Office of Utilities Regulation

Update of the Mobile Cost Model – The Decision on Rates

Determination Notice

OUR

OFFICE OF UTILITIES REGULATION

2021 September 1

DOCUMENT TITLE AND APPROVAL PAGE

1. DOCUMENT NUMBER: 2021/TEL/011/DET.003

2. DOCUMENT TITLE: Update of the Mobile Cost Model – The Decision on Rates – **Determination Notice**

3. PURPOSE OF DOCUMENT

This document contains the main decisions of the Office of Utilities Regulation regarding the update of the cost model for mobile termination rate and the output of the updated model.

4. ANTECEDENT PUBLICATIONS

Publication Number	Publication Title	Publication Date
2020/TEL/005/CON.001	Update of the Mobile Cost Model Consultation Document	2020 June 2
TEL2013001_DET001	Determination Notice for Cost Model for Mobile Termination Rates – The Decision on Rates.	2013 May 30
TEL2012001_DET001	Determination Notice on Cost Model for Mobile Termination Rates.	July 24, 2012

5. Approval

This document is approved by the Office of Utilities Regulation and the decisions therein become effective on **2021 September 1**.

On behalf of the Office:

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Ansord E. Hewitt

Director-General

2021/09/01

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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 methodology for the existing cost model used to calculate the mobile termination rate was determined in the 2012 July 24 document "Cost Model for Mobile Termination Rates – The Determination Notice" (Document No: TEL2012001_DET001). The methodology set out in that Determination Notice was utilized in the update of the cost model.

This Determination Notice sets out the Office's response to the issues raised by stakeholders who commented on the draft long run incremental cost ("LRIC") model. Further, the Determination Notice indicates the resulting mobile termination rate ("MTR") from the cost model.

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Chapter 1: Introduction

Background

1.1 On 2012 July 24, the Office of Utilities Regulation (OUR or Office) published the document titled "Cost Model for Mobile Termination Rates – The Determination Notice" (Document No: TEL2012001_DET001) which outlined the methodology to be followed in the development of a Mobile Cost Model. The existing Mobile Cost Model and the Determination Notice entitled "Cost Model for Mobile Termination Rates – The Decision on Rates" (Document No. TEL2013001_DET001) were issued on 2013 May 30.

1.2 In keeping with its express statutory powers to determine the charges for interconnection services, the OUR initiated a consultation process to update the existing Mobile Cost Model. On 2020 June 02, the OUR issued the Consultation Document, titled "Update of the Mobile Cost Model" (Document No: 2020/TEL/005/CON.001) (the "Consultation Document"). Responses to the Consultation Document were requested from industry stakeholders by the deadline of 2020 June 30. On 2020 July 01 the OUR approved a request for the extension of the deadline for the submission of responses. All stakeholders were therefore allowed to submit their responses by 2020 July 15.

1.3 The OUR received responses to the Consultation Document from Cable & Wireless Jamaica Limited ("C&WJ") and Digicel Jamaica Limited ("Digicel"). Stakeholders were then given until 2020 August 10 to comment on the responses received. The OUR received comments from Digicel and C&WJ.

Purpose of this Determination Notice

1.4 This Determination Notice details the OUR's comments on the responses to the Consultation Document and the comments on the submitted responses.

1.5 This Determination Notice also details the changes that have been made to the draft cost model because of the comments and responses received, to produce the final version of the mobile cost model ("the Model"). It also sets out the OUR's decision on the mobile termination rate.

Structure of Document

1.6 The remainder of this document is structured as follows:

- **Chapter 2:** outlines the Legal Framework that describes the remit of the OUR in regard to the setting of interconnection rates.

- Chapter **3:** presents a summary of the general comments from stakeholders and the OUR's Responses to Stakeholders' general comments to the OUR's proposals in the Consultation Document.

- **Chapter 4:** presents a summary of the comments received from stakeholders on the proposed market and technological developments considered in the update process, and provides the OUR's response.

- Chapter **5:** presents a summary of the comments made by stakeholders on specific topics of special relevance, and provides the OUR's response.

- Chapter **6:** presents a summary of additional comments from C&WJ on a set of inputs in the updated model, and provides the OUR's response.

- 0 presents the results of the final model, and sets out the mobile termination rate (MTR) for the period 2021-2025.

- 0 summarises the determinations made in this document.

Chapter 2: Legislative Framework

2.1 As part of its overall functions to regulate specified services and facilities under section 4(1) of the Telecommunications Act (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."

Chapter 3: OUR's Responses to Stakeholders' General Comments

Introduction

3.1 The feedback from stakeholders' included general comments which were not directed towards the proposed market and technological developments considered in the update process or a particular aspect of the draft cost Model.

3.2 The OUR has considered the general comments made by stakeholders and now provides in this Chapter, a summary of the stakeholders' general comments and the OUR's responses to those comments.

Impact of Covid

Stakeholders' Comments

3.3 Digicel noted that the OUR based its projections on a reasonably stable and progressive evolution of the market. Digicel further claimed that these developments are supported by assumptions related to broader trends in the Jamaican and international economies. The company opined that due to the Covid-19 pandemic, these assumptions are at best optimistic, and most likely unrealistic. Digicel concluded that the OUR should either adopt assumptions and projections which will mitigate the risk of under recovery of investment, or, defer its update of the model until the OUR can make a more reliable projection of future market conditions.

3.4 In its response to Digicel's comments on the Covid-19 impact, C&WJ noted that Digicel was not specific about the elements of the market evolution to which it referred or what constituted "optimistic". C&WJ also observed that Digicel did not provide any evidence of how the Covid-19 pandemic was expected to impact the market over the modelling period. C&WJ opined that Digicel's intent was "to undermine confidence" in the consultative process or simply delay it.

OUR's Response

3.5 The OUR notes that Digicel did not provide data to support its assertions related to any potential impact of the Covid-19 pandemic, despite being mentioned in several comments.

3.6 Regarding demand usage statistics, the OUR highlights that data related to voice traffic shows that the volume of mobile on-net and off-net calls observed

in Q2 2020 remained stable, compared to Q1 2019 (+0.01% and 0.14% respectively)[1] When it comes to data traffic, recent reports illustrated an increase in mobile data traffic during the first three months of 2020, in many countries[2]. In addition, voice and data traffic figures provided by C&WJ, seems to show a return to trends that are overall in-line with the OUR's projections for the period starting 2020 June.

3.7 Accordingly, the OUR sees no need to delay the update process.

Pure LRIC Standard

Stakeholders' Comments

3.8 Digicel claimed that the OUR's use of a pure-LRIC cost standard in the estimation of the mobile termination rate will significantly increase the risk that the mobile termination rate mandated by the OUR will not allow operators to recover the costs they actually incurred. The company opined that while it is within the OUR's remit to set prices, it does not have the legal standing to "compel licensees to sell services at a loss".

3.9 Digicel further stated that it was the view that when setting the mobile termination rate, the OUR must ensure that the rate set is sufficient to allow cost recovery, in order to not infringe upon the company's constitutional property rights.

3.10 C&WJ, in its comments on Digicel's response, urged the OUR to disregard Digicel's allegations that the adoption of a pure LRIC termination rate will infringe its property rights, noting that the allegations are unfounded and irrelevant. C&WJ pointed out that in many jurisdictions, termination is priced lower than pure LRIC, for example at zero, and that the issue of infringement of property rights has not arisen in any of those jurisdictions. C&WJ also pointed out that Digicel's "infringement of constitutional property rights" position is essentially the same "pure-LRIC = discouragement of investment" position taken by Digicel when the initial mobile LRIC model was being developed.

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[1] OUR Telecommunications Market Information Report April - June 2020

[2] See: https://www.oecd.org/coronavirus/policy-responses/keeping-the-internet-up-and-running-in-times-of-crisis-4017c4c9/ and https://www.ericsson.com/en/mobility-report/articles/communication-needs-in-times-of-crisis

3.11 C&WJ noted that the OUR has already explicitly rejected Digicel's position at least twice before. C&WJ further noted that Digicel has not presented a valid argument in support of its claim that the assumptions and projections proposed by the OUR will lead to under-recovery of investment.

OUR's Response

3.12 Digicel is well aware that the standard to be used in the setting of the mobile termination is prescribed under legislation, and is not left to the discretion of the OUR. Section 33(1)(g) of the Act states: "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." This standard outlined in the legislation corresponds to the costing methodology that is known globally as pure LRIC.

3.13 Notwithstanding the foregoing, the OUR would like to highlight the fact that the pure LRIC approach includes all costs directly related to the service of termination. As such, there is no reason why it should result in under recovery of investment, as all capital costs related to providing termination services are included when calculating the mobile termination rate.

Determination 1: The Office reaffirms that the mobile termination rate will be set using a pure LRIC approach as is required under the Telecommunications Act.

