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LIME

Our ref: GRCR/GR 15.19
09 April 2009

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

Dear Mr. Archbold,

Re: CD 2009-1 – FLLRIC Implementation; and ICT Decision 2008-2 – Decision for the Costing Manual Consultation

Further to section 4 of CD 2009-1, Cable and Wireless (Cayman Islands) Limited, t/a LIME ("**LIME**") is submitting the revised forward-looking long-run incremental cost ("**FLLRIC**") models in response to the directives of the Authority in ICT Decision 2008-2. These are being provided in electronic form only, given the impracticality of printing large Excel files:

- CYM fixed 09-04-08 conf.xls
- CYM mobile 09-04-08 conf.xls

Public versions of the models, with confidential data replaced with "dummy" data, per the Authority's directive in paragraph 439 of ICT Decision 2008-2, will be provided for the public record, again in electronic form only.

LIME notes that the modifications mandated by the Authority touched all aspects of the model build and, in some instances, aspects that were quite fundamental to the working of the model. In complying with the Authority's directions, LIME has had to make certain alterations which inevitably resulted in the elimination of some components of the model, change of assumptions, addition of services and volume updates.

As directed by the Authority, the resulting model no longer calculates incremental cost through demand-zeroing iterations, but rather calculates service unit costs on a total service basis. In addition, the calculation

of Incremental Specific Fixed Costs has been removed, and such joint costs are now allocated on the basis of assigned network routing factors.

In reviewing the directives of the Authority, it became apparent that in a few cases there were mis-understandings of assumptions employed in the model and to earlier responses interrogatories. In those cases, LIME has provided further explanations and documentation in an effort to add clarity.

The attached confidential Attachment A summarizes LIME responses to the various directives in ICT Decision 2008-2. Given that some directives are common to both the fixed and the mobile models, LIME has grouped the directives into the following five logical categories.

1. Mobile Technical
2. Model Reconfiguration
3. Cost Adjustments
4. Volume/Growth and Routing Factors
5. Fixed Technical
6. Documentation

A redacted version of Attachment A will be provided for the public record.

In addition, LIME is submitting the following appendixes to Attachment A:

- Appendix I –Radial Distances between Cellsites
- Appendix II – Basics of Radio Network Design, Planning & Optimization
- Appendix III – Fixed Assets Revaluation
- Appendix IV – FAC-TD Values 07-04-09 conf_v1
- Appendix V – TD LRIC Input 07-04-09 conf_v1
- Appendix VI –HLR_VLR
- Appendix VII – Trial Balance 31 Mar 08
- Appendix VIII – Routing Factor Analysis
- Appendix IX – GIS Service Tool
- Appendix X – Spares
- Appendix XI – Traffic and product
- Appendix XII – Cayman IRU Costs
- Appendix XIII – Traffic Stats
- Appendix XIV – Cabinet forecast 2008
- Appendix XV – Nortel-meridian-sales
- Appendix XVI – Mobile costs
- Appendix XVII – NGN Diagram

LIME requests confidential treatment of all Appendices except

- Appendix II – Basics of Radio Network Design, Planning & Optimization
- Appendix IX – GIS Service Tool
- Appendix XV – Nortel-meridian-sales

In addition, LIME has prepared a redacted version of the following Appendix:

- Appendix VIII – Routing Factor Analysis

The other Appendices contain confidential information about LIME's network design, customers, costs or revenues. This information is not made available to the public, and LIME consistent treats it as confidential. It s disclosure to the public, in particular to its competitors, can reasonably be expected to cause LIME financial and competitive harm, as LIME's competitors would be able to prepare targeted and more effective competitive responses to LIME's initiatives, which would be to LIME's financial and competitive detriment. Except as noted above, LIME does not propose to prepare redacted versions of the confidential Appendices as these consist for the most part of complex spreadsheets or confidential contracts, and redacted versions would be meaningless.

Finally, LIME notes that the Authority directed it in paragraph 436 of ICT Decision 2008-2 to "provide a proposed Mobile Termination Rate ("**MTR**") filing detailing the cost of mobile termination and the derivation of the proposed rate using both the 2G/2.5G and 3G network modules". However, in an email dated 27 March 2009, the Authority granted LIME's request for an extension of time to file the 3G mobile model until 18 May 2009. LIME submits, therefore, that it would be premature for it to provide the information required by paragraph 436 at this time. In addition, LIME proposed to its interconnected partners in the Cayman Islands, by letter dated 29 January 2009 and copied to the Authority, an MTR of CI$ 0.0864, and the parties have begun their Interconnection Negotiation renewal negotiations on that basis.

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

Sincerely yours,
Cable & Wireless (Cayman Islands) Ltd. d.b.a LIME

'Signed'

_____

Anthony Ritch
Country Manager

c.c. Donald Austin, EVP Legal Regulatory and Corporate Affairs, LIME
Camile Facey, VP Legal Regulatory and Corporate Affairs (Jamaica & OFC), LIME
Ed Duke, Regulatory Finance Advisor, LIME
Interested Parties in CD (2009-1)/(2008-2)

ATTACHMENT A

Revisions to FLLRIC Model Ordered by the Authority in ICT Decision 2008-02
Submitted by LIME in CD 2009-01 (8 April 2009)

