

BEREC Report on the outcome of the public consultation on the draft BEREC Guidelines to assist NRAs on the consistent application of Geographical surveys of network deployments

Contents

Executive Summary	2
1. Introduction	3
2. Comments on the Introduction to the Guidelines	4
2.1. Comments on Subject matter.....	4
2.2. Comments on Scope of the Guidelines.....	7
2.3. Comments on Calendar of delivery of the Guidelines	11
3. Comments on the content of the Guidelines	12
3.1. Comments on Definitions	12
Responses to Question 1	19
3.2. Comments on Data sources.....	21
3.3. Comments on geographical spatial resolution of data.....	22
3.4. Elements of characterization of network connectivity or services.....	26
3.5. Comments on data and characteristics of a GIS system.....	39
3.6. Comments on Forecasts	39
3.7. Comments on Publication, confidentiality issues and aggregation of data to provide information to third users	44
3.7.1. Publication of data.....	44
3.7.2. Confidentiality.....	46
3.7.3. Data aggregation.....	47
3.7.4. Access to information by public authorities	48
3.7.5. Annex 3: speed classes.....	49
Annex 1	51
List of received contributions.....	51

Executive Summary

The draft BEREC Guidelines on Geographical Surveys (GSs) of network deployments was approved for public consultation at the 40th BEREC ordinary meeting that took place in Crete, Greece, from 2 to 4 October 2019.

According to Article 22(1) of the European Electronic Communications Code ('EECC') National Regulatory Authorities ('NRAs') and/or Other Competent Authorities ('OCAs') shall conduct a GS of the reach of electronic communications networks capable of delivering broadband by 21 December 2023 and shall update it at least every 3 years.

The Guidelines submitted are designed in accordance with Article 22 of the EECC and intended to provide guidance to NRAs/OCAs on common approaches to develop GSs. NRAs/OCAs shall take utmost account of these Guidelines when developing these surveys.

The Guidelines consist of seven sections. The first section includes specific definitions to be considered for the purpose of these Guidelines. A second section specifies the sources of information for the GSs.

The section "Geographical Spatial resolution of data" specifies the spatial resolutions to be used for data collection for fixed and mobile broadband networks.

The section "Elements of characterization of network connectivity or services" describes the types of information that the NRA/OCA must attain in order to characterize the reach and performance of broadband networks. This includes a normalized structured subset of the data detailed in the subsections.

- For fixed broadband the Guidelines distinguish the data requirements on the type of resolution chosen by the NRA/OCA: whether there is a precision at the address or grid level.
- For mobile broadband the document presents a proposal for characterization of the reach of the mobile broadband network based on 100 x 100 m grids (or similar polygon).

The "Data and characterization of a GIS system" section provides information on these tools and the GIS layers relevant to these guidelines.

The section "Forecast specificities" provides a series of recommendations on the information to request in order to implement surveys of forecasts of broadband reach that are relevant for the needs of the regulatory and policy functions referenced in Article 22.

Finally, the last section provides guidance regarding the publication, confidentiality and aggregation of data to provide information to third users.

During the public consultation stakeholders were requested to provide comments to the Guidelines and to answer four questions concerning speed calculation, information requirements, the need to procure performance information and the need to define thresholds for key parameters.

Stakeholders were invited to submit their inputs by 21 November 2019 17:00 CET to PC_Geo_surveys@berec.europa.eu.

All stakeholders were strongly encouraged to submit their contributions as early as possible.

All contributions were published on the BEREC website, taking into account requests for confidentiality and restricted use of personal data.

1. Introduction

In this document comments are grouped according to the Guidelines' section they refer to. The four questions and the comments related to them are explicitly included in the upcoming sections. Summaries of the answers received during the public consultation were prepared by the drafters' team and the BEREC Office.

During the period from 10 October to 21 November 2019 BEREC received 27 contributions from the following stakeholders¹:

1. Association of Cable and Telecom Networks in the Czech Republic ("APKT")
2. Bird & Bird on behalf of telecom operators T-Mobile/Tele2, KPN, Vodafone/Ziggo and CAIW in the Netherlands ("the Dutch operators")
3. Česká telekomunikační infrastruktura ("CETIN")
4. Danish Energy Agency ("DEA")
5. Department of Communications, Climate Action & Environment of the Irish Government ("the Irish Department")
6. Javier Aracil (Universidad Autónoma de Madrid), Ljiljana Simic and Petri Mähönen, (Aachen University) ("Aracil, Simic and Mähönen")
7. European Competitive Telecommunications Association ("ECTA")
8. EIR
9. EOLO SpA ("EOLO")
10. European Telecommunications Network Operators' Association ("ETNO")
11. Fastweb
12. German Federal Ministry of Transport and Digital Infrastructure ("BMVI")
13. Federal Ministry Republic of Austria: Transport, Innovation and Technology ("BMVIT")
14. FTTH Council Europe ("FTTHc")
15. GSMA
16. National Chamber of Ethernet Communications ("KIKE")
17. Liberty Global

18. Linkem S.p.A (“LINKEM”)
19. Marco Forzati (“Forzati”)
20. Open Fiber
21. Polish Chamber of Electronic Communications (“PIKE”)
22. Proximus
23. SFR (Confidential response)
24. Telecom Industry Association Denmark (“TI”)
25. TIM
26. VATM Verband der Anbieter von Telekommunikations- und Mehrwertdiensten : ANGA Verband Deutscher Kabelnetzbetreiber, BITCOM Bundesverband Informationswirtschaft, Telekommunikation und Neue Medien, BREKO Bundesverband Breitband, BUGLAS (Federal glass fibre connection), ECO Verband der Internetwirtschaft, The Initiative of European System Operators (“Assn_DE”).
27. Vodafone

BEREC is grateful to receive the submissions and has carefully considered them, and sets out its summary of assessments and responses in this report. The non-confidential responses are published on BEREC’s website.

2. Comments on the Introduction to the Guidelines

The comments on the Introduction of the Guidelines are grouped as in the draft version of the Guidelines.

2.1. Comments on Subject matter

BEREC responds first to general comments made on the GL’s level of harmonisation and proportionality.

Level of harmonization

More specifically, the level of harmonization of the geographical surveys has raised concerns among several respondents. **Assn_DE** warns that Article 22 (7) of EECC must be transposed by each Member State (hereinafter MS). For this reason, **Assn_DE** reminds that the BEREC Guidelines (hereinafter GL) are simply a tool to contribute to a uniform implementation and to assist NRAs/OCAs in their task. Therefore, **Assn_DE** considers that the GL should give enough discretion to the NRAs/OCAs to decide to what extent the geographical surveys are

¹ Listed below in alphabetical order.

necessary. Moreover, in their view, Article 22 (7) EECC does not specifically demand any extra collection of data rather than the existing ones.

ECTA totally opposes the current level of harmonization in the GL and indicates that they are too ambitious and at odds with the legislative mandate of Article 22(7) EECC. According to **ECTA**, the EECC in its Recital 62 indicates that BEREC's function is to guide the NRAs/OCAs on the best practices to approach such task. More specifically, **ECTA** finds that BEREC does not fulfill the mandate of Article 22 by setting the objective to "progress towards a significant level of harmonization of the theoretical mobile coverage calculations" in paragraph 67 in the draft GL. **ECTA** considers that the GL are not ready for adoption before several important adjustment are made.

ECTA considers that Article 22 EECC does not imply any absolute mandate to 'improve the information on geographical broadband reach in Europe' as BEREC suggests in paragraph 5², but rather a mandate to produce information as relevant to various tasks of competent authorities under the EECC. **ECTA** also reminds that authorities must ensure that requests for information to undertakings in that context are duly justified and proportionate to the performance of the regulatory task in question.

Proportionality

The Dutch operators, FTTHc and KIKE point out that the proportionality must be an essential principle in these GL. **Proximus** and **ETNO** urges BEREC to rely on the existing methodologies used by the NRAs/OCAs. To justify this, **Proximus** explains the case of Belgium, where, the Belgian NRA (BIPT) could fulfill data collection requirements specified in the GL by applying minor changes on the existing exercises. Additionally, **ETNO** asks for a cost-benefit analysis if an NRA/OCA decides to require additional information that goes beyond the data required in the GL. **The Dutch operators** argue that NRAs/OCAs should request relevant information only if this information is not available in the market.

In summary, many operators and operators' associations provide general comments on the objectives and proportionality of the GL. Whilst some welcome BEREC's position that the workload for GS should be kept proportional (**ETNO and TIM**) or accept that GL should contribute to a uniform implementation of GS (**Assn_DE**), other question the ambition of the GL in that Article 22 does not require the harmonization of data (**ECTA**), is not for statistical purposes (**KIKE, PIKE**) or that the data requests in the GL are unjustified and not proportionate (**ECTA**) or not mandated by Article 22 (**ECTA, Assn_DE**).

BEREC Response 1

First, it should be noted that for the purposes of Article 22 the costs of data provision for operators should be appropriate, as the Article provides the means for a streamlined data collection, which will generally avoid that the same data is requested twice by several authorities or to cater for different functions.

² Unless otherwise stated, all the GL paragraph references in this document refer to the draft GL document.

Moreover, BEREC's view is that the GL are fully consistent with Article 22, proportionate and opting for a "minimalistic approach" to harmonization (rather than "maximalistic" as expressed by ECTA).