Implementation of a Glidepath for the new rates

Stakeholders' Comments

3.14 C&WJ noted that the questions posed by the Consultation Document only cover cost assumptions and other specific inputs used in the model, when the previous consultative process also dealt with the mechanism for translating the model results into tariffs. Following this, C&WJ assumed that "the OUR is not proposing changes in the structure of the rates" and that "there is no discussion of a glidepath, because there will be none." C&WJ noted that this should lead to an immediate implementation of the pure LRIC rates calculated from the model, "upon the issuance of the OUR's determination of the final pure LRIC values." C&WJ is of the view that such an approach is "fully justified" since any delay in the implementation of the new rates would be detrimental to the market,

and more specifically to the customers (main beneficiaries of any potential reduction in the MTR).

3.15 Digicel noted that "Flow has attempted to attribute a decision to the Office that has not actually been made. Specifically, it seeks to infer that simply because the Office has not included a discussion on the timing of the application of any changes to Mobile Termination Rates that any such change will be effective immediately." Digicel pointed out that the current process is an update of the cost model developed in 2013, claiming that "[t]his issue is separate and distinct from any consideration or decision on the timing of [implementation] on rate changes." Digicel stated that, as stipulated in paragraph 15.5 of OUR's document "Cost Model for Fixed Termination Rates – The Decision on Rates" (Document No: 2017/TEL/004/DET.002) which was published in 2017 July 07, the Office has previously indicated that while deciding on the "timing of any reduction", the OUR has a statutory mandate "...to balance short term welfare gains of immediate price reductions with the long term interests of protection of efficient investment incentives..."

3.16 Digicel indicated that it is of the view that "until the update of the model is completed and an output generated, it is not possible for the Office to properly conduct this balancing exercise." Digicel added that "[a] decision on the timing of implementation for regulated price changes has material effects on the regulated entities and by virtue of the requirements of Section 4(2) of the Telecommunications Act, the Office has an obligation to consult on such a decision."

OUR's Response

3.17 As mentioned by Digicel, the current consultation process is an update of the previous cost model. Therefore any determination made in the Determination Notices titled "Cost Model for Mobile Termination Rates" (Document No: TEL2012001_DET001) ("the Methodology")[3] and "Cost Model for Mobile Termination Rates - The Decision on Rates" (Document No: TEL2013001_DET001) ("the Decision")[4], will remain in effect unless superseded by a determination made in this document.

3.18 In the Methodology, the OUR determined that it will decide on a glide path after the mobile cost model was developed and the mobile termination rate (MTR) calculated. The issue of the glide path was only discussed in reference to the

[3] Published on 2012 July 24.
[4] Published on 2013 May 30.

move of the MTR from the TLRIC level to the pure LRIC level. This was due to the fact that the Act had been amended during the consultation process to mandate that MTR be set at the pure LRIC level, and the OUR was of the view that, if necessary, it would allow time to adjust to the new cost standard. In the Methodology, the OUR also made it clear that it does not support the setting of the mobile termination rate above cost stating "The Office's position is that the Act clearly stipulates that the price of wholesale termination should reflect cost. As the Office has indicated throughout this Determination Notice, keeping rates above cost has negative effects on competition and consumer welfare. Therefore, rates must be adjusted to cost based levels in as short a time as possible."

3.19 In the Decision, the Office indicated that given the small difference between the 2013 TLRIC rate and future period pure LRIC rate, it did not think necessary to implement a glide path. In the current situation, the prevailing MTR was set based on pure LRIC. Given that the Act requires that the MTR be cost oriented, the Office does not deem it necessary to consider a glide path for the implementation of a new MTR.

Determination 2: The Office will not implement a glide path for the implementation of the new mobile termination rate.

Chapter 4: Market and Technological Developments Considered

Introduction

4.1 Chapter 3 of the Consultation Document presented the market and technological developments considered in the update of the Model.

4.2 The OUR has considered the comments made by stakeholders on the market and technological developments considered and now provides a summary of the stakeholders' comments, its responses, and subsequent determinations below.

Market Developments

Stakeholders' Comments

4.3 Digicel noted the "market perspectives examined by the OUR," and agreed with the "broad direction of travel." The company indicated it was however of the view that "some of the timelines associated with the market evolution are overly optimistic". Digicel pointed out that it held this view "before the impact of the Covid-19 pandemic was taken into account and even more so when these impacts are factored in."

4.4 C&WJ indicated its agreement with the trends that the OUR identified for the demand forecast. The company also indicated that it will provide more specific comments on the OUR's demand analysis in its responses to the chapter on Topics of Special Relevance.

OUR's Response

4.5 The OUR acknowledges C&WJ's agreement with the demand forecast trends and Digicel's agreement with the "broad direction of travel" of the market perspectives.

4.6 The OUR has already addressed Digicel's comments regarding the "potential impact" of the Covid-19 pandemic on voice and data traffic in Chapter 3. The OUR highlights that the timeline issue mentioned by Digicel is addressed

separately in the "Market Demand" and "Demand Usage Statistics" sections of this document.

Technological Developments

VoLTE / LTE

Stakeholders' Comments

4.7 C&WJ agreed with the OUR's approach of not including VoLTE in the model, and consequently modelling only LTE/LTE-A traffic demand rather than the entire LTE network.

4.8 Digicel provided no comment on this aspect of the model.

OUR's Response

4.9 The OUR acknowledges C&WJ's agreement.

Determination 3: The Model will not include VoLTE. Consequently, the Office will only model LTE/LTE-A traffic demand rather than the entire LTE network.

Inclusion of IP Interconnection

Stakeholders' Comments

4.10 C&WJ agreed with the OUR's approach of including IP Interconnection in the Model.

4.11 Digicel provided no comment on this matter. However, it did provide a response to the OUR's proposal for the IP interconnection implementation timeline which will be addressed in Chapter 5.

OUR's Response

4.12 The OUR acknowledges C&WJ's agreement.

Determination 4: The Model will include IP Interconnection.

Other Financial and Technical Considerations

Unattributable Costs

Stakeholders' Comments

4.13 C&WJ agreed with the OUR's assumption regarding the setting of unattributable costs at 25%.

4.14 Digicel provided no comment on unattributable costs.

OUR's Response

4.15 The OUR acknowledges C&WJ's agreement.

Determination 5: Unattributable costs are set at 25%.

Share of Urban Busy Hour Traffic

Stakeholders' Comments

4.16 C&WJ disagreed with the OUR's proposal to reduce the share of urban busy hour traffic for voice and data.[5] C&WJ is of the view that the share of busy hour traffic should be increasing, not decreasing, considering the ongoing urbanization of Jamaica and the fact that information communiction technology (ICT) usage by rural subscribers is consistently lower than the usage by urban users.

4.17 Digicel provided no comment on the share of urban busy hour traffic.

OUR's Response

4.18 The OUR disagrees with C&WJ. The values proposed by the OUR were based on data collected from both stakeholders, before being anonymized. In addition,

[5] The share of urban busy hour traffic for voice and data was 54% and 50% respectively in the anonymized version of the draft model.

C&WJ did not provide any data to support its position, which remains speculative.

4.19 The OUR will therefore maintain the current assumptions in the Model.

Determination 6: The share of urban busy hour traffic for voice is 53.51%. The share of urban busy hour traffic for data is 51.02%.

WACC Value Considered in the Model

Stakeholders' Comments

4.20 C&WJ agreed that the WACC value currently used in the Model (20.93%), should be updated when a Determination Notice is issued as a result of the WACC consultation launched on 2020 June 24.

4.21 Digicel provided no comment on the WACC value.

OUR's Response

4.22 The current WACC value of 20.93% will remain in effect for the period prior to the effective date of the new WACC value which is 2021 November 28. The final Model therefore contains two WACC values; 20.93% for the period before 2021 November 28 and 16.95% thereafter. The OUR will set two mobile termination rates; a pre-2021 December 01 mobile termination rate, based on the current WACC of 20.93% and a post-2021 December 01 rate based on the updated WACC of 16.95%[6].

Determination 7: The Model will utilize two WACC values; 20.93% for the period before 2021 November 28 and 16.95% thereafter.

Share of Co-located Sites and Cost Reduction due to Site Co-location

Stakeholders' Comments

4.23 C&WJ agreed that the model should reflect greater co-location and reduced costs attributable to co-location.

[6] Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers - Determination Notice (Document No: 2021/TEL/010/DET.002) dated 2021 August 31.

4.24 Digicel provided no comment on the share of co-located sites and the cost reduction due to sites co-located.

OUR's Response

4.25 The OUR acknowledges C&WJ's comment regarding the share of co-located sites and cost reduction due to increased site co-location.

Determination 4: The share of co-located sites considered in the draft Model will not be updated.