#	PARA:	DIRECTIVE	COMMENT
		Mobile Technical	
1	76	Supply a fully functional and documented 3G mobile model, where account must be taken of growth in the network and in particular for higher bandwidth services.	This is a work in progress and will be submitted separately.
2	46	Allow for flexibility in costing the optimal number of cell sites	In ICT Decision 2008-2, the Authority states that the number and locations of the cellsites should not be fixed, and thus the model should allow for flexibility in costing the optimal number of sites. LIME submits that the model already allows this flexibility. LIME points the Authority to its Mobile Manual section 9, 'Mobile Network - Radio and Switching', where a detailed description of the calculation of the optimal number of radios and base stations is given. The process starts with key input assumptions which are user defined. Of those inputs, the 'Traffic Distribution', 'Coverage area surface (km2)', 'Cell sectorisation per area' and 'Maximum cell radius' are instrumental characteristics in determining the optimal number of sites. Indeed these are to be defined by the user and thus allow for flexibility in calculating the number of sites. LIME observes that there may be some inconsistency in the Authority's directives as the directive listed in paragraph 341 appears to be in conflict with that of paragraph 46. In paragraph 341 the Authority acknowledges and accepts LIME's approach to dimensioning the radio network, but in paragraph 46 implies that the radio network is based on a fixed number of sites, which is certainly not the case. Nonetheless, in this revision, LIME has obtained more accurate information on one of the key inputs, the 'maximum cell radius', based on its GIS database. As such this information has been updated resulting in an increase in the number of sites to 42 which is much closer to the actual number of sites in

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			LIME's network. This, we believe, attests to the model's ability to calculate an optimal number of sites. LIME submits Appendix I which captures spreadsheet technical information on existing cellsite radial distances plus Google earth maps showing coverage areas. LIME also draws reference to technical documentation that is followed by its engineering department when sizing and determining optimal coverage for its network, see Appendix II.
3	46	Provide evidence that demonstrates the optimality of the number cell sites adopted	The model now calculates 42 sites. The model's average radial distances have been updated with a more accurate measure obtained from LIME's internal GIS system. This has resulted in the number of cellsites moving from 17 to 42 which is more in line with LIME's actual installation today. LIME believes that the model demonstrates optimality since an input of more accurate data results in a determination closer to actuality. See Appendix I (Google earth maps plus Excel spreadsheet of radial distances) and Appendix II which captures the theoretical and practical steps in radio planning which is consistent with LIME's approach to cellsite planning and optimization.
4	119	Increase the unsuccessful call rate from 24% to 32% in both mobile and fixed modules	This change to the technical assumptions has been done.
5	119	Use a busy hour assumption of 25 days per month for both the mobile and the fixed modules and adopt a percentage of traffic in the busy hour of 9%, also in both modules.	This change to the technical assumptions has been done.

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		Model Reconfiguration	
6	94	Implement a cost allocation methodology based on a "large increment approach"	LIME has conducted extensive changes to the models in order to implement this revision. The models now calculate unit costs based on a "large increment approach". As a result of this revision the following file and sheet changes were effected. Some files became redundant and were removed. These are: - Consolidation - MS Access Model Files Added - 'TD LRIC Input 07-04-09 conf_v1' (This file has been added to allocate the retail costs directly to the expense factors input sheets. This was previously managed through the MS Access Model which has now become redundant) Sheets removed from the Bottom-up models (the primary function of these sheets was to facilitate the macro calculation of LRIC and ISFC values through demand zeroing. This feature has been ceased as per the Authority's Decision 2008-2 and therefore they are no longer required). - RF to TD - BU Output - FAC output The following sheets have been added in fulfilling the Authority's order to use a 'large increment' approach to costing the services. The FAC Input sheet forms a direct interface with the expense factor output file and thus removes the need for macros. Sheets added: - FAC input - Reval_Assets

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#	PARA:	DIRECTIVE	COMMENT
			- Overhead_exp. Sheets relocated from the Consolidation file to the Bottom-up Models. - Mobile Network Costs - Mobile Service Costs - Fixed Network Costs - Fixed Service Costs The resulting models are much simpler with fewer external links and macros, and each of the models now contains its own output sheets.
7	94	Remove calculations related to the zeroing out of demand in both fixed and Mobile Models	This has been done as part of revision 6 above.
8	246	Remove Pivot tables in the FLLRIC model and replace these with alternative calculations, i.e. calculations that make use of Excel formula and which are directly performed in the relevant cell.	This has been done in part as a natural consequence of revisions 6 and 7 above. In addition all other pivot tables have been removed.
9	246	Use named ranges in the FLLRIC model to assist in the understanding of calculations	Named ranges have been used wherever possible in both the mobile and fixed models.
10	246	Eliminate the use of macros in the FLLRIC model where possible. Where macros are used they should be well documented. Calculation processes should be noted and steps that are preformed by macros should be explained.	Most of the macros have been eliminated. LIME has left intact the macros that control the menu items and the one required for updating static values whenever there is a change in model inputs. All others previously required for model calculations are removed.
11	246	Minimise duplication in the FLLRIC model.	LIME has revised the models and eliminated as many instances of duplication as possible. The models now carry separate but single points of input for assumptions which then flow through successive calculation sheets.
12	246	Show any hidden cells in the FLLRIC model. No calculations or input should be hidden anywhere in the workbooks.	There are now no hidden cells or sheets in any of the models and supporting files.