In drafting the GL BEREC has consulted with the European public authorities (NRAs, OCAs and the EC) on all the different information needs for each of the functions established in the EECC that relate to GS (state aids, designating areas (art 22.2 and 22.3), the allocation of public funds for the deployment of Electronic Communication Networks (ECNs), the design of national broadband plans, the definition of coverage obligations attached to the rights of spectrum, the verification and imposition of services within the Universal Service Obligation (USO), market analysis procedures, etc). These functions require a rich and varied set of information and BEREC has endeavoured to select and harmonize only a small set of parameters that were identified as necessary to carry out many functions and in many MSs. This means that BEREC has considered the relevant functions when drafting the GL and is not requiring information that is not considered necessary to carry out the functions as expressed by the public authorities³. Rather it is the contrary, some MS may need and may request some additional information because of national specificities and, in fact, some of the public authority responses to the public consultation are requesting for more information to be included in the GL rather than less. Moreover, in drafting the GL BEREC has also taken into consideration the current approaches and methodologies of European coverage surveys in different MS and identified best practice examples (as ECTA suggests BEREC should do), upon which some of the BEREC decisions are based.

The harmonization of some core indicators is indispensable for many reasons. First, there is a need of harmonized coverage information at the MS level, so that MS, the EC and BEREC (see Article 22 (5) paragraph 2) can have a real picture of the evolution of the reach of broadband networks in Europe. This will enable an effective monitoring of the evolution towards the EU broadband targets for 2025 and moreover, will allow the EC to make informed decisions with regards to the allocation of European funds for the deployment of broadband networks. Harmonization is also required so that state aid decisions are undertaken under a common information (to some basic extent) across Europe and also, to promote the consistent application of regulatory obligations.

Some responses request BEREC to consider the costs of data provision, in particular, when data requirements are new or may disturb current national practices. BEREC has consistently done so, and where it has found a substantive divergence in national practices and considered that the costs of harmonization would be too large, BEREC has abstained from proposing new or modified indicators or from requiring further harmonization of methodological issues. In those occasions the GL provide with optionality for NRAs/OCAs. However, Article 22 is a new obligation, and BEREC recognizes that for many MS, especially those that are not at the forefront in the production of geographically referenced broadband reach data, it may well imply additional costs to operators and to the public authorities, yet these costs are fully justified given the ambitious remit of the Article and the needs identified by the public authorities.

As mentioned in some occasions NRAs/OCAs may require additional information as the draft GLs only provide for a small set of indicators. In those circumstances, those NRAs/OCAs will assess the proportionality of these requests, and consider the costs and benefits of obtaining this additional information.

Finally, regarding the Dutch operators comment it needs to be noted that the information requested by the GL is typically not in the market.

Efficiency of reporting lines

According to **FTTHc**, there is a need for coordination with Article 20 EECC. **FTTHc** advocates for establishing the appropriate reporting lines. This can make future reporting easier and not an unreasonable burden on operators particularly if the data required is part of the data set reported by the operator internally.

Other operators request BEREC to take care of the efficiency of reporting lines and to avoid that the same information is requested more than once in different procedures or by different institutions, for example under different market consultation procedures, regarding network plans or in relation to the Single Information Point from the Cost Reduction Directive (**FTTHc**, **Vodafone**, **Assn_DE**). **FASTWEB** asks BEREC to state that there should be one data collection and data owner in each MS.

BEREC Response 2

BEREC understands the need for data requests to be streamlined, so that the same information is not requested by different bodies or to deliver for different functions and recommends that each data proposed in the GL is collected once and is not subject to several requests, unless properly justified. However, this statement has no bearing on the institution or institutions managing the data sets as these tasks may be performed by one or more than one institution. It is for MSs to decide on the best institutional design for the collection and management of data.

Moreover, note that Art 20 (2) EECC considers the sharing of data among public bodies when data is needed to fulfil responsibilities under Union Law.

2.2. Comments on Scope of the Guidelines

Some of the responses question the scope and objective of the draft GL. There are comments concerning the following topics:

- 1.) The consideration of state aid needs in the scope of the GL and the relationship between the GL and the EC State Aid Guidelines

The use of the GS information for State Aid assessments has raised some doubts to the respondents. **ECTA** reminds that as long as the State Aid application is not the main objective

³ Therefore, the information required by the GL is not for statistical purposes but rather to inform regulations and policies.

of the GS, BEREC should delimit the role of the GS's information in the State aid law/procedure. **FTTHc** questions the utility of the GSs' information in the State Aid assessments. Also, **FTTHc** points out that the geographical analysis required for the State aid procedures are far more detailed. Secondly, the State Aid procedures are not conducted by NRAs in the most of the cases.

ECTA expresses that BEREC should be careful that the GL confound with the State Aid Regime and suggests that BEREC, rather than providing guidance on the state aid regime should explain the relevance of the GL to the state aid assessment regime. **ECTA** also requests that GL "narrowly delimit and concisely state the contribution that the GL can be expected to make to State aid practice, focussing on methodological aspects concerning GS". According to **ECTA** BEREC should "clarify that precisely targeted requests for geographic information in a specific State aid compatibility assessment must always take precedence over surveys or forecasts made by NRAs in application of art. 22 of the Code." The **FTTHc** questions the reasons to collect data for state aids using the Art 22 GS, since the State Aid regime requires a public consultation which should provide for the information. The **FTTCc** establishes that the "state aid application will go beyond anything collected in the Article 22 context".

Moreover, the **Irish Department** and the **BMVIT** point at the need to provide information as to whether an area is – or is likely to be – covered by an NGA network in the context of state aid proceedings and recommend introducing a definition of NGA in the GL. The **Irish Department** states that it should be mandatory in a state aid context to gather information on the minimum committed information rate to each user, network dimensioning, capacity information, the cell edge/cell area probability etc. The **BMVIT** also requires the development of a toolkit in the future to gather information on high quality connection information.

BEREC Response 3

The GL are not providing guidance for the state aid regime, but must reflect the fact that Article 22 paragraph 1 states that "the GS shall include a survey of the current geographical reach of broadband networks within their territory, as required for (...) and for the surveys required for the applications of state aid rules". Therefore, the Article 22 GS must reflect some of the state aid information needs. This GS should not take precedence over surveys of current network reach or of forecasted plans made by OCAs/NRAs in specific State aid compatibility assessments, which can be more complete (include more information) or more relevant, for example because of their timing. However, if the Article 22 GS is carried out in a period that is suitable for the state aid consideration and has information from all the relevant agents, the information retrieved thereby could be a substantive complement/input to the state aid submission. Under good circumstances, the NRA/OCA may decide that the role for the state aid public consultation is only to fill in the missing information in the Article 22 survey.

BEREC has considered the need to provide for an optional NGA identifier in the case of fixed broadband. Regarding the comments on introducing an NGA definition in the GL which would be relevant in the State Aid context, BEREC's position is that this should be dealt with in the context of State Aid Guidelines. It is noted that in the current State Aid Guidelines provide some reference to NGA in paragraph 58, and identify some technologies as being NGA.

On any additional information, it should be noted that GL are only to assist state aid proceedings with some information, but if more information is needed, NRAs/OCAs may request more information in the context of the Article 22 survey or resort to the state aid mandatory public consultation mechanism. BEREC will make clear to the GL that NRAs can use information collected under Art 22 to assist the state aid process but may also need to collect complementary information in line with the State Aid guidelines.

BEREC also agrees that in the future more information regarding high quality connections may be needed and should be developed.

- 2.) On BEREC's decision not to include in the GL demand information or physical infrastructure information

ETNO and **Vodafone** share BEREC's point of view that data on physical infrastructures do not fall within the scope of the GL. **Vodafone** explains that "Obligations under art 22 of the EECC are complimentary to, and consistent with all other mapping and reporting requirements, including existing NRAs/OCAs requirements and other pan-European instruments such as BCRD (Broadband Cost Reduction Directive)" and requires that the BEREC GL minimize any additional compliance cost by preventing repeated information requests.

Assn_DE mentions the Directive 2014/61/EU (the "cost reduction" directive). This directive addresses data collection on physical infrastructure through several requirements and explains that BEREC should not disregard the relationship and the distinction between the Single Information Point according to the Cost Reduction Directive (Directive 2014/61/EU) and the GS in the context of Article 22 EECC.

Finally, **ETNO** also shares BEREC's view that data on broadband demand does not fall within the scope of the draft GL.

BEREC Response 4

In accordance to the comments and BEREC's initial position, BEREC considers that data on physical infrastructures is out of the scope of Article 22.

- 3.) The inclusion of QoS-2 and QoS-3 as information required for verification.

The definition of the three main indicators QoS-1, QoS-2 and QoS-3 has received several criticisms by the respondents. **GSMA**, **Vodafone**, **ECTA** and **TIM** disagree with the mandatory inclusion of the performance indicators: QoS-2 and QoS-3. According to **ECTA** and **DEA**, the GS must focus only on the reach/coverage of the mobile and fixed telecommunications networks in order to fulfil the mandate of the Article 22 of the EECC.

More specifically, **the Dutch operators**, **DEA**, **ETNO**, **ECTA**, **Vodafone Group** and **TIM** claim that QoS-2 and QoS-3 data cannot be used as verification tool for the validation of QoS-1. In this line, **GSMA**, **ETNO** and **TIM** remind BEREC that QoS-2 and QoS-3 indicators are based on a limited number of samples while the QoS-1 is a parameter that reaches all the European

territory. On their part, **KIKE** and **PIKE** sustain that NRAs/OCAs should perform the work regarding the indicators QoS-2 and QoS-3.

In conclusion several operators (**Vodafone and TIM**) and operators' associations (**ECTA, GSMA**) request the GL to consider only QoS-1 information. Some argue that measurements are beyond the scope of Article 22 which they view as providing for a survey on the network capabilities, whilst measurements rather demonstrate actual network performance (**ECTA, VODAFONE, GSMA**). Others mention that measurements are very costly to implement (**ECTA**) and should be undertaken by authorities rather than operators (**PIKE, KIKE**). **ECTA** also requests that the GL should always refer to QoS-1 reach and performance indicators.

