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LIME

Our Ref: GRCR/GR15.19
01 September, 2010

Mr. David Archbold,
Managing Director,
Information and Communication Technology Authority,
3rd Floor Alissta Towers,
P.O. Box 2502
Grand Cayman.
KY1-1104

Dear Mr. Archbold,

Re: Third Round Interrogatories Regarding LIME's FLLRIC Phase 3 Submissions – LIME's Response to Interrogatories

Cable and Wireless (Cayman Islands) Limited, trading as LIME ("LIME") is submitting the attached responses to the Authority's 02 August 2010 interrogatories on the above-noted subject. Some of the company's interrogatory responses are being submitted in confidence, and redacted versions of the responses will be provided for the public record.

Also attached are confidential revised versions of the fixed, 2G mobile, and 3G mobile modules, and relevant attachments. Redacted versions of the revised modules will be provided for the public record.

Pursuant to regulation 3 of the *Information and Communications Technology Authority (Confidentiality) Regulations 2003*, LIME is submitting some of the information in the responses to interrogatories 2, 12, 15, and 16, and in the cost model modules, in confidence to the Authority. This is information that is financial or commercial information that is treated consistently in a confidential manner by LIME and that is not otherwise publicly available. Its disclosure to the public, in particular to LIME's competitors, would give them a better understanding of LIME's costs and customers, which would enable them to prepare more targeted competitive responses in the marketplace, thereby significantly prejudicing LIME's competitive position and resulting in significant financial loss. Please note that the redactions to the modules are consistent with the Authority's rulings in its 14 January 2010 letter and in ICT Decision 2010-2.

Please do not hesitate to contact the undersigned if you should have any questions.

Yours Sincerely,

Cable and Wireless (Cayman Islands) Ltd. d.b.a. LIME

'Signed'

Anthony Ritch
General Manager LIME (Cayman)

c.c. Donald Austin, EVP Legal Regulatory and Corporate Affairs
Frans Vandendries, VP Legal Regulatory and Corporate Affairs (Central)
FLLRIC distribution list

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1. All three cost modules in their current versions contain links to other worksheets.

The fixed module contains links to:

- (a) '09_11_16 Appendix IV-FAC-TD Values 07-04-09 conf_revised (int 120).xls',
- (b) 'Appendix V-TD LRIC Input_10_06_30 conf.xls',
- (c) 'CVR_06.xls',
- (d) 'CVR_01.xls' and
- (e) 'CYM Mobile 2G - updated 10_06_30 conf.xls'.

While (b) and (e) are files received as part of the most recent submission, (c) and (d) are unknown to the Authority and (a) points to "C:\Documents and Settings\ewhitlock001\Local Settings\Temp\wzf22b\". While the module user could modify the link to point to a file previously received, this creates uncertainty and should not be necessary. In this particular case the latest version of Appendix IV received by the Authority is named slightly differently than the one referred to. It uses square parenthesis in the file name ("[int 120]" instead of "(int 120)").

The 2G module contains links to:

- (a) 'CYM fixed - updated 10_06_25 Conf.xls',
- (b) '09_11_16 Appendix IV-FAC-TD Values 07-04-09 conf_revised (int 120).xls',
- (c) 'CYM fixed - updated 10_06_30 Conf.xls', and
- (d) 'Appendix V-TD LRIC Input_10_06_30 conf.xls'.

The Authority has not received the file referred to in (a) which would appear to be an older version of the fixed module and which points to "C:\Documents and Settings\ewhitlock001\Local Settings\Temp\wz47bf\". As above the file '09_11_16 Appendix IV-FAC-TD Values 07-04-09 conf_revised (int 120).xls' is named slightly differently than the one received by the Authority.

