

## **Definitions for communications services and networks used in Traficom's statistics and requests for information**



## Version history

Version	Date	Description
1.0	12/12/2017	The first (draft) version of the document concerns information about availability and subscription and usage volumes.
2.0	10/8/2018	<p>Definitions for revenue and investment information have been added.</p> <p>Definitions for mobile subscription types have been updated.</p> <p>Number of other IPTV subscriptions -section has been added and updated the definition for actual IPTV subscriptions.</p> <p>A definition for mobile subscriptions with a fixed-line telephone number has been added.</p>
3.0	16/8/2018	Section 4.2. updated with new signal strength limits.
4.0	3/12/2018	<p>Availability definition specified in section 3.2.</p> <p>Section 3.5. Fixed network broadband subscriber connections by municipalities filled in.</p> <p>Definition for hybrid connections added.</p> <p>Sharpened the definition of mobile data in section 4.3.</p> <p>In section 4.2. coverage defined for speed category 300Mbps.</p>
5.0	24/5/2019	<p>Fined down definitions for fixed broadband subscriptions and fibre local loops. Edited definition for M2M subscriptions.</p> <p>Added definition for base stations.</p>
6.0	26/11/2019	<p>Added new definitions for wholesale market indicators for fixed network (section 3.6).</p> <p>Added definitions concerning joint use and joint construction (section 3.7).</p> <p>Specified the definition of fixed broadband subscription.</p> <p>Added the definition for data transfer in fixed broadband networks.</p> <p>Updated the new definition for M2M subscription and information about inclusion of these to usage volumes.</p>
7.0	26/5/2020	<p>Added definition for FWA-subscription as fixed network technology category (3.1).</p> <p>Added picture about counting housing companies' subscriptions (3.2).</p> <p>Added FWA-SIM-card definition to mobile connections (4.3).</p>
8.0	29/6/2020	Added 5G-mobile network coverage

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## 1 Introduction

The definitions described in this document are applied in Traficom's requests for information and the statistics prepared based on them, unless otherwise stated. Each request for information details the information required.

This document replaces all previous individual documents such as the TIKU-SL-A and TIKU-SL-B memos including TIKU-M definitions.

This document is a so-called 'live document', which means that the definitions are updated whenever there is a need to change, specify or clarify them.

## 2 General definitions

### TELECOMMUNICATIONS OPERATOR

In this context, telecommunications operator (or telecom operator) refers to a service provider with a business ID (differing in this respect from the general definition) that offers a network service or communications service to a set of users that is not subject to any prior restriction, i.e. that is involved in public telecommunications services.

### NETWORK SERVICE

A service where a telecommunications operator provides a communications network in its ownership or for other reasons in its possession for the purposes of transmitting or distributing messages.

### COMMUNICATIONS SERVICE

A service consisting fully or primarily of transmitting messages in a communications network. Also transfer and transmission service in a mass communications network is considered to be a communications service.

### NETWORK OPERATOR

A network company is an organisation that owns or manages a mobile communications network or a fixed broadband or telephone network or mass communications network, and provides network services therein.

### SERVICE PROVIDER

An organisation that provides communications services to its end customers.

If a network service provider charges its end customers also for a communications service (for example for an internet service), it is considered to be a service provider in this context.

If the network service and the communications service are charged by different companies, only the telecommunications operator charging for the communications service is considered to be a service provider.

If a customer is charged for several communications services (for example an internet connection and IPTV), each of the telecommunications companies providing these services is considered to be a service provider.

### FIXED NETWORK

The physical infrastructure through which a network service can be provided to fixed locations. End customers' properties are connected to the network by means of cabling or a dedicated wireless connection.

### MOBILE NETWORK

A public mobile network that is implemented using radio technology and operates on radio frequencies which are subject to a licence.

**END CUSTOMER**

An organisation, residential customer (household) or person who has entered into a contractual relationship with a telecommunications company regarding a communications or network service.

**RESIDENTIAL CUSTOMERS**

Residential customer refers to any subscription paid by a private person (personal identity code).

**CORPORATE CUSTOMERS**

Corporate customer refers to any subscription paid by a company (business ID).

**3 Information on fixed telecommunications networks and the services offered therein****3.1 Access technology categories in the fixed network****COPPER CONNECTIONS (CU)**

This category includes all DSL technology-based connections delivered/offered by a telecommunications operator to end users where a local loop owned by the telecommunications operator and terminated at a plot or building is implemented fully or partly by means of metallic local loops, i.e. copper twisted pair cabling. Of a solution where an optical fibre cable is terminated at an operator-owned equipment facility and the final leg (last mile) is copper wire, also the term FTTC (fibre to the cabinet) can be used.

DSL (Digital Subscriber Line) connections are divided into two classes, CU and FTTB, based on the implementation of the local loop. If this information is not available in a telecommunications operator's systems, the distribution of CU and FTTB connections must be estimated as accurately as possible and the estimated number of connections given.

Traditional ADSL technology can allow speeds of up to 24 Mbps, if the distance to the operator's equipment facility is less than a kilometre. However, if the distance is much greater, e.g. 5 kilometres, the speed rarely exceeds 2 Mbps. The maximum speed of a VDSL2/FTTC connection can be over 100 Mbps if the copper leg is sufficiently short, no more than a few hundred metres. The more advanced Vplus technology, which uses vectoring, can deliver speeds of more than 300 Mbps.

**FTTB CONNECTIONS (FTTB)**

This category includes all individual connections (end user volume) delivered/offered by a telecommunications operator where a local loop owned by the telecommunications operator is terminated at a plot or building using fibre and where the internal network of the housing company or property has been implemented using VDSL2 or Ethernet technology (or more advanced DSL technology such as G.fast).

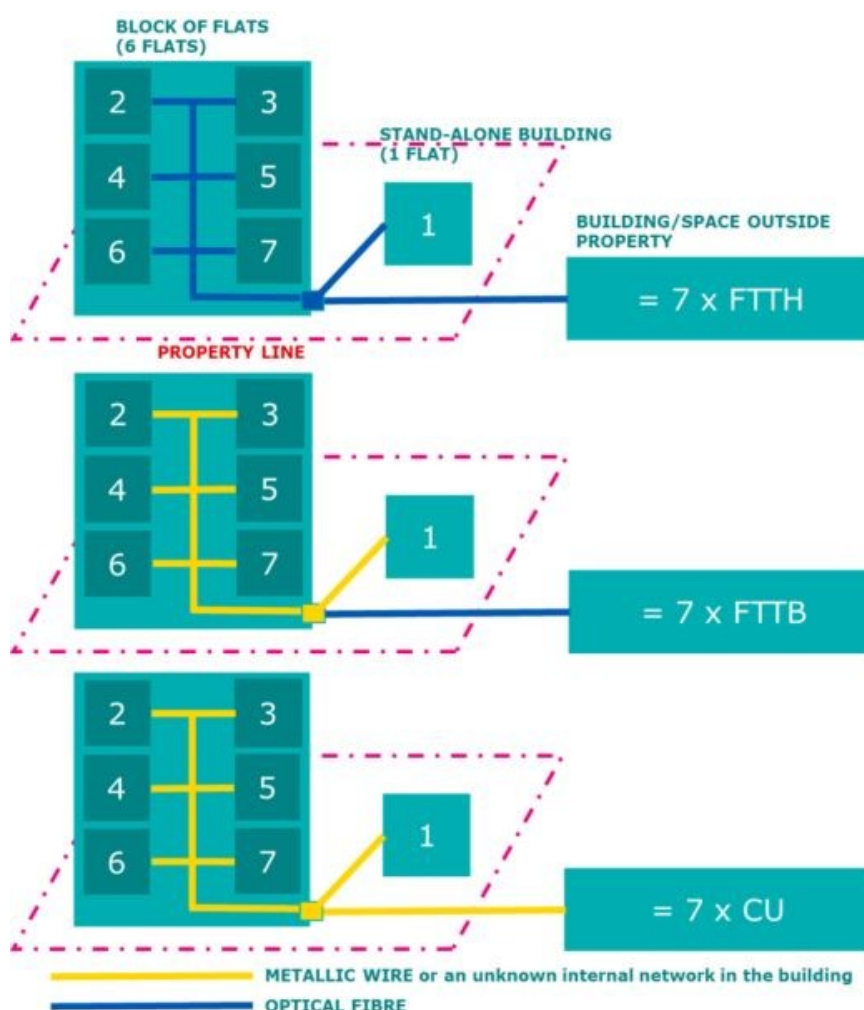
As indicated above, DSL subscriptions are divided into two classes, CU and FTTB, based on the implementation of the local loop. If this information is not available in a telecommunications operator's systems, the distribution of CU and FTTB connections must be estimated as accurately as possible and the estimated availability and number of connections given.