BEREC Response 5

First, it must be clarified that the current GL, correspond to phase one, which as explained in paragraph 14⁴ deals only on QoS-1 information, which is the information that phase one draft GL request NRAs/OCAs to provide for. Phase 2, concerns the verification of QoS-1 information, for example, by measurements. The verification of QoS-1 information is very important to assess the validity of submitted data. The work on phase 2 will start in 2020 (see BEREC Response 6).

With regards to verification, several responses argue that QoS-2 and QoS-3 information cannot be used to verify QoS-1 information as measurements only refer to a limited number of samples, and in particular, with QoS-3 indicators measurements are affected by factors which cannot be controlled by network operators (**ETNO, GSMA and TIM**). The **DEA** also explains that concepts such as maximum speed are not verifiable and adds that there is nothing in the EECC stating that it is obligatory for MS to perform a QoS-2/3 mapping.

BEREC Response 6

During 2020 when BEREC starts working on verification, it will examine in detail the limits of verification methodologies. However, a priori, BEREC understands that QoS-1 theoretical speed data estimates will differ from QoS-2/QoS-3 measurements, but also considers that these measurements and in particular, QoS-2 information can be helpful to verify whether the QoS-1 estimates are within a reasonable margin of QoS-2 active network measurements.

4.) The scope of Article 22 is the designation of Areas only

The Dutch operators consider that the scope of Article 22 is the designation of areas only.

BEREC Response 7

BEREC understands that allowing for the designation of areas is one of the important functions that the GS must serve, but clearly Article 22 expresses that the GS should also cater for the needs of other functions as expressed in BEREC Response 1.

5.) The role of the BEREC GL with respect to how the GS should be used.

ECTA requires BEREC to explain the use of surveys in the context of the definition of relevant geographic markets and in a state aid context and states that “while surveys can and should

⁴ Unless otherwise stated all the GL paragraph references in this document refer to the draft document.

provide authorities with a better analytical basis for their decisions (...), their implementation and use should complement, not displace thorough substantive reasoning". **Assn_DE** requests that NRAs should collect the data for market analysis purposes.

BEREC Response 8

Indeed, BEREC agrees that information cannot substitute reasoning. However, according to BEREC's understanding, the task that BEREC is carrying out by delivering the draft GL refers to the information collection and its means and subjects, but not to explain how NRAs/OCAs may use or consider the GS information. For example, the information provided by the GS according to Article 64(3) EECC may also be taken into consideration for market analysis purposes, but NRAs should be the ones to decide about the relevance of the GS results when carrying out market analysis procedures and about the weight these results should have in their decision making.

2.3. Comments on Calendar of delivery of the Guidelines

Several respondents expressed concerns about the effect of the Very High Capacity Network Guidelines (VHCN GL) on these GL. **ETNO** and **ECTA** point out that the definition of what is a VHCN will have a great impact in the regulation. Therefore, **ECTA** calls BEREC to abstain to set any VHCN definition that can be reversed by the upcoming VHCN Guidelines and to clarify that no data collection will occur before the adoption of VHCN Guidelines to avoid reclassification. **TIM** believes that the GL should take place after the BEREC VHCN Guidelines are adopted. **ETNO** points at the fact that it is not possible to fully appreciate the scope and effects of the consulted GL since there is no information on the VHCN Guidelines at this stage.

The **Dutch operators** ask BEREC to clarify if phase 2 of the GL will be subject to a separate consultation. With the current state of the Guidelines, only the QoS-1 can be assessed. In the same vein, **Aracil**, **Simic** and **Mahönen** would prefer to have all the means of verification in these Phase 1 GL.

BEREC Response 9

The GL require operators to qualify their networks as VHCN or not, and to provide this qualification taking into consideration the forthcoming BEREC VHCN Guidelines and the VHCN definition included in Article 2 EECC. Therefore, to provide the VHCN qualifier in the context of an Article 22 survey, operators will need to assess whether they can provide a broadband service: (a) by a fixed network with a fibre roll out at least up to the address; (b) with a wireless network with a fibre roll out up to the base station; or in the absence of the conditions under a and b: c.) a fixed-line broadband connection that delivers at least certain QoS level thresholds under usual peak time conditions and d.) a wireless broadband connection that delivers at least certain QoS level thresholds under usual peak time conditions⁵. In the revised GL BEREC will extend the category of VHCN information to incorporate each of the 4 possible VHCN categories. These thresholds will be determined by

⁵ See Art 2, EECC.

the VHCN Guidelines and Article 2 EECC clearly determines that those will regard: uplink and downlink bandwidth, resilience, error-related parameters and latency and its variation. Therefore, operators that want to declare a VHCN network in an address or a grid will be expected to inform one of the four aforementioned conditions. Operators will be able to comment on the draft VHCN Guidelines as this will be for public consultation in the first quarter of 2020.

BEREC clarifies that the VHCN Guidelines will be approved before any data collection takes place in the context of Article 22. However, it would not be right for BEREC not to include in the GL the need to request VHCN information as the objective of promoting the widespread deployment and take-up of VHCNs is an objective for BEREC, the EC and MS as established by Article 3 EECC. Indeed, Article 22.2 and 22.3 are the cornerstone for this objective as they establish the identification of designated areas, this is areas where there is no VHCN and where it has been established that there is no known prospects of such deployment or of a deployment of a network or at least 100 Mbps download speed.

Considering the request for BEREC to provide already in phase 1, for each definition and data request, the means for its verification, whilst BEREC appreciates this comment, it is clear that this is not possible at this stage, since there is a further need to consult stakeholders on verification.

BEREC can confirm that there will be a separate consultation on the phase 2 GL tasks and directs **the Dutch operators** to the BEREC work programme for 2020.

3. Comments on the content of the Guidelines

3.1. Comments on Definitions

The definitions contained in section 2.1 of the GL have raised several criticisms as well as proposed changes by the respondents. Apart from the one-by-one analysis of each definition, BEREC has collected general comments about the definitions section. One of the contributors, **ECTA**, thinks that the whole section should be reviewed because many definitions contain fundamental unjustified policy positions. The **BMVI** states that the definitions are not always clear. And, they do not match with the common terminology used in Germany.

BEREC Response 10

BEREC is proposing definitions which are useful to understand and interpret the GL.

Regarding the different comments on the definitions not fully coinciding with the ones used in some MS, BEREC acknowledges that some definitions are new and may need to be accommodated in the different MS. However, BEREC has kept the definitions of address and buildings and premises passed as general as possible so that it would be easier for MS to adapt but still useful for harmonization purposes.

Comments on specific definitions:

Address:

From the **DEA** perspective, a building is not necessary to have an address. Thus, while the GL states that “**Address:** An address is an identification of the fixed location of a building or a group of buildings.....”, **DEA** suggests: “**Address:** An address is an identification of the fixed location, where there may exist one building or a group of buildings....”

BEREC Response 11

BEREC agrees with the comment received and will change the definition of “Address” as follows: “An address is an identification of a fixed location, where there may exist one building or a group of buildings (...)”

Broadband

KIKE and **PIKE** argue that only networks beyond 30 MBPS (or 100 Mmps in the future, according to **PIKE**) should be considered in the GS. **KIKE** adds that BEREC should not collect information on legacy networks. **The Dutch operators** consider that there is no need to provide information when a network delivers speeds beyond 100 Mbps.

BEREC Response 12

Despite the EC’s strategy on Connectivity for a European Gigabit Society only mentions high broadband speeds, Article 22 refers to a GS of the reach of electronic communications network capable of delivering broadband, a concept which includes basic broadband. Thus, the concept of basic broadband, according the EC⁶ include data rates of at least 2 Mbps.

Second, some of the regulatory functions mentioned in Article 22, require information about networks with download speeds that exceed 100 Mbps, for example the designation of areas described in Article 22 (2).

Finally, note that Article 22 of the EECR refers to broadband and makes no restrictions on the broadband data rates that can be delivered by electronic communication networks. Indeed, having information on the full range of data rates will enable to assess the real picture of the evolution of the reach of broadband network across Europe.

Address passed

BEREC should clarify whether there is a difference between “homes passed” and “address passed” (**the Dutch operators**)

BEREC Response 13

The concept of “homes passed” is not included in the GL. This concept could be a limited concept since, “homes” might be interpreted as just residential homes, excluding business addresses. Thus, in order to include all type of addresses, business and residential, BEREC decided to adopt the concept “premises passed”.

⁶ EC, [DESI Report 2018; Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society](#).

Premises passed

The four-week period in which one premise must be connected (in order to consider it passed) has raised several comments and change proposals by respondents. **Open Fiber** wants to make sure that any delay caused by the external factor is excluded from the period's count. **ECTA** considers that the four weeks period constitutes a key policy issue which has not been explicitly consulted. **TIM** suggests prolonging the time to connect from four weeks to three months. Similarly, **BMVIT** wants to prolong the connection period from four weeks to twelve weeks. On the other hand, **ETNO** wants to delete any reference to a maximum connection period to consider one premise passed.

FTTHc proposes to use the definition of homes passed set by the Fiber Council Global Alliance (FGCA). According to **FTTHc**, the FGCA definition is more objective and excludes the premises that cannot be connected without further installation of substantial fibre plant to reach the area in which a potential new subscriber is located.

Aracil, Simic and Mähönen also made an alternative write-up⁷ to the current definition to include more objective criteria within the definition, consistency checks and the idea that associated facilities to provide access to internet services are provided. According to these three consultants, the external factors leave room for 'interpretation' and can be used by operators to extend the 4 weeks deadline. **TIM**⁸ and **ETNO**⁹ also proposed alternative definitions for "premises passed".