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13	246	Remove redundant information in the FLLRIC model and remove assumptions and input which are not used for any purposes in the modules.	All redundant information has been removed.
14	253	Revise the workings of the model to make it more simple to use. For example, input changes to capital costs, the WACC, asset lives etc. should to the largest extent possible flow automatically through the modules to service unit costs without the need for manual changes.	This has been revised and the models operate such that input values require only a single point of input.
15	246	Introduce colour coding in the FLLRIC model, i.e. different cell or font colours depending on the nature of the cell. In Excel different styles can be defined. Examples of useful cells types include: Input data (where a user may enter a value), calculations, warning messages, cells that link to external data and confidential data.	Extensive use of colour coding has been employed throughout each model.
16	335	Where possible, reduce the number of times the services lists is duplicated in the modules and instead use references to one set of common data	All redundant information has been removed.
Cost Adjustments			
17	236	Base its network expenses factors on 'current investment' (as opposed to 'forward-looking investment') and 'current expenses'	In a letter dated 22 August 2008, LIME sought clarification on how the term 'Current Investment' should be interpreted. The Authority in its response dated 5 September 2008 pointed LIME to footnote 85, paragraph 231 of its Decision. In reference to the term "current investment", paragraph 231 and footnote 85 states "i.e. using physical quantities and current unit prices for the same or equivalent assets as in the C&W FAC model." A subsequent discussion with the ICTA staff further revealed that an asset revaluation was to be done.

#	PARA:	DIRECTIVE	COMMENT
			Conducting a full asset revaluation is both a time consuming and expensive exercise. In determining an approach to this exercise and in consideration of its intended purpose, LIME adopted the following approach in revaluing the assets in its register. 1) The most recent full financial year ending Fixed Asset Register (FAR) was chosen, this being March 2008 ending. The assets were grouped into categories to match that of the LRIC network assets. 2) Analyse the ages and technology of each asset category. 3) Assets with ages less than 3 years, including works in progress, were considered sufficiently current and were left at book value. The results of this analysis show that the NGN softswitches, Mobile MSC and remotes were all less than 3 years and indeed this is as expected since LIME has conducted extensive upgrades to its network in converting to an IP network. About ### of the transmission network was found to be sufficiently current, and the greater part of the access network were greater than 3 years. LIME notes that the access network carries in excess of ### of the value of assets aged greater than 3 years. 4) LIME therefore reasoned that for those assets aged over 3 years an indexation type revaluation using Turner Indices were appropriate. The access network capital costs are labour intensive and also subject to commodity price fluctuations rendering both cost types good candidates for an indexation type revaluation. 5) All revalued assets were mapped unto the LRIC list of network assets. See Appendix III for the working details of the revaluation exercise. The results of the revaluation are captured in the model sheet called 'Reval_Assets' which is then linked to the expense factors sheets, namely 'Expense Factors' and 'overhead_exp'.

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18	104	Revise (where relevant) and clearly indicate in both fixed and mobile modules inputs or cost factors used to account for economically efficient sharing.	LIME reminds the Authority that the models employ a top-down approach to allocating operating expenses. Inevitably this approach ensures that the costs are those of a combined business whose structure and processes reflect economically efficient sharing, and not that of stand-alone businesses. The ABC/FAC model (this was previously submitted to the ICTA) splits shared costs through selected cost drivers and allocates them to the relevant network elements and services. Those costs that are associated with specific network items were identified and categorized as such. For example, there are costs directly related to mobile switching maintenance which were identified and categorised as a mobile switching maintenance expense factor. There are others, however, such as building costs which are shared. These would have been categorized as overhead type expense factors. The results of the FAC/ABC exercise then form the inputs for the determination of the operating and overhead expense factors in each model. Notwithstanding the above LIME has identified further opportunities for economically efficient sharing of facilities. Some of the cellsites in the mobile model have been identified as being shared with the fixed line network. This is shown in the 'Cost Assumption' sheet, col 'G100'. Those cellsites shared with the fixed line are labeled 'Fixed Line' and for these no leased/rental costs are applied since those costs would have been allocated through the ABC model via expense factors. In addition, the national submarine cable cost is now split between the fixed and mobile networks. See 'B59' of the 'Transmission Links' sheet in the mobile model and cell 'C33' of the 'International TX Costs' sheet in the fixed model.

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19	104	Use transmission costs in the mobile network module that are the lower of the rates for commercially provided fixed-line links or the costs of self-supplied wireless facilities.	The model has been revised to include an automatic switch between commercially provisioned leased lines and self installed wireless transmission facilities. This is shown from cell 'A42' of the 'Transmission Links' sheet in the mobile model. The automatic switch is located in cell 'L116' of the 'Network Costs' sheet in the mobile model.
20	128	Use asset lives as set out in Table 3.	The model has been revised as per the Authority's decision on asset lives. LIME notes, however, that the Authority did not provide for an asset life for Interconnect billing equipment and that one is also needed for the additional VOIP equipment listed.
21	132	Use commercial exchange rates. (paragraph 132)	This has been revised as per the Authority's request. The models now reflect exchange rates as provided by Management of LIME's Purchasing Department. This is shown in cell 'C8', in the 'Cost Assumptions' sheet of the Mobile model and cell 'B7' in the 'Cost Assumptions' of the Fixed model.
22	138	For equipment that is subject to the duty exemption, take account of duty exemption on imported equipment by modifying component costs in the FLLRIC model showing explicitly the cost with and without duty and use the cost without duty to develop unit costs	LIME is no longer entitled to any duty exemptions on imported network equipment. LIME currently pays 20% on all imported equipment, and the models have been revised to reflect this reality.
23	150	Use a simple annuity to annualize costs and apply the annuity on a monthly basis.	This has been applied to both models.
24	213	Adopt an average WACC of 9.5% in both fixed network and mobile network modules in line with the Authority's technology neutral approach to regulation	This has been adopted in both models.