In very short FTTC connections and FTTB connections where traditional copper lines are only used in the internal network, vectorised G.fast or XG.fast technology can be used alongside VDSL2. They allow a transmission speed of several hundred Mbps, and can even exceed 1 Gbps.

### FTTH CONNECTIONS

This category includes all fibre-only (FTTH/-O) connections delivered/offered by a telecommunications operator to an end user's home or to a corporate customer. For fibres delivered all the way to the end user (FTTH/-O), the number of end customer subscriber connections is reported (detached houses, apartments where fibre is extended to individual apartments, and companies where the fibre is extended to individual companies within an office building).

These connections also include real estate subscriber connections involving a fibre leg from an operator network to the premises of individual end customers for which the operator charges each inhabitant or company individually. Please note! These do not include trunk extensions to housing companies (housing company subscriptions). FTTH enables symmetrical connections of up to several Gbps.



### CABLE MODEM CONNECTIONS (CABLE MODEM)

This category includes all cable modem connections delivered/offered by a telecommunications operator to end users, also fibre legs to a plot or building where cable TV network DOCSIS technology/cabling is used, even to a minor extent. DOCSIS 3.x technology enables connections with a download speed of 1Gbps.

### FWA MOBILE NETWORK SUBSCRIPTION

FWA subscription (FWA = Fixed Wireless Access) means a data subscription that has been provided through a mobile network and that has been allocated a certain resource reservation in the area of a certain base station or certain base stations

(for ex. a frequency band, a part of capacity of a base station/sector, or a slice of the network). This reservation guarantees the subscription a certain part of the resource capacity. FWA subscriptions include the subscriptions for which the minimum, normal and maximum data transfer speeds have been specified in the same way as for other fixed-line subscriptions.

An FWA subscription is sold to a specific address, i.e. it has a fixed place of use.

These subscriptions are not included in the subscription numbers in the part of the survey concerning mobile networks. SIM cards used by these subscriptions are reported independently in SIM cards.

The subscriptions are reported separately as residential and corporate subscriptions. Residential customer refers to any subscription paid by a private person (personal identity code). Corporate customers include all subscriptions paid by a company (business ID).

### **OTHER FIXED-LINE WIRELESS CONNECTIONS**

This category includes all connections provided by a telecommunications operator to end users where the last mile is implemented using radio technology, excluding connections implemented by means of a mobile communications network. Includes connections implemented using WLAN and WiMAX technology and the @450 network.

### **CONNECTIONS BASED ON OTHER TYPES OF TECHNOLOGY**

This category includes all connections delivered/offered by a telecommunications operator to end customers using other techniques than those listed above, and connections where the number of end users is unknown. PLEASE NOTE The types of connections included in this category are specified in a separate question.

### **ETHERNET CONNECTIONS**

All broadband connections implemented using Ethernet technology are included in this category. Ethernet refers to, for example, the internal network of an apartment building where the wiring complies with the generic cabling standards and where the network upload and download speeds are up to 1Gbps. Ethernet requires an optical fibre connection to the building distribution point. In the availability information, the definition of Ethernet is replaced by FTTB, which includes also all copper-based internal networks.

### **VDSL CONNECTIONS**

All broadband connections implemented using VDSL/VDSL2 technology are included in this category. The definition covers connections where the last mile is implemented using copper cabling. The category also includes connections where only the internal network of a building is copper-based. In accordance with the new definition, VDSL connections are divided into two classes, CU and FTTB, depending on whether only the internal network is copper cable-based, or also the local loop to the equipment facility.

## **3.2 Fixed-network subscriber connection availability**

Details about the availability of subscriber connections in the fixed network must be notified to Traficom primarily in CSV file, which allows different types of information, for example information on broadband technologies and speed categories, to be delivered in a single file. Alternatively, information on the availability area can be delivered in a Shape file or by drawing the area using the drawing tool of the data collection system.

Telecommunications operators can provide a number of location details to increase the reliability of positioning in unclear cases.

### **SUBSCRIBER CONNECTION AVAILABILITY (CONSTRUCTION PHASE)**

The following information is collected and itemised on broadband availability:

1. The availability of subscriber connections that are in use or can be activated without construction (for example, a building cable that has already been installed and terminated).

OR

2. Subscriber connection availability, where a network has been built in the vicinity of the customer's location (for example, the network reaches the border of the plot) or where such a connection can be provided in equivalent time and at an equivalent cost.

### **CONSTRUCTION ID**

To report availability in as much detail as possible, the construction ID is recommended. The construction ID is an identifier used in the building database of the Population Register Centre. It is a unique and permanent identifier given to all buildings.

The permanent construction ID (VTJ-PRT) is provided by the Population Register Centre and it was adopted in 2014.

### **POSTAL ADDRESS AND POSTCODE**

If a construction ID is not available, an address can be given. Addresses are slightly less accurate as address details can vary according to source.

The address set in the building database of the Population Register Centre is a recommended address source. Other address sources are available, including Posti (Finland Post). There can be small differences between these address databases, for example the address used for delivering mail can be different from the address of the building in the database of the Population Register Centre.

### **COORDINATES**

If you do not have the construction ID or the address of a location, you can enter the coordinates. Traficom's system will use these coordinates to position the nearest building and link it to the availability information.

The building database uses the coordinates of the centre of the building. Originally, the building database was published using WGS84 coordinates. The main coordinate system used is the ETRS-TM35FIN plane coordinate system, a Finnish system designed in compliance with a Public Administration Recommendation (JHS recommendation). ETRS-TM35FIN coordinate information is given in metres in east coordinates and north coordinates.

### **MAP IMAGE**

Alternatively, availability can be presented in a map image or drawing. The map image or drawing is made on the availability area within which the specified subscriber connection type is available for most buildings.

For example, in a new residential area whose construction has not yet been completed, the addresses may not yet be known, and therefore a map can provide more accurate information.

In such cases, location information is delivered in the form of a polygon Shape (SHP) map or by drawing a map using the drawing tool of the data collection



system. The map image or drawing must depict the availability area within which the specified subscriber connection is available for most buildings. A SHP typically contains four different files, the extensions of which are SHP, SHX, DBF and PRJ.

### **BUILDING DATABASE**

A database maintained by the Population Register Centre which contains information on every building and apartment located in Finland. As of summer 2017, the database has been available in an open version at no cost. The free version contains the construction IDs, addresses and coordinates of buildings in Finland. The free version of the building database is available for download at: <https://www.avoindata.fi/data/en/dataset/postcodes>.

### **FIXED BROADBAND SUBSCRIBER CONNECTION AVAILABILITY ACCORDING TO DOWNLOAD SPEED**

A speed category is allocated to each subscriber connection based on the maximum data transmission rate marketed to end users (the upper limit of the speed range). If exact information is not available, the speed category of the available connection is based on the telecommunications operator's estimate of the speeds available at each location, for example based on the length of the local loop.