Chapter 5: Topics of Special Relevance

Introduction

5.1 Chapter 4 of the Consultation Document presented the topics of special relevance. The topics of special relevance with a greater impact potential are:

- Market Demand
- Demand Usage Statistics
- 3G Coverage Extension and Introduction of HSPA+ Technology
- Timeline of implementing IP Interconnection
- Update of the Transmission Links Used
- Unit Cost and Price Trends

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

Market Demand

Stakeholders' Comments

5.3 Digicel agreed, to a large extent, with the trends presented by the OUR. However, Digicel noted that specific attention should be paid to the share of M2M SIMs in the mobile base, since these SIMs are for data-only usage and may reduce the average voice usage per user.

5.4 C&WJ stated that the number of mobile subscribers and mobile internet users forecasted until 2025 appeared reasonable based on historical trends.

5.5 In relation to M2M traffic, C&WJ noted that M2M device data volume per unit should be less than that of consumer mobile devices, while being less peaky than other voice and data devices. C&WJ was of the view that M2M traffic will have less of an impact on the cost of network deployment and that M2M demand is likely to be "complementary, not substitutional to traditional forms of demand."

OUR's Response

5.6 Regarding M2M SIMs, the OUR assumes that they should not represent more than 2% of the total SIM fleet over the modeling period, based on levels

observed in similar countries. This view is supported by recent studies[7] showing that the deployment of 5G should be the main driver of the development of M2M/IOT over the world. In light of this, and taking into account the low level of data consumption per M2M SIM (tens of Mbytes for M2M SIMs compared to more than 1Gbyte for "traditional" SIMs), the OUR is of the view that M2M SIMs should have a limited impact over the modelling period. More specifically, M2M contribution to global data traffic should remain insignificant, yielding a marginal impact on the cost of the network.

5.7 The OUR therefore sees no need to update market demand.

Determination 9: The Office reaffirms the market demand figures used in the draft Model.

Demand Usage Statistics

Voice Traffic Figures

Level of Forecasted Voice Traffic and Usage

Stakeholders' Comments

5.8 Digicel was of the view that the forecasted average usage per user (AUPU) is underestimated, given the change in usage statistics linked to the Covid-19 pandemic. Digicel claimed, that with remote working and learning being likely maintained after the lifting of Covid-19 restrictions, there is no clear evidence whether the expected decrease in voice usage will be at the same trend. Digicel also added that it is not clear at this stage whether the growth of call duration expected by the OUR will accelerate.

5.9 C&WJ considered the overall level of forecasted voice traffic presented in the Consultation Document reasonable. It also agreed with the OUR's assumptions regarding the sources of incoming traffic. In its comments on Digicel's response, C&WJ stated that Covid-19 should not have any long-term impact on voice demand. The company provided the OUR with confidential data related to its customers' voice traffic for the period 2020 March to July. This data seems to show a return to trends at the end of the first wave of the Covid-19 pandemic, that are mostly inline with the OUR's projections.

[7] See: GSMA study « Internet of Things In the 5G era - Opportunities and Benefits for Enterprises and Consumers » published in November 2019, available at https://www.gsma.com/iot/wp-content/uploads/2019/11/201911-GSMA-IoT-Report-IoT-in-the-5G-Era.pdf

OUR's Response

5.10 As already stated in Chapter 3, Digicel did not provide any evidence to support its assertions related to the expected impact of the Covid-19 pandemic on voice usage. In addition, the data provided by C&WJ seems to show a return to normal trends at the end of the first wave of the Covid-19 pandemic.

5.11 The OUR therefore sees no need to update the level of forecasted voice traffic.

Determination 10: The Office reaffirms the level of forecasted voice traffic used in the draft Model.

Share of On-net Traffic Among Voice Traffic

Stakeholders' Comments

5.12 C&WJ indicated that it expected the share of on-net traffic among voice traffic to decline "*more sharply*" than the OUR forecasted. The company argued that "[*T]he continuing fall in mobile termination rates will facilitate greater reductions in on-net vs. off-net price differentials.*" C&WJ also stated that observed differentials between on-net and off-net traffic were partly the result of current market shares. The company opined that, assuming 50% market share (as per the draft cost model), falling mobile termination rates should lead to a symmetry where on-net traffic share is around 50%.

5.13 Digicel did not provide any feedback on this aspect of the updated model.

OUR's Response

5.14 The OUR would like to remind stakeholders that the overall forecast of market demand assumed trends for the modelling period. C&WJ has indicated its agreement with the trends identified by the OUR for the subscriber and traffic forecasts. The level of on-net and off-net traffic in the Model was obtained by the multiplication of the forecasted minutes of on-net usage by the number of subscribers, yielding the 9% decrease of on-net share among local outgoing traffic over the modelling period.

5.15 The OUR cannot anticipate a continued decline of the mobile termination rate, since the rate will be set for the modelling period, based on the calculation of the updated model. The OUR agrees with C&WJ that the on-net traffic share in the model should be set at 50%. This is already taken into account in the current

model assumptions, since the value of on-net traffic share in Sheet "0. Control", is already set at 50%.

5.16 Accordingly, the OUR sees no need to update the forecasted level of on-net and off-net traffic.

Determination 11: The share of on-net traffic in the Model is set at 50%.

The Average Call Duration per Destination

Stakeholders' Comments

5.17 C&WJ indicated that most of the figures related to the average call duration per destination by call type seem reasonable, except for outgoing and incoming international calls. The company provided confidential data which showed that the average call duration in minutes of international outgoing and of incoming calls made and received by C&WJ's customers is higher than the values used in the draft Model.

5.18 Digicel did not provide any feedback on this aspect of the draft Model.

OUR's Response

5.19 The average call in minutes per destination used in the draft Model was estimated as an average of both stakeholders (before anonymization). In addition, the draft Model uses an average weighted call duration in minutes, based on the weight of each type of traffic among total traffic. Taking into account the contribution of international outgoing traffic and international incoming traffic to total voice traffic in 2018 (1.1% and 1.2% respectively), assuming a higher call duration for both these traffic types, would have a marginal impact on the model's outcomes.

5.20 In the light of the foregoing, the OUR sees no need to update the average call duration in minutes of international outgoing and incoming calls.

Determination 5: The average call duration in minutes of international outgoing and incoming calls considered in the draft Model will not be changed.

Data Traffic Figures

Stakeholders' Comments

5.21 Digicel claimed that remote working and learning should lead to an increase in demand for specific devices that are mainly data only (like tablets). The company noted that, while there might be an increase in mobile internet subscriptions, there is likely to be a greater proportion of data-only LTE devices. Digicel added that such data-only devices should not affect the voice demand on 2G and 3G networks. Digicel also stated that Wi-Fi offload of data services onto fixed networks may also be a feature of the market going forward. The company opined that these factors should result in an increased demand for capacity in the network periphery.

5.22 C&WJ is of the view that the 2018 average monthly data consumption was overestimated given the data consumption figures C&WJ had submitted to the OUR.

5.23 C&WJ however, found the data growth rates and the data migration to 4G assumed by the OUR to be reasonable. In its comments on Digicel's response, C&WJ noted that Digicel's statements regarding the impact of Covid-19 on data traffic "are not clear in terms of the relevance or implications for cost modelling." The company provided the OUR with internal data traffic figures which showed an initial decline in mobile data traffic at the start of the pandemic, followed by a return to levels which reflected a longer term data increase trend. C&WJ also stated that its own data (that was shared with the OUR), is not showing a significant impact on both total and peak-hour traffic during the first half of the year. The company also observed that voice and data traffic levels are getting "normalized", in line with the OUR's forecasts.

OUR's Response

5.24 The OUR notes Digicel's reference to the expected impact of the Covid-19 pandemic on data usage. However, the company did not provide any quantitative information or tangible facts that can be used to challenge the OUR's forecasted data figures. On the other hand, confidential data presented by C&WJ seems to show a resumption of data traffic growth starting from 2020 June (compared to 2019 levels), after an observed decline in April and 2020 May.

5.25 The OUR already anticipated an increase of 15%, in terms of total data traffic forecasted in 2020, compared to 2019. The forecasted data traffic also includes data-only device traffic.

5.26 Regarding C&WJ's comments about the over estimation of the 2018 average monthly data consumption given its figures, the difference may reflect the gap between the level observed across the entire market, and that observed for C&WJ's customers.

5.27 In light of this, the OUR will maintain its forecasted data traffic figures.

Determination 6: The Office reaffirms the forecasted data traffic figures used in the draft Model.

3G Coverage Extension and Introduction of HSPA+ Technology

3G Coverage Extension

Stakeholders' Comments

5.28 Digicel indicated that economic contraction, additional costs due to "the constraints of the current spectrum cap" and "limited availability" of fibre-based connectivity, should limit its capacity to increase its 3G coverage within the timeline proposed by the OUR, and mainly for areas of lower density and weaker demand. In addition, Digicel claimed that an increase of existing sites' capacity may be needed, to respond to the expected changes affecting demand (in terms of both geographic distribution and usage patterns).

