



Notice to supply information and documents to the Commerce Commission Sections 98(a) and (b) Commerce Act 1986

To:

Chorus Limited
Level 10,
State Insurance Tower
1 Willis Street
Wellington

Attention: Vanessa Oakley, General Counsel and Company Secretary

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 Chorus 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. Chorus 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. Chorus Limited must label and identify all information and documentation, and explain which information relates to which paragraph of this Notice.
8. Chorus Limited must supply the requested information and documents under cover of a letter on Chorus Limited's letterhead, signed by a person with the appropriate authority.

Dated at Wellington 17 April 2014

Signed by:

A handwritten signature in black ink, appearing to read 'Elisabeth Welton', with a long horizontal flourish extending to the right.

Elisabeth Welton
Commissioner

Attachment A

1. For the purposes of this Notice, the following terms have the following meanings:
 - 1.1 **Chorus Limited** means Chorus 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 **DSLAM** mean both Digital Subscriber Line Access Multiplexer (DSLAM) and Multi-Service Access Node (MSAN) equipment.
 - 1.6 **DWDM** means dense wavelength division multiplexing.
 - 1.7 **EAS** means Ethernet Aggregation Switch.
 - 1.8 **ETP** means external termination point.
 - 1.9 **EUBA** means Enhanced UBA.
 - 1.10 **FTTN** means Fibre-to-the-Node.
 - 1.11 **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.
 - 1.12 **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.
 - 1.13 **MDF** means Main Distribution Frame.
 - 1.14 **NBAP - non building access point** - Means a location, other than End User Premises, Service Provider Premise or Reseller Premises, which may not have a physical address and where either Chorus or Access Seeker Equipment is installed in order to deliver a service. NBAP Examples include but are not limited to: cell tower and base station, cell site and base station, public Wi-Fi hotspot, surveillance equipment, ticketing systems, ATM machines, and SCADA systems.

- 1.15 **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.
- 1.16 **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 would be recorded in separate rows.
4. Regarding all information requested please provide a glossary of terms used.
5. The Commission requires the following information:
6. Information and documents requestedPlease provide the following in respect of Chorus' copper and fibre local access and core networks:
 - 6.1 For all of Chorus' in-use non-building access points (NBAPs) connections:
 - 6.1.1 Each unique NBAP site connection identifier;
 - 6.1.2 The Chorus services, copper and/or fibre based, delivered at the NBAP site e.g. UCLL, UBA , EUBA etc.;
 - 6.1.3 The geographic location (X, Y coordinates) of each unique NPAP connection.
 - 6.2 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.
 - 6.3 To the extent they are available, Chorus' yearly master UFB deployment plans, in the form of the GIS .shp file, through to the end of the project by UFB cabinet area or, if not available, by UFB exchange area.
 - 6.4 Chorus' 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 to mitigate local and regional catastrophic events.

- 6.5 Example exchange floor plans and local area copper networks roll out plans (GIS maps) representative of a typical exchange at each layer of Chorus' network hierarchy, by way of example;
 - 6.5.1 Wellington Central;
 - 6.5.2 Masterton;
 - 6.5.3 Johnsonville;
 - 6.5.4 Shannon exchanges; and
 - 6.5.5 The layout of active cabinets.
- 6.6 For all exchange nodes - Telecom and Chorus:
 - 6.6.1 Each unique exchange node identifier, the name of the exchange and whether it is Chorus or Telecom owned, and the geographic location (X, Y co-ordinates) where each exchange is located;
 - 6.6.2 In the case of a Chorus exchange whether it is classified as an urban exchange in accordance with Appendix 1, UCLL Price List, the size of its MDF (copper pairs) and ODF (fibres), having regard to the categories specified in 6.15.1Central office;
 - 6.6.3 A table listing and classifying Telecom and Chorus exchange nodes according to their logical network hierarchy (tier), by parent exchange node identifier;
 - 6.6.4 A schematic illustrating the entire network hierarchy; and
 - 6.6.5 Exchange Node identifier and, its geographic coverage area in the form of a GIS .Shp file.
 - 6.6.6 In respect of Chorus' UFB deployment, we require;
 - (a) the split ratio
 - (b) the location of PON splitters by exchange and cabinet node identifier,
 - (c) The unit cost of PON splitters
- 6.7 For all fibre and copper cabinet nodes:
 - 6.7.1 Each unique cabinet node identifier, the node identifier of the exchanges it is parented off, if the cabinet is connected to a protected local access ring, and if the cabinet is exclusively:
 - (a) a fibre active or passive cabinet;
 - (b) a copper active or passive cabinet; or
 - (c) a shared, copper and fibre, active or passive cabinet.
 - 6.7.2 If the cabinet is active, the technology deployed (ADSL/VDSL, Point to Point/PON) should be specified.
 - 6.7.3 Cabinet node identifier and geographic location (X,Y) coordinates of where the cabinet is located, its geographic coverage area in the form

of a GIS .shp file, and the node identifier and XY coordinates of the exchanges it is parented off.