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The 3G module contains links to:

- (a) '09_11_16 Appendix IV-FAC-TD Values 07-04-09 conf_revised (int 120).xls',
- (b) 'CYM fixed - updated 10_06_30 Conf.xls',
- (c) 'CVR_01.xls',
- (d) 'CVR_06.xls', and
- (e) 'Appendix V-TD LRIC Input_10_06_30 conf.xls'.

Item (a) points to "C:\Documents and Settings\ewhitlock001\Local Settings\Temp\wz47bf\" and is named slightly differently than the file received by the Authority, and (c) and (d) are unknown to the Authority.

The Authority notes that the links between the modules and various files must be made and saved in the same folder to work as intended. When files are open simultaneously and linked, then saving a file to a new file name will result in the links moving to the saved file. As noted in 13 May 2010 letter to LIME, when submitting revised versions of the FLLRIC cost model, LIME is directed to provide all modules and all linked spreadsheets with fully functional links between them. Further, each spreadsheet and module should be identifiable by a version number. Provide updated modules and any linked files where all links are working as intended.

RESPONSE

Attached please find the following updated modules and linked files:

Fixed module:

CYM fixed - updated 10_09_01 Conf.xls

Fixed module links:

Appendix III Fixed Assets Revaluation_20-09-09 Conf.xls

Appendix IV-FAC-TD Values 10_09_01 Conf.xls

Appendix V-TD LRIC Input_10_06_30 Conf.xls

CYM Mobile 2G - updated 10_09_01 Conf.xls

Mobile 2G module:

CYM Mobile 2G - updated 10_09_01 Conf.xls

Mobile 2G module links:

Appendix IV-FAC-TD Values 10_09_01 Conf.xls

Appendix V-TD LRIC Input_10_06_30 Conf.xls

CYM fixed - updated 10_09_01 Conf.xls

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Mobile 3G module:

CYM Mobile 3G - updated 10_09_01 Conf.xls

Mobile 3G module links:

Appendix IV-FAC-TD Values 10_09_01 Conf.xls

Appendix V-TD LRIC Input_10_06_30 Conf.xls

CYM fixed - updated 10_09_01 Conf.xls

Please note that an analogous set of modules will be sent with the "_MTM interconnect" suffix, which are required for responding to interrogatory 16b below.

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2. In LIME's response to the second round interrogatory No. 17a, it explained how the cost of the HLR has been derived noting that the figure obtained was drawn from a bill of materials. However, this bill of materials was not provided in response to the interrogatory. In interrogatory No. 17a the Authority specifically requested detailed documentation (for example an invoice) to show the cost of the HLR cost element as indicated in cell E27 of the 'Cost assumptions' sheet. The Authority further noted that in ICTA Decision 2008-2 paragraph 361, it directed LIME to document the HLR cost and other cost inputs. Provide the bill of materials.

RESPONSE

In our response to interrogatory 17a, we supplied a figure from a proposed bill of materials from a vendor quote rather than an invoiced bill of materials. We have done further investigation to find an actual invoice sufficiently detailed to be responsive to the ICTA's interrogatory. As a result of that investigation we attach an extract of a 25 June 2008 invoiced bill of materials from Ericsson provided by an affiliate company in the Eastern Caribbean. Please see attached file "FLLRIC Interrog 2 attachment 10_09_01 Conf.pdf." The relevant information can be found on pages 21-25. The HLR costs apply to two separate units for two jurisdictions. Certain of the costs are unit specific (see, Sections 1.9.1 and 1.9.3), while other costs apply to both units (see, Sections 1.9.11-1.9.13, 1.9.15, and 1.9.35). These latter costs are apportioned equally between the two units in order to arrive at a single HLR cost. The bill of materials is subject to a discount. However, the discount is not applied to specific component prices, but instead offers certain components for "free." In order to calculate an appropriate discount on a per component basis, the discount on the overall bill is applied to each individual HLR component. The contract's overall discount can be found on the final page of the bill of materials (see, Grand Total USD—Total Price and Total Net Price, on page 27). The percentage discount on the overall bill is ##%.