The concept of "normal connection fees" has been heavily criticized. **ETNO** wonders what "additional or exceptional costs" means. For example, is the cost that the customer incurs for laying the introduction cable on his private domain (e.g. in the front garden) considered as an additional cost? Also, **ETNO** points out that the commercial conditions attached to this definition are out of purpose and NRAs cannot monitor these retail prices.

Finally, **Open Fiber** and **FTTHc** consider necessary a specific definition for "premises passed by fixed wireless access". **Open Fiber** argues that the "close proximity" concept cannot be applicable in the case of fixed wireless access. There is a basic architectural distinction between FWA and fixed networks, since the former is a wireless infrastructure whose resolution should be at least a 100mx100m grid (or equivalent polygon), while for the latter the

⁷ Proposed definition: "An operator may report a premise as passed only if, on request of an end-user, it commits to connect the end-user premises with electronic communications networks (as per article 2 (1) of PE-CONS 52/18) within normal connection fees, i.e. without any additional cost if it is the standard commercial practice and in any case not exceeding the usual cost in the country, which may be defined by the NRA/OCA. Additionally, all the associated facilities (as per article 2 (10) PE-CONS 52/18) to provide access (as per article 2, (27) of PE-CONS 52/18) to internet services (as per regulation 2015/2120, article 2) are already provided at the address level, up to the distribution point at the serving location. Furthermore, the operator must be able to technically connect the end-user usually in no more than 4 weeks from the date of the request."

⁸ Proposed definition: "An operator may report a premise as passed only if it has deployed the broadband network up to the boundaries of the private domain of the premise (i.e. the borderline between the public and private domain). In addition, the operator shall connect the premise not only with normal activation fees for the end user, but also without additional infrastructure deployment on behalf or with costs borne by the operator providing the retail service to the end user".

⁹ Proposed definition: "An operator may report a premise as passed only if it has deployed the broadband network up to the borderline of the private domain of the premise".

level of resolution should be the address (as it is properly defined by BEREC in the Draft at page 13).

BEREC Response 14

BEREC agrees that it would be appropriate for the premises passed definition to state what can and cannot be in place for a premise to be deemed 'passed', and that the definition should reflect that generally the broadband network should be up to the boundaries of the private domain of the premises.

Regarding the 4 weeks period to connect, BEREC considers that the exceptions included in footnote 10 in the GL already meet the concerns identified by stakeholders in their responses to the public consultation related to weather events or delays that are not under the control of operator. Also, BEREC considers indispensable to provide a time frame in the definitions so that the data collected from different operators is comparable and based on a common reference. BEREC has given a lot of consideration on what would be an adequate time frame for the definition, as the definition should first suit all Europe and second reflect the possibility for the end user to get a service on a "reasonable" time. BEREC considers that 4 weeks is a good choice in the latter respect and a reasonable compromise between the different positions provided by authorities in the several consultations. Regarding the concept of standard connection costs, these costs refers to the connection of a broadband access, which BEREC considers that is more closely reflected by a residential connection fee. However, every NRA may further qualify the concept of "normal" connection fee.

Regarding FWA access, since FWA networks differ structurally from other fixed ones, it would be necessary a specific definition for premises passed in case of FWA networks. Identification of premises passed considers that an existing network or network components are deployed in close proximity to the premises. The concept of 'close proximity' is not applicable in case of wireless connections.

Thus, BEREC proposes to change the definition as follows: A premise is considered passed if, on request from an end-user, the relevant operator can provide broadband services (regardless of whether these premises are already connected or not connected to the network) at the end-user premises. The provision of broadband services at the end users premises should not exceed normal connection fees, i.e. without any additional or exceptional cost if it is the standard commercial practice and, in any case, not exceeding the usual cost in the country. The reference for "normal connection fees" should be determined by the relevant NRA/OCA. Furthermore, the operator must be able to technically connect¹⁰ the end user, usually within 4 weeks from the date of the request.

BEREC notes generally, for a premise to be passed, the broadband network must be deployed up to the boundaries of the private domain of the address (i.e. the borderline between the public and private domain)"

¹⁰ This four-week period does not take into account delays due to external, non-technical factors, such as delays from the end user side, delays arising from operator administrative reasons, or delays due to extreme weather conditions).

BEREC also acknowledges that FWA networks differ structurally from fixed networks and thus, a new specification for addresses passed with FWA will be added to the definition. “A given address is passed when there is an existing access point (typically the mast with antenna) nearby, typically with direct visibility to the end-user location and that a potential commercial offer can be accessible for end-users”.

Reach of Fixed Broadband Networks

According to **TIM**, the definition should only refer to the premises that need a broadband connection (excluding i.e. cemeteries or abandoned houses). **ETNO** believes that the definition should refer to premises and not to addresses to give a more accurate picture of the effective reach of a fixed network (especially in urban areas).

BEREC Response 15

BEREC considers that although in a few occasions, for some addresses there may be no end-user present, it would be very difficult to identify these addresses so as to exclude from the data collection. Moreover, a building with no users may well be occupied in the future.

Regarding coverage calculation, it should be noted that for fixed networks and grid level information the GL will allow the calculation of coverage percentages in terms of premises. Yet, when information is obtained at an address level and there is no information provided on premises passed in each address, the NRAs/OCAs will need to assume that all the premises in the address are covered to perform the coverage calculation.

Reach of Mobile Broadband Networks

Aracil, Simic and Mähönen propose an alternative write-up¹¹ of the current definition by explicitly defining “availability” in terms of coverage and/or capabilities (e.g. average/min/max DL/UL speed) of the mobile broadband service delivered.

BEREC Response 16

BEREC acknowledges the comment but considers that the current definition of reach of mobile broadband networks is adequate in the context of these GL. This definition aligns with the EC glossary definition of basic broadband, (where broadband is defined on the being 2 Mbps).

Maximum available speed

TIM finds it difficult for operators to calculate the maximum speed reached by end user because it is affected by alien factors to operators such as the CPE or the domestic private network. **DEA** sees little relevance of maximum available speeds and finds unclear the notion of “at least some of the time”. However, **DEA** adds that even with a clear definition, it is difficult to find relevance for such figure.

¹¹ Proposed definition: “The reach of mobile broadband is the availability of a mobile broadband network that permits the delivery of a broadband service of a given speed class (and other relevant network performance parameters) with a specific mobile technology available at a specific location.”

DEA, Aracil, Simic and Mähönen and **TIM** would prefer a definition that refers to the potential maximum speed that a network can provide (and not based on the end-user experience). Additionally, **DEA**¹² and **TIM**¹³ have provided alternative definitions.

Aracil, Simic and Mähönen consider the definition and the concept “some of the time” not precise enough. For this reason, they propose an alternative write-up¹⁴. Additionally, they also propose to include a new definition to this section: the minimum speed: “the minimum speed is the lowest speed that is delivered to the end-user, according to the service delivery contract. In principle, the actual speed should not be lower than the minimum speed at any time, except in cases of service interruption”.

BEREC Response 17

BEREC has considered the comments and clarifies that the maximum speed concept is a theoretical concept, reflective of the capability of the network under optimal environment conditions. Yet, these optimal conditions must be realistic and that is why the definition has a consideration that end users should be able to achieve this speed (even if for a very small period of time or “some period of time”).

In BEREC’s views it may be confusing to refer to a “maximum” speed in peak time conditions, precisely where traffic is congested, and would rather relate this maximum achievable to optimal conditions. Moreover, BEREC will propose a new speed definition (see BEREC response 18) which will be reflective of peak time conditions.

Regarding minimal speeds BEREC considers disproportionate to request information on minimal speeds to operators (and therefore, to define this concept). The reason is that this information is not relevant to inform on the capability of a network. Rather it is a concept that may relate to the contract between the end user and the provider and that will change whenever the contract changes, therefore beyond the scope of Article 22. Moreover, a premise does not need to be connected (i.e. have a contract) to be considered as passed.

Normally available speed

The normal available speed definition has also received several change proposals and comments among the respondents. **Vodafone** and **Assn_DE** indicate that BEREC has gone too far setting a specific percentage threshold (95%) in the definition. In the same vein, **Assn_DE** proposes to make the information about the normally available speed optional. Furthermore, **Assn_DE** warns that the operators are not collecting this data nowadays.

¹² Proposed definition: “The maximum speed is the maximum speed that an end user is theoretically able to reach (not by chance) at a certain address/grid, considering the technology used could expect to receive at least some of the time (e.g. at least once a day). The parameters should describe the capability of the network elements. Limitations of the end user QoS caused by the CPE should not be taken into account.”

¹³ Proposed definition: “...potential speeds on existing infrastructure that will be accessible within a limited effort (for example for a small cost for digging, new equipment etc.)”.

¹⁴ Proposed definition: “The maximum speed is the speed that an end-user in the address/grid could expect to receive at least some of the time under usual peak-time conditions. The parameters should describe the capability of network and not the parameter of service.”

Vodafone and **Assn_DE** have proposed an alternative definition that does not mention any specific percentage¹⁵ changing the current wording "...95% of the time over the whole day..." for "...most of the time..." **Forzati** advocates to change the definition from the current wording "...expect to receive 95% of the time over the whole day..." to "...expect to receive 95% of the time over each given hour of the day and the year..." to prevent the avoiding of peak hours.

In general, **KIKE**, **PIKE**, **BMVI**, **CETIN** and **TIM** disagree with the concept "normal speed" because this concept is affected by factors which are not in the control of the operator. According to **CETIN**, it is not possible to report normal speed for a wholesale provider as this depends on network elements outside the wholesale service.

