to fixed local	6.72
Terminating to fixed national	6.72
Terminating from international direct to fixed	6.72

Table 14: Fixed termination rates applicable from 2021 to 2025 [Source: Axon]

Determination 11: The charges for terminating traffic to special services shall be those listed in Table 16 and Table 17. The fees shall be charged on a per-second basis. These rates shall remain in effect for a period of five (5) years unless they are reviewed earlier.

Termination services (JMDcent / min)	2021-2025
Terminating to weather warning service	13.79
Terminating to national freephone access service	6.72
Terminating to own freephone access service	6.72
Terminating to international freephone access service	6.72
Terminating to home country direct collect service	4.62
Terminating to emergency services	0.07
Terminating to national DQ	0.07
Terminating to international DQ	0.07

Table 16: Rates for termination to special services applicable from 2021 to 2025 [Source: Axon]

Services (JMD / min)	2021-2025
Use of Flow's call centre	14.10

Table 17: Rates for using Flow's call centre applicable from 2021 to 2025 [Source: Axon]

Determination 12: The charges for transit shall be those listed in Table 19. The transit rates shall be charged on a per-second basis. These rates shall remain in effect for a period of five (5) years unless they are reviewed earlier.

Transit services (JMDcent / min)	2021-2025
Domestic transit	0.53
International transit	0.56

Table 19: Fixed transit rates applicable from 2021 to 2025 [Source: Axon]

Determination 13: In instances where the interconnecting operator is a licensed domestic carrier with customers on its network, once there are no technical reasons on the part of the interconnecting operator preventing it from obtaining direct interconnection with C&WJ's mobile switch, C&WJ is obligated to offer direct interconnection to its mobile switch. In such cases, there shall be no transit or other costs of connection for the interconnecting operator other than the tariffs listed in the approved Tariff Schedule for mobile termination rates or as separately determined by the Office. Where the interconnecting operator is not a licensed domestic carrier, C&WJ is not obligated to offer direct interconnection to its mobile switch pending the agreement of commercial terms with the interconnecting operator, regardless of whether or not there is agreement on technical terms. In any event, disputes regarding commercial issues relating to interconnection to C&WJ's mobile switch should be referred to the Office for resolution.

Determination 14: Flow will have ten (10) working days from the effective date of this Determination Notice within which to submit a revised RIO Tariff schedule reflecting the rates established in this Determination Notice to the Office.

Determination 15: Except in the case of an early review, the Office will begin the process of data collection to update the model one (1) year in advance of when a rate review becomes due. In the case of the next five (5) year review, if the Office is unable to complete its review by 2025 December 31, the interconnection rates existing in the market at the time will remain in force until the review is completed.

Annex B. Summary of changes in the Updated Fixed Cost Model

Changes	Chapter	Section
Number of access nodes has been changed based on updated figures provided by Flow.	Chapter 4	Number of Access Nodes
Cost trends has been changed, ensuring alignment to the figures in the Mobile Model for equivalent assets.	Chapter 4	5.17. Unitary Costs and Cost Trends
The WACC value has been updated from 14.16% to 14.96% (in J$ terms) according to the OUR's Determination Notice, "Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers" Document N°. 2021/TEL/010/DET.002.	Chapter 4	5.18. WACC

Table 20. Summary of changes included in the Updated Fixed Cost Model [Source: OUR]