The HLR cost calculation is summarized in the table below. The total discounted HLR cost is # #.

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		List Price	Discount Price
1.9.1	HLR Hardware (HW)	\$ ## ##	\$ ## ##
1.9.3	HLR Software (SW)	\$ ## ##	\$ ## ##
1.9.11	HLR/AUC Support (50%)	\$ ## ##	\$ ## ##
1.9.12	Network Deployment Integration (NDI) HLR (50%)	\$ ## ##	\$ ## ##
1.9.13	SWAP HLR (50%)	\$ ## ##	\$ ## ##
1.9.15	HLR Market Adaptation (50%)	\$ ## ##	\$ ## ##
1.9.35	Implementation SW & HW (50%)	\$ ## ##	\$ ## ##
	Shipping	\$ ## ##	\$ ## ##
	Total HLR Cost USD	\$ ## ##	\$ ## ##
	Total HLR Cost CID (1CID:1.2USD)	\$ ## ##	\$ ## ##

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3. In LIME's response to the second round interrogatory No. 22, it referred to calculations set forth in 'Appendix III Fixed Assets Revaluation_20-09-09.xls'. While the Authority has received several versions of Appendix III these would all appear to be older versions of the one referred to by LIME. Provide 'Appendix III Fixed Assets Revaluation_20-09-09.xls'.

RESPONSE

Attached please find the requested file, "Appendix III Fixed Assets Revaluation_20-09-09 Conf.xls." Note that we have added "Conf" to the end of the filename to indicate the document is confidential.

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4. In LIME's response to the second round interrogatory No. 23 it explained that it had removed the macro that performs an update of the 'Demand Calculations' sheet. However, inspection of the VBA Module 5 in the fixed module shows that the 'update_fac' macro which performs the task of updating cell C41 in the 'Demand Calculations' sheet is still present. In addition, the formula in cell D41 'Demand Calculations' sheet is not used in the calculations. In order to remove all reference to the macro, the pasted value in cell C41 must be replaced with or linked to the formula in cell D41 and the relevant portions of the 'update_fac' macro removed.

In LIME's response to the second round interrogatory No. 25, it explained that it had removed the macro that performs an update of the 'Network Costs' sheet. However, inspection of the VBA Module 5 in the fixed module shows that the 'update_fac' macro which performs the task of updating cells F56:Q56 in the 'Network Costs' sheet is still present and that values in cells F56:Q56 are still used in the calculations. In order to remove all reference to the macro, the pasted values in cells F56:Q56 must be replaced with or linked to the formula in cells F55:Q55 and the relevant portions of the 'update_fac' macro removed.

More generally, the Authority notes that all three modules contain macros. For example, the 3G module contains: 'CopyOriginalVolumes', 'define', 'GenerateRF', 'gotocontents', 'Macro1', 'temp' and 'test'. In ICTA Decision 2008-2 paragraph 246 LIME was directed to eliminate the use of macros where possible. Ensure only macros that are essential for the functioning of each module are retained. Delete all other macros in the fixed, 2G and 3G modules and submit the revised modules.

RESPONSE

We have removed the macros in the fixed, 2G and 3G modules, as instructed.

In particular, we have revised the 2G model at cells C41 and D41 of the Demand Calculations sheet and removed the 'update_fac' macro. The approach is now analogous to that found in the 3G model.

We have also revised the 2G model at cells F56:Q56 of the Network Costs sheet and removed the 'update_fac' macro. The approach is now analogous to that found in the 3G model.

