COMMERCE COMMISSION NEW ZEALAND

Notice to supply information and documents to the Commerce Commission

Sections 98(a) and (b) Commerce Act 1986

To:

Vodafone New Zealand Limited
Level 1, Lambton House
160 Lambton Quay
Wellington 6011

Attention: Liesbeth Koomen, Legal and External Affairs Director

Purpose of the Notice

1. We (the Commerce Commission) are reviewing the price to be paid for the Unbundled Copper Local Loop (UCLL) and Unbundled Bitstream Access (UBA) services provided by Chorus Limited, as defined in subpart 1 of Part 2 of Schedule 1 of the Telecommunications Act 2001 (Telecommunications Act). We are required to make a price review determination as soon as practicable in respect of the UCLL service (refer sections 47 and 51 of the Telecommunications Act 2001) and we are required to make reasonable efforts to make a price review determination in respect of the UBA service before the expiry of three years from separation day, which is 30 November 2014 (refer section 78(3) of the Telecommunications (TSO, Broadband, and Other Matters) Amendment Act 2011).

2. The purpose of this Notice is to obtain information and documents relevant to our price review determinations for the UCLL and UBA services.

3. The Notice is issued under sections 98(a) and (b) of the Commerce Act, and section 15(f) of the Telecommunications Act.

4. We consider it is necessary and desirable for Vodafone New Zealand Limited to provide us with the information and documents specified in **Attachment A** to this Notice to assist us in making the price review determinations.

Date and place of response

5. The information and documents in response to this Notice must be delivered to the Commission's Wellington office at Level 6, 44 The Terrace for the attention of Keston Ruxton, or by email to telco@comcom.govt.nz with the subject "Response to section 98 Notice – UCLL and UBA", by 5pm on 20 May 2014.

6. Vodafone New Zealand Limited must provide all information and documents in Attachment A in electronic .csv, .shp, or pdf format, as appropriate, via email or on a flash drive.

7. Vodafone New Zealand Limited must label and identify all information and documentation, and explain which information relates to which paragraph of this Notice.

8. Vodafone New Zealand Limited must supply the requested information and documents under cover of a letter on Vodafone New Zealand Limited's letterhead, signed by a person with the appropriate authority.

Dated at Wellington 17 April 2014

Signed by:

Elisabeth Welson
Commissioner

Attachment A

1. For the purposes of this Notice, the following terms have the following meanings:

   1.1 **Vodafone** Limited means Vodafone Limited, its interconnected bodies corporate (as defined in section 2(7) of the Commerce Act), business units or joint ventures, and any current or former agents, employees, officers and directors thereof.

   1.2 **ATM** means Asynchronous Transfer Mode.

   1.3 **BUBA** means Basic UBA.

   1.4 **Core network** means the active part of a network starting after the MDF. This includes the passive links between exchanges.

   1.5 **DMR** means digital microwave radio.

   1.6 **DSLAM** mean both Digital Subscriber Line Access Multiplexer (DSLAM) and Multi-Service Access Node (MSAN) equipment.

   1.7 **DWDM** means dense wavelength division multiplexing.

   1.8 **EAS** means Ethernet Aggregation Switch.

   1.9 **ETP** means external termination point.

   1.10 **EUBA** means Enhanced UBA.

   1.11 **FTTH** means fibre-to-the-home which, for the avoidance of doubt, is to the ETP only.

   1.12 **FTTN** means Fibre-to-the-Node.

   1.13 **FWA** means fixed wireless access.

   1.14 **Leased line** means any point to point link with a dedicated capacity regardless of the type of link (e.g. copper and fibre). This includes leased lines, fibre circuits, managed services etc.

   1.15 **Local access distribution network** means that part of local access copper and fibre networks between the copper cable terminal (CT) or fibre access terminal (FAT) and the active or passive cabinet/ fibre flexibility point (FFP) or exchange the CT or FAT is parented off.

   1.16 **Local access feeder networks** means that part of local access copper and fibre networks between an active or passive cabinet /fibre flexibility point (FFP) and an exchange MDF/ODF handoff point.

   1.17 **MDF** means Main Distribution Frame.

   1.18 **ODF** means Optical Distribution Frame.