Instead of the speed class, data transmission speed can be reported as the exact maximum speed advertised/indicated in the subscription agreement (the upper limit of the speed range). The speed categories applied are as follows:

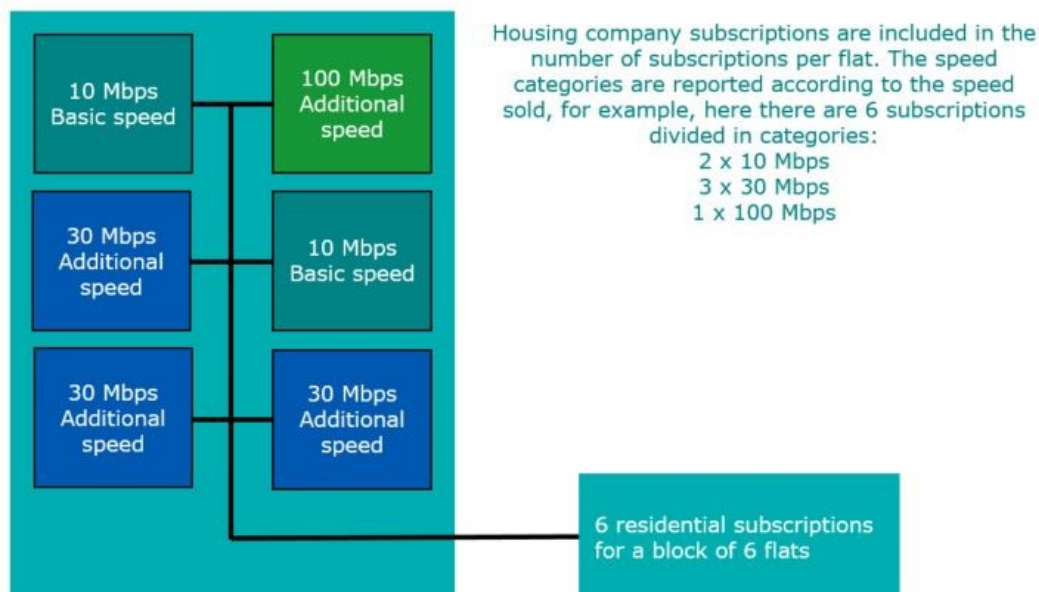
- **Less than 512Kbps (DL speed not given)**
- **512Kbps to 1.99Mbps**
- **2Kbps to 9.99Mbps**
- **10 to 29.99Mbps**
- **30 to 99.99Mbps**
- **100 to 299.99Mbps**
- **300 to 999.99Mbps**
- **1,000Mbps or more**

### **FIXED BROADBAND SUBSCRIBER CONNECTION AVAILABILITY ACCORDING TO UPLOAD SPEED**

Each available subscriber connection is placed in a speed class based on the maximum data transmission speed advertised to end users (the upper limit of the speed range). If exact information is not available, the speed category of the available connection is based on the telecommunications operator's estimate of the speeds available at each location, for example based on the length of the local loop.

Instead of the speed class, data transmission rate can be reported as the exact maximum speed advertised/indicated in the subscription agreement (the upper limit of the speed range). The speed categories applied are as follows:

- **Less than 512Kbps (UL speed not given)**
- **512Kbps to 99.99Mbps**
- **100Mbps or more**



### 3.3 Fixed-line telephone subscriber connections and call volumes

Report every subscriber connection which is active in that an end user pays for it either directly or indirectly.

#### FIXED-LINE TELEPHONE SUBSCRIBER CONNECTIONS

All PSTN, ISDN and VoIP lines are considered to be fixed-line telephone subscriber connections.

#### PSTN/ISDN LINES

PSTN and ISDN lines include analogue telephone lines and ISDN basic rate interface and primary rate interface lines, converted to channels (timeslots). ISDN lines are counted as timeslots. For example, the basic rate interface (2B+D) is counted as two and the primary rate interface (30B+D) is counted according to timeslots in use.

#### VOIP CONNECTIONS

VoIP connections include all individual VoIP connections and all VoIP telephone switchboard solutions implemented for corporate customers.

#### INDIVIDUAL VOIP CONNECTIONS

Individual VoIP connections include individual VoIP subscriptions provided by a telecommunications operator to residential and corporate customers, e.g. so-called Puhekaista subscriptions or equivalent. It refers to a telephone solution utilising broadband access which can be used to call PSTN and mobile networks and which have a fixed-line telephone number. These do not include IP telephone switchboard systems or their extensions or trunk extensions of telephone switchboards.

#### VOIP TELEPHONE SWITCHBOARD SOLUTIONS FOR CORPORATE CUSTOMERS

VoIP telephone switchboard solutions includes the number of telephone switchboard solutions using VoIP technology that have been sold by a telecommunications operator to corporate customers (number of customers). The number of corporate end customers is reported here so that each company or public corporation that has made an individual agreement is counted separately. If a corporate customer has made a group-level agreement, it is counted as one customer. However, if different legal companies within one group have made independent purchase agreements, each of these is counted as a separate

customer. This question also covers VoIP switchboards implemented by means of, for example, application service provision (ASP service).

#### **NUMBER OF CALLS IN THE FIXED NETWORK**

Total number of calls made from fixed-line telephones, including local, long-distance and international calls, calls to service numbers and freephone numbers as well as calls to mobile numbers.

#### **FIXED NETWORK CALL MINUTES**

Total minutes of calls made using fixed-line telephones, including local, long-distance and international calls, calls to service and freephone numbers as well as calls to mobile numbers.

#### **DATA VOLUME IN THE FIXED BROADBAND NETWORK**

Data traffic sent (uploaded) or received (downloaded) using fixed broadband subscriptions of the telecommunications operator at a given time. Please provide the figure in gigabytes (in binary).

The figure includes data traffic sent (uploaded) and received (downloaded) by customers.

### **3.4 Fixed network broadband, cable TV and IPTV subscriber connections**

Report every subscriber connection that is active in that an end user pays for it either directly or indirectly.

#### **FIXED-LINE BROADBAND SUBSCRIBER CONNECTIONS**

The total number of all active broadband subscriptions in the fixed network regardless of technology. Here, it is irrelevant whether the subscription has been used or not. What is relevant here is that the subscription is sold for using internet services.

A broadband subscription means an active broadband subscriber connection, not a fibre connection that has not been taken into use, for example.

#### **FIXED-LINE BROADBAND SUBSCRIBER CONNECTIONS BY DOWNLOAD SPEED**

Report the number of subscriber connections in each category according to the maximum download speed (DL) advertised to end users/referred to in the subscriber connection agreement. Each connection is entered into the category whose title matches the maximum speed (the upper limit of the speed category) of the connection in the subscription connection agreement. The speed categories applied are as follows:

- **Less than 10Mbps**
- **10 to 29.99Mbps**
- **30 to 99.99Mbps**
- **100 to 299.99Mbps**
- **300 to 999.99Mbps**
- **1,000Mbps or more**

#### **FIXED-LINE BROADBAND SUBSCRIBER CONNECTIONS BY UPLOAD SPEED**

Report the number of subscriber connections in each category according to the maximum upload speed (UL) advertised to end users/referred to in the subscriber connection agreement. Each connection is entered into the category whose title matches the maximum speed (the upper limit of the speed category) of the connection in the subscription connection agreement. The speed categories applied are as follows:

- **Less than 10Mbps**
- **10 to 99.99Mbps**
- **100Mbps or more**

### **FIXED-LINE BROADBAND SUBSCRIBER CONNECTIONS BY CONNECTION TECHNOLOGY**

Fixed-line broadband subscriber connections can be divided into the following connection technologies:

- **COPPER CONNECTIONS**
- **FTTB CONNECTIONS**
- **FTTH CONNECTIONS**
- **CABLE MODEM CONNECTIONS**
- **FIXED-LINE WIRELESS CONNECTIONS**

### **FTTB CONNECTION CATEGORIES**

Subscriber connections based on FTTB technology can be divided into the following connection technologies:

- **Ethernet connections**
- **VDSL connections**

### **HYBRID CONNECTIONS**

A hybrid connection contains a fixed network broadband connection and a supplementary mobile network-based connection.