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5. In LIME's response to the second round interrogatory No. 30, it stated that there must be a misunderstanding regarding the network components listed in the 'Cost Assumptions' sheet and the network elements. It provides examples of where there is not a one-to-one mapping between the two, including the 'MSC' network element which is made up of the 'MSS', 'media gateway' and 'TCU' components, and the 'IP Core' network element which is made up of the 'SGSN', 'GGSN' and 'internet gateway' components. The Authority recognizes that the network elements can contain sub-elements or components. The list of components in the 'Cost Assumptions' sheet (cells C18:C38) in the 3G module should be accounted for on the 'Network Cost' sheet or somewhere else in the module. Linking all the instances where the components are referenced in the module to the 'Cost Assumptions' sheet will simplify module maintenance and reduce the chances of errors if and when the component list is changed. A further update to the modules is therefore required. Update the module by linking all the instances where the components are referenced in the module to 'Cost Assumptions' sheet, or define the components separately (as is done with the network element in the 'Network Elements' sheet) and link all references to the components back to that central location.

RESPONSE

The 3G module has been updated as requested. The referenced list of network components is found in the "Cost Assumptions" sheet, cells C83-C108.

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6. In LIME's response to the second round interrogatory No. 32(a), it noted that the term 'HLR/VLR/AUC' in the 3G module has been replaced by the term 'HLR'. The Authority's inspection of the module indicates that the term 'HLR/VLR/AUC' is still used in some cases, e.g. in the 'Network Element' sheet. Correct the module to ensure that the term 'HLR/VLR/AUC' is consistently replaced with 'HLR' throughout the 3G module.

RESPONSE

[The replacement has been made.](#)

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7. In LIME's response to the second round interrogatory No. 36, it argued that the 850MHz 3G data cell radius reduction factor of 25% is a reasonable assumption. As corroboration, LIME cited an Ofcom analysis from 2007 which implied a cell range reduction of between 11% (for a shift from GSM900 to UMTS900 data) and 48% (for a shift from UMTS900 voice to UMTS900 data). The Authority notes that the Ofcom report referred to by LIME is an old one; a new one was published by Ofcom in May 2009 "Application of spectrum liberalization and trading to the mobile sector – A further consultation". In Annex 13 to that report (available here: <http://stakeholders.ofcom.org.uk/binaries/consultations/spectrumlib/annexes/annex13.pdf>), page 30-31, Ofcom refers to two whitepapers published by Global mobile Suppliers Association (GSA) and Nokia-Siemens. Both show that UMTS900 voice coverage is better than GSM900, and that GSM900 voice coverage in a suburban area indoors is similar to the coverage obtained by the same network for 1 Mbps data service using WCDMA 900. Update the 3G module to take into the account the findings in the 2009 Ofcom report. If LIME is of the view that such changes should not be included in the module provide a detailed explanation justifying the continued use and appropriateness of the radius reduction factor.

RESPONSE

We have amended the model to eliminate the 25% reduction factor based on the evidence the ICTA has noted (at Technical Assumptions, cell C105 of the 3G module). However, the Authority should keep in mind that this evidence is provided by vendors who are trying to promote 3G network facilities. We believe, in practice, that the performance would be lower for a network based on equivalent cell radii for voice coverage.

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8. In LIME's response to the second round interrogatory No. 40, it noted that the 3G module has been revised by labeling cost items appropriately and modifying formulas to refer directly the 'Cost Assumptions' sheet. The Authority's inspection of the module suggests it has not changed compared to previous versions. For avoidance of doubt, the relevant cell range subject to modification is G138:G149 in the 'Network Costs' sheet in the 3G module. Revise the 3G module accordingly.

RESPONSE

The 3G model has been revised as requested.

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9. In LIME's response to the second round interrogatory No. 41, it reported that it had made appropriate corrections to the reported number of national retail calls in the fixed module (C27 in the 'drivers' sheet of '09_11_16 Appendix V-TD LRIC Input 07-04-09 conf_revised.xls' versus X33 in the 'TD Volume input for TD' sheet in the latest version of the fixed module). The Authority has been unable to identify this correction. Identify how this correction has been made or make the appropriate corrections to the fixed module.