2. For the purposes of this Notice, we ask the GIS information to be presented, in New Zealand Transverse Mercator (NZTM) projection, in one of the following formats:

   2.1 ESRI Shape File Format;

   2.2 ESRI File Geodatabase;

   2.3 MapInfo TAB Format; or

2.4 MapInfo MIF/MID.

3. Regarding all information requested please provide a file (in .csv format) listing the name of each file provided, the information contained within the file, the date the information was queried and the date the file was prepared. Where different dates apply to pieces of information within the same file, these should be recorded in separate rows.

4. Regarding all information requested please provide a glossary of terms used.

5. The Commission requires the following information:

Information and documents requested

6. Please provide the following in respect of Vodafone's copper and fibre local access and core networks:

6.1 For each copper exchange and cabinet can the same coverage areas be considered for a GPON deployment? If no, please explain why the coverage areas are different. This is not a question regarding efficiency but a question regarding technical feasibility.

6.2 In respect of any Vodafone PON deployment, please provide;

6.2.1 the split ratio,

6.2.2 the location of PON splitters by exchange and cabinet node identifier,

6.2.3 The unit cost of PON splitters

6.3 Vodafone's business and network contingency plans, including data on the provisions that have been made in respect of insurance and network and core asset geographic redundancy which mitigate local and regional catastrophic events.

6.4 Examples of exchange floor plans and local area copper networks roll out plans (GIS maps) representative of a typical exchange at each layer of Vodafone's network hierarchy (including cabinets).

6.5 For DWDM networks:

6.5.1 The cost of the platforms (split by asset);

6.5.2 The cost of the amplifier;

6.6 For submarine links:

6.6.1 The cost per km of submarine links;

6.6.2 The cost of a typical landing station (material, installation, maintenance, planning, design);

6.7 For microwave links:

6.7.1 The cost per typical link (please provide link configuration including size of the dishes, length of the link and capacity);

6.8 Service lead-ins
The Commission seeks business, technical and cost information related to the provision of copper and fibre lead-in services; being the connection from

an ETP or building frame to the nearest point on Vodafone's local access network, as at 7th February 2014. For all dwellings– residential and commercial:

(a) Vodafone's engineering design, planning and installation practice guidelines (pdf) for the installation of copper and fibre lead-ins, aerial and underground, in rural and urban exchange areas; as used to inform and instruct service companies, for single and multi-dwelling units, including:

(i) Number of cable pairs or fibres allocated per customer for: residential (including lifestyle properties), residential apartments (MCU), commercial offices, retail and small health facilities (e.g. doctors' clinics), the UFB priority sites of education, health, local and central government, and maraes.

(ii) Standard and non-standard installation scenarios

(b) The use of poles for aerial lead-ins for single and multi-unit dwellings:

(i) Information on the commercial and technical terms under which Vodafone continues to use poles from third parties, e.g. local power companies, for provision of fibre and copper lead-in services.

(ii) Information, to the extent that Vodafone has such information, on any special conditions limiting the use of existing or new poles for the purpose of providing copper or fibre service lead-in connections, issued in accordance with the New Zealand Utilities Advisory Group (NZUAG) National Code of practice or other relevant legislation or code of practice, by a territorial local authority area.

(iii) For each exchange the percentage split between overhead and underground service lead-ins.

(c) The Commission seeks cost information relating to all services provided by third parties, e.g. service companies, in relation to the provision of copper and fibre lead-in service to single and multi-unit dwellings, including:

(i) Service company charge codes and associated statements of work;

(ii) Fixed and variable unit costs, exclusive of GST and any profit or other operational margins; and

(iii) Transaction volumes by service company patch.

(d) Description and unit cost for materials used in the provision of copper and fibre service lead-in for single and multi-unit dwellings:

(i) ETP, for both copper and fibre;

(ii) Ducts (per metre);

(iii) Underground lead-in cables, copper and fibre, noting cable pair and fibre counts;

(iv) Aerial lead-in cables, copper and fibre, noting pair and fibre counts;

(v) Installation Labour costs, by service company area

6.9 Line Fault Index

The Commission seeks the number of faults per 1000 active lines per year over the past 5 years, categorised by overhead and underground, copper and fibre local access areas, on:

6.9.1 Vodafone's copper local access network (exchange to ETP);

6.9.2 Vodafone's fibre local access network (exchange to ETP);

For avoidance of any doubt; faults for which no Vodafone fault was found (i.e. NFF), faults attributed to the core network or to an access seeker, and faults on the consumers' side of an ETP are to be excluded.