- 6.8 For all manholes, chambers and pits:
 - 6.8.1 The number, by exchange node coverage area, and by function; i.e. exclusively fibre, exclusively copper or shared copper and fibre, and by size, as categorised by the number of ducts it supports.
- 6.9 For all copper and fibre cable terminals:
 - 6.9.1 Number of Fibre Access Terminals (FATs) per exchange area, by type - aerial, underground/pillar; and
 - 6.9.2 Number of copper cable terminals per exchange area, by type - aerial, underground/pillar.
- 6.10 Network Topology:- Inter-exchange links
 - 6.10.1 For all physical inter-exchange node links:
 - (a) In a CSV file:
 - (i) A unique point to point link identifier;
 - (ii) Start and end exchange node identifiers, consistent with those used in 6.6;
 - (b) A GIS file, formatted according to paragraph 2 above, showing the geographical route of each inter-exchange link, including rings, complete with attributes and identifiers for nodes and links.
 - 6.10.2 For the DWDM network:
 - (a) The network topology including all nodes and links between the different nodes;
 - (b) The position of the DWDM platforms;
 - (c) The position of the amplifiers;
 - (d) The cost of the platforms (split by asset);
 - (e) The cost of the amplifier;
 - 6.10.3 For the submarine links:
 - (a) The list of links;
 - (b) The length of each link;
 - (c) The exchange ID to which the entry and exit points are linked;
 - (d) The cost per km of submarine links;
 - (e) The cost of a typical landing station (material, installation, maintenance, planning, design);
 - 6.10.4 For the microwave links:
 - (a) The list of links;

- (b) The exchange ID to which the entry and exit points are linked;
- (c) The cost per link;

6.10.5 A GIS map of any business rings (i.e. all the dedicated links in the access network for business and major account customers). It is sometimes called BTO (business to order). If this is not available, the length of any such business rings and the percentage of that length share which is located in the same trench as other, copper and fibre, access and core networks.

6.11 Network Topology:- the routing of service traffic

Please provide a routing matrix that indicates the probability of traffic from each NGN service transiting or being processed by a core network asset (e.g. a NGN switch). For example, if a switch is used twice by a certain NGN service the routing probability for the device should be recorded at 200%. The matrix should include all network layers including transmission links between devices within the same network layer and between devices at different layers of the core network. Table 1 – network routing typology serves as an illustrative example;

Service	DSLAM	DSLAM to first switch link	First switch	Ring of first switch	First switch to second switch link	Second switch	Ring of second switch	Second switch to EAS link	EAS handover switch
Voice									
BB									
Multicast									
Unicast									
LL									

Table 1 - Network routing typology matrix

6.12 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 Chorus's local access network, as at 7th February 2014. For all dwellings– residential and commercial:

- (a) All marketing collateral available to wholesalers and consumers (end users), informing of Chorus' policies and practices in relation to the installation of copper and fibre service lead-in services in brown-field and green-field scenarios, for single and multiunit dwellings;
- (b) Chorus' policies (business rules) detailing how it has chosen to capitalise and expense costs arising from the installation of

copper and fibre service lead-ins in brown-field and green-field scenarios. Must identify the costs Chorus elects to capitalise and those it seeks to recover by on charging to external parties, for single and multi-dwelling;

- (i) Standard installations; and
 - (ii) Non-standard installs;
- (c) Chorus' 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 unit, 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;
- (d) The use of poles for aerial lead-ins for single and multi-unit dwellings:
- (i) information on the commercial and technical terms under which Chorus 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 Chorus 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.
- (e) 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.

Chorus may where appropriate reference information provided to the Commission in response to the section 98 notice issued to it dated 7th February 2014.

(f) 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, 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 patch;

(g) To the extent Chorus has the information, the:

- (i) geographic location (X, Y coordinates) of multiunit complexes;
- (ii) number of copper cable pairs and/or fibres to the site;
- (iii) size of the building frame (MDF) expressed in terms of the number of lead-in copper cable pairs and fibres that could be terminated.