5.29 C&WJ agreed with the coverage assumptions proposed by the OUR, taking into account historical trends, as well as the company's expectations regarding future deployment. In its comments on Digicel's response, C&WJ stated that there was no evidence that the cost of network expansion should be higher in uncovered rural areas, compared to covered rural areas. In addition, C&WJ claimed that densification and investment in existing sites should result in "lower investment per unit of capacity," as one would leverage existing sites or complement existing sites with smaller ones.

OUR's Response

5.30 The updated model assumes an increase in 3G coverage from 89% in 2018, to 95% in 2019, and 98% starting from 2020. These assumptions were made

based on data collected from operators. The selected value for 2019 remained below Digicel's data.

5.31 In addition, the Fair Trading Commission (FTC) has launched a study at the request of the Spectrum Management Authority (SMA) to assess the level of competition related to spectrum allocation. According to the FTC, this assessment should help "to determine whether the policy should continue, be changed or discontinued".[8] The issue raised by Digicel regarding the "current spectrum cap" should be solved with this study.

5.32 Regarding Digicel's statement that the "limited availability" of fibre-based connectivity, should limit its capacity to increase its 3G coverage the OUR notes that the model assumes a mix of fibre-based and micro-wave connectivity solutions at the backhaul. (The share of both technologies is discussed in the section "Share per technology at the backhaul" below). Furthermore, the OUR has not received any recent complaint from Digicel about any action initiated by C&WJ to hamper Digicel's efforts to acquire fibre-based backhaul connectivity.

5.33 Accordingly, the OUR sees no need to update the coverage assumptions.

Determination 7: The Office reaffirms the coverage assumptions used in the draft Model.

Split of 3G Traffic per Bearer

Stakeholders' Comments

5.34 C&WJ agreed with the split of 3G per bearer, but expected the downlink share attributable to HSPA+ to be higher, given its internal statistics related to the usage of its customers.

5.35 Digicel did not provide any feedback on this aspect of the updated model.

OUR's Response

5.36 The updated model assumes the downlink share attributable to HSPA+ is 85%. This value, while remaining slightly below the levels observed by C&WJ, seems from the OUR's point of view relevant for an efficient "Generic Operator," taking into account the values reported by both Digicel and C&WJ.

[8] Source : https://jamaica-gleaner.com/article/business/20200724/ftc-assessing-spectrum-allocation-effect-telecoms-competition

Determination 8: The downlink share attributable to HSPA+ is set at 85%.

Timeline of Implementing IP Interconnection

Stakeholders' Comments

5.37 Digicel claimed that it would not be able to commit to the timelines indicated by the OUR for the migration to IP interconnection. The company indicated that the financial and operational impact of the Covid-19 pandemic had resulted in a review of Digicel's "investment decisions".

5.38 C&WJ was of the view that the OUR should assume 100% IP Interconnection implementation from 2021, rather than 70% in 2021 and 100% starting from 2022. In its comments on Digicel's response, C&WJ argued that the OUR should assume efficient technologies, based on the methodology followed. Thus, it claimed that the network of an efficient operator, if "built today," should have IP interconnection fully operational.

OUR's Response

5.39 The OUR disagrees with both Digicel and C&WJ albeit for different reasons.

5.40 Digicel has not provided any evidence related to the impact of the Covid-19 pandemic, and the way it may result in a postponement in required investments related to IP migration. In addition, such investments are estimated to be 10.5 Million Jamaican dollars ("JMD") in 2021 (as per the updated model). In comparison, savings, in terms of CAPEX needed to acquire the voice termination equipment[9], should be around 72.9 Million JMD in 2021, as illustrated in the table below.

IP interconnection timeline	2019	2020	2021
70% IP interconnection in 2021	195 455 000	189 591 350	111 026 670
without IP interconnection	195 455 000	189 591 350	183 903 610
Yearly Savings			72 876 940

Table 1 Yearly CAPEX for the acquisition of voice termination equipment – Source: the updated cost model

[9] Namely the media gateway, the PE-Router and the SBC.

5.41 Regarding C&WJ's comment that the Model should assume, 100% IP Interconnection implementation from 2021, the OUR had considered the level of readiness of both Digicel and C&WJ. Furthermore, sensitivity analysis conducted by the OUR showed that assuming 100% IP interconnection in 2021, rather than 70%, would not have a significant impact on the calculated MTR.

5.42 Accordingly, the OUR maintains the assumptions related to the timeline of implementing IP interconnection, as defined in the updated model.

Determination 9: The Model assumes 70% IP Interconnection implementation in 2021 and 100% starting from 2022 January 01.

Update of the Transmission Links Used

Share per Technology at the Backhaul

Stakeholders' Comments

5.43 Both Digicel and C&WJ disagreed with the OUR's proposal on the share per technology at the backhaul, albeit for different reasons.

5.44 Digicel was of the view that the proposed increase in the use of fibre based backhaul to 60% may be a "valid theoretical assumption" that cannot be achieved in practice. According to Digicel, this is due to "the structure of the fixed market where Flow continues to hold bottleneck control over the provision and pricing of fibre-based backhaul in much of the geography of Jamaica".

5.45 C&WJ, on the other hand, was of the view that the backhaul technology split should be more weighted in favour of fibre-based solutions. The company stated that a large majority of its mobile sites are connected to fibre backhaul and claimed that this percentage should be higher, given traffic volumes.

5.46 In its comments on Digicel's response, C&WJ argued that the OUR should assume an efficient operator, with an efficient network built at minimized cost, regardless of the levels of Digicel's or C&WJ's investments in fibre backhauling.

OUR's Response

5.47 The OUR disagrees with both Digicel and C&WJ.

5.48 As stated before, the OUR is not in receipt of any recent complaint from Digicel, dealing with any action initiated by C&WJ to hamper Digicel's efforts to acquire fibre-based backhaul connectivity.

5.49 As noted in C&WJ's response, the "OUR should assume an efficient network minimizing the backhaul investment". Hence, the Model assumes a significant increase in the share of fibre-based solutions, mainly with the deployment of LTE technology. The Model should also consider the level of readiness of all stakeholders, including Digicel, when it comes to the weight of fibre-based solutions among backhaul. The OUR believes that the proposed value (59.81% in the updated model, compared to 28% in the previous model) guarantees a "fair balance" between the efficiency of the modelled operator and the current situation of both stakeholders. Indeed, before being anonymized, this value was defined based on data collected from both operators.

5.50 Accordingly, the OUR sees no need to update the share per technology at the backhaul considered in the model.

Determination 10: The share per technology at the backhaul considered in the draft Model will not be updated.

The Number of Transmission Links

Stakeholders' Comments

5.51 Digicel questioned the declining number of required links over the modelling period, while traffic is increasing.

5.52 In its comment on Digicel's response, C&WJ noted that Digicel may have misunderstood how trhe Model works. The company pointed out that only 2G and 3G networks are explicitly modelled while assuming an increasing share of LTE/LTE-A among total data traffic. C&WJ highlighted that, although data traffic is growing overall, 2G/3G data traffic is assumed to decrease, which will result in less need for 2G/3G transmission links.

OUR's Response

5.53 The number of required transmission links is mainly linked to voice, SMS, and data forecasted traffic over the modelling period. Only data traffic carried through 2G and 3G networks is involved in the dimensioning of the transmission

links, since the approach employed in the updated model is to model only LTE/LTE-A traffic demand (while assuming an increasing share of LTE/LTE-A among data traffic over the modelling period).

5.54 Digicel stated that the traffic is increasing over the modelling period. However, as shown in Table 2 below, the forecasted voice and SMS traffic is declining, year over year. The Model assumes that the expected increase of total data traffic over the period from 2019 to 2025, including data traffic via LTE network, should be driven mainly by the larger adoption and development of LTE/LTE-A technology. The share of LTE/LTE-A among total data traffic is expected to increase from 29% in 2019 to 56% in 2025. On the other hand, the share of 2G and 3G data traffic among total data traffic is expected to decrease from 71% in 2019 to 44% in 2025.

5.55 Accordingly, the data traffic carried by 2G and 3G networks is expected to remain largely stable over the period 2022 to 2023, before it starts decreasing as shown in Table 2.

	2019	2020	2021	2022	2023	2024	2025
Total voice traffic (M mn)	6 138	6 016	5 893	5 827	5 706	5 554	5 318
Total SMS traffic (M SMS)	554	484	476	467	463	461	460
Total 2G/3G data (M MB)	33 381	35 027	36 194	36 542	36 468	36 041	35 365

Table 2 Forecasted voice, SMS and 2G/3G data traffics in Jamaica – Source: updated model

Determination 11: The number of transmission links considered in the draft Model will not be updated.