RESPONSE

LIME has made the appropriate correction to the fixed module. In particular, the erroneous value reported previously in fixed module, sheet "Volume input for TD," cell X33 has been replaced with the correct value (42,544,099), as reported in Appendix V, sheet "drivers," cell C27.

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10. Second round interrogatories Nos. 42-48 all contained questions on the routing factors used in the 3G module and the documentation for them contained in the spreadsheet 'CYM 3G Routing Factors 20091012.xls'. An updated version of the spreadsheet 'CYM 3G Routing Factors 20091012.xls' was not provided by LIME in their submission of responses to second round interrogatories. Provide an updated version of 'CYM 3G Routing Factors 20091012.xls' including all corrections made to routing factors following second and third round interrogatories and justification for these changes.

RESPONSE

LIME has appended an updated version of the CYM 3G Routing Factors sheet, with corrections and justification for the corrections. We have also included an updated version of Appendix VIII, with the Routing factor analysis for the fixed and 2G modules.

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11. In LIME's response to the second round interrogatory No. 43, no explanation of the '400-3G: IP Core Network' routing factors was provided. Provide a detailed explanation to justify the '400-3G: IP Core Network' routing factors.

RESPONSE

The IP Core Network, as a network element against which routing factors are calculated, includes IP transmission and packet switching, which combines SGSN, GGSN and IP backbone components. It is the element across which 3G traffic data, as opposed to voice and non-3G data services, such as SMS, MMS, and GPRS/EDGE services, are transmitted and processed. As such, only two services use the IP Core Network: mobile data (a service for subscribers of the Cayman mobile network) and inbound data roaming (a service for subscribers of foreign networks). In the model we have used a "1" for the 3G traffic of both domestic users and inbound roaming users. We have no basis to believe that the two types of users would use the IP core network in different proportions, so the use of "1" appears reasonable.

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12. In LIME's response to the second round interrogatory No. 50, it provided a spreadsheet showing how the impact of substitution was taken into account in their demand projections. It is not clear to the Authority how the figure of ##% of mobile subscribers who have "cut the cord" is reflected in LIME's demand projections. For example, how is the figure of ##% reflected in the demand assumptions for number of voice subscribers, data and SMS subscribers, and traffic for each service? Provide a detailed explanation and the underlying calculations of how the figure is used in each module.

RESPONSE

In its response to the second round interrogatory No. 50, LIME presented an analysis identifying the implied level of wireless substitution, based on the company's projected growth of fixed and mobile subscribers. In particular, these projections implied a rate of wireless substitution (e.g., LIME mobile subscribers that have dropped their LIME fixed line) equal to 19 percent. This estimated rate of wireless substitution is therefore reflected in the reduced number of LIME fixed subscribers. But for wireless substitution, LIME would be serving a greater number of fixed subscribers. The amount of LIME fixed subscribers foregone as a result of wireless substitution is equal to 19 percent of the number of mobile subscribers. LIME did not disaggregate mobile subscriber and usage into categories of mobile subscribers who have cut the cord and those who have not.

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13. The 'Mobile Service Costs' sheet in the 2G module is unable to provide meaningful results due to the presence of #ref errors (invalid cell reference). These would appear to result from a faulty link to an older version of the fixed module 'CYM fixed - updated 10_06_25 Conf.xls'. Correct the module to remove the #ref errors.

RESPONSE

LIME has corrected the 2G mobile module as instructed.

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14. The 'Routing Factors Input' sheet in the 3G module contains routing factor information from column AG to DG which would not appear to be used and contains #ref errors. Provide an updated version of 3G module with the input in columns AG to DG of the 'Routing Factors Input' sheet removed or explain why the input in columns AG to DG should be retained.

RESPONSE

LIME has removed the columns as instructed.