For each of paragraphs 6.9.1 and 6.9.2 please specify the percentage share of overhead (where: overhead + underground = 100%) to total deployed cable.

6.10 Copper and fibre local access distribution and feeder networks

6.10.1 Aerial and underground distribution and feeder networks:

(a) Information on the commercial and technical terms under which Vodafone continues to use ducts and poles of third parties, e.g. local power companies, for the purpose of fibre and/or copper local access distribution and feeder networks.

(b) The share of total trench and pole km in Vodafone's local access distribution and feeder and core networks that are shared with other utilities.

(c) For each exchange the percentage split between overhead and underground within distribution and feeder networks.

(d) Information, to the extent that Vodafone has such information, on any special conditions limiting the use of existing or new ducts and poles for the purpose of copper and/or fibre local access distribution or feeder networks, also any special conditions limiting the use of specific trenching or drilling

techniques, such as shallow or micro-trenching issued in accordance with the New Zealand Utilities Advisory Group (NZUAG) National Code of practice or other relevant legislation, by a territorial local authority area or code of practice, by a territorial local authority area.

(e) Engineering planning and design rules
Vodafone's engineering design and planning guidelines (pdf) to construct aerial and underground local access distribution and feeder networks, in rural and urban environments, including current planning and design rules describing:

(i) The number of pairs/fibres planned per customer/premises passed in copper and fibre local access distribution networks.

(ii) The number of feeder pairs/fibres dimensioned in a copper, fibre or shared copper and fibre local access network. These should be categorised by active and passive cabinets.

(iii) The maximum span length of aerial and length of underground cable between joints in the distribution and feeder sections of a Vodafone local access copper and fibre network.

(iv) Where manholes/chambers and hand hole joints are designed to be placed within the distribution and feeder sections of a local access distribution network.

(v) The maximum and national average design distance between poles in the distribution and feeder section of a local access copper and fibre cable network in urban and rural exchange areas.

(vi) The maximum and average span length of aerial and length of underground cable between a cabinet or FFP and customers' premises in a local access copper and fibre cable network in urban and rural exchange areas.

(vii) Maximum and average cable length between exchanges and cabinets (active and passive) in urban and rural exchange areas.

(viii) The allowances made for terminations, cable joints and cable sag between poles per km of overhead when calculation the amount of cable required.

(ix) The allowances made for terminations and cable joints in chambers/manholes when calculating the amount of copper and fibre cable required per km of underground, ducted and direct buried, local access network.

(x) In the case of aerial deployments the minimum ground and road clearance heights in the distribution and feeder sections of a local access copper and fibre network.

(xi) In the case of underground deployments the maximum duct fill factors in a distribution and feeder access network.

(f) Cables: a technical description of aerial and underground cables as used in the distribution and feeder sections of local access copper and fibre networks including:

(i) Outside diameter of the copper and fibre cables

(ii) Cost per metre of copper and fibre aerial and underground cable

(iii) Readily available cable drum length for aerial and underground copper and fibre cables

(iv) Average cable jointing cost (labour + materials) for aerial and underground copper and fibre cables.

(g) Poles:

(i) Technical description of poles (including height)

(ii) Unit material cost of poles, including cable supports, (per km of pole line) by service company area

(iii) Installation labour costs, per service company area

(iv) Planning and design costs, per service company area

(v) The percentage of poles within Vodafone's local access distribution and feeder local access copper networks that can be used for fibre local access networks.

(h) Ducts: a technical description of ducts currently installed within the distribution and feeder sections of Vodafone's copper and fibre local access networks, including air blown micro-ducts, including:

(i) Internal and outside diameters of ducts used within Vodafone's local access distribution and feeder networks

(ii) Unit material cost per metre, per service company patch

(iii) Installation labour costs per metre, by service company patch area

(iv) Planning and design costs per metre of ducting, by service company patch area

(v) The percentage of ducts within Vodafone's local access distribution and feeder local access copper networks that can be used for fibre local access networks.

(i) Manholes, chambers and hand hole joints:

(i) Technical description of manholes, chambers and hand hole jointing pits as currently being installed within the distribution and feeder sections of Vodafone copper and fibre local access networks, including those used with air blown micro-ducts

(ii) Average unit material costs of manholes/chambers and hand hole joints according to type and size as measured in terms of the number of supported ducts by service company patch

(iii) Installation labour costs according to type and size, by service company patch area

(iv) Planning and design costs according to type and size, by service company patch area.