Hybrid connections are allocated into speed classes based on the speed of the fixed network connection. Similarly, hybrid connections are classified based on their fixed network related features in network availability information.

### **CABLE TELEVISION SUBSCRIPTIONS**

Number of cable TV subscriptions provided by a service provider to end customers. This includes the number of household-dwelling units and companies connected to a cable TV network. A household-dwelling unit consists of the permanent occupants of a dwelling. The number reflects the number of cable TV contracts, or, if a contract indicates the number of household-dwelling units covered by the contract, the number of units should be given. Use the following categories to report the information.

- **Residential customers and household-dwelling units in housing companies**
- **Housing company customers where the number of household-dwelling units is unknown**
- **Other corporate customers**

Housing company customers include all subscriptions paid by a housing company where the service provider does not know the number of end users/household-dwelling units. If the service provider knows the number of household-dwelling units covered by a housing company subscription, report the number of household-dwelling units as residential customers. If the service provider is unable to distinguish between housing company customers and corporate customers, the housing company customers are reported as corporate customers and an estimate of the number of housing company customers is indicated in 'Additional information'.

### **NUMBER OF ACTUAL IPTV SUBSCRIPTIONS (ALL FREE-TO-AIR CHANNELS)**

This is the number of IPTV subscriptions that are managed by the service provider and enable the reception of ALL traditional linear TV channels (e.g. free-to-air channels in the terrestrial network).

The IPTV service may be delivered directly to the broadband customer of the

service provider or to the broadband customer of a party other than the service provider using over-the-top technology. In the IPTV service, some of the channels may also be delivered to the customer over the terrestrial or cable TV network (so called hybrid solutions).

#### **OLD DEFINITION: IPTV SUBSCRIPTIONS**

Number of IPTV subscriptions provided by the service provider to end customers / number of valid IPTV contracts. This includes the number of such IPTV subscriptions/valid IPTV contracts that are managed by the service provider and enable the reception of at least traditional linear TV channels (e.g. free-to-air channels in the terrestrial network). An IPTV service can be delivered directly to the broadband customers of a service provider or to the broadband customers of a non-service provider using so-called over-the-top technology. In the IPTV service, some of the channels may also be delivered to the customer over the terrestrial or cable TV network (so called hybrid solutions).

#### **NUMBER OF OTHER IPTV SUBSCRIPTIONS (SOME FREE-TO-AIR CHANNELS)**

This is the number of IPTV subscriptions that are managed by the service provider and enable the reception of AT LEAST ONE free-to-air channel (linear TV broadcast).

The IPTV service may be delivered directly to the broadband customer of the service provider or to the broadband customer of a party other than the service provider using over-the-top technology. In the IPTV service, some of the channels may also be delivered to the customer over the terrestrial or cable TV network (so called hybrid solutions).

### **3.5 Fixed network broadband subscriber connections by municipalities**

Those telecommunications operators that provide broadband services in fixed network to end-customers must report broadband subscription figures in CSV format. Subscription figures should be provided per municipality and divided according to transfer speeds, connection technologies, and customer types.

When reporting subscriptions per municipality, the below values should be used. Definitions for values correspond to those used when reporting availability (see above).

#### **DOWNLOAD SPEED (DL)**

- **0,5+**
- **2+**
- **10+**
- **30+**
- **100+**
- **300+**
- **1000+**

#### **UPLOAD SPEED (UL)**

- **0,5-**
- **0,5+**
- **100+**

#### **CONNECTION TECHNOLOGY**

- **CU**
- **FTTB**
- **FTTH**
- **Cabel modem**

#### **CUSTOMER TYPE**

- **Residential**
- **Corporate**

### 3.6 Wholesale market information on fixed networks

#### CONNECTED FIBRE LOCAL LOOPS

A local loop is a physical connection between the facilities of the end customer and the switching centre, multiplexer or another similar equipment facility in the local loop network. A fibre local loop is a local loop where the fibre reaches the building distributor (FTTB) or the apartment (FTTH). An end customer refers to a natural person or a company. End customer premises include the building distributor or other similar connection point in single-family houses, attached houses, blocks of flats or business properties.

The number of connected fibre local loops owned by the telecommunications operator is reported. The total number consists of local loops connected for the own use of the telecommunications operator and local loops connected for (leased to) other telecommunications operators. If there are several local loops described above delivered to the end customer premises, report each of these local loops as a separate local loop. For example, an optical fibre pair is counted as two local loops. They also include connected local loops as part of bitstream or VULA products in the own use of the operator or leased to other telecommunications operators.

The fibre local loops are categorised into loops where the fibre reaches the building distributor and for loops where the fibre reaches the apartment.

Fibre local loops in reserve shall not be included in the reported figures. Local loops in reserve mean such fibre local loops owned by the telecommunications operator which have been built and can be easily deployed (e.g. by a cross-connection implemented by a cross-connection cable in a central office) but which are not connected for in use at the time.

#### VULA PRODUCTS LEASED TO OTHERS

VULA-product is a virtual unbundled local access product implemented in copper or fibre local loop networks between the access point of the service operator and a customer. An end customer refers to a natural person or a company.

The VULA product is implemented as an active layer 2 product with a guaranteed bandwidth and at a local access point. The access point is located in the main distribution frame (MDF) or fibre distribution frame (ODF) or in their immediate vicinity in a location in which an active multiplexing device is located (such as a multiplexing switch or router). A VULA product is transferred to the leasing service operator over a standard Ethernet interface.

In practice, a VULA product consists of the following:

- physical copper pair or optical fibre owned by the network operator
- active device, such as DSLAM or Ethernet switch owned by the network operator
- terminal device of a customer
- backbone network connection from the active device of the operator to the local interconnection point of the wholesale customer
- active multiplexing device (if required) at the access point.

A VULA product is, like a bitstream product, a capacity product (see the question about bitstream connections), with the distinction that the interconnection point (drain access) is local for VULA but regional for bitstream. For VULA, the lessee can also control the backhaul section from the backbone network to its own network. With a VULA product, the lessee has the opportunity to control the service provided to retail customers better than with a bitstream product.

Separately reported are 1) number of VULA products leased to other telecommunications operators in FTTC networks (Fibre to the Cabinet) and 2) number of VULA products leased to other telecommunications operators in fibre networks (P2P or PON) implemented by FTTB (Fibre to the Building distributor) or FTTH (Fibre to the Home).

### **BITSTREAM CONNECTIONS LEASED TO OTHERS**

Bitstream product refers to a non-physical or virtual, bidirectional capacity service offered by a network operator to a service operator between the customer and the access point of the service operator. An end customer refers to a natural person or a company.

The lessee can, with the help of a bitstream product, provide its own internet services to end users without using its own devices that improve the throughput of the network, such as splitters, fibre switches and DSLAM. A bitstream product typically includes a subscription and the required data link to the regional network access point. As service transfer interfaces, a wholesale service includes the network interconnection point of the operators, i.e. drain access, and the switch port of the access network or the port of the customer device. For example, a wholesale product concerning an xDSL subscription typically consists of a local loop, DSLAM port, VLAN channel from the DSLAM to the interface of the network and service operators, and related installation and maintenance services. In the location of the subscription user, the service is transferred from the switch port of the building distribution point of the property or the port of the customer device. The service operator is typically responsible for the customer device and subscription management carried out using the customer device. In addition to copper networks, bitstream products can be implemented in FTTC, FTTB and FTTH applications and in PON systems.