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25	213	Ensure input values elsewhere in the FLLRIC model reflect the use of nominal WACC.	This has been done. See Appendix IV, the FAC/ABC output file 'FAC-TD Values 07-04-09 conf_v1' in the 'Working Capital' sheet.
26	236	Ensure that expense factors do not include any costs specific to Hurricane Ivan, but only those costs that are required in the operation of a telecommunications business in a hurricane prone area. Provide documentation on the hurricane specific costs included in the FLLRIC model.	All costs associated with Hurricane Ivan has been zeroed, therefore no 'Ivan' costs flow through the models.
27	236	Split the cost centre/activity combination (in the ABC model) if relevant into what can be capitalised labour expenses (associated with the design, engineering, installation, creation of the network and commissioning) and non-capitalised labour expenses for the mobile network operating expenses 100-Provide Mobile Cellsites'. Alternatively, C&W must explain why spitting the costs would not be appropriate.	Capital labour has already been removed from the expenses. This has been done in the ABC/FAC model, sheet 'Summary' column G of the 'Model' file. The category '100-Provide Mobile Cellsites' is an activity expense category specially defined to capture activity expenses relating to the provision of mobile services. This is not an accounting expense category used by LIME's financial department.
28	236	Allocate royalty costs based on revenue rather than costs	This has been completed and the models now allocate royalty costs on the basis of revenues. See Appendix V, row 66 in the 'exp_alloc' sheet.
29	236	Add an option to the FLLRIC model allowing the user to take account of efficiency improvements, i.e. by adding an input parameter that adjusts the expense factors directly by whatever efficiency improvement the user is investigating.	LIME has made the revision in each model. Each model now has an FAC input sheet which is directly linked to both expense factor sheets. Column 'C' has been designed in this sheet to allow the user the ability to apply efficiency adjustments directly against each and every expense factor cost category. Any percentage so applied represents the proportion of cost allowed.
30	301	All equipment cost inputs must reflect a "real life" level of discount from list pricing.	Any discounts applied reflect real life discounts.

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#	PARA:	DIRECTIVE	COMMENT
31	306	Split the costs of the STM capacity for national inter-island traffic between the fixed and mobile modules by ensuring there is no double counting.	LIME has completed this revision. The national submarine cable cost is now split between the fixed and mobile networks. See 'B59' of the 'Transmission Links' sheet in the mobile model and cell 'C33' of the 'International TX Costs' sheet in the fixed model.
32	346	Split the cost of VLR and HLR and allocate the costs based on primary cost driver of each. If C&W believes it is appropriate to regard HLR and VLR costs together, detailed documentation must be provided to the Authority showing that this is an appropriate treatment of these costs	The Authority states in paragraph 345 of its Decision: "The treatment of the HLR/VLR cost as a single cost component may not be appropriate as the VLR functions are generally used only for roaming services while the HLR functions are used for all access services". This statement reflects a fundamental mis-understanding of the functions of VLR and HLR, which is understandable as most texts in describing the functions of the VLR use the term 'roaming'. While this is technically correct, it is not roaming in terms of the Roaming service. In this case, the VLR acts as a dynamic database that keeps track of subscriber's whereabouts while connected to the network (while they 'roam' throughout the network moving from one MSC to another). The VLR works in unison with the HLR which is a static database that captures the universe of all subscribers authorized to use the network; this includes visitors (in this case Roaming service users) to the network. LIME submits that both the HLR and VLR primary functions are subscriber based. LIME points the Authority to Appendix VI, Nokia Electronics Documentation, which provides a description of both components. In this document detail descriptions of the HLR and VLR are provided, for the VLR it states "The VLR, embedded in the MSCi, stores the subscriber information of all mobile subscribers currently using the network controlled by the MSCi…" This means that the VLR keeps a running tab of all subscribers attached to a particular MSC, if there is more than one MSC. In the case of the Cayman Islands, where there is only one MSC, all active subscribers are monitored by the VLR.

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#	PARA:	DIRECTIVE	COMMENT
33	361	Split the costs of the STM capacity for national inter-island traffic between the fixed and mobile modules, rather than fully counting the costs in both fixed and mobile modules	LIME has completed this revision. The national submarine cable cost is now split between the fixed and mobile networks. See 'B59' of the 'Transmission Links' sheet in the mobile model and cell 'C33' of the 'International TX Costs' sheet in the fixed model.
34	389	Provide supporting material to allow the Authority to verify the accuracy of the calculations performed in the 'Revenue Mapping' sheet in the top-down retail module.	LIME submits Appendix VII which captures its March 2008 ending Trial Balance and a copy of the revenue sheet of the FAC/ABC 'RA' file. The mapping of the revenues in the Trial Balance to the FAC revenue format can easily be traced. The 'Revenue' sheet is then linked to 'Appendix V- 'TD LRIC Input 07-04-09 conf_v1', the Top Down FAC file. Please note that the revenues have been updated to reflect the year ending 31 March 2008. This was necessary in order to have included services which previously did not obtain a full revenue stream because the previous version was based on 2006 financials when certain interconnect wholesale services were not fully developed and therefore did not reflect full revenues.
35	389	Apply a bad debt factor to both retail and wholesale services.	This has been done and is captured in the "Fixed Service Costs" sheet of the Fixed model and the "Mobile Service Cost" sheet of the Mobile model.
Volume/Growth and Routing Factors			
36	335	Update the fixed network model and service list to reflect all significant services that C&W currently provides.	LIME has included the VOIP service in the Fixed Model. LIME has noted that the Authority in its Decision 2008-02, paragraph 334, made mention, in addition to the VOIP service above, of including IP-VPN service in order to reflect full use of IP and Data transmission resources. LIME believes the service referred to as "IP-VPN" was meant to refer to LIME's MPLS-based IP-VPN QoS service which is designed to provide enterprises with an extremely robust Wide Area Network solution for connecting partners and customers at fixed and remote locations for Internet, intranet, extranet and e-business applications. This service is delivered over LIME's MPLS-enabled IP Network, which is