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15. In LIME's response to the second round interrogatory No. 57 it provided additional information on the "(Budgetary) Mobile to Mobile Costing for Digicel Cayman". In particular, LIME submitted the confidential spreadsheet '10_06_30 3rd round FLLRIC interrog – 57 – attach 1 – conf.xls'. According to LIME this spreadsheet includes separate sheets with calculations of how each cost item is determined. These items include: 'Omnil.inc SS ADM', 'E1 Ports', 'IRM', 'Nokia Signalling Ports' and 'Mobile CDR Processing'. The Authority has reviewed the cost items contained in the spreadsheet and has been unable to reconcile the input costs and calculations in the sheets 'Carrier cost', 'cayman' and 'Joining Services – Inputs' with the final costs shown in the 'Schedule' sheet. The Authority notes that, in second round interrogatory 57a, LIME was directed to provide detailed calculations for the cost items shown in "(Budgetary) Mobile to Mobile Costing for Digicel Cayman". LIME, in its response, did not provide the calculations. Explain in detail and provide the calculations for how the once-off and monthly recurring costs for the items 'Omnil.inc SS ADM', 'E1 Ports', 'IRM', 'Nokia Signalling Ports' and 'Mobile CDR Processing' have been derived using the information contained in the sheets 'Carrier cost', 'cayman' and 'Joining Services – Inputs'.

RESPONSE

The attached file "FLLRIC Interrog 15 attachment 10_09_01 Conf.xls," sheet "schedule" has been updated to include all of the underlying calculations, with reference to the relevant support sheets. With one exception the figures provided previously are unchanged. The exception is the amount reported previously for CDR Processing. Upon further clarification from the vendor, an annual recurring cost for CDR Processing of # # was incorrectly classified as a once-off cost. The attached analysis corrects this misclassification.

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16. In LIME's response to the second round interrogatory No. 57c it notes that the 2G and 3G modules contain only costs associated with interconnect via the fixed network and that there are no costs associated with direct mobile interconnect. In order to allow the Authority to evaluate the two interconnection scenarios, LIME is requested to provide the following:
- (a) 2G, 3G and fixed cost modules which reflect interconnect via the fixed network taking into account changes identified in the interrogatories above.
 - (b) Revised 2G, 3G and fixed cost modules which have been adjusted to accommodate direct mobile interconnection in addition to direct fixed interconnection. In addition, provide detailed documentation explaining the assumptions used to determine those costs and the changes to each module.
 - (c) A table, as set out below, showing for each module (2G, 3G and fixed) the interconnection functions needed and associated cost items (e.g. E1 Ports, Signalling Ports, Billing etc.) in each of the interconnection scenarios. Accompanying this table, provide documentation for each cost item, identifying any assumptions used to determine those costs.

List of cost items (incl. cell references)					
Indirect interconnect			Direct mobile interconnect		
2G	3G	Fixed	2G	3G	Fixed

RESPONSE

- (a) The revised 2G, 3G and fixed cost modules which reflect interconnect via the fixed network taking into account changes identified in the interrogatories above are attached and listed in our response to interrogatory 1.
- (b) Revised 2G, 3G and fixed cost modules are also attached which have been adjusted to accommodate direct mobile interconnection in addition to indirect interconnection through the fixed network. These

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modules are differentiated by the "_MTM interconnect" suffix. The approach for revising the modules to incorporate the possibility of mobile-to-mobile interconnect and the accompanying assumptions are described here.

The modification to the modules was undertaken in the following three steps. First, we allow for the adjustment to the relevant volumes in the modules to reflect the fact that mobile-to-mobile traffic is now no longer routed through the fixed switch as domestic transit traffic. Second, we allow for the removal of any variable interconnection specific cost from the fixed model for carrying mobile-to-mobile traffic. Third, we allow for adding direct interconnection cost to the mobile models (2G and 3G). We discuss each of these steps in turn.