Bitstream products are supplied at best effort quality level without guaranteeing any service quality. The service implementation method does not provide the lessee with similar freedom of choice over subscription management as leasing a local loop does, because the service implementation is in the area of responsibility of the network operator until the regional transfer interface.

Separately reported are 1) number of bitstream products leased to other operators in copper local loops. The number includes wholesale broadband products fully using copper or FTTC (Fibre to the Cabinet) and 2) number of bitstream products implemented by FTTB (Fibre to the Building distributor) or FTTH (Fibre to the Home) and leased to other operators.

### **OLD DEFINITION: LOCAL LOOP**

A local loop is a physical connection between the facilities of the end customer and the switching centre, multiplexer or another similar equipment facility in the local loop network. An end customer refers to a natural person or a company. End customer premises include the building distributor or other similar connection point in single-family houses, attached houses, blocks of flats or business properties.

A local loop means a connected fibre connection.

### **OLD DEFINITION: FIBRE LOCAL LOOPS THAT ARE IN USE AND ARE OWNED BY THE TELECOMMUNICATIONS OPERATOR (I.E. CONNECTED FIBRE CONNECTIONS)**

A fibre local loop is a local loop where the fibre reaches the building distributor (FTTB) or the apartment (FTTH). The number of fibre local loops owned by the telecommunications operator is reported. The total number consists of local loops in own use and local loops used by (e.g. leased to) other telecommunications operators. If there are several local loops described above delivered to the end

customer premises, report each of these local loops as a separate local loop. Similarly, enter the fibres in each fibre pair as a separate local loop. Reserve local loops are NOT included in the total number. The fibre local loops are also categorised into loops where the fibre reaches the building distributor and for loops where the fibre reaches the apartment.

**OLD DEFINITION: BITSTREAM CONNECTIONS LEASED TO OTHERS**

The number of wholesale broadband subscriber lines (bitstream) leased to other service providers regardless of technology. The lessee can, with the help of a wholesale broadband product, provide its own internet services to end users without using its own devices that improve the throughput of the network, such as splitters, fibre switches and DSLAM.

**OLD DEFINITION: LOCAL LOOPS IN RESERVE**

Local loops in reserve include such metallic local loops owned by the telecommunications operator which have been built and can be easily deployed (e.g. by a cross-connection implemented by a cross-connection cable in a central office) but which are not in use at the time.

**OLD DEFINITION: METALLIC LOCAL LOOPS OWNED BY THE TELECOMMUNICATIONS OPERATOR**

The total number consists of local loops in the telecommunications operator's own use or in the own service provider's use, local loops leased to other telecommunications operators or local loops in reserve.

**UPPER BANDS LEASED TO OTHERS**

The number of upper bands of metallic local loops leased to other service providers by the network company. Leasing upper bands means, in this context, that the lessee can provide its own internet services to end users with parallel connection by using its own devices that improve the throughput of the network, such as splitter and DSLAM.

**3.7 Broadband networks which are in joint use and/or which have been built by means of joint construction**

Information about broadband networks which are in joint use and/or which have been built by means of joint construction is collected from all network operators.

**TOTAL KILOMETRES OF THE CABLE DUCTS IN JOINT USE OF THE OPERATOR (INCLUDING CABLE ROUTES, CONDUITS AND PRE-INSTALLED PIPES)**

Cable ducts, cable routes, conduits and pre-installed pipes are operator-owned cable ducts, cable routes and pre-installed pipes which are technically suitable for joint use and have enough space for placing cables.

As a subcategory of this, the total kilometres of those cable ducts that are also in the use of other operators is also reported. Cable ducts owned by the operator and used jointly by other telecommunications operators mean cable ducts, conduits and pre-installed pipes with the right for other operators to accommodate cables.

Cable ducts leased from other operators are not included in either of these.

**KILOMETRES OF CABLE DUCTS OF THE OPERATOR LEASED FROM OTHER COMPANIES THAN TELECOMMUNICATIONS OPERATORS (INCLUDING CABLE ROUTES, CONDUITS AND PRE-INSTALLED PIPES)**

Cable ducts and pre-installed pipes leased from other companies than telecommunications operators mean cable ducts, conduits and pre-installed pipes owned by other companies than telecommunications operators where the telecommunications operator has access to accommodate telecommunications



cables.

Cable ducts leased from other operators are not included.

#### **CABLE DUCT**

Cable duct means a protective structure of concrete or plastic for the purpose of accommodating cables which is placed in a street area. The aim of a cable duct is to protect the cables placed in them from strain on the street area construction and enable maintenance and use of the cables and installation of additional cables, if there is enough space.

#### **CABLE ROUTE**

Cable route means a physical infrastructure suitable for joint use with a possibility to place cables afterwards, if there is enough space in the cable route. Cable route does not mean, for example, a shielding for the cable.

#### **PRE-INSTALLED PIPE AND PROTECTIVE PIPE**

Pre-installed pipes and protective pipes mean usually plastic pipes which are installed in connection with network construction and in order to meet future needs. Afterwards, it is possible to install fibre cables in the pre-installed pipes, and if there are already micro channel tubes pre-installed, it is possible to just blow fibre in. The pre-installed and protective pipes are terminated in manholes enabling maintenance and installation of new cables. Cable joints are placed in the manholes.

#### **POLES, TOWERS AND MASTS OWNED BY THE COMPANY IN JOINT USE OF OTHER TELECOMMUNICATIONS OPERATOR**

This includes those poles, masts and towers which also accommodate communications network equipment of other operators.

#### **POLE**

Operator-owned poles in joint use mean poles, such as overhead lines and lamp posts suitable for joint use. They may also accommodate communications network equipment of other operators.

#### **MAST**

Operator-owned masts in joint use mean, among other things, different mass communications masts, and towers mean high self-supporting constructions differing from masts in a way that they do not need any supporting wires. They may also accommodate communications network equipment of other operators.

#### **LENGTH OF CABLE ROUTES BY JOINT CONSTRUCTION**

Route by joint construction means a cable route which accommodates cables or network elements of several operators, and the operators have carried out the contracting work simultaneously.

#### **CABLE ROUTE**

Cable route means an underground or airborne space to accommodate a telecommunications cable.

## **4 Information on mobile networks and services**

### **4.1 Mobile network technology categories**

#### **GSM**

This category includes the coverage areas of all mobile networks built using GSM network technology. GSM coverage is based on the 900 and 1800 MHz frequency bands.

A mobile network technology that enables telephony, short message services and low-speed data transmission.

#### **UMTS**

This category includes the coverage areas of all mobile networks built using UMTS network technology. UMTS coverage is based on the 900 and 2100 MHz frequency bands.

A mobile communications technology which enables more telephone services, SMS services and broadband data transmission services, and connection speeds of less than 42Mbps.

#### **LTE**

This category includes the coverage areas of all mobile networks built using LTE and LTE-A network technology. LTE coverage is based on the 700, 800, 1800 and 2600 MHz frequency bands.

LTE network technology enables more services that are more advanced than those enabled by UMTS technology and connection speeds of less than 300Mbps.

LTE-A network technology enables services that are more advanced than those enabled by LTE technology and connection speeds of less than 1Gbps.

### **GENERATION CLASSES OF MOBILE NETWORKS**

A term describing how technologically advanced a mobile network is, refers to a single or several network technologies.

#### **2G**

A mobile network enabling telephony and short message services, refers to GSM network technology.

#### **3G**

A mobile network enabling broadband services, telephony and short message services, refers to UMTS network technology.

#### **4G**

A mobile network enabling broadband services, telephony and short message services, refers to LTE and LTE-A network technology.

#### **5G**

Next generation mobile network, network technology to be determined, standardisation underway.