6.13 Line Fault Index

The Commission seeks the number of faults per 1000 active lines¹ (connections) per year over the past 5 years, at the national level split by service company patch, and also in recently built (within the last 10 years) copper and fibre local access areas, for example Hobsonville², Auckland, noting the service company patch for those areas on:

6.13.1 the UCLL local access network (exchange to ETP);

6.13.2 Chorus' fibre local access network (exchange to ETP).

For avoidance of any doubt, faults for which no Chorus 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.

6.14 Copper and fibre local access distribution and feeder networks:

6.14.1 Aerial and underground distribution and feeder networks:

¹ Having the same meaning as 'active connections' in paragraph 6.19.2 (a) (Chorus specific users).

² The Commission is aware a suburban area in Auckland had its local access network upgraded around 2008-2010. That area may have been Hobsonville.

- (a) Information on the commercial and technical terms under which Chorus 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 Chorus' 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 Chorus 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.
- (e) Engineering planning and design rules
Chorus' 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 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 Chorus 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) 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 active and passive cabinets in urban and rural exchange areas as classified in 6.6.2.
 - (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:
- (i) Technical description of aerial and underground cables as used in the distribution and feeder sections of local access copper and fibre networks including;
 - (ii) Outside diameter of the copper and fibre cables;
 - (iii) Copper pair and fibre counts per cable type;
 - (iv) Cost per metre of copper and fibre aerial and underground cable;
 - (v) Readily available cable drum length for aerial and underground copper and fibre cables;
 - (vi) Average cable jointing cost (labour + materials) for aerial and underground copper and fibre cables.
- (g) Poles:
- (i) Technical description of poles (incl., height);
 - (ii) Unit material cost of poles , including cable supports, (per km of pole line) by service company patch area;
 - (iii) installation labour costs, per service company patch area;
 - (iv) Planning and design costs, per service company patch area;

- (v) The percentage of poles within Chorus' 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 Chorus' copper and fibre local access networks, including air blown micro-ducts, including:
- (i) internal and outside diameters of ducts used within Chorus' 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 Chorus' 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 Chorus 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, Motorway, 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.

6.15 Node configuration – exchanges and active cabinets

For Chorus owned exchanges and cabinets please provide the following information:

6.15.1 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 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 MDF/ODF;
- (e) Average service company costs, by patch, to: run, remove or re-terminate a:
 - (i) Copper jumper
 - (ii) Fibre patch.

6.15.2 Operational expenses

For each class of representative exchange and active cabinet chosen for paragraph 6.5, (to be chosen for the most modern configuration) please provide averaged over the past 12 months;

- (a) Monthly power consumption expressed in kw/hrs Monthly cost (\$/kW_{cooling}) for air conditioning
- (b) Monthly cost (per site) for security services.

6.15.3 Capital expenses

For each class of representative exchange and cabinet chosen for paragraph 6.5, (to be chosen for the most modern configuration) please provide;

- (a) Average power supply unit capital cost
- (b) Average back-up power unit capital cost
- (c) 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.

6.16 Core network

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

A description of Chorus' 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 other), along with the following data:

- 6.16.1 Type of the equipment (MSAN, OLT, switch, router, Media Gateway and any other);
- 6.16.2 Exchange ID, consistent with those specified in paragraph 6.6.1;
- 6.16.3 Parent nodes;
- 6.16.4 Capacity of the equipment (Max number of ports or Max Mbit/s);
- 6.16.5 Equipment type reference (if available);

6.16.6 The role and extent to which Software-defined networking (SDN) technologies will appear in Chorus' targeted NGN networks.

6.17 Dimensioning rules:

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

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

6.17.3 The number of ports per card;

6.17.4 The number of cards per Sub-rack;

6.17.5 The number of Sub-rack per Rack;

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

6.17.7 Electricity (kW) requirement;

6.17.8 Air conditioning requirement (kW);

6.17.9 Asset footprint including working space;

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

6.17.11 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);

6.17.12 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;

6.17.13 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;

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

6.17.15 The number of racks currently housed;

6.17.16 In square metres:

(a) The total internal area of each exchange;

(b) The total area currently used for equipment;

(c) The area currently used for revenue generating activity outside of network services;

6.17.17 The total physical rack space currently unutilised;

6.17.18 The physical rack space currently used for equipment (in metres squared);

6.17.19 The physical rack space currently used as working space (in metres squared);

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

6.17.21 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.