Unit Cost and Price Trends

General Comments from Digicel on C&WJ's Response

Stakeholders' Comments

5.56 Digicel noted that C&WJ's response did not make reference to the potential impact of the Covid-19 pandemic, and more specifically, to the resulting

additional operational costs. Digicel added that these costs such as, construction for sites or towers, equipment installation activities, additional protective equipment, and loss of efficiency due to remote working will result in higher costs than have been modelled.

5.57 Digicel also claimed that C&WJ tried to reduce the costs used for several inputs in the model. The company added that it broadly agrees with the values proposed by the OUR, while asking the OUR to exercise caution when dealing with C&WJ's remarks and comments. Digicel indicated that "the Office must err on the side of caution in potentially mandating a price that is lower than actual cost." Digicel was of the view that the potential negative impact of a price deemed too high on consumers remains negligible compared to the repercusions of a "too low" price impacting the investment capacity of operators.

OUR's Response

5.58 The OUR notes Digicel's broad agreement with the cost values proposed by the OUR.

5.59 The OUR notes that Digicel did not provide the OUR with any evidence or data to support its claims that the Covid-19 pandemic effect on operational cost will result in higher costs than those modelled.

5.60 In relation to Digicel's comment that the OUR must err on the side of caution in potentially setting a price that is lower than cost, the OUR reiterates that the Act stipulates that wholesale termination rates should reflect cost. Additionally, the pure LRIC approach stipulated by the Act for the setting of termination rates includes all costs directly related to the service of termination.

5.61 It should be noted that all updates made to the "Unit Costs and Price Trends" are considered relevant and based on evidence provided in the consultation process or gathered subsequent to the consultation of the draft Model.

Network Equipment Unit Cost

2018 Unit CAPEX

Stakeholders' Comments

5.62 C&WJ agreed with most of the network unit CAPEX assumed by the OUR, given the main design parameters used, except for the following items where the unit CAPEX seemed high compared to C&WJ's own experience and the ECTEL model: 2G IBS, 3G IBS, BSC, RNC and MSC-S.

5.63 Digicel did not provide any feedback on this aspect of the updated model.

OUR's Response

5.64 The unit CAPEX figures were defined relying on multiple sources: stakeholders' data, ECTEL model, as well as a benchmark and interviews conducted with experts in support of the benchmark exercise. Internal data provided by the stakeholders were prioritized, when available and consistent.

5.65 Regarding the items mentioned by C&WJ in its comments, the OUR notes that the assumed values for 2G/3G IBS were based on data submitted by the operators, before being anonymized. The OUR also highlights that C&WJ did not provide the design parameters associated with the Unit CAPEX cost of its RNC during the data collection phase. Compared to the design parameters and unit CAPEX shared by Digicel, the value used for this equipment seems reasonable. The same main design parameters used for the dimensioning of the MSC-C (busy hours call attempts – maximum number of subscribers handled) were not provided by C&WJ.

5.66 Accordingly, the OUR sees no need to update the network equipment unit CAPEX used in the draft Model.

Determination 12: The Office reaffirms the network equipment unit CAPEX used in the draft Model.

Unit CAPEX Price Trend

Stakeholders' Comments

5.67 Both Digicel and C&WJ disagreed with the OUR's proposal in relation to unit CAPEX price trend, albeit for different reasons.

5.68 Digicel claimed that the costs used by the OUR are likely to be lower than the costs incurred by operators in the future, given geopolitical dynamics and the resulting sanctions on some equipment manufacturers. The company indicated that there is a risk that Jamaican operators could be forced into a supplier and/or equipment swap-out whichwould increase CAPEX. Digicel was of the view that United States of America ("US") statements could lead operators to move towards solutions with a lower functionality/price trade-off. The company also claimed that operators (not only in Jamaica) could face, following any potential exclusion of Chinese suppliers, issues with equipment supply that should push prices upwards.

5.69 C&WJ also disagreed with the proposed price trend, assumed to be at -3% per year, based on its own experience showing greater decline. C&WJ also referred to the ECTEL model, which assumes an average 5% decline in prices per year.

5.70 C&WJ disagreed with Digicel's claims regarding the impact of the geopolitical dynamics on CAPEX. The company noted that the likelihood of Jamaican operators being forced to switch suppliers or swap-out equipment is extremely small. C&WJ stated that Digicel's position is speculative, and that the validity of Digicel's argument was relying on multiple assumptions including:

- The geopolitical dynamics surrounding Huawei products are long term and not symptiomatic of current trade negotiations or other political considerations that are mid-term.
- Huawei's competitors will take advantage of the situation, by imposing higher prices and the global market not being able to counter this.
- The increased costs will be reflected in replacement CAPEX during the period being modelled.
- Replacement CAPEX will be a significant share of the overall CAPEX for the Generic operator.

5.71 Finally, C&WJ noted that, for the moment, it has not observed any increase in the prices of radio access network equipment supplied by its vendors.

OUR's Response

5.72 The OUR highlights that the average price trend is calculated following the same methodology defined in the previous model, as the difference between:

- JMD devaluation against US Dollar (defined at 4% per year in the model) and
- The expected decrease in the equipment price in United States dollars ("USD") estimated to be 7.0% per year.

5.73 OUR utilized data collected from operators to define the "average" expected decrease in the equipment price of the network equipment and transmission links, since the model assumes "a unique" average price trend for all.

5.74 Based on the comments received, the OUR conducted a complementary benchmark exercise dealing with the minimum and maximum yearly average price decrease considered in some recent models[10]. This benchmark exercise

[10] For the same modelling period ranging from 2019 to 2024

was supported by interviews with international telecommunications experts. The outcomes are presented in the table below.

Country / Model	Year of latest update	Maximum value used	Minimum value used
ECTEL	2018	7.3%	2.0%
UK	2018	12.7%	1.1%
Portugal	2017	10.0%	1%
Interviews with experts		7%	3%

Table 3 Benchmark on the "yearly average price decrease" of the network and transmission equipment

5.75 Considering the average of the minimum and maximum values used in ECTEL's model, those gleaned from international telecommunications experts interviewed during the model update process, as well as comments received from Digicel and C&WJ, the OUR has updated "the expected decrease in the equipment price in USD" used in the model to 5%, instead of 7%.

Determination 13: The expected decrease in the equipment price in USD used in the Model is set to 5%.

5.76 The OUR has also updated the "JMD devaluation against USD" considered in the Model to 3.04%, representing the difference between inflation rates in the USA and Jamaica[11].

Determination 141: JMD devaluation against USD is set at 3.04%, representing the difference between inflation rates in USA and Jamaica.

OPEX Mark-ups Used in the Model

Stakeholders' Comments

[11] Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers - Determination Notice (Document No: 2021/TEL/010/DET.002) – dated 2021 August 31.

5.77 Both Digicel and C&WJ disagreed with the OUR's proposal in relation to the OPEX mark-up applied over the network equipment unit CAPEX, albeit for different reasons.

5.78 Digicel was of the view that the Covid-19 pandemic and the lack of "immediate prospect" of a vaccine should lead to higher network OPEX, due to restrictions related to social distancing, the use of Personal Protective Equipment, and restrictions on iInternational travel. Digicel believes that such measures may be required for the upcoming eighteen to twenty-four months. Digicel also claimed that this cost increase could cover up to 40% of the modelling period.

5.79 C&WJ disagreed with the OUR proposed OPEX mark-ups, claiming that these mark-ups used are "exaggerated," mainly for "intelligent components at switching nodes, which the OUR has set at 25%." C&WJ claimed that this mark-up is "far above" its own experience, as well as levels observed via benchmarks such as the ECTEL model. C&WJ added that OPEX mark-up used for switching components should be below mark-ups associated with equipment at lower levels of the network hierarchy (i.e. BTS, Node-B, BSC or RNC).

5.80 C&WJ disagreed with Digicel's claims that the Covid-19 pandemic will lead to higher cost, noting that it has not observed any significant change in cost (increase or decrease) attributable to the pandemic. C&WJ stated that even if costs were to be impacted this should not be significant, due to the minuscule share of costs that may be impacted by the pandemic. The company also pointed out that the modelling exercise is for the long term and therefore any associated cost increase/decrease would be insignificant.

OUR's Response

5.81 The OUR notes that Digicel provided no evidence related to the potential increase in operational costs due to the Covid-19 pandemic impacts. The OUR is also of the view that the duration of the repercussions from the Covid-19 pandemic over the modelling period is hard to predict.

5.82 Despite claiming that the OPEX mark-ups are exaggerated, C&WJ also did not provide alternative values based on its own experience.

5.83 In defining the OPEX mark-ups the OUR took account of data used in similar costing models such as the ECTEL model and data gleaned through interviews conducted with telecommunications experts. See Table 4 below.