## **4.2 Mobile network coverage**

The availability of services in a mobile network must be reported to Traficom as network coverage areas. Network coverage areas are reported individually for each mobile technology category (GSM, LTE, 5G). Moreover, the coverage areas where each of the pre-defined speed categories (service description) are available must be specified within each technology category. Telecommunications operators must estimate themselves the coverage area that best describes each speed category using the predefined limits and parametrization. The aim is that the reported coverage area matches the actual coverage area as closely as possible.

Mobile network coverage areas are submitted as polygon Shape (SHP) files. The Shapes must depict the coverage area within which the service indicated by the specified technology and speed category is available. A separate layer or map image must be provided of each technology and speed category pair when reporting coverage areas. A SHP typically contains four different files, the

extensions of which are SHP, SHX, DBF and PRJ. Coverage area maps must be based on the signal strength limits defined by Traficom.

Coverage area maps currently reported to Traficom:

- **LTE Basic coverage**
- **LTE Download 30Mbps (download)**
- **LTE Download 100Mbps (download)**
- **LTE Download 300Mbps (download)**
- **5G Basic coverage**
- **5G Download 30Mbps (download)**
- **5G Download 100Mbps (download)**
- **5G Download 300Mbps (download)**
- **5G Download 1000Mbps (download)**
- **LTE Coverage obligation area**
- **GSM Coverage obligation area**

### **RESOLUTION OF MOBILE NETWORK COVERAGE AREA MAPS**

Network availability is calculated on the basis of coverage area maps using population grid data provided by Statistics Finland. The grid data consists of 250x250 metre geographical cells. Therefore more detailed coverage area maps are not required. Large and detailed individual data set overloads the calculation processes of the data collection system and may even prevent data submission.

Traficom's recommendation on the delivery format of Shape coverage area maps:

- A single map file must not contain more than 5,000 individual map objects representing a geometric area. If there are many individual areas representing a specific technology or transmission speed level, they should be combined into a single map object, where possible.
- If the geometric areas are marked on the basis of a square-shaped grid, the recommended minimum size of each grid cell is 50x50 metres.

### **BASIC COVERAGE**

Basic coverage refers to a coverage area within which signal strength limits are met: -90 dBm (RxLev) in the GSM network, -100 dBm (RSCP) in the UMTS network, -110 dBm (RSRP) in the LTE network and -120 dBm (RSRP) in the 5G network.

### **COVERAGE OBLIGATION AREA**

Maps depicting the coverage obligation area refer to a coverage area which meets the population coverage requirements laid down in the licences. The obligation to notify coverage obligation areas only applies to operators who are subject to population coverage requirements.

In coverage calculations, the limit -90 dBm in the GSM network and -110 dBm in the LTE network can be used.

### **EXTERNAL COVERAGE**

External coverage refers to a coverage area achieved with a regular mobile terminal device outdoors at an approximate height of 1.5 meters from the ground.

### **FIXED RECEPTION**

Fixed reception refers to a coverage area achieved with an external directional antenna which is connected to a mobile terminal device and placed at an approximate height of 5 meters from the ground. The assumed gain of the extra antenna is 10 dBd (10 sBd = 12.15 dBi).

### **SPEED CATEGORIES**

Speed categories indicate the download speed of inbound traffic in a mobile network that can be achieved in locations within the coverage area.

Speed category specific coverage maps represent availability in ideal conditions and does not consider network congestion nor structural or geographical obstacles.

The speed categories applied are as follows:

- **512Kbps or more**
- **2Mbps or more**
- **10Mbps or more**
- **30Mbps or more**
- **100Mbps or more**
- **300Mbps or more**
- **1000Mbps or more**

Traficom has defined spectrum specific and speed category specific signal strength limits to the reported coverage areas. These definitions should form as reliable as possible a picture on the extent, overlap, and development of networks.

The reported LTE coverage areas by speed category are based on these spectrum area specific signal strength limits (dBm):

	<b>Spectrum area (MHz)</b>					
<b>Speed category</b>	<b>700</b>	<b>800</b>	<b>1800</b>	<b>2100</b>	<b>2600</b>	<b>3500</b>
LTE 30 Mbit/s (DL)	-85	-85	-85	-100	-100	
LTE 100 Mbit/s (DL)			-85	-85	-85	
LTE 300 Mbit/s (DL)*			-60	-60	-60	

\* Requires MIMO solution / wider than usual spectrum blocs

If wider spectrum blocs are used (e.g. in shared networks) can signal strength limit from higher spectrum area or corresponding value in the CA table be applied.

When using multiple spectrum blocs (Carrier Aggregation, CA) these are the applied limits (dBm):

	<b>Spectrum area (MHz)</b>					
<b>Speed category</b>	<b>700</b>	<b>800</b>	<b>1800</b>	<b>2100</b>	<b>2600</b>	<b>3500</b>
LTE 30 Mbit/s (DL)	-100	-100	-110	-110	-110	
LTE 100 Mbit/s (DL)	-85	-85	-95	-95	-95	
LTE 300 Mbit/s (DL)*			-68	-68	-68	

\* Requires use of at least three different spectrum areas / wider than usual spectrum blocs

If both spectrum areas under and over 1GHz are in operation, can either defined signal strength limit be used at operator's own discretion.

The reported 5G coverage areas by speed category are based on these spectrum area specific signal strength limits (dBm):

Speed category	Spectrum area (MHz)					
	700	800	1800	2100	2600	3500
5G Basic coverage	-120					
5G 30 Mbit/s (DL)	-85					
5G 100 Mbit/s (DL)						-110
5G 300 Mbit/s (DL)						-100
5G 1000 Mbit/s (DL)						-65

### 4.3 Mobile subscriber connection and usage volumes

#### SIM CARDS

The number of SIM cards includes all SIM cards sold for residential customers, corporate customers and M2M communications (postpaid and prepaid).

Includes prepaid SIMs which have been used for receiving calls or making calls in the past three months, or which have been topped up with call time in the past three months. Moreover, include all prepaid SIMs that have been used for data transmission or that have been topped up with data in the past three months.

SIM cards for hybrid connections must be calculated separately from the other classes. In subscriber figures these are only included in the number of fixed network subscriptions.

#### M2M CONNECTIONS (SIM CARDS)

Total number of SIM cards in M2M (Machine-to-Machine) subscriptions. This includes all mobile subscriptions sold specifically for machine-to-machine communications (open and closed systems).

#### FWA SIM CARDS

FWA SIM cards include the cards used in FWA subscriptions. These subscriptions are not counted as mobile network subscriptions.

FWA subscription (FWA = Fixed Wireless Access) means a data subscription that has been provided through a mobile network and that has been allocated a certain resource reservation in the area of a certain base station or certain base stations (for ex. a frequency band, a part of capacity of a base station/sector, or a slice of the network). This reservation guarantees the subscription a certain part of the resource capacity. FWA subscriptions include the subscriptions for which the minimum, normal and maximum data transfer speeds have been specified in the same way as for other fixed-line subscriptions.

An FWA subscription is sold to a specific address, i.e. it has a fixed place of use.

SIM cards for FWA connections must be calculated separately from the other classes. In subscriber figures these are only included in the number of fixed network subscriptions.

#### MOBILE SUBSCRIPTIONS

A subscription can include one or two SIM cards. Multi-SIM subscriptions are subscriptions where two SIM cards share the same features, usage limits (if any) and telephone number.

The total number of subscriptions in this category includes all the subscriptions of residential customers and corporate customers, but not any M2M connections.

The so-called hybrid connections are only included in the fixed network subscription numbers.

#### **MOBILE SUBSCRIPTIONS (VOICE ONLY)**

This category contains all the subscriptions that do not include any data transmission services that are subject to a monthly charge or on which no data transmission services have been used for the last three months. In other words, they can only be used for telephony (including VoLTE) and sending SMSs and MMSs.