#	PARA:	DIRECTIVE	COMMENT
			precisely the type of network modeled in the fixed network model. As a forward looking model, IP technologies were employed, costed and modeled, as shown in the 'Cost Assumption' and routing factor sheets. IP networks represent the world of converged technologies where advanced protocols allow the transmission and management of different traffic types. LIME submits that MPLS-based IP and NGN technologies have already been modeled. The "error" in the model however was in the labeling of the services which in some cases retained legacy names. This is the case, where instead of carrying the term MPLS IP-VPN QoS (a forward-looking term) we had the name of a legacy 'Frame Relay' service. Indeed the underlying technology used in the modeling is IP-based technology and certainly not the legacy ATM systems used for LIME's Frame Relay services. Given this we have altered the name Frame Relay to now read 'MPLS IP-VPN' consistent with the technology modeled.
37	378	Update the mobile network module to reflect all existing services in use.	LIME has included the SMS Termination service. LIME notes that the Authority suggested the inclusion of LIME's Push to Talk service. LIME, however, is of the opinion that this is not in any way a major service and it is a subset of LIME's Mobile Data service which has been modeled. This service at present has only a handful of customers with little or no usage at present. LIME has no expectations of this service increasing beyond what it is today.
38	119	Develop and document a clear and consistent definition of the factors used to develop actual, network and dimensioned demand. In particular, those associated with the provisioning allowance used for demand driven by lines should be addressed.	LIME understands the confusion caused by the apparent contradiction between the definition given and the manner it has been used in the model. Such confusion is understandable, however, as terms used in an engineering sense may have different meanings when used in a "lay" sense. LIME has made changes to alleviate this confusion but at the same time maintain the integrity of the engineering application. The term "provisioning" when used for 'lines' represent catering for stopped and allocated lines. Appendix XIV, LIME's Cabinet forecast record for 2008, as opposed to the context of growth

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			when applied to other network elements. As such we have created a separate term for lines called 'Provisioning Allowance for Lines'. This is shown in the 'Demand Assumption' sheet, cell 'B13'. All other network elements are provided with a separate 'provisioning allowance ' in cell 'B9'. As a result, the formula in row 144 of the 'Demand Calculation' sheet has been altered to accommodate this separation. Appendix XIV represents LIME actual 2 year forecast over 2008 demand obtained from Outside Plant Engineering and Planning Department. The records clearly support LIME's assertion with respect to the need to have a provisioning allowance for Lines. Column makes this calculation for each cabinet and an overall at the bottom in row 160. The overall average is calculated to be ###. LIME contends therefore that the ### used in the model represents a reasonable provision. In columns AF – AH growth rates were calculated. The growth rate for the 2 year period is ### and the average rates for 2009 and 2010 are ### and ### respectively. LIME believes therefore that the ### used in the model is reasonable.
39	119	Explicitly show existing demand and forecasted demand for services in both fixed and mobile modules, i.e. a growth rate should be shown for each service and the relevant planning horizon provided.	This has been completed, the input volume sheets each now contain a section showing the growth rate and planning horizon assumptions.
40	119	Provide justification for both explicit and implicit utilization in the different parts of the network.	This has been done. See Appendix XIV, which shows in cell'AJ160' for the access loop an average utilization of ###, and Appendix XIII for details of Cellsite, Exchange and Transmission Utilizations.
41	119	Provide supporting descriptions associated with all key volume input entries and in particular inputs such as ADSL Retail minutes.	See Appendix XI for a Description of the Key Volume Inputs.

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42	328	Explain in detail routings for each service.	See Appendix VIII for a description of all Routing factors used in the models.
43	328	Explain the conversion of data usage to minute demand for data services.	This is a standard conversion applied to the number of Mbps in order to convert to a minute measure used for capacity sizing. The formula is located in Cell 'C4' of the 'Demand calculations' sheet and it is: =1/(BH_pcent/mins_erlangs/channels). This is multiplied to the 2Mbps volume in the volume input sheet.
44	328	Explain why domestic transit only consists of handing over traffic at the host exchange and does not contain any transit between exchanges.	Domestic transit is an interconnect service provisioned through a single point of interconnection. This particular service receives traffic from outside of the PSTN (incoming traffic from a third party operator or LIME's Mobile network) and hands it off to another network. Therefore, such a call would utilise PSTN network resources of a single host exchange and 2 interconnection links and interconnect billing equipment. Also see the definition provided in the 'routing factor' sheet of the fixed model.
45	328	Explain why the DQ wholesale services solely contain host switch elements and those relating to DQ and interconnection	This service is an interconnect service which utilizes a single point of interconnection at a host exchange. DQ wholesale traffic would arrive at the point of interconnection from outside of the PSTN network where it would consume host switch resources and then conveyed to the DQ/Operator platform/s which is also directly connected to the host exchange. Thus such a call would utilise one interconnect link, one host switch resource, one DQ/Operator platform and of course the interconnect billing equipment. Also see the definition provided in the 'routing factor' sheet of the fixed model.
46	328	Base the routing factor calculations on a revised traffic sample containing no irregular events that affect the distribution of traffic. If such data is not available, C&W should attempt to adjust for the impact of irregular events and justify the associated assumptions.	LIME has been unable to obtain an updated sample of traffic at the level of detail previously provided. In lieu of this LIME has adjusted the existing sample to exclude the hurricane period containing the irregular data. The months removed are: September 04, October 04, November 04 and December 04. The routings are now determined on the basis of the months

#	PARA:	DIRECTIVE	COMMENT
			April - August 04 and January - February 05 data. LIME believes this is reasonable and representative of customers' calling profiles. See Appendix VIII.
47	328	Explain the use of international transmission every time the following services are provided: 'ADSL Retail', 'ADSL Wholesale', 'Dial-up internet usage' and 'Direct connect'.	ADSL and Dial-up internet usage and Direct Connect are all Internet services that require international transmission facilities to connect to the 'WWW' outside of the Cayman Islands.
48	328	Explain the equivalence of the services 'Domestic leased line retail' and 'Domestic leased line wholesale'.	These two services are generally provisioned the same regardless of whether they are used by a wholesale customer or retail customer. We know that Domestic Leased circuits all require an end to end or point to point connection, thus both types would require 2 access loops, and 2 RSU – host links. Also both would utilize the Data equipment. Where uncertainty comes in is in determining the level of utilization of the Host – host transmission and National transmission links. In the absence of detail customer locations and circuit routings, LIME assumed just about ### of the circuits flow through the host - host links and ### flow through the national submarine links.
49	328	Explain why payphone services make no use of the network elements in the access network	This issue was raised in a previous interrogatory (see ICTA Interrogatories Third Round question 1c) and LIME responded by applying the change to the model. The fixed model routing for Payphones has since reflected a routing of 1 for the access local loop.
50	328	Explain why the international transit service from and to OLO make use of the RSU element and 'RSU to Host transmission' element.	This was an over-sight. The routings have been revised to exclude the use of the RSU element and 'RSU to Host transmission' element.

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51	328	Explain the derivation of the routing factors for the service 'National Call' that uses information to split between local and trunk calls by providing the underlying calculations and source values	LIME has revised this approach and now calculates the routings for this service solely based on the analysis captured in Appendix VIII.
52	328	Explain the assumed equivalence of the routing factors for fixed to mobile (C&W) and fixed to mobile (other).	Fixed to Mobile (C&W) and Fixed to Mobile (Other) include essentially the same fixed origination service. The utilization of network resources between the customer originating the call and the point of interconnection on average is the same, especially given the relatively small and simple PSTN network in the Cayman Islands.
53	346	Provide information to justify the division of the number of data and SMS subscribers by ten and make the assumption explicit in the module.	It is possible that this was a left over assumption where it was assumed about 10% of subscribers were GPRS enabled. However this is no longer required as most if not all handsets are GPRS enabled. This oversight has been removed.
54	373	Explain the routing factors used for the SMS service.	This is captured in Appendix VIII RF Analysis Revised.
55	373	Provide documentation showing that the added processor time for specific call types is reasonable within the mobile network it is modelling. The Authority does not regard the reference to OFTEL as satisfactory.	This has been revised to exclude the use of OFTEL's data. The model now applies a routing of 2 for Mobile on-net calls and a routing of 1 for off net calls.
56	373	Provide a service definition of the 'Mobile Voice Mail (retail)' service and justify the routing factors used for this service.	See Appendix VIII RF Analysis Revised.
57	373	Demonstrate that the routing factors in the mobile network module accurately reflect the use of the prepaid platform.	In the absence of more detailed comparative volumes between prepaid and postpaid customer, LIME employed a proxy using the proportion of Active prepaid customers in the network. Previous volumes of Active Prepaid Subscribers versus total Active subscribers

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			were use to estimate the proportion of customers using the prepaid platform. See Appendix VIII RF Analysis Revised for the calculation. At the time, the numbers read ### active prepaid vs ### of total active which produced a split of ###. Updated figures of prepaid active vs total active, also shown in the Appendix, gives a proportion of ###. The model has been updated to reflect this.
58	373	Explain and justify the routing factors for 'fixed to mobile (C&W)' and 'fixed to mobile (other)' are the same.	Fixed to Mobile (C&W) and Fixed to Mobile (Other) include essentially the same fixed origination service. The utilization of network resources between the customer originating the call and the point of interconnection on average is the same, especially given the relatively small and simple PSTN network in the Cayman Islands.
Fixed Technical			
59	266	Justify the optimality of all the inputs used in the access network part of the fixed network module. The Authority emphasises that the access network should reflect forward-looking principles and a simple replication and revaluation of C&W's existing access network cannot be regarded as a cost efficient solution without proper documentation. Justification should also be given for the assumed planning horizon.	The design and roll out of LIME's access network is facilitated through the use of a modern GIS tool. This tool allows LIME's engineers to efficiently design the best route for cable runs, locate distribution cabinets, install DPs and also identify obstacles, for example when preparing for cable runs a chosen path may not always be the best as buildings or other operator's facilities may be in the way. The GIS tool saves time and money in identifying at an early stage in the design/planning process the most optimal route and location for access facilities. Prior to the implementation of the GIS system LIME's access network design and planning would involve extensive field surveys in order to determine the best possible route or location for its facilities. There are constraints, however. The Cayman Islands are geographically located within the hurricane belt which puts all overhead facilities at risk, including towers. A forward-looking operator entering the access network arena would have to seriously consider placing most if not all cables underground. Doing so, however, may not be economically and financially feasible as such an undertaking would be very expensive. An intricate balance would have to be found, one that ensures financial viability and efficient

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			operation. The right mix of overhead and underground cable placement would have to be determined, representing an optimal solution. LIME contends that its network can be considered optimal. Appendix IX provides a detail presentation highlighting the functions and benefits of LIME's GIS system.
60	266	Align and use a consistent set of cable sizes through-out the access network modelling in the fixed network module	This has been completed.
61	266	Ensure that interpolation between equipment sizes does not result in erroneous component costs in the fixed network module.	This has been corrected and the interpolation between sizes now works effectively.
62	266	Address the Authority's concerns with regard to the allocation of duct costs between access and core network.	Exclusive duct means that a single bore is housed in a particular trench. Once a trench holds more than one bore it is considered a shared duct, from an engineering standpoint. The Authority's interpretation does not reflect this engineering standpoint and LIME apologises for the label which led to this interpretation. LIME submits that all ducts are shared between the core and access networks. Indeed a single bore duct may house both core network cables and access network cables. The main driver for ducts is the km length of cables they carry, and as such LIME has appropriately applied the relative proportions of km length of access cables vs.core network cables to split the cost of duct between the Core Network and Access Network.

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63	275	Separate the MG investment into fixed and variable according to dimensioning rules and functionality of the equipment. Where this is not possible, C&W must correct for the methodological problems identified by the Authority.	This has been corrected. The MG investment costs are analysed on the basis of simple linear regression rules and the previous anomaly where the proportion of fixed cost increased as the number of lines/MGs increased has been eliminated.
64	275	Use a consistent demand set to separate the fixed cost investment per MG into a 'Fixed Cost per MG' and the 'Variable Cost per MG'.	This has been corrected.
65	275	Eliminate the use of estimates that mix old and new switching technologies and update the fixed network module to reflect MG investments based on NGN equipment only	All Remotes have been converted to NGN and are now considered MG or MSANs. The previous list in the fixed model contained all the remote locations that existed at the time of model build and, inadvertently, some of the legacy labels were imported.
66	284	Correct the input duct dimensions to match the cost inputs used in the fixed network module.	Duct cost as captured in the duct cost sheet applies cost to a range of duct bores, for example, ducts with 3-4 bores carry the same cost and all ducts with greater than 12 bores carry similar cost. This is now explicitly reflected in the 'Duct Calculations' sheet.
67	284	Ensure an appropriate portion of pole costs are allocated to the core network.	LIME has now applied a #### proportion of Pole cost to the core network based on km length proportion of total aerial cable in the core network.
68	287	Provide justification for the unitization of the 400-Contact Centre Platforms based on calls rather than minutes.	Call Servers are typically sized using Busy hour call Completions or Busy Hour Call Attempts. The driver of these systems is number of calls and not volume of minutes. Also the Performance indicator employed in monitoring performance of call centers is number of completed calls. Please refer to Appendix XV: under the section labeled 'Symposium Call Center' the Busy Hour Capacity is measured as # Calls per hour.
69	301	Indicate whether one or two USP's are needed in the fixed network module.	LIME submits that only one USP is required and the model now reflects this.

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70	301	Amend the fixed network module to take account of the cost of spare equipment inventory in a manner consistent with the mobile network module approach, i.e. as an additional percentage of the original investment. The percentages used should be justified and documented.	The fixed model now accounts for spares similarly to the mobile model. See Appendix X for supporting documentation on the proportion of spares applied to the different network elements.
		Documentation	
71	246	Provide clarifying descriptions associated with inputs making it clear from where each are derived and/or from where they originate.	This has been done.
72	301	Provide information explaining in detail the source all assumptions marked as "C&W", "Benchmark" or "Cayman".	This has been done.
73	253	Provide documentation for those parameters that require several steps to be performed when updating.	This has been done.
74	132	Provide documentation for all exchange rates used.	LIME has included in each model its commercial exchange rates used for the purchasing of capital network equipment.
75	138	Provide documentation for categories of equipment that are subject to duty exemption.	LIME is required to pay 20% duty on all network equipment imported into the Cayman Islands.
76	236	Explain the apparent disparity in detail between interconnect specific costs incurred in the fixed module with those in the mobile module.	The management of PSTN Interconnection arrangements and facilities is conducted by LIME's Carrier Services Division which must act in a non-discriminatory manner towards all interconnecting parties, including LIME's Mobile business. As such, interconnecting parties bear the cost of interconnection facilities between their networks and the PSTN. This should not be a shared cost. In light of this we have included cost for the provision of an interconnect link between the Fixed network and the Mobile. This is shown in the 'Transmission Links' sheet of the mobile model forms part of the outputs in the mobile Network Cost sheet and the service cost sheet.

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			Some sharing of facilities exist, however, resulting in a greatly reduced need for cable runs, duct/trenching, joining/splicing and manhole/joint boxes typically required if the point of interconnection and the Mobile Switch are located at different locations. The shared costs are allocated through the overhead expense factors. With respect to the expense item "100-Support Regulatory Costing" , this is now allocated as a shared cost through the overhead expense factors. Also, the expense factor cost '100-Manage Mobile Interconnect Specific Requirements' in the mobile model is now allocated 100% to the interconnect specific network item.
77	236	Explain the relevance of the fixed network specific costs "100-R&M Exchange Equipment – Ericsson Switch" considering that an NGN is being modeled	LIME agrees that the term used refers to legacy switching equipment and is supplier specific and therefore has renamed this expense item to '100-R&M Exchange Equipment - Switch Maintenance', a more generic term. LIME believes that this expense item is relevant under forward looking assumptions. Indeed NGN switching equipment would require supplier support. The level of support, however, may vary from that of the past. An efficiency adjustment can be applied against this expense in column 'C' of the 'FAC Input' sheet to reflect the cost of a forward-looking operator.
78	236	Explain the cost centres/activity centres related '100-Provide Mobile Switching Equipment' (in the ABC model), and if relevant split them into capitalised labour expenses and non-capitalised labour expenses.	Capital labour has already been removed from the expense and therefore it is not relevant to apply a further split. A split has already been applied as shown in the ABC/FAC model, sheet 'Summary' column G of the 'Model' file. The category '100-Provide Mobile Switching Equipment' is an expense factor category specially defined to capture activity expenses relating to the provision of mobile services. This is not an accounting expense category used by LIME's financial department.

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79	236	Explain the relevance of including both '100-Non Broadband Radio – Ericsson Support' and '100-Telecoms Equipment – Nortel Support' in the light of the forward-looking assumption and modelled technology.	LIME agrees that the terms used refer to supplier specific legacy switching equipment and therefore has renamed these expense items using more generic terms: • 100-Mobile Radio - Maintenance Support • 100-Mobile Switch Support LIME believes that these expense items are relevant under forward-looking assumptions. Indeed Mobile switching equipment and radio equipment would require supplier support. The level of support, however, may vary from that of the past. An efficiency adjustment can be applied against each of these expenses in column 'C' of the 'FAC Input' sheet to reflect the costs of a forward looking operator.
80	119	Provide documentation and supporting evidence for the existing demand volumes and forecasted changes in demand.	See Appendix XI.
81	266	Provide documentation to show that exclusive duct is used in the same proportions as number of km in each network or where this is in error, correct the approach ensuring it is reflective of forward-looking operator.	The information captured in the model was extracted from LIME's GIS system. LIME considers this information to be accurate and as explained in note 62 above, the use of the term 'exclusive' vs 'shared' is incorrect and has been rectified.
82	280	Provide further documentation on the transmission network not changing as network demand changes	See Appendix XVII which shows the forward-looking NGN network diagram of LIME's core network infrastructure including the transmission rings. This diagram largely informed the build of the transmission module.
83	284	Provide documentation for the optimality and/or efficiency of the infrastructure inputs used (cabling, ducting trenching etc.). This should include a discussion of how excess capacity has been taken into account, how legacy impacts have been dealt with and the choice of trenching terrain.	The design and roll out of LIME's access network is facilitated through the use of a modern GIS tool. This tool allows LIME's engineers to efficiently design the best route for cable runs, locate distribution cabinets, install DPs and also identify obstacles, for example when preparing for cable runs a chosen path may not always be the best as buildings or other operator's facilities may be in the way. The GIS tool saves time and money in identifying at an early stage in the design/planning process the most optimal route and location for access facilities.

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			Prior to the implementation of the GIS system LIME's access network design and planning would involve extensive field surveys in order to determine the best possible route or location for its facilities. There are constraints, however. The Cayman Islands are geographically located within the hurricane belt which puts all overhead facilities at risk, including towers. A forward-looking operator entering the access network arena would have to seriously consider placing most if not all cables underground. Doing so, however, may not be economically and financially feasible as such an undertaking would be very expensive. An intricate balance would have to be found, one that ensures financial viability and efficient operation. The right mix of overhead and underground cable placement would have to be determined, representing an optimal solution. LIME contends that its network can be considered optimal. Appendix IX provides a detail presentation highlighting the functions and benefits of LIME's GIS system.
84	306	Provide documentation of the IRU price given that the cost of International Transmission (Submarine) is a considerable component of Total Cost	See Appendix XII for documentation supporting the IRU price included in the model.
85	313	Provide complete documentation and clarifying descriptions of each technical assumption, making it clear what each assumption represents and indicating its source. Where an assumption is derived, accompanying calculations are to be provided.	See Model manuals previously submitted for detail descriptions of technical assumptions.

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86	361	Provide documentation for the cost assumptions employed in the mobile network module, indicating in the documentation whether these inputs correspond to actual invoiced items, average values derived from recent procurement activity, benchmark values (and if so their origin) or some other source. In addition C&W must provide supporting documentation for the level of discounts off list prices.	See Appendix XVI, as well as Appendix X Part I.
87	361	Provide information supporting its use of spares in the mobile network module.	See Appendix X for supporting documents on the cost of spares in the mobile and fixed models.