6.17.22 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.

6.18 Demand

6.18.1 Chorus specific traffic

Please provide the following information for all services provided by Chorus over NGN and legacy networks. The services should be

grouped into 5 categories: 'Voice', 'Broadband', 'Multicast', 'Unicast', and 'Leased Lines'. Voice includes provider supplied VOIP, ISDN2, ISDN30, PSTN-only customers and Broadband customers with PSTN services:

- (a) Peak throughput (in Mbps) measured at a point immediately following the DSLAM (on the core network side) for each service during the busiest hour of the busiest day in March 2014.
- (b) Peak to mean bandwidth ratio for the busiest day in March 2014.
- (c) Peak throughput (in Mbit/sec) and monthly total GB use for UBA broadband end users for March 2014.
- (d) A forecast of peak throughput (in Mbit/sec) and monthly GB use for UBA broadband end users projecting 5 years out from March 2014.
- (e) For multicast (e.g. IPTV traffic), the following data is required:
 - (i) Number of channels in the core network (Standard / High Definition / Radio channels). This is the total number of channels handled by the operator's IPTV platform;
 - (ii) Bitrate per channel in the core network (Low / Standard / High Definition / Radio channels);
 - (iii) Engineering rules for multi-cast (number of channels LD/SD/HD delivered to different levels of the network, number of channels LD/HD/HD delivered to DSLAM; etc.);
 - (iv) Customer upload traffic percentage compared to download traffic.

6.18.2 Chorus specific users

- (a) To enable DSLAM configuration to be set we require the number of active connections for all services (including dedicated, UBA, EUBA, VDSL, SHDSL, other commercial bitstream services) as at 31 March 2014 per active node.
- (b) The number of active lines per exchange and per active cabinet. The exchanges and cabinets should be grouped by their unique identifiers.
- (c) A forecast of total active lines (grouped into 'UBA', EUBA and 'all other services') projecting 5 years out from March 2014.

6.18.3 A list of all services provided by Chorus, including consumer and business grade services.

6.18.4 Leased lines

- (a) The exchange entry and exit points for each leased line service. The exchanges should be grouped by their unique identifiers.
- (b) The capacity (in Mbps) of each active leased line connection as at March 2014.
- (c) Contention ratio.
- (d) Whether they are connected to DSLAMs/dedicated switches.

6.18.5 The most up-to-date external (e.g. Cisco, Ovum, IDC, NSN) forecasts Chorus hold of active lines, total GB usage and per user GB usage.

6.19 Staffing, product management, commercial and financial operations:

6.19.1 A count of the total number of staff, including independent contractors acting in the nature of employees, and the total expenditure on those staff for the financial year ending 30 June 2013. These should be categorised by the following areas or roles:

- (a) management and professional services;
- (b) finance, payroll, human resources and administration;
- (c) sales and marketing;
- (d) general customer services, and customer services technical support;
- (e) network design and planning, and network operations including and network engineers required for;
 - (i) the access network;
 - (ii) core platforms;
- (f) access network technicians;
- (g) core network technicians;
- (h) other.

6.19.2 For the financial year ending 30 June 2013, council rates and local taxes incurred for each property owned by Chorus and the general ledger (GL) code that they are recorded against. The properties' uses should be noted and they should include those for:

- (a) Exchange buildings and buildings primarily used for housing network equipment;
- (b) Cabinets, poles, ducts and such like copper and fibre local access network infrastructure;
- (c) Office buildings and buildings not primarily used for housing network equipment.

6.19.3 Network operating expenses:

- (a) An itemised list of annualised proactive and reactive maintenance costs for the following assets and the GL codes that these costs are recorded against:
- (i) Exchange buildings
 - (ii) Active and passive cabinets
 - (iii) Local access copper feeder and distribution networks
 - (iv) Local access Fibre feeder and distribution networks
 - (v) IT systems including software.
- (b) For the financial year ending 30 June 2013, please provide details on the following categories of network operating expenses:
- (i) Labour costs (network operations)
 - (ii) Provisioning
 - (iii) Network maintenance
 - (iv) Rent and rates (network operations)
 - (v) Property maintenance (network operations)
 - (vi) Electricity (network operations)
 - (vii) Insurance (network operations)
 - (viii) Other network costs.