BEREC Response 18

BEREC considers that to complement the maximum speed definition, it is necessary to collect data on a speed definition that relates to the quality of the broadband service that consumers can expect to get in different locations and therefore be reflective of the demand in different zones (as zones vary according to their broadband needs).

In this respect, BEREC finds suitable to provide a definition as suggested by **Aracil**, **Simic and Mähönen** which focusses on peak time conditions and considers the advantages of this reference: (i). the definition reflects demand needs (at peak times, this is when most consumers may experience problems in their broadband service performance), (ii). the definition overcomes the problem pointed at by several respondents in the "normal speed" definition of "avoiding" peak times. (iii). the speed information in peak time would be related to investment needs, (iv.) relevant to the identification of VHCN served areas, and also (v) useful to end consumers, who care about peak time¹⁶. Finally, by referring to peak time, there is more certainty in the environment under which the speed information should be calculated by operators (as opposed to "the whole day" as initially proposed), which makes for more reliable calculations.

On the other side, BEREC would like to avoid the reference to "maximum speed" in peak time conditions, and would rather favour speed information values which would not reflect extremes but rather what users may normally expect in these circumstances. Referring to normal expectations rather than extreme values will also facilitate the verification of data.

Because of all of this, BEREC will substitute the normal speed definition with the following:

Expected peak time speed. The expected peak time speed is the speed that an end-user in the address/grid could expect to receive when using a broadband service under the whole peak-time period. The speed should describe the actual capability of network and not be related to any particular retail service offered at the address/grid.

¹⁵ Proposed definition: "Normally available speed: The normally available speed is the speed that (1) an end user in the address/grid could expect to receive most of the time over the whole day when accessing the service or (2) a reasonable proportion to the maximum speed. The parameters should describe the capability of network."

¹⁶ But since end users may have other informational needs, it is possible that NRAs/OCA's prefer to use other indicators to provide additional information to end consumers.

“Peak time” will not be defined by BEREC in these GL, as peak time may vary, for example among networks and areas. NRAs should (if they find this necessary) provide guidance on this aspect.

It should be noted that the expected peak time speed is a QoS-1 requirement, which is unrelated to any commercial conditions offered by operators, but rather should reflect the capability of the network. Because of this, in principle, BEREC does not see why such estimates cannot be obtained by wholesale providers who control access networks. NRAs/OCAs should evaluate if the information that wholesalers can produce is of sufficient quality.

Responses to Question 1.

Question 1

In BEREC’s current Public Consultation on the implementation of the Open Internet Regulation (paragraph 140), BEREC is requiring that the speed values required by Article 4(1) (d) of the Regulation EU 2015/2020¹⁷ should be specified on the transport layer protocol payload, and not based on a lower layer protocol. Is there any reason why this layer should not be used in proving information about speeds in the context of a GS of Broadband reach?

ETNO, **GSMA**, **Vodafone**¹⁸, **BMVI** **ECTA**, the **Irish Department** and **Aracil**, **Simic** and **Mähönen** show their support for the use of the transport layer protocol payload. However, these answers were referring to measurements and not to QoS-1 calculations. Some of these respondents have mentioned some nuances in their stance.

Although **ETNO** supports the use of the transport layer (along with the IP packet payload), **ETNO** notes that the application layer captures better the end-user perception than the transport layer. The **GSMA** and **Vodafone** make the same comment about the application layer.

Even though **ECTA** approves the use of transport layer protocol, **ECTA** regrets the removal of the of Layer 3 measurements from the suite of possible options as well as the removal of the speeds specifications based on IP packet payload measurements. More generally, **ECTA** considers the question of alignment between the different sets of Guidelines as principally hypothetical in nature, as the mandate under Article 22(7) EECC does not extend to the conduct of actual measurements.

Aracil, **Simic** and **Mähönen** state that collecting data from lower layer speeds a part from the transport layer could provide highly valuable complementary data. They note that the transport

¹⁷ Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open internet access and retail charges for regulated intra-EU communications and amending Directive 2002/22/EC and Regulation (EU) No 531/2012, <https://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=CELEX:02015R2120-20181220> .

¹⁸ Vodafone welcomes the clarification made by BEREC where is clear that transport layer protocol payload has the same meaning as the prevalent term, namely “Transmission Control Protocol (TCP)”.

layer QoS-1 calculation would require some extra assumptions and is not as straightforward as lower level capabilities estimation.

On the other side, **some contributions** support the use of other layers to provide information about speeds. **One** defends the use of the radio layer for the mapping of the coverage (QoS-1). In its view, the transport layer varies according to the protocol. Additionally, it is difficult to model. **Another contribution** defends the use of the physical layer (equivalent to radio layer, in mobile) because the transport layer is affected by the end user equipment.

Open Fiber and **FTTHc** note that differentiated wholesale models may lead to different speeds on the transport layer for the same physical network at the same address. Both contributors state that with unbundled optical fiber lines and layer 2 bitstream access models (based on Ethernet) lower layer protocols should be used to reduce unnecessary and /or conflicting data sets and to obtain a common ground. For this reason, **Open Fiber** requires an explanation about which kind of protocol of transport layer is mentioned in the Question 1.

The **Dutch operators** indicate that the distinction between transport layer and lower layers is unclear. According to them, BEREC should refer to the OSI model as in the new Open Internet Regulation Guidelines.

BEREC Response 19

Most comments agree with the BEREC proposal to use the transport layer protocol payload in providing information about speeds in the context of the Art 22 GS, but some would appreciate that lower levels would be proposed, for example, the IP packet payload layer or the physical layer in the mobile case.

BEREC's main consideration regarding speed layers is that the GS results must provide sufficient and coherent information to designate areas as per Article 22 (2). This implies that the requirements underlying the new VHCN classes and the speed classes in Annex 2 (especially, the reference to the 100 Mbps threshold) should be the same. Therefore, the layer where speeds need to be calculated in order to deliver a speed class declaration should be the layer indicated in the VHCN Guidelines. Thus, BEREC suggests to calculate speed based on the IP packet payload layer (network layer)¹⁹

The IP packet payload layer is considered suitable because nowadays nearly all data communications networks are based on the Internet Protocol (IP) and also because there is no need to choose among different protocols that affect speeds (in contrast to the transport layer or the application layer).

¹⁹ This layer shall be the layer indicated in the VHCN Guidelines. Thus, in case the final VHCN guidelines consider a different layer, the later should also be considered for the purpose of speed calculations under these Guidelines.

In general, in common fixed connections, the use Level-3 (network) vs Level-4 (transport) for the estimation of (access network) speed may be assumed as equivalent due to the limited impact of packet loss and retransmissions caused by “round trip-time”. In most circumstances, the choice among these two layers, should have limited impact on the classification of one address/grid in one speed class or another²⁰.

Finally, BEREC warns that comparisons of QoS-1 estimations with effective QoS-2 and QoS-3 measurements (usually made in transport layer) as well as estimations in case wireless links has to carefully consider that packet loss and round-trip time that heavily affect the transport protocol (in particular limiting the throughput of TCP connections²¹).

3.2. Comments on Data sources

Section 2.2 of the GL identifies the sources of information for the GS. **TIM** agrees with the obligation for all operators, including the smaller ones, of providing information that NRAs/OCAs. Yet, **ECTA** is afraid that the GL approach would result in imposing undue administrative burdens on smaller operators that weigh disproportionately and may negatively affect competition. Moreover, if it is decided not to publish small operator information, then the data collection would yield no benefit in terms of end-users being able to discover the smaller/challenger operators’ presence at the location of interest.

ECTA proposes that BEREC revises paragraph 36 in the draft GL to introduce a clear hierarchical order of data gathering by NRAs/OCAs so that first information is retrieved from NRAs/OCAs knowledge, then from public sources of information and third party information. After, from SMP operators in broadband markets, then from operators who self-provide or provide to companies taking wholesale network access and, finally, as a last resort, from wholesale access takers whose network/service reach is determined by wholesale offers. **ECTA** encourages BEREC to adopt such prioritised data gathering to evade unnecessary data duplication and associated inefficiencies.

BEREC Response 20

First of all, BEREC wants to clarify that the obligation is for operators who can control any part of the access network (see Art 2.16, 2.27 and 2.29). Moreover, the requirement also excludes mobile operators that do not hold spectrum rights.

It must be also noted costs will be borne by operators and also by the public authorities requesting the information as they will need to provide the resources to collect and manage information. Some MS have several hundred fixed broadband operators, most of which are

²⁰ Indeed according page 9 of BoR (17) 178, BEREC’s Net Neutrality Regulatory Assessment Methodology the differences in measured speeds resulting from the 2 considerations are really small. However, for some technologies this choice is not innocuous and could lead to different download class declarations. For example, FWA 150 Mbit/s would fall in a range between 100-300 if measured at IP level and in range 30-100 if measured at TCP/transport layer.

²¹ See for reference, Mathis, Semke, Mahdavi & Ott (Computer Communication Review, 27(3), July 1997).²² *EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks (2013/C 25/01)*

very small. In the case of mobile broadband the number of operators that would have to provide information in each MS are much smaller and in most cases these are large operators present in several European MS. Therefore, BEREC understands ECTA's concern regarding the costs of compliance of the smallest operators in Europe in the case of fixed broadband. Because of this, in preparing these GL, BEREC has carefully considered their proportionality.

Having said this, to provide for a complete map of the fixed broadband network reach, it is necessary to gather information in all areas, and this implies consulting all the operators with access networks. The contrary would mean that for some areas, there may be no information. However, NRAs may want to ease the compliance costs for some of the small fixed broadband network operators, considering that where a wholesale access exists and the information that could be provided by wholesalers would be sufficient and good, to release access seekers from the obligation to provide such information.