1. Volume adjustment. As mobile-to-mobile traffic is already entered as such in the mobile modules (see, cells X8 and Z8 in "Volume Input for TD"), no adjustment is necessary to those modules. In the fixed module, the mobile-to-mobile traffic appears within domestic transit service volumes. Based on current data, we know that approximately ##% of domestic transit traffic is mobile-to-mobile traffic. We, therefore, make use of the Input Service Growth Factors columns of the "Volume Input for TD" in the fixed module. We input ##% in cells N11 and P11 to make the adjustment.

2. Removing variable interconnect specific cost in fixed module. The capital cost associated with interconnect specific costs in the fixed model are:

- a) the billing platform costs at cell E294 of the Cost Assumption sheet, and all other cells referencing to cell E294; and
- b) the access ring tributary cards found at cell H218 of the "Cost assumptions" sheet, and all other cells referencing to cell H218.

The variable cost of the billing system is difficult to determine as it is not explicitly specified in the original cost of CI\$##. As a reasonable assumption, however, we take the value of the billing platform upgrade for mobile-to-mobile billing, which is approximately CI\$## (see the information provided in response to interrogatory 15). This adjustment is now shown in cells E294-E296 of the "Cost assumption" sheet in the fixed module.

The variable transmission equipment costs are automatically adjusted by reducing the domestic transit volume, as described above in step 1.

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In other words, the reduced transit traffic reduces the number of interconnection circuits required, which in turn reduces the number of trib cards in the model.

With respect to opex associated with mobile transit interconnection traffic, we have identified the relevant elements of opex from the expense factor sheet and tracked them back to the FAC opex sources. We have then reduced the original opex that serves as the basis for the expense factor by

- ##% for all billing-related interconnect specific opex (corresponding to the % reduction in capital costs described above)— "FAC Input sheet" cells C45-50; and
- ##% for other opex on the assumption that they are volume driven (and we have reduced domestic transit by the same factor as discussed above)— "FAC Input sheet" cell C44.

3. Adding MTM interconnect specific cost to the mobile modules.

On the basis of the data supplied in interrogatory 15, we have determined the incremental capital cost and opex associated with the mobile to mobile interconnect. We note we have not applied the approach to pricing found in the workbook supplied with interrogatory 15, but have applied the cost inputs from the workbook to the LRIC framework.

In particular, we gather only the relevant investment costs, as capital costs will be determined by the annualisation formulas within the model, and the opex will be introduced through expense factors.

The relevant network investment costs for an in-span interconnection of the type envisaged for the mobile networks can be grouped into five types: 1) Signalling ports, 2) STM-1 Cards providing connectivity from the switch to ADM Mux, 3) the ADM Mux providing transmission, 4) the fibre, cable and ducting to the cable join with the other network, and 5) the billing platform.

The figures for these investments are found in the following locations in the workbook supplied in response to interrogatory 15:

1. signaling ports at cell E28 in the "Cayman" sheet
2. STM-1 cards at cell E23 in the "Cayman" sheet
3. ADM Mux at cell H16 in the "Cayman" sheet

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4. interconnect specific civil works: estimated as the once-off costs for the joint box, duct and cable at cells S15 and S26 in the "schedule" sheet.
5. interconnection billing: from cell D12 in the "Carrier Cost" sheet

We note that there are freight and installation (both services and IRM—installation related material) costs associated with the first three investments totalling some USD## (cells E24:E26 of the Cayman sheet in the workbook supplied for interrogatory 15). We equi-proportionately mark up the equipment costs by this amount.

We have introduced these figures into the mobile modules in "Cost assumptions" sheet as follows:

- Signalling at cell E173 (E215 in the 3G model)
- STM-1 cards at E176 (E218 in the 3G model)
- ADM Mux at E179 (E221 in the 3G model)
- Civil Works at E182 (E224 in the 3G model)
- Interconnection billing at E185 (E227 in the 3G model)

These figures are run through the model as any other cost input. (in this case "Transmission links" to "Network Costs", etc. in both the 2G and 3G models.

c) We believe that our response to a) and b) adequately describe how the functions and costs of the MTM interconnect is modeling in the modules.