For each of the above categories, please provide:

- (i) Total expenditure for the financial year.
- (ii) List of GL codes/activities included in each category with a meaningful description of the activity performed. This listing should be consistent with the categorisation used for Chorus's statutory accounts.
- (iii) Break down of each category of network operating expenditure split by copper only, fibre network only and share (i.e. common to both copper and fibre).
- (iv) To the extent possible with existing information, the value for each combination of equipment type, exchange service area (or if appropriate service company contract area (patch)) and GL code. If the information can only be split by two or three of these categories provide the most detailed level of information that is available. It is expected that, at a minimum, a value will be provided for each GL code.
- (v) Explanations and/or reconciliation of any variance between the values provided at a category level and those reported in Chorus's statutory accounts.

6.19.4 Non-network operating expenses

- (b) For the financial year ending 30 June 2013, please provide details on the following categories of non-network operating expenses:
- (i) Labour costs (non-network operations)
 - (ii) Information technology costs
 - (iii) Insurance (non-network operations)
 - (iv) Consultants
 - (v) Rent and rates (non-network operations)
 - (vi) Property maintenance (non-network operations)
 - (vii) Electricity (non-network operations)
 - (viii) Other

For each of the above categories provide:

- (i) Total expenditure for the financial year.
- (ii) List of GL codes/activities included in each category with a meaningful description of the activity performed and the value of expenditure on each item. This listing should be consistent with the categorisation used for Chorus' statutory accounts.
- (iii) Identification by category of any non-network operating expenses which relate to the transition of staff, systems and processes from Telecom to Chorus or other once-off costs (e.g., relating to natural disasters).
- (iv) Explanations and/or reconciliation of any variance between total expenditure values provided at a category level and those in Chorus' statutory accounts.

6.19.5 Capital expenditure

- (a) For the financial year ending 30 June 2013, please provide the specified information about Chorus':
- (i) Capital expenditure by exchange service area (or if unavailable, by candidate area) for investment which is specific to on Chorus's fibre network. This information is to be split using the same row categories (e.g., fibre optic cable, ducts and man holes) that Chorus used when completing 'Schedule 3: Report on Fixed Assets and Fixed Asset Movements – Fibre' for 2012/13 as required under the Commission's Chorus Information Disclosure Determination 2012 (Chorus ID).
 - (ii) Capital expenditure by exchange service area (or if unavailable by candidate area) for investment which is

shared between Chorus's fibre and copper networks. This information is to be split using the same row categories that Chorus used when completing 'Schedule 3: Report on Fixed Assets and Fixed Asset Movements – Shared' for 2012/13 as required under Chorus ID.

- (iii) Capital expenditure, split by exchange service area (when available), for investment which is specific to Chorus's copper network. This information is to be split using the same or similar row categories to those that Chorus used for 2012/13 when completing 'Schedule 3: Report on Fixed Assets and Fixed Asset Movements – Shared' as required under Chorus ID.

6.19.6 Fixed Asset Register

Please provide the following information about Chorus's fixed asset register (FAR) as of 30 June 2013 with land and capital values listed separately:

- (a) List of FAR codes or types with :
 - (i) Period depreciation, closing gross book value, and closing net book value as of 30 June 2013.
 - (ii) mapping of each FAR code or type to either: network asset type and/or network component (e.g. passive copper network, feeder copper loop, PSTN switch) which are meaningful described or; non-network asset type, or support plant asset type or group.
 - (iii) Accounting life, engineering/technical life and depreciation profile used for calculating depreciation for statutory reporting purposes.
 - (iv) Basis for valuation. This should include details of any revaluation of the assets including any revaluating assets on separation to a value different to that which they were valued at by the pre-separation Telecom.
- (b) For network assets a breakdown of asset value mapped by both:
 - (i) ESA (or when unavailable, candidate area); and
 - (ii) the asset's use i.e. whether is specific to copper, specific to fibre or shared.

6.19.7 This mapping is to be provided to the FAR code level when possible, and if it is not then by network asset type/component (when possible).

6.19.8 Commercial arrangements applicable to the financial year ending 30 June 2013 limited to:

- (a) Agreements relating to leases of buildings, land and equipment to and from third parties.
- (b) Details of wholesale electricity supply agreements that include the unit cost of electricity used in KWh.

6.19.9 Any reports prepared by, or for, Chorus which benchmark Chorus network and non-network costs against international peers.

6.19.10 Project related financial analysis already produced regarding greenfield network builds.

6.19.11 The latest WACC calculations for UFB projects.