Regarding ECTA's comment on a hierarchical approach, it is clear to BEREC that many of the information needed in the context of Article 22 can only be provided by operators. Where information may be provided by public authorities or NRAs/OCAs this has already been recognised by the draft GL that require public authorities to compile the address databases or identify some special buildings (schools, hospitals, highly digitalized industries, etc). Regarding the hierarchy among different types of operators, it should be noted first that the map should be complete, and some areas may be served only by small operators. Therefore, BEREC does not see how to avoid information requests to the different types of operators when they self-supply. Moreover, requiring for information at different stages according to a pre-defined hierarchy may be quite cumbersome for NRAs/OCAs. In the case of wholesale access operators, BEREC refers to the previous paragraph.

3.3. Comments on geographical spatial resolution of data

Fixed networks

ECTA, the Dutch operators, Fastweb, BMVIT and Liberty Global disagree with the level of resolution for fixed networks: the address. According to **Fastweb** and **ECTA**, there is no justification to determine this high level of resolution. And, therefore, this decision goes beyond the scope of the EECC. **Liberty Global** questions it for legacy networks. The **Dutch operators** state that the GL should provide for more national flexibility to be proportionate and appropriate, **Liberty Global** supports the proposal of allowing MS to use grids instead of addresses temporarily and would support that solutions would be considered by MS to alleviate the cost of compliance to operators.

The **Dutch operators** explain that for the application of state aid rules or to designate an area it is not necessary to request data at address level or at 100x100 grid resolution. This level of detail may be proportionate only to comply with Article 22(6) of the Code, if the relevant information is not available on the market.

Proximus explains that it is too difficult to map addresses in a grid box of 100 x 100 m.

BMVIT points out that Austria, currently, is using 100 meters grid for collecting this information. And, they would like to keep it as it stands. **BMVIT** adds that Austria is not collecting information about non-residential premises such as hospitals or major transport hubs. So, **BMVIT** suggests **BEREC** launch a toolkit to gather this additional information in the future.

BMVI, **Linkem** and **TIM** express their support to the level of resolution set in the GL. **Linkem** agrees that a high resolution is necessary for most of the regulatory and policy functions that the GS is intended to provide information for and that criteria must be homogeneous within all MS.

The transition period when fixed operators can report information at 100x100 meters resolution (instead of the address) has raised some comments. **Aracil**, **Simic** and **Mähönen** would like to set an explicit deadline for this transitional period: they propose to allow this interim level of resolution until 2025. **BMVI** considers the exact address data as imperative and does not support a transition period of 100m x 100m for fixed networks, as this would not include any added value compared to a current resolution of 250m x 250m. According to **BMVI**, this will solely produce unjustified additional expenditures. Especially with view to funding purposes an address based resolution is required.

Finally, **DEA** suggests to write only “digitalized businesses” and not “highly digitalized businesses” in paragraph 32.

BEREC Response 21

BEREC notes the comments and presents the following arguments to support its views:

First, in the context of GL, in 2019, **BEREC** consulted NRAs and OCAs on the importance of survey characteristics and indicators, according to the different functions referenced in Article 22 EECC. For fixed broadband, the key characteristic “a high resolution of data” was considered mandatory or important for many functions and in many MS.

- i) Specifically, QoS data provides the highest added value for all user groups when data is collected on the most detailed level as possible, which is “address”, thus coarse estimates are avoided and, furthermore, data can be aggregated in an easy and unproblematic way providing better estimations in “larger areas”.
- ii) However, in order to reach a minimum common level of data quality, QoS initiatives should aim at reaching at least temporarily a level of detail of up to “100mx100m grid”. In this case, if a “100mx100m grid” is chosen by the NRAs rather than “address”, then it is doable for the NRAs to map addresses in the grid box if address information is available.

Secondly, in the 3rd Plenary of 2019, the BoR approved the Draft GL for public consultation with the agreement of all NRAs and with no objections on the high resolution necessary to collect the data. The EC has also explained that a good resolution is indispensable for the carrying out of several tasks such as the monitoring and establishment of broadband objectives or the decision-making on the funding of broadband networks. Therefore, there is a broad agreement among European public authorities that address level data is an indispensable characteristic of the Article 22 Broadband GS.

Thirdly, because of the reason mentioned in i), address data information is also necessary to identify the precise boundaries of areas where there exists no VHCN deployment, therefore improving the identification of “designated areas”.

Finally, the *EU State Aid Guidelines*²² paragraph (78) requires a “Detailed mapping and analysis of coverage” and footnote 92 establishes that such “mapping should be done on the basis of homes passed by a particular network infrastructure (...)”.

- This concept is key in view of the need to prevent overbuilding of existing infrastructures, thus for state aid purposes a level of granularity at address level is required.
- Sometimes low-resolution data provided by the government for State Aid purposes could raise questions from operators or regional authorities making the cases difficult and litigious.
- Furthermore, there are special difficulties determining the different types of white, grey and black areas as well as the fulfilment of the requirement of step change which often prompt the need to have very good resolution. For example, in those cases where the intervention area is totally, or partially covered by one or more NGA networks (grey or black NGA areas), an address-level mapping and investment forecast is always essential to underpin any analysis of an eventual public intervention for the deployment of a very high capacity network.

Regarding **PROXIMUS** comment, it needs to be noted that according to GL operators are not requested to map addresses in a grid, but to provide estimates of premises passed in each grid when a grid base approach is used.

BEREC recognises that the length of the transitional period is not established in the GL. BEREC considers that at this stage it is not possible to establish an end date for this period, since addressing resources do not exist in several countries and establishing those requires time. However, in BEREC’s view in the future it will be necessary to examine how different MS have transposed and enabled the Article 22 provisions and then consider the need to revise and update GL. In that context BEREC will consider the need to extend or end the transitional period. Therefore, BEREC will be introducing in the GL text the provision of an Implementation Report that will enable the consideration of the revision of GL.

Finally, BEREC notes that the “highly digitised businesses”, is the terminology used as a connectivity target in 2020 in the related EC Communication²³ and also in recital (24) of the EECC, where the objectives of the EC strategy on Connectivity for a Competitive Digital Single Market are underlined.

Fixed Wireless Access (FWA)

Aracil, Simic and Mähönen consider that FWA networks should be treated in the same way as the mobile networks. According to **Aracil, Simic and Mähönen**, tethered connections

²² *EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks (2013/C 25/01)*

²³ Towards a European gigabit society Connectivity targets and 5G.

(cable, fiber) are very predictable and the medium is not dynamic. In wireless, even in the case of FWA the medium is highly dynamic and is load dependent.

Linkem agrees that the level of resolution should be the 100x 100 m grid, and requests BEREC to include a specific view for fixed wireless access operators.

BEREC Response 22

With regards to the basic architectural distinction between FWA and fixed networks, BEREC notes that the former is a wireless infrastructure that provides the service on a relatively small area that can be represented by a 100mx100m grid (or equivalent polygon), while for the latter the level of resolution should be the address. While fixed broadband networks present accurate information at the address level with exact geocoding, for wireless broadband networks data could be collected at a grid scale, as one wireless access point deals with a group of points in a certain area (thus, the parameter of close proximity is technically unsustainable). Address level resolution may also be used, and is quite relevant for specific FWA applications (e.g. the case of point to point radio connection).

Thus, BEREC is considering the comment on the resolution for FWA and will make it optional for NRAs whether they want to collect the data at the level of “address” or (at least) “100mx100m grids”.

Address Database

ETNO welcomes the introduction of paragraph 47, where BEREC encourages NRAs/OCAs to check the operator’s address databases with the NRAs/OCAs’ databases. **Proximus** also welcomes this paragraph but urges BEREC to develop the necessary know-how. Unlike **ETNO** and **Proximus**, another contribution would delete this paragraph.

Although **BMVI** would appreciate the possibility to have a unique database, it nowadays seems impossible to develop this as there is no common database on addresses to work with.

In **DEA**’s experience it could be handy to split the address into different fields, e.g. street name, number, zip code etc.

Finally, two comments relate to the provision of information in the address and grid database. **Fastweb** defends that operators should not be expected to provide information on the number of dwellings in a 100 x 100 area or each street number. **ETNO** warns that most operators do not have information about public service buildings located at specific addresses.

BEREC Response 23

Despite this being the ideal situation BEREC acknowledges the difficulties in using a unique address data base in many MS, and because of this BEREC is only recommending this and accepting other alternatives. The combination of different operator data bases requires know how that should be developed nationally because of national specificities. In the future, in the context of the Implementation Report, BEREC will consider whether to further elaborate on this.

BEREC will include in the GL a reference to the splitting of the address into different fields.

Finally, paragraph 46 explains that the address database is to be compiled by the NRA/OCA. Operators should not be expected to collect this information, yet if they know this information, NRAs/OCAs could consult them in order to complete the database. Footnote 32 in the revised GL clarifies this.

Mobile networks

Proximus, Fastweb, Liberty Global, and the Dutch operators do not agree with the 100x100 meters grid as the level of resolution for the mobile networks. These respondents find this level of resolution too precise.

The Dutch operators argue that grids are not the proper tool for data aggregation because MNOs have different cells with different technical characteristics. Also, they ask to make the performance indicators optional if there is a license coverage requirement or other reporting mechanisms.

Linkem and **TIM** agree with the GL resolution proposal. **DEA** does not disagree with the proposal but asks for clarification of the concept “at least 100m x 100m” because it is ambiguous.