Equipment	2011 Model values	Updated OPEX Mark-ups	Source of the update	ECTEL Model	Other models
BTS 900	13.88%	18.00%	Available cost models / Interviews with experts	36.0%	5% - 10%
BTS 1800	13.88%	18.00%	Available cost models/ Interviews with experts	36.0%	5% - 10%
Node B	11.13%	10.00%	Interviews with experts	19.0%	5% - 10%
2G IBS	14.00%	18.00%	Interviews with experts		
3G IBS	11.00%	10.00%	Interviews with experts		
2G TRX	13.88%	10.00%	Interviews with experts		
3G Transceivers	11.13%	10.00%	Interviews with experts		
Aggregators	13.88%	12.00%	Available cost models/ Interviews with experts		10.0%
BSC	17.00%	17.00%	Available cost models/ Interviews with experts	20.4%	1% - 20%
RNC	15.57%	12.00%	Available cost models/ Interviews with experts	19.1%	1% - 15%
MGW	25.83%	15.00%	ECTEL Model / Interviews with experts	15%	20%
PE-Router		15.00%	Interviews with experts		10% - 25%
SBC		15.00%	Interviews with experts		10% - 25%
MSC-S	25.00%	25.00%	Available cost models/ Interviews with experts	10% - 43%	12% - 36%
SGSN	25.83%	25.00%	Available cost models/ Interviews with experts		

Equipment	2011 Model values	Updated OPEX Mark-ups	Source of the update	ECTEL Model	Other models
GGSN	25.83%	25.00%	Available cost models/ Interviews with experts		
SMSC	25.83%	25.00%	Available cost models/ Interviews with experts		
MMSC	25.83%	25.00%	Available cost models/ Interviews with experts		
HLR	23.57%	25.00%	Available cost models/ Interviews with experts		
VMS	25.00%	25.00%	Available cost models/ Interviews with experts		
VLR	23.57%	25.00%	Available cost models/ Interviews with experts		
IN	25.83%	25.00%	Available cost models/ Interviews with experts		
NMS	25.83%	25.00%	Available cost models/ Interviews with experts		
Portability Platform	25.83%	25.00%	Available cost models/ Interviews with experts		
Signalling transfer platform	25.83%	25.00%	Available cost models/ Interviews with experts		
Billing Platform	25.83%	25.00%	Available cost models/ Interviews with experts		
International Media Gateway		15.00%	Available cost models/ Interviews with experts		

Table 4 Updated OPEX Mark-ups in the model and sources used in the update

Determination 15: The Office reaffirms the OPEX Mark-ups, as detailed in the "Updated OPEX Mark-ups" column in Table 4 above.

Network Site Unit Cost

Network Site Unit CAPEX and OPEX in 2018

Stakeholders' Comments

5.84 Digicel and C&WJ disagreed with the OUR regarding the network site unit CAPEX and OPEX for the year 2018, albeit for different reasons.

5.85 Digicel was of the view that the site costs proposed should be "higher than assumed." The company stated that the OUR assumed an extension of coverage, through the increase of the number of rural sites. Digicel claimed that these additional sites would be more expensive to deploy and operate, compared to the rural sites already deployed. Digicel added that the empirical evidence for this higher cost can be deduced from the fact that if these "new" sites could be operated profitably, operators would have already deployed them.

5.86 C&WJ found site "acquisition costs... highly inflated." C&WJ stated that, based on its own experience, the cost acquisition of non-self-standing sites was on average 20-40% of the cost associated to self-standing sites. Following this, C&WJ was of the view that the cost used in the model should be discounted, to reflect the assumed share of non-self standing towers. In addition, C&WJ "urged" the OUR to review the implications of using the "Annual CAPEX/site" figure indicated at K449 in the 3.0 Generic Operator sheet, claiming that this figure should point to a "one-off" cost.

5.87 C&WJ in its comments on Digicel's response, noted that "Digicel is confusing profitability with cost" C&WJ was of the view that an operator's decision not to invest in increased coverage did not imply that the cost of providing coverage in incremental areas was higher than areas already covered.

OUR's Response

5.88 The OUR would like to remind stakeholders of the way the Model calculates the site unit CAPEX and OPEX, for year 2018, in the table "Nodes Sites Cost" of the sheet "3.0 Generic Operator."

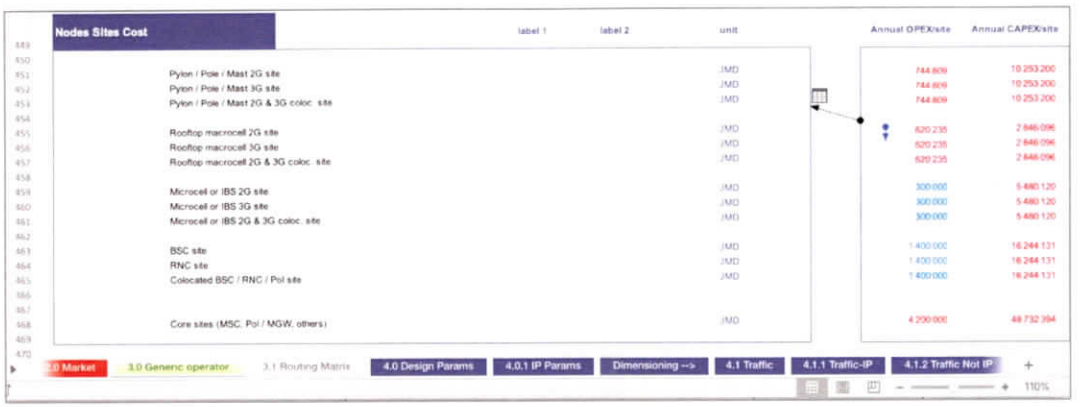

Figure 2 Extract from the updated model - Table "Nodes Sites Cost"

5.89 This calculation is done relying on the considered Unit CAPEX per site category, and assuming a certain level of cost reduction due to site colocation. The unit CAPEX and OPEX for the 2G and 3G sites were defined based on data collected from operators. Unit CAPEX and OPEX for remaining categories of sites were defined relying on available benchmarks.

5.90 The level of cost reduction due to site colocation is defined at sheet "0. Control," cell I55, and set at 40% based on data collected from both operators. As highlighted by C&WJ in its comment, "one-off expenditures" per site category are calculated in sheet "5. Unit CAPEX OPEX," at tables "Ntw Sites unit invest" (starting at line 50) and "Ntw Sites unit cost" (refer to line 124), using the table "Nodes Sites Cost" above.

5.91 Both "Ntw Sites unit invest" and ""Ntw Sites unit cost" have the same structure. As an illustration, the table "Ntw Sites unit invest" extracted from the model is presented below.

Figure 3 Extract from the table " Ntw Sites unit invest "

5.92 For the calculation of the cost of "BTS site", "Node B site" and "Colocated BTS/Node B site", the following inputs defined at sheet "0. Control" are also used:

- The share of pylon sites among 2G/3G urban sites defined at sheet "0. Control," cell I41 and set at 68%.
- The share of pylon sites among 2G/3G rural sites defined at sheet "0. Control," cell I41 and set at 100%.

The higher share of pylon sites among rural sites implies higher cost for rural sites, as stated by Digicel.

5.93 Regarding Digicel's comment in relation to the additional rural sites, the OUR highlights that this is more of a "coverage issue," that was already discussed in section "3G coverage extension". Accordingly, the issue will not be discussed in this section.

5.94 Given the foregoing, the OUR sees no need to update the unit CAPEX and OPEX defined for the network sites.

Determination 16: The Office reaffirms the unit CAPEX and OPEX defined for the network sites in the draft Model.

Network Site Unit CAPEX and OPEX Trends

Stakeholders' Comments

5.95 Digicel and C&WJ disagreed with the OUR regarding the network site cost trends, albeit for different reasons.

5.96 Digicel was of the view that a higher prospective average site cost should be assumed. Digicel argued that current sites may need to handle more equipment, because of observed changes in demand distribution. Digicel added that, given the capacity requirements of towers, this could lead to an upgrade of passive infrastructures.

5.97 C&WJ found the site acquisition and OPEX trends "highly inflated," and urged the OUR to use the inflation rate, as the assumption for the evolution of these price trends.

5.98 Digicel disagreed with C&WJ regarding the use of estimated inflation as a much more reasonable assumption for the price trend associated with site costs. Digicel claimed that, due to the Covid-19 pandemic, the expected trends for the evolution of site acquisition and OPEX should be higher than inflation.

5.99 C&WJ disagreed with Digicel, claiming that densification and additional investment in existing sites should result in lower investment per unit of capacity,

as operators would be leveraging existing sites or complementing them with smaller sites

OUR's Response

5.100 The OUR highlights that Digicel did not provide any evidence or data regarding the amount of passive equipment that may be implicated by a potential replacement. The OUR also notes that the model calculates the number of replacement sites based on the associated economic life.

5.101 Site unit CAPEX includes two components: the cost of acquisition of the passive equipment (standing for approximately 25% from total site CAPEX) and the cost related to the site construction.