#### **VOICE AND DATA SUBSCRIPTIONS (VOICE + DATA)**

Voice and data subscriptions in the mobile network include all subscriptions productised for telephony and data transfer. The subscriptions include data transmission services that are subject a monthly fee and they can be used for traditional telephony (calls, including VoLTE/SMS/MMS) that are subject to a subscription-specific pricing scheme.

#### **MOBILE BROADBAND SUBSCRIPTIONS (DATA ONLY)**

Mobile broadband subscriptions include all mobile data subscriptions productised by a company for data transfer. Some of these subscriptions can technically be used for telephony (calls, including VoLTE/SMS/MMS) but they have been sold for data-only use.

#### **OLD DEFINITION: MOBILE VOICE AND DATA SUBSCRIPTIONS (VOICE+DATA)**

Mobile voice and data subscriptions refers to all subscriptions that include data transmission services subject a monthly charge or that have been used to purchase data transmission services in the last three months and that can also be used for traditional telephony (calls, including VoLTE/SMS/MMS) which is subject to a pricing scheme.

#### **OLD DEFINITION: MOBILE BROADBAND SUBSCRIPTIONS (DATA ONLY)**

Mobile broadband subscription refers to a mobile data connection that does not include traditional telephony (which includes VoLTE). These types of connections cannot be used for telephony, and the pricing scheme does not include telephony charges. In other words, these connections can only be used for data transmission and possibly for sending SMSs and MMSs.

#### **MOBILE SUBSCRIPTIONS WITH UNLIMITED DATA IN FINLAND**

This category includes all mobile subscriptions subject to a monthly charge where the subscription agreement does not impose restrictions on data usage. Such restrictions include data transmission volume related restrictions (gigabytes) and time related restrictions. Moreover, they must have a maximum data transmission speed which exceeds 144 kbps (or a maximum transmission speed according to network capacity).

#### **ACTIVE PREPAID SUBSCRIPTIONS**

An active prepaid subscription refers to a prepaid SIM that has been used for receiving or making calls in the past three months, or which have been topped up

with call time in the past three months. This category also includes all prepaid subscriptions that have been used or topped up with data in the last three months.

#### **MOBILE SUBSCRIPTIONS WITH A FIXED-LINE TELEPHONE NUMBER**

Mobile subscriptions (for example DNA Kotiluuri, Saunalahti Kotipuhelin and Telia Home Number [Telia Kotinumero]), which have a fixed-line number. A subscription may have a mobile network number which is only intended for localisation purposes in cases of emergency and is not known to the end customer.

#### **MOBILE BROADBAND SUBSCRIBER CONNECTIONS BY DOWNLOAD SPEED**

Report the number of subscriber connections in each category according to the maximum download speed (DL) advertised to end users/referred to in the subscriber connection agreement. Enter each subscription into the category whose title matches the maximum speed (the upper limit of the speed category) of the connection. Subscriptions with unlimited data transmission speed are allocated to speed classes based on their maximum speed in the network.

The speed categories applied are as follows:

- **DL less than 10Mbps**
- **DL 10 to 99.99Mbps**
- **DL 100 to 299.99Mbps**
- **DL 300Mbps or more**

#### **MOBILE BROADBAND SUBSCRIBER CONNECTIONS BY UPLOAD SPEED**

Report the number of subscriptions in each category according to the maximum upload speed (UL) advertised to end users/referred to in the subscription agreement. Enter each subscription into the category whose title matches the maximum speed (the upper limit of the speed category) of the connection. Subscriptions with unlimited data transmission speed are allocated to speed classes based on their maximum speed in the network.

The speed categories applied are as follows:

- **UL less than 10Mbps**
- **UL 10 to 99.99Mbps**
- **UL 100Mbps or more**

#### **MOBILE CALL MINUTES**

Mobile call minutes include all call minutes placed from domestic mobile networks, excluding end users' calls from an international number (roaming). Traffic for M2M subscriptions is not included in this.

#### **MOBILE CALLS (VOLUME)**

Mobile call volume is the number of calls placed from domestic mobile networks, excluding end users' calls from an international number (roaming). Traffic for M2M subscriptions is not included in this.

#### **SMSS**

SMSs include all text messages sent from domestic mobile networks, excluding end users' messages from an international number (roaming). Text messages which, according to the telecommunications operator, are sent from an application (so called A2P messages) are not included in the volume either. Traffic for M2M subscriptions is not included in this.

#### **MMSS**

MMSs include all multimedia messages sent from domestic mobile networks, excluding end users' messages from an international number (roaming). Traffic for M2M subscriptions is not included in this.

### **MOBILE DATA**

Mobile data is the total volume of packet-switched outbound and inbound data traffic in domestic mobile networks at a given time in gigabytes. Includes data traffic sent (uploaded) by customers and received (downloaded) by customers, excluding roaming.

The data transfer volume for M2M subscriptions is given separately and it is not included in the other reported volumes. M2M subscriptions include all mobile subscriptions sold specifically for machine-to-machine communications (in open and closed systems).

Volume of mobile data is counted using the binary system.

Monthly and subscription-specific median of packet-switched data transfer in the mobile network is calculated as an average of the subscription-specific medians of each month. Median does not include roaming data or data transfer from M2M subscriptions.

### **TOTAL NUMBER OF 5G BASE STATIONS**

5G base stations for all frequency bands are reported. A base station means one site regardless of how many cells/sectors it includes.

## **4.4 Wholesale information on mobile networks**

### **CALL TERMINATION ON MOBILE NETWORKS**

Includes all voice call termination from a mobile operator's own network (including call termination from the operator's own fixed network) and other telecommunications operators' networks (fixed networks, other mobile networks and from abroad) to the mobile operator's network, in total, in minutes.

### **INTERNAL CALLS WITHIN AN OPERATOR'S NETWORK**

Internal calls refers to terminated calls from a mobile operator's and service operator's own numbers, own fixed lines and from the numbers of external service and virtual operators operating in the mobile network to the mobile network, in minutes.

### **INTERNATIONAL CALL TERMINATION**

Includes terminated calls from foreign mobile networks and foreign fixed networks in minutes.

### **TERMINATION OF CALLS PLACED USING CARRIER ACCESS CODE OR CARRIER PRE-SELECTION**

Includes calls placed from domestic fixed networks to the network of a mobile operator using either a call-specific carrier access code or carrier pre-selection, in minutes.

## **5 Revenue and investment information from telecommunications companies**

### **5.1 Information required for collecting the information society fee**

The amount of the information society fee is 0.12 per cent of a telecommunications operator's turnover from public telecommunications operations in Finland, based on the financial year preceding the determination of the fee but no less than EUR 300.

### **COMPANY'S TURNOVER IN FINLAND**

Includes company's total turnover in Finland as well as turnover divided into following subcategories:



- **Fixed network**
- **Mobile network**
- **TV and radio: transfer and transmission services**
- **TV and radio: content services**
- **Other operations**

Turnover is indicated in euros, excluding taxes and including all wholesale and retail service revenues. Email and other messaging service revenues are listed under "Fixed network".

The turnover from TV and radio operations is divided into two subcategories for information society fee determination purposes.

Content services refers to revenues from television and radio operations and video-on-demand services related to programme content and programmes, for example channel packages for consumers.

Transfer and transmission services refers to the technical transfer of programming for example in a cable TV, broadband or terrestrial network, and the related wholesale and retail fees collected. Access and monthly fees collected from customers connected to the network of a telecommunications operator pursuing television broadcasting and/or internet operations and used, for instance, for maintaining the network are included in the turnover from network operations. Also fees collected from other broadcasters than those subject to the must-carry obligation for programme transmission are included.