BEREC Response 24

BEREC notes the point raised about the 100x100 meters grid being a level of resolution too precise for mobile networks. Yet, in some countries the level of resolution is already at a 100x100 meters grid, and even sometimes at a 20x20 meters grid, thus it would be beneficial to reach some level of harmonisation. Moreover, this is the recommended level of resolution in the BEREC Common Position on Information to Consumers on mobile coverage²⁴

BEREC agrees with the ambiguity of the concept “at least 100x100 meters”. It should be clarified that “at least” means “100x100 meters or lower”, so as not to prevent any MS from being more precise.

3.4. Elements of characterization of network connectivity or services

3.4.1 Fixed broadband

Technology and VHCN information

ETNO defends that, if an address has access to more than one technology for one operator, it suffices that the operator provides information on the most recent (future-proof) technology.

²⁴ BoR (18) 237

FTTHc disagrees with the BEREC stance of setting the VHCN on a boolean basis. According to the **FTTHc**, BEREC could opt for a boolean response if it is measuring whether the network is FTTH or FTTB, but in other cases they would favor collecting data, at least in a QOS-1 form, about latency, jitter and other errors parameters, at least using stylised considerations. Moreover, the **FTTHc** advocates for a differentiation between VHCNs and networks with one-dimensional upgrades to 100mbps download speeds to comply with Article 3 of the EECC.

BEREC Response 25

First, even if there are multiple technology available at one address, providing data for only the most recent one would not be sufficient for Article 22 requirements.

Second, as explained in BEREC Response 9, BEREC will enrich the collection of VHCN declarations by considering 4 situations that reflect the diversity of VHCN networks: i) there is fiber roll out at least to the address (relevant for fixed-line), (ii) there is fiber roll out up to the base station (relevant for mobile and FWA), (iii) there is no fiber to the address yet fixed-line performance thresholds as included in criterion 3 in the BEREC VHCN Guidelines are satisfied (relevant for fixed-line and FWA) and (iv), there is no fiber to the station, yet wireless performance thresholds as included in criterion 4 in the BEREC VHCN Guidelines are satisfied (relevant for mobile and FWA). It should be noted that in cases (iii) and (iv) a declaration that an address is covered by a VHCN network will imply that all of the performance thresholds for peak time conditions are satisfied in that address or grid as required by the VHCN Guidelines.

In particular, for FWA, if all the criterion 3 performance thresholds in the VHCN Guidelines are satisfied (as per class 3 in Table 1 of the GL), then the operator shall inform class 3 rather than class 4 or 2 (even if those are satisfied). It should be clear that, only in this case, FWA may be considered equivalent to a 'fixed very high capacity network'.

Third, the VHCN information required would identify addresses/grids that would be differentiated from any address/grid that does not satisfy those requirements (for example, addresses or grids covered by a network offering broadband services of 100 mbps).

Speeds

CETIN and **APKT** defend that only one value should be reported according to the EU 2015/2120 regulation.

ETNO considers that the traditional networks must be exempt from the speed-reporting obligations if there is an ongoing deployment of a VHCN or an active copper switch-off process is in place. **ETNO** explains how difficult is gathering the speed data for legacy networks and suggests using commercial side indicators such as Akamai, Ookla, etc; yet **ETNO** points out these indicators are not very reliable.

KIKE and **PIKE** point out that speed indicators reflect consumer usage and cannot be collected without end user consent.

DEA defends the collection of absolute speeds instead of collecting data in the suggested speed classes. According to **DEA**, this would allow granular analyses. Additionally, with the absolute speeds approach, it is possible to scale the speeds upwards.

ECTA explains that reporting upload and download speeds in different columns may not reflect commercial reality as commercial packages are typically marketed as combinations of different upload and download speed values.

Finally, **ETNO** considers that if BEREC would issue recommendations on the methods for calculating speed information of fixed networks in the future, as foreseen in paragraph 58, it should consider the specific technology types (see Table 1 [of the draft GL]) and the different implementations at the different operators.

BEREC Response 26

BEREC will consider that the maximum achievable and the expected peak-time speed (see definition section) are required in the case of fixed networks. Article 22 is an ambitious article, meaning to provide information for many functions. For example, the maximum achievable speed information, relates to the potential performance of the network, and to the traditional concept of coverage, and is useful in the context of national broadband plans. The expected peak-time speed information relates to VHCN networks, which are at the core of Article 22 and would also be useful to inform end consumers. Both speed definitions are necessary to identify areas with market failure.

Regarding the costs of providing two different kinds of speed information, BEREC wants to note that the GL do not limit the methodologies an operator can use to provide the speed information, that there is no need to update this information in a frequent way, and that reasonable assumptions can be made to provide the speed information as far as those are acceptable to NRAs/OCAs. See footnote 38 in the revised Guidelines.

In BEREC's view any operator who can control any part of the access network (including wholesalers) should be able to provide maximum speeds and the expected speeds. Speeds are not referred to specific commercial offers but to the capacity of the network

All operators and technologies should provide information on speed, there is no reason at this stage to exclude legacy networks as those are relevant in many MS and for many end-users.

BEREC disagrees that these QoS-1 speed indicators cannot be collected without end user consent. These are calculations to be undertaken by operators.

BEREC recognizes the benefits in collecting absolute speed values, but favors speed categories to alleviate the difficulties in the provision of information by operators.

BEREC notes that the speed declarations should reflect network performance under optimal demand conditions (maximum speed) and worst demand conditions (peak time) and are not related to existing commercial offers.

FWA

Aracil, Simic and **Mähönen** point out that FWA services should not be counted as fixed broadband.

Regarding the FWA networks, **BMVI** asks for a clear distinction between 4G and 5G services and the services provided with WiMax, WLAN and radio link.

EOLO considers that the FWA definition should be further clarified by specifying that the FWA network is a fixed access network with dedicated equipment²⁵ and usage of dedicated frequency spectrum band (above 3.4-GHz) not used to provide mobile services. According to **EOLO**, this point is not reflected in Table 1 as the concept used there is “FWA in licensed spectrum (for example Wimax, 4G, 5G)”. **LINKEM** requests BEREC to provide a specific view for FWA networks addressing in particular high capacity networks operating with licensed spectrum and standard technology.

BEREC Response 27

BEREC recognizes that FWA architecture is different than fixed due to the intrinsic characteristics of wireless connectivity. As a consequence, some specificities have been introduced in the GL (see BEREC Response 14 and BEREC Response 22).

End-users traditionally consider FWA as a substitute of “traditional” fixed line solutions as end-users are receiving similar services over FWA infrastructure (using the same end-user equipment (terminals) as for “traditional” fixed access). In line with technological neutrality principle, fixed and FWA architectures can both be used for the provision of fixed services.

Moreover, NRAs/OCAs tend to include in their GS, FWA infrastructure into fixed broadband rather than mobile broadband (where the mobile broadband infrastructure should be protected, promoted, etc. in quite different way). BEREC notes that in many national tenders carried out in MS, fixed and FWA have been considered as distinct to mobile, as two different types of networks capable of responding to different needs.

The FWA infrastructure uses the same backhaul and backbone infrastructure as other fixed infrastructures, only the “last mile” is different (wireless local loop). The provision of service in such “last mile” can be supported by using either licensed or unlicensed spectrum. The FWA with licensed spectrum (P2P direct connection but probably also fixed LTE) usually provides access with better quality because there is no (or very low) interference, while the FWA with unlicensed (free) spectrum (typically, Wi-Fi) provides lower quality access which can be significantly cheaper for the end-users.

²⁵ EOLO suggests BEREC to follow the AGCOM's definition of the FWA architecture set in the provision 292/18/CONS. This definition is based on four characteristics: (1) the fact that fiber and/or other backhauling technologies reaches a base radio station and (2) the user equipment is connected to the base radio station by using a specific radio frequency range. About the dedicated frequencies, (3) it does not have to be managed customer mobility (it can lead to performance degradation) and (4) radio base station bandwidth is shared by a fixed number of customers, set out in advance.

BEREC notes that it not necessary to specify additional classes of licensed spectrum because such information is implicitly included in provided definitions as it is required to ensure that the “expected speed” falls within the speed classes defined in this GL. Thus, BEREC does not further specify spectrum band as well as the type of technology (e.g. 4G vs 5G). Moreover, NRAs/OCAs may include more classes in Table 1 if they find this necessary, in so far they are able to group them in the classes promoted by BEREC.

Finally, BEREC maintains a separation between specialized architectures and service perspective and to ensure any reasonable GIS post elaboration that could make possible the merging of information coming from fixed and FWA architectures, BEREC establishes that the same speed classes defined for fixed also apply also to FWA.

RESPONSES TO QUESTION 2

Question 2

BEREC has considered several methods to calculate speed information according to the relevant fixed network. The development of these methods often requires information on the position of network infrastructure (for example, collecting the distance to the street cabinet or the switching centre). Do you consider information on location of infrastructures strictly required for the purpose of Article 22? If so, what is the minimum information level related to network infrastructure that the Geographic Survey should collect and why?

Most of the respondents (**ETNO, CETIN, KIKE, DEA, the Dutch operators, PIKE, BMVIT, BMVI, TIM, TI, and Assn_DE**) don’t agree with the inclusion of information about the location network infrastructure. They consider this irrelevant for the purpose of Article 22 EEC.

ETNO, CETIN and **Assn_DE** remind that the purpose of the GSs is capturing the broadband’s reach and not the broadband’s network information. In addition, **ETNO** and **TIM** consider that the information on the location of the infrastructure should be treated as confidential, if BEREC decides to collect it.

BMVIT and **DEA** raise the specific case of their countries, Austria and Denmark, where the NRAs are currently gathering data over broadband’s speeds. Both of respondents would like to allow NRAs to stick with their current methodologies as they do not see any reason to change them.