5.102 Following the comments received from Digicel and C&WJ, the OUR reviewed the "Network Site Unit CAPEX and OPEX Trends" presented in the draft Model. The review examined confidential benchmark data from a number of countries including Tunisia, Morocco, Mali, Mauritania and the Ivory Coast as well as a data from a global Tower Co. Interviews were also conducted with industry experts who currently work with or used to work with regulatory agencies, international consultancies, equipment manufacturers, and telecommunications operators[12]. Based on updated data, the average price increase of the passive equipment is assumed to be around 8.04%, set at the sum of the devaluation of JMD against USD (estimated at 3.04%) and the expected increase in the average price in USD of the passive equipment (assumed to be 5%). The OUR assumes the cost of a site's construction to increase at the same trend as the inflation rate, set at 4.98% (cf. WACC Determination Notice[13]).

5.103 The OUR will therefore update the annual price increase for unit CAPEX of network sites to 5.7% (compared to 6% in the draft model), estimated as the blended annual increase of the passive equipment and construction parts of the site CAPEX[14].

Determination 24: The annual price increase for unit CAPEX of network sites is set at 5.7%.

[12] These experts include chief technical officers and chief financial officers from telecommunications operators in the African, Arab, and Asian/Pacific Regions.

[13] Estimate of the Weighted Average Cost of Capital for Telecommunications Carriers - Determination Notice (Document No: 2021/TEL/010/DET.002) dated 2021 August 31.

[14] This blended annual increase is calculated, assuming that the passive equipment should represent 25% of the site cost. The proposed value for the update = 25% x 8.04% + 75% x 4.98%

5.104 Regarding site OPEX trends, the OUR again highlights that Digicel did not provide any data to support its claim that this OPEX trend should be higher than inflation, due to the expected impact of the Covid-19 pandemic. In addition, the OUR reiterates the repercussions of the Covid-19 pandemic over the modelling period are hard to predict.

5.105 The OUR agrees that inflation remains a good "proxy" for OPEX trends (as suggested by C&WJ in its comments), even if the inflation rate calculation involves several components (such as "Food & Non-Alcoholic beverages," as well as "Clothing and Footwear") that appear to have no impact on the evolution of OPEX associated with network sites.

5.106 The OUR will update the site OPEX trend to the estimated inflation rate of 4.98% (cf. WACC Determination Notice[15]). It is important to note that the Model assumes the same OPEX trend for network equipment, network sites and other transmission links.

Determination 17: The OPEX trend for network equipment, network sites and transmission links is set at 4.98%.

Transmission Unitary Cost

General Comments

Stakeholders' Comments

5.107 Digicel noted that the model assumes the generic operator operates with self-provisioned fibre-based transmission links. Digicel added that, "from a practical point of view," prices considered in the model could be achieved only by C&WJ. Digicel claimed that this is the result of the monopoly on fixed connectivity in Jamaica enjoyed by C&WJ.

5.108 C&WJ in its comment on Digicel's response noted that Digicel seemed to be replaying the argument made in its feedback on "Share per Technology at the Backhaul". C&WJ noted that in order to be consistent with LRIC methodology the OUR should choose the "cost-minimization approach to provide the service". C&WJ is of the view that Digicel's decisions regarding investments in fixed infrastructure are irrelevant for modelling purposes, noting that the fact that

[15] Supra note 13

Digicel limited its investment in fixed infrastructure does not mean that the efficient operator would do the same.

OUR's Response

5.109 The OUR highlights that the considered modelling approach assumes an efficient operator minimizing the backhaul investment. It therefore does not take the investment decisions of an individual operator into account.

Determination 26: The Office reaffirms the assumption made in the draft Model that the generic operator will self-provision fibre-based transmission links.

2018 Unit CAPEX Used

Stakeholders' Comments

5.110 Digicel noted that the model contained a single distant independent price for fibre-based connectivity. Digicel also noted that the rationale behind the selection of average connection cost was not clear. Digicel also noted that the OUR just started a project aiming to model the cost of fixed infrastructure.

5.111 C&WJ claimed that it was difficult to assess the 2018 unit CAPEX, since the length of the transmission links were not clearly defined in the model. C&WJ also stated that proposed values seemed high, based on its internal data provided in the data request process, as well as the ECTEL model.

5.112 C&WJ in its comments on Digicel's response regarding the rationale behind the selection of the average connection cost, noted that the OUR is updating a cost figure that was included in the previous model. C&WJ found it surprising that Digicel had objections to the approach, given it did not object in the previous modelling process.

5.113 C&WJ also noted that defining costs for fibre segment used in mobile networks does not necessitate a separate fixed cost model proceeding since previous cost modelling exercises conducted in Jamaica, and elsewhere, have not required such a pre-condition.

OUR's Response

5.114 Regarding fibre-based solutions, the OUR highlights that, similar to the previous model, the updated version still assumes an average cost per capacity estimated based on the average length per connection and capacity. Despite stating that assumed values are high, C&WJ did not provide any data to support its views. The OUR also notes that both Digicel and C&WJ did not provide data related to the unit CAPEX of fibre-based transmission links during the data collection phase. The OUR relied on the feedback of experts to define the values used in the model. The unit CAPEX of microwave-based solutions in the updated model was defined relying on data collected from operators.

5.115 Given the foregoing, the OUR sees no need to update unit CAPEX of transmission links.

Determination 18: The OUR reaffirms unit CAPEX of transmission links as per Table *5*.

Transmission link		Unit	2018 Unit CAPEX
Wireline	STM1	JMD	2 650 000
	STM4	JMD	2 950 000
	STM16	JMD	9 200 000
Micro-Wave	ADM STM1	JMD	1 450 000
	ADM STM4	JMD	1 550 000

Table 5 Unit CAPEX of transmission links

Price Trend

Stakeholders' Comments

5.116 Digicel disagreed with the price trend considered, claiming that backhaul connectivity contracts for the new sites will likely involve multiyear commitments. The company was therefore of the view that the percentage annual decrease in cost assumed, may not be achieved over the modelling period.

5.117 C&WJ disagreed with the OUR when it comes to both price trends assumed for the unit CAPEX. C&WJ stated that the decline in transmission link prices have been much greater in C&WJ's experience, as reflected in the data submitted to the OUR. C&WJ added that for microwave transmission, the ECTEL model assumed a larger decrease.

5.118 C&WJ also disagreed with the OUR, with respect to the OPEX trend, stating that it "could not understand" the reasons behind using values higher than the inflation rate.

5.119 In its comments on Digicel's response, C&WJ noted that the methodology utilized in the Model implies that the generic operator modelled would make optimized decisions from the inception of its network.

OUR's Response

5.120 With respect to unit CAPEX price trends, the model used the same price trend for all network components, including transmission links. The OUR has already agreed to update this price trend (see Determination 24). The OUR has also updated the OPEX price trend to 4.98% (see Determination 25).

Chapter 6: Comments from C&WJ on Other Inputs

Introduction

6.1 In its response to the Consultation Document, C&WJ provided feedback on inputs of the updated model which were not addressed in the document. The additional inputs commented on were:

- Percentage of busy day traffic for both voice and data
- Assumption related to "Salary increase"
- 3G Cell radii
- Share of pylon-type structures among rural sites

6.2 This chapter provides a summary of these comments and the OUR's responses.

Percentage of Busy Day Traffic for both Voice and Data

Stakeholders' Comments

6.3 C&WJ noted that the "% busy day traffic for both voice and data" remained unchanged, compared to the previous model. C&WJ claimed that, based on its internal data and global trends showing a less "peaky" traffic, the "% busy day traffic for both voice and data" should be decreased, compared to the previous model.

6.4 Digicel did not comment on this aspect of C&WJ's response.

OUR's Response

6.5 The data provided by C&WJ in its response to the data request did not allow the OUR to estimate the "% busy day traffic for both voice and data" for C&WJ customers, during the update of the previous model. The company also did not provide any data on this issue as part of its reponse to the Consultation Document.

6.6 A comparison of the values used in the model with levels observed in other countries is presented in the table below.

Country/Model	Year	Voice	Data
OUR's model		7.5%	6.0%
Portugal	2017	5.9%	6.9%
UK	2018	8.0%	6.0%
Mexico	2016	8.7%	5.0%
ECTEL	2015	6.3%	7.9%
Tunisia	2017	10.0%	7.6%
Morocco	2019	11.0%	6.0%

Table 6 Benchmark data related to the percentage of busy day traffic for voice and data

6.7 Based on the above table, it seems difficult to confirm the global trend indicating that traffic is becoming less "peaky", as mentioned by C&WJ. In addition, the benchmark data does not give any indication regarding the values that could be used to update this parameter of the model.

6.8 In light of the above, the OUR sees no need to update the assumptions related to the "% busy day traffic for both voice and data".

Determination 19: The Office reaffirms the "% busy day traffic for both voice and data" considered in the draft Model: 7.5% for voice and 6% for data.