#### **TURNOVER FROM MUTUAL TELECOMMUNICATIONS OPERATIONS OF LIABLE OPERATORS WITHIN THE SAME CORPORATE GROUP**

For the calculation of the information society fee, the telecommunications operator may deduct the turnover from telecommunications operations in Finland of liable operators within the same corporate group. This applies to telecommunications operators that are part of a corporate group referred to in Chapter 1 Section 6 of the Accounting Act (1336/1997). The corporate group's internal turnover is naturally deducted only once.

If there have been changes in the corporate structure of the telecommunications company between the end of the previous financial year and the time of issue of the fee decision, the fee is determined on the basis of the operator's share of the total turnover from telecommunications operations in the previous closed financial year.

The deducted turnover items must be itemised and reported in a separate attachment.

#### **COMPANY-REPORTED TURNOVER USED AS THE BASIS FOR DETERMINING THE INFORMATION SOCIETY FEE (=1F - 1D+1E+Q2))**

Company's turnover estimate is entered to be used as the basis for determining the information society fee. The figure must be based on the information provided in the answers to the two preceding sections.

The figure is calculated as follows:

1f: Turnover in total, excluding the following:

1d: TV and radio: content services

1e: Other operations:

K2: Turnover from mutual telecommunications operations of liable operators within the same corporate group

Itemisation of reported deductions/deducted turnover items is provided in writing.

## 5.2 Investments in Finland

Details provided for previous year must be based on financial data. Information provided for ongoing year must be based on current best estimate of investments in the year in question.

### COMPANY'S INVESTMENTS IN FINLAND

Gross investments are entered in euros, including, e.g., real estate, vehicles and office equipment supporting the business in each subcategory.

All fibre investments, including backbone fibre, must be entered under fixed network.

If you are unsure whether an investment (for example an equipment room) should be entered under fixed network or mobile network, choose fixed network.

Public aid is entered separately in the field provided.

Other investments are investments which are unrelated to telecommunications, TV or radio infrastructure.

Investments are reported in these subcategories:

- **Fixed network**
- **Mobile network**
- **TV and radio operations**
- **Other investments**

In each subcategory investments are reported in these groups:

- **All investments**
- **Company's tangible investments**
- **Company's intangible investments**
- **Public aid-funded investments**

### FIBRE INVESTMENTS BY SUBCATEGORY

Fibre investments are reported both for previous year and ongoing year. Estimates of ongoing year's investments provide an indication of how investments will develop; the euro sums provided do not need to be exact. Fibre investments in both reported years are reported in following subcategories and as a whole:

- **Fibre investments in the backbone network**
- **Fibre investments in access networks/subscriber networks**
- **Fibre investments in base station connections**

## 5.3 Fixed network revenues

### RETAIL REVENUES FROM FIXED NETWORKS

All revenues are entered excluding tax. Retail revenues are reported in these subcategories:

- **Voice services**
- **Data transfer services**
- **Other retail revenues**

Under voice services, enter fixed telephone network customer revenues from circuit-switched, ISDN and VoIP voice subscriptions. Voice service revenue information includes all monthly subscription charges, domestic and international calls and service calls.

All broadband service revenues are entered under data transmission services regardless of the technology used. Data transmission service revenues include all subscription-based monthly, installation, activation and other subscription maintenance related fees.

If certain revenues are not clearly either fixed or mobile network revenues, enter them under fixed network revenues.

#### **RETAIL REVENUES BY CUSTOMER TYPE (RESIDENTIAL/CORPORATE)**

Retail revenues from voice services and retail revenues from data transmission services are reported separately for residential and corporate customers.

Housing company subscriptions have been included in the residential customers category. If this has not been possible, these subscriptions have been included in corporate customers and turnover for housing company subscriptions has been indicated separately.

#### **WHOLESALE REVENUES FROM FIXED NETWORKS**

All revenues are entered excluding tax. Network leasing also includes one-off items, such as activation fees. Other wholesale revenues include revenues from third-party invoicing, if included in the turnover.

Information is reported in following subcategories:

- **Interconnection and traffic fees**
- **Network leasing to another telecommunications company**
- **Other wholesale revenues**

### **5.4 Mobile network revenues**

#### **RETAIL REVENUES FROM THE MOBILE NETWORK**

Revenues are reported separately to each mobile subscription type.

#### **MOBILE SUBSCRIPTIONS (VOICE ONLY)**

This category contains all the subscriptions that do not include any data transmission services that are subject to a monthly charge or on which no data transmission services have been used for the last three months. In other words, they can only be used for telephony (including VoLTE) and sending SMSs and MMSs.

#### **VOICE AND DATA SUBSCRIPTIONS (VOICE + DATA)**

Voice and data subscriptions in the mobile network include all subscriptions productised for telephony and data transfer. The subscriptions include data transmission services that are subject a monthly fee and they can be used for traditional telephony (calls, including VoLTE/SMS/MMS) that are subject to a subscription-specific pricing scheme.

#### **MOBILE BROADBAND SUBSCRIPTIONS (DATA ONLY)**

Mobile broadband subscriptions include all mobile data subscriptions productised by a company for data transfer. Some of these subscriptions can technically be used for telephony (calls, including VoLTE/SMS/MMS) but they have been sold for data-only use.

#### **M2M SUBSCRIPTIONS**

M2M subscriptions refers to subscriptions that have been productised for data transfer between machines.

#### **ROAMING REVENUES FROM RETAIL SERVICES**

Roaming revenues include income from charges to a domestic subscription from services used abroad. Roaming revenues are indicated in euros.

Roaming revenues are reported under same mobile subscription types as retail revenues.

#### **WHOLESALE REVENUES FROM THE MOBILE NETWORK**

All revenues are entered excluding tax. Wholesale revenues from roaming include roaming income from other (foreign) telecommunications operators for mobile services used in Finland. Network leasing includes revenues from lease products and one-off items, such as activation fees. Under other wholesale revenues, enter third-party invoicing, if included in the turnover.

Information is given in following subcategories:

- **Interconnection and traffic fees**
- **Wholesale revenues from roaming**
- **Network leasing to other telecommunications companies**
- **Other wholesale revenues**

### **5.5 Total turnover from TV, radio and other operations**

#### **TV AND RADIO OPERATIONS**

##### **RETAIL REVENUES FROM TV AND RADIO OPERATIONS**

All revenues from retail customers by service. The revenues do not include equipment sales.

##### **IPTV SERVICES**

IPTV services includes revenues from IPTV subscriptions (such as monthly and set-up fees) and from content services (such as channel packages and video-on-demand services). IPTV services do not include revenues from data transmission services (broadband subscriptions).

##### **CABLE TV SERVICES**

Cable TV services includes revenues from cable TV subscriptions (such as monthly and set-up fees) and revenues from cable TV content services (such as pay-TV services). Does not include revenues from data transmission services (cable modem).

##### **TERRESTRIAL TV SERVICES**

Terrestrial TV services includes revenues from retail customers for terrestrial pay-TV services, such as monthly and set-up fees.

##### **OTHER TV SERVICES**

Other TV services is for other TV service revenues from retail customers.

##### **WHOLESALE REVENUES FROM TV AND RADIO OPERATIONS**

All wholesale revenues from television broadcasting and radio broadcasting services in the terrestrial network.

##### **TERRESTRIAL NETWORK'S TV BROADCASTING SERVICES**

Television broadcasting services in the terrestrial network includes revenues from multiplexing, transfer and transmitting services. Also includes revenues from antenna site rental and related services.

##### **TERRESTRIAL NETWORK'S RADIO BROADCASTING SERVICES**

Radio broadcasting services in the terrestrial network includes revenues from transfer and transmitting network services. Also includes revenues from antenna site rental and related services.

**OTHER TELEVISION AND RADIO BROADCASTING SERVICES**

Other television and radio broadcasting services is for wholesale revenues from other services.

**OTHER OPERATIONS**

**REVENUES FROM OTHER OPERATIONS**

Enter all revenues excluding tax. Equipment sales and other activities are reported separately.