Overall, **DEA, Assn_DE, ETNO** and **TIM** request BEREC to rely on reported speeds by operators without the need to provide any information about the location of the infrastructure. Nonetheless, **TIM** wants standardized rules for all operators within one country for the estimation of the maximum speeds.

Some other respondents (**ECTA, Vodafone, BMVI** and another contribution) consider the option to include information about network infrastructure (not specifically the location) only for some specific type of networks, especially for legacy copper networks. **ECTA**, considers that physical information about networks where distance-based attenuation is relevant might be collected. **Vodafone** also considers that the infrastructure information could be relevant only for copper networks. **BMVI** points out that the length of copper lines could be useful for verification purposes.

Additionally, **ECTA** recalls the existence of the Single Information Point where BEREC and NRAs can retrieve all the infrastructure-related information. So, **ECTA** urges BEREC to rely on existing data sources.

FTTHc and **Vodafone** defend to exclude specifically the fiber networks (also HFC networks, in the case of **Vodafone**) from any infrastructure information requirement. In their view, if there is no attenuation, the information about infrastructure is irrelevant.

Open Fiber and **Aracil, Simic** and **Mähönen** advocate to collect information about infrastructure. On the one hand, **Open Fiber** considers the distance between the end user and the exchange the best parameter to get the actual speeds, especially for copper services such as ADSL and VDSL. On the other, **Aracil, Simic** and **Mähönen** think that, at least, the closest active node from the operator should be required to the operators. This data would help NRAs to verify the reported bandwidth as well as provide for the identification of isolated households. Similarly, in the case of wireless systems the distance to the closest base stations or access points provides very valuable information for verification purposes.

The **Irish Department** does not consider the information about infrastructure's location strictly necessary, but expresses that information about infrastructure²⁶ is needed to validate the coverage and performance information submitted by operators.

BEREC Response 28

In accordance with most answers and its initial position, the GL will not require that network infrastructure location is collected to characterize the network. However, NRAs/OCAs who perform QoS-1 coverage and performance calculations may legitimately request information about the characteristics of infrastructures and their positions (or distances from any address to a network element). This happens more commonly for mobile, but may also occur in a fixed broadband context, for example, where there is a passive fiber network, where the optical line termination point is not at the address and distances may be collected.

BEREC agrees that (for all technologies using copper and FWA) the length of the last mile²⁷ might be important for NRAs/OCAs to verify the data provided by operators and to check the consistency of the operator's speed declarations. This "distance information" is far less sensitive as it does not require the disclosure of network element positions.

BEREC will consider the suitability and proportionality of the distance information in phase 2, in the context of the variety of verification checks that can be carried out by NRAs/OCAs and their needs to verify. To ensure a harmonized data collection and to give NRAs guidance in verifying the collected data, BEREC will publish phase 2 GL in due time.

3.4.2 Mobile broadband

²⁶ Such as the infrastructure used, the product specifications of the equipment deployed, how they are configured, the link budget designed.

²⁷ This is either the length of the copper line with wired options, or the length of the radio path with FWA.

BEREC is addressing first the responses to question 3 and question 4 in the GL, as those are issues that frame the BEREC response to most of the other comments received for mobile broadband.

RESPONSES TO QUESTION 3

Question 3:

As explained above, BEREC considers that the characterization of the mobile network is reliant mainly on technology (subsection 2.4.2.1), and that NRAs/OCAs may collect performance information, such as QoS-1 speed information (subsection 2.4.2.2.) as they see fit for their own needs. That is, each MS may decide on the performance information suitable for its own national circumstances.

However, BEREC would like to hear views on the following issues:

a) Does such optionality compromise the purposes of Article 22, or should BEREC consider making some performance information non-optional? If so, why, and which information should be mandatory?

b) Which kind of performance information may be better to inform end users? (Note that in all circumstances NRAs/OCAs should consider that BoR (18) 237 has already recommended that "In order to improve the information on mobile coverage given to the public, NRAs may want to consider specifying at least four levels of mobile coverage. Generally, the levels of mobile coverage could be chosen to reflect the different probabilities of successful service reception which equates to service availability". As an example, a service could be characterized by the following graded approach: capability to the end user to: 1) browse traditional web pages and consult emails, 2) to view enriched web content and to stream standard quality video, 3) to stream high definition videos.

Responses to Question 3 A):

ETNO, GSMA, BMVI, DEA, BMVIT, Proximus, Assn_DE and **TIM**, find the information based on technology sufficient to comply with the Article 22. The **Dutch operators** remark that performance information for end-users should only be requested by NRAs/OCAs if the relevant information is not available on the market, pursuant to Article 22 (6) EECC.

Some of the respondents qualify the reasons for their responses. **ETNO** points out that the QoS-1 indicator is not a good choice as a measurement of performance as estimating speeds on the basis of signal strengths that are the outcome of theoretical radio models is not an appropriate method, because speeds are determined by many more factors (e.g. data traffic demand, frequency bands and other features like 4x4 MIMO, 64 QUAM, etc). **ETNO** explains it is difficult to integrate data traffic demand in theoretical calculation models, because it is very volatile.

According to **Assn_DE**, as long as MS use different bandwidths, the comparison of speed information among MS is not feasible. Therefore, there is no point for a harmonization. Similarly, **ETNO** requests BEREC to bear in mind that networks in different MS will perform differently due to many factors, such as assigned bandwidth, coverage obligations, permitted EIRP1 maximum allowed field strength and building penetration losses.

TIM claims that is difficult to provide information on speeds at so detailed level, 100x100 meters area and another response warns that there is no existing methodology for calculating of reliable QoS-1 data.

DEA and another contribution propose to avoid the collection of normal upload and download speed, in the case of mobile networks. According to the second response, these speeds are not predictable. **DEA** raises concerns over the potential mismatch between mapped and experienced speeds.

BMVI, GSMA and **DEA** prefer to give as much flexibility as possible to the NRAs/OCAs. In that way, they will be able to deal with MNO with more freedom.

On the contrary, **Aracil, Simic and Mähönen** and **the Dutch operators** argue that collecting only technology-level is not enough to comply with the purposes of the Article 22 and defend that defend that NRAs/OCAs should collect speed information. **Aracil, Simic and Mähönen** quote paragraph 69 to express that there is a need to collect speed data and qualify the BEREC decision as not logically consistent (as speed information is nonetheless required to qualify a grid as VHCN).

Finally, **PIKE** advocates to demand the same information for mobile and fixed operators (who according to the GLs are obliged to provide more information).

BEREC Response 29

The GL provide flexibility for NRAs with respect to the performance information they decide to collect in the case of mobile networks, making speed information an optional requirement. Question 3a requested views as to whether this optionality compromised the purposes of the Article. It must be noted that almost all answers to the public consultation (some by operators and some by public authorities) state that the optionality does not compromise the purposes of the Article 22, and only a few consider that it does and that speed information should be a non-optional requirement.

BEREC is aware that performance information for mobile networks is very varied across Europe (and not only based on speeds) and that different public authorities have undergone considerable efforts to consult and agree with operators on how performance information should be collected. BEREC needs to be cognizant of this and also admit that the calculation of speed information for mobile networks is complex, as speed is subject to many uncertainties as expressed in many responses. Moreover, the responses to the mobile section also show important divergences in the proposed possible methodologies/hypothesis that should underlie the speed estimation, showing that there is no consensus on one methodology.

Because of this and in alignment with most of the responses obtained, BEREC favors a low degree of harmonization on this topic and provides for MS to decide on the kind of performance information they need to collect reflecting their needs, leaving the decision to collect speed information to NRAs/OCAs.

Paragraph 69 provided reasons to support the request of speed information, and NRAs/OCAs may opt to request this information if they consider this proportionate and useful. Also, the GL

will provide for some VHCN qualifier which will require the operator to assess that speed values exceed a certain threshold if it wants to declare a grid as VHCN covered when there is no fiber to the base station. According to BEREC this is an indispensable information request to identify areas with VHCN, a function which is central to Article 22. BEREC wants to note that this request is posed only in some circumstances, and considers one unique speed threshold.

Finally, BEREC informs, based on several national initiatives, that it is possible for operators to provide significant QoS 1 speeds with a level of resolution 100mx100m.

Responses on Question 3 B):

ETNO proposes the use of the QoS-2 through drive tests as the best tool to inform end-users. Yet, **ETNO** advocates to let each NRAs/OCAs decide if they perform these drive tests or not.

The Irish Department advocates for the QoS-2 indicator but based on normally available speed (and not on average speed). In the view of this response, QoS-2 must be a complement of the QoS-1 that should be performed too.

DEA defends that the only relevant information to inform end-users is achievable download speed. In addition, **DEA** defends that the information provided to consumers should be decided by each NRA.

According to **Assn_DE**, the penetration rate has to be defined by specified speed information (Mbit/s).

Aracil, Simic and Mähönen consider that minimum information that should be available for each end-user is the download speed and the download class. However, **Aracil, Simic and Mähönen** notice that the European end-users are increasingly getting interested in other indicators such as the upload speeds as well as the delay.

TIM requires an explanation to the end-users of the content supported for each technology. For example, consulting emails could be provided on 3G, HSDPA and 4G/5G. The information about speeds depends on many factors such as the CPE and the network load.

ETNO and **Proximus** favor the use of the multiple coverage levels to inform the end-users. They report different levels of coverage. However, if the multilevel coverage approach is used, levels need to be specified and discussed at national level with the MNOs.

Assn_DE, BMVI and Aracil, Simic and Mähönen warn BEREC that requirements of applications contained in the examples of the question 3 evolve over time. Therefore, these examples might not be effective.

ECTA defends that there is no need for additional performance information to end-users can be readily justified at this point.

BEREC Response 30

BEREC agrees that differentiating mobile coverage in multiple levels is an appropriate way to inform