Assumption related to "Salary Increase"

Stakeholders' Comments

6.9 C&WJ indicated that while it understood that salary increases would track inflation, it disagreed with the assumption related to salary increases. C&WJ claimed that with the migration to IP interconnection and the automatization of most of the mobile interconnection costs, less full time employees may be required to handle interconnection activities. This should counter the expected increase in the salary per interconnection employee. C&WJ stated that the annual increase should be set at zero over the period.

6.10 Digicel did not comment on this aspect of C&WJ's response.

OUR's Response

6.11 The OUR disagrees with C&WJ. C&WJ's assumption requires the number of Full-Time Equivalent (FTE) working on interconnection to be reduced, following migration to IP interconnection. In reality, even with migration to IP, additional FTEs handling equipment used in IP interconnection should be taken into account.

6.12 Thus, the OUR sees no need to update the assumption related to the annual salary increase.

Determination 20: The Office reaffirms the annual salary increase of 4% considered in the draft Model.

3G Cell Radii

Stakeholders' Comments

6.13 Regarding 3G Cell Radii, C&WJ observed that the assumptions in the revised model were significantly lower than that of the previous model, as well as values submitted by C&WJ in its response to the data request and international benchmarks. C&WJ stated that the OUR should revert to the cell radii assumed in the previous model.

6.14 Digicel did not comment on this aspect of C&WJ's response.

OUR's Response

6.15 The OUR disagrees with C&WJ regarding the 3G cell radii that should be defined in the updated model. The value of the cell radii is used for the calculation of the number of 3G stations. This parameter is frequently used to "calibrate the model," so that the number of stations obtained represents an average of Digicel and C&WJ, since both have a similar number of 3G stations. This is in line with the Methodology[16].

6.16 Thus, the OUR sees no need to update 3G cell radii used in the model.

[16] Determination Notice on Cost Model for Mobile Termination Rates (Document No: TEL2012001_DET001) dated 2012 July 24.

Determination 21: The Office reaffirms the 3G cell radii used: 0.95Km for urban areas and 3.5 Km for rural areas.

Share of Pylon-type Structures Among Rural Sites

Stakeholders' Comments

6.17 C&WJ noted that the OUR's assumption that 100% of rural sites are pylon-type structures is incorrect and cited its own experience.

6.18 Digicel did not comment on this aspect of C&WJ's response.

OUR's Response

6.19 The OUR acknowleges the information provided by C&WJ regarding the share of pylon-type structures among rural sites. Based on the information provided by C&WJ and the potential need to densify some rural areas, the OUR took the decision to update the share of pylon-type structures among rural sites in the Model.

Determination 31: The share of pylon-type structures among rural sites is set at 88%.

Chapter 7: Mobile Termination Rates

7.1 This Chapter presents the results of the finalized Model following the updates discussed in the previous sections and sets the new mobile termination rate.

7.2 As mandated by the Act, mobile termination rates shall be cost-oriented and based on the Pure LRIC standard.

7.3 As determined in Chapter 4, the final Model contains two WACC values; 20.93% for the period before 2021 November 28 and 16.95% thereafter.

7.4 Since any determination made in the Methodology and the Decision remains in effect, unless superseded by a determination in this Determination Notice, the mobile termination rate shall be charged on a per-second basis. below presents the results of the Model, utilizing the two WACC values.

WACC	2021	2022	2023	2024	2025	Average 2021-2025
WACC = 20.93%	0.795	0.773	0.754	0.737	0.723	0.756
WACC = 16.95%	0.724	0.704	0.687	0.673	0.661	0.690

Table 7 Pure LRIC MTR (JMD) – Source: the updated cost model

7.5 As discussed earlier in this document, the Office will not implement a glide-path for the period 2021-2025. Based on this and the results presented in

7.6 Since any determination made in the Methodology and the Decision remains in effect, unless superseded by a determination in this Determination Notice, the mobile termination rate shall be charged on a per-second basis., the Office has determined two mobile termination rates applicable for the period 2021-2025. They are listed in Table 8.

Period	Applicable Mobile Termination Rate
Effective 2021 October 01 - 2021 November 30	0.76 JMD per minute
Effective 2021 December 01	0.69 JMD per minute

Table 8 Mobile termination rates applicable from 2021 to 2025

7.7 Since any determination made in the Methodology[17] and the Decision[18] remains in effect, unless superseded by a determination in this Determination Notice, the mobile termination rate shall be charged on a per-second basis[19].

Determination 22: The charges for mobile termination shall be those listed in Table 8. The mobile termination rate shall be charged on a per-second basis. These rates shall remain in effect until 2025 December 31, unless they are reviewed earlier.

Determination 23: Mobile carriers will have ten (10) working days from the effective date of this Determination Notice within which to submit a revised Reference Interconnection Offer Tariff Schedule reflecting the rates established in this Determination Notice to the Office.

Determination 34: The Office will begin the process of data collection to update the model one year in advance of when a rate review becomes due. If the Office is unable to complete its review by 2025 December 31, the mobile termination rate existing in the market at the time will remain in effect until the review is completed.

[17] Determination Notice on Cost Model for Mobile Termination Rates (Document No: TEL2012001_DET001) dated 2012 July 24.

[18] Determination Notice for Cost Model for Mobile Termination Rates – The Decision on Rates (Document Number: TEL2013001_DET001) dated 2013 May 30.

[19] As stipulated in Determination 15, of the 2012 Determination Notice.

Appendix A – List of Determinations

Determination 1: The Office reaffirms that the mobile termination rate will be set using a pure LRIC approach as is required under the Telecommunications Act.

Determination 2: The Office will not implement a glide path for the implementation of the new mobile termination rate.

Determination 3: The Model will not include VoLTE. Consequently, the Office will only model LTE/LTE-A traffic demand rather than the entire LTE network.

Determination 4: The Model will include IP Interconnection.

Determination 5: Unattributable costs are set at 25%.

Determination 6: The share of urban busy hour traffic for voice is 53.51%. The share of urban busy hour traffic for data is 51.02%.

Determination 7: The Model will utilize two WACC values; 20.93% for the period before 2021 November 28 and 16.95% thereafter.

Determination 8: The share of co-located Sites considered in the draft Model will not be updated.

Determination 9: The Office reaffirms the market demand figures used in the draft Model.

Determination 10: The Office reaffirms the level of forecasted voice traffic used in the draft Model.

Determination 11: The share of on-net traffic in the Model is set at 50%.

Determination 12: The average call duration in minutes of international outgoing and incoming calls considered in the draft Model will not be changed.

Determination 13: The Office reaffirms the forecasted data traffic figures used in the draft Model.

Determination 14: The Office reaffirms the coverage assumptions used in the draft Model.

Determination 15: The downlink share attributable to HSPA+ is set at 85%.

Determination 16: The Model assumes 70% IP Interconnection implementation in 2021 and 100% starting from 2022 January 01.

Determination 17: The share per technology at the backhaul considered in the draft Model will not be updated.

Determination 18: The number of transmission links considered in the draft Model will not be updated.

Determination 19: The Office reaffirms the network equipment unit CAPEX used in the draft Model.

Determination 20: The expected decrease in the equipment price in USD used in the Model is set to 5%.

Determination 21: JMD devaluation against USD is set at 3.04%, representing the difference between inflation rates in USA and Jamaica.

Determination 22: The Office reaffirms OPEX Mark-ups, as detailed in the "Updated OPEX Mark-ups" column in Table 4 above.

Determination 23: The Office reaffirms the unit CAPEX and OPEX defined for the network sites in the draft Model.

Determination 24: The annual price increase for unit CAPEX of network sites is set at 5.7%.

Determination 25: The OPEX trend for network equipment, network sites and transmission links is set at 4.98%.

Determination 26: The Office reaffirms the assumption made in the draft Model that the generic operator will self-provision fibre-based transmission links.

Determination 27: The OUR reaffirms unit CAPEX of transmission links as per Table 5.

Determination 28: The Office reaffirms the "% busy day traffic for both voice and data" considered in the draft Model: 7.5% for voice and 6% for data.

Determination 29: The Office reaffirms the annual salary increase of 4% considered in the draft Model.

Determination 30: The Office reaffirms the 3G cell radii used: 0.95Km for urban areas and 3.5 Km for rural areas.

Determination 31: The share of pylon-type structures among rural sites is set at 88%.

Determination 32: The charges for mobile termination shall be those listed in Table 8. The mobile termination rate shall be charged on a per-second basis. These rates shall remain in effect until 2025, unless they are reviewed earlier.

Determination 33: Mobile carriers will have ten (10) working days from the effective date of this Determination Notice within which to submit a revised Reference Interconnection Offer Tariff Schedule reflecting the rates established in this Determination Notice to the Office.

Determination 34: The Office will begin the process of data collection to update the model one year in advance of when a rate review becomes due. If the Office is unable to complete its review by December 31, 2025, the mobile termination rate existing in the market at the time will remain in effect until the review is completed.