(j) Trenching costs per metre, per duct, taking account of the following:

(i) Environment; CBD, arterial/major urban and rural roads, motorways, and other urban and rural roads;

(ii) Trenching technology, e.g. open, drill, plough, shallow etc., and to the extent ground types impact the choice of trenching technology and therefore trenching cost, by:

(aa) Igneous Rocks:

(i) extremely weak to weak
(ii) weak to extremely strong

(bb) Sedimentary Rocks:

(i) very loose to compact (very soft to stiff)
(ii) very compact (very stiff) to weak
(iii) moderately strong to extremely strong

(cc) Metamorphic Rocks.

Where possible the ground type should be based on the 2nd Edition NZ Land Resource Inventory lithology classifications which define the lithology into the above broad categories. Information on the definitions and rock types that make up these classifications can be found within the LRIS Data Dictionary which is available for download from https://lris.scinfo.org.nz/document/162-lris-data-dictionary-v3/

(k) Total average costs per installed km of local access distribution and feeder network, copper and fibre, overhead and underground, by service company patch area, including:

(i) Average material costs per km

(ii) Average installation labour costs per km

(iii) Average design and planning labour costs per km.

(l) Please provide five representative service company quotes of recently completed subdivision projects from around the country. Quotes should detail the design, planning and construction costs of copper and fibre local access distribution networks.

6.11 Node configuration - exchanges and active cabinets
For Vodafone owned exchanges and cabinets please provide the following information:

6.11.1 MDF/ODF
For the most common MDF and ODF configurations e.g. 100, 200, 500, 1000 copper lines or fibres terminated:

(a) Total average annual maintenance costs taking account of reactive and proactive maintenance;

(b) Design guidelines for planning the MDF/ODF footprint, taking account of both sides of the MDF and working space;

(c) Average design and planning cost;

(d) Average cost to install (material and labour) and commission a MDF/ODF;

(e) Average service company costs, by patch, to: run, remove or re-terminate a:

(i) Copper jumper

(ii) Fibre patch

6.11.2 Capital expenses
For each class of representative exchange and cabinet chosen for paragraph 6.4 (to be chosen for the most modern configuration) please provide:

(a) The average power supply unit capital cost

(b) The average back-up power unit capital cost

(c) The average active air conditioning (AC) unit capital cost

(i) The Coefficient of Performance ($COP_{cooling}$) of the active AC unit.

(d) Average passive air conditioning unit capital cost.

6.12 Core network

With regard to Vodafone's target core network architecture, the Commission requests the following information:

A description of Vodafone's targeted NGN switching network (IP,MPLS core network). This shall include a list of the network nodes (OLT, DSLAM/MSAN, CMTS, leased lines specific equipment, Second Level Ethernet switch (if any), First level Ethernet switch, edge router, core router, Softswitch, Media Gateway, BRAS, IMS, IPTV platform and any others), along with the following data:

6.12.1 Type of the equipment (MSAN, OLT, switch, router, Media Gateway and any other);

6.12.2 Capacity of the equipment (max number of ports or Max Mbit/s);

6.12.3 Equipment type reference (if available)

6.12.4 The role and extent to which Software-Defined Networking (SDN) technologies will appear in Vodafone's targeted NGN networks.

6.13 Dimensioning rules:

6.13.1 The different types of cards available (per speed, number of ports, usage);

6.13.2 The capacity of 1 port (links, Mbits/s);

6.13.3 The number of ports per card;

6.13.4 The number of cards per Sub-rack;

6.13.5 The number of Sub-rack per Rack;

6.13.6 The max capacity per Sub-rack if any (Mbits/s);

6.13.7 Electricity (kW) requirement;

6.13.8 Air conditioning requirement (kW);

6.13.9 Asset footprint including working space;

6.13.10 Spare capacity (if this spare capacity is installed in order to handle future demand, the time horizon of this future demand should be specified);

6.13.11 The traffic allowance made for growth when dimensioning traffic based assets (e.g. a new router may be dimensioned based on expected maximum traffic volumes over a 3 year period rather than current traffic volumes)

6.13.12 Unit costs of the core assets:

(a) The brand of the asset (if available);

(b) The model name of the asset;

(c) The material price list (cost) per equipment split between line card, subrack and rack. If the supplier offers any discount,

please provide details; including the reference year of the costs provided;

(d) The installation cost split between line card, subrack and rack. The cost of installation for extra subracks or extra line cards should be provided (using purchase costs or estimates);

(e) The design and planning cost;

(f) The annual maintenance cost;

(g) The supplier annual support cost;

(h) All other opex (to be described);

(i) The price trend over 10 years (or maximum available period) for opex and for capex;

(j) Specify whether there is a warranty included in the price of the equipment and if yes, what is it the scope of costs covered and how long it applies. What is the cost of the warranty? Is the warranty extended after the initial period? If yes, what is the cost?

(k) The cost of software licence.

6.13.13 The technical specification (including its vendor and model), port utilisation, latest historical cost per unit (specify whether this is purchase or installed cost) and services provided by each card deployed at each EAS;

6.13.14 Technical dimensioning rules detailing the maximum utilisation allowed as a percentage of its technical limit;

6.13.15 The air conditioning requirements and the power requirement of air conditioning systems;

6.13.16 For each MDF housed at an exchange:

(a) The technical specification (including its vendor and model), utilisation, latest historical cost per unit (specify whether this is purchase or installed cost);

(b) An itemised installation cost for the 5 most recent MDF installations.

6.13.17 For each ODF housed at an exchange:

(a) The technical specification (including its vendor and model), utilisation, latest historical cost per unit (specify whether this is purchase or installed cost);

(b) An itemised installation cost for the 5 most recent ODF installations.

6.14 Customer demand forecasts, on a per customer basis, per services at busy hour (Mbit/sec) and average monthly usage (sent and received GBytes) per customer, and per service (legacy and NGN):

6.14.1 Voice;

6.14.2 Broadband;

6.14.3 Multicast;

6.14.4 Unicast.

6.15 Migration from copper to FTTH
Please provide:

6.15.1 Statistic on the migration of customers from copper to Vodafone FTTH services and new FTTH customers (i.e. not migrating from a copper service);

6.15.2 Marketing studies Vodafone has that indicate the expected take-up rates, over time, of customer migrating to:

(a) Fibre based services;

(b) Fixed wireless access (FWA) (e.g. RBI);

by major Retail and wholesale market segments.

6.16 IT systems including software
Please provide a list of IT systems, based on Vodafone's current preferred IT architecture (pre or post the TelstraClear merger) detailing:

6.16.1 A short description of systems function – i.e. network planning, billing, etc.;

6.16.2 Annualised capex and opex;

6.17 Average cost to build, operate and maintain typical RBI Fixed wireless access sites, including:

6.17.1 Engineering design rules, noting specific RBI requirements as they impact the design and maintenance of RBI networks infrastructure and customer service level commitments , including:

(a) Service level availability

(i) Traffic parameters e.g. peak and sustainable rates

(ii) Quality of service parameters e.g. latency and jitter.

6.17.2 Material costs

(a) Cost of the tower for most common configurations (mast/tower, 25m/30m/35m/40m etc);

(b) Average cost of site preparation for each the previous configuration including split at least between grounding, earthing (including earthquake and wind protection);

(c) Average cost of site security;

(d) Average cost of building site access (the path to reach the mobile site);

(e) Average cost of the cabinet;

(f) Average cost of the power assets (rectifier, meter, batteries);

(g) RAN hardware (including antennas, cables) and software costs (please provide 5/6 typical configurations).

6.17.3 Labour costs:

(a) Design;

(b) Planning;

(c) Maintenance (reactive and proactive):

(i) Please provide any third party agreements.

6.17.4 Opex:

(a) Land rental cost;

(b) Access rights and site access costs.

6.17.5 Power connection charges

6.17.6 Backhaul costs:

(a) Backhaul DMR costs

(b) Backhaul fibre costs.

6.18 For each RBI site (already deployed, current sites being upgraded to RBI specifications, and future sites), please provide:

6.18.1 Site configuration (configuration to be chosen among most common configurations listed above)

6.18.2 X,Y coordinates, actual and indicative in cases of planned sites for which a definitive location has yet to be secured

6.18.3 FWA coverage areas

6.18.4 Power consumption charges.

6.19 Please provide a copy of the business case that was used to assess Vodafone's participation in the RBI project, including WACC calculations, expected costs, demand and revenues expected to be contributed by other services (mobile and co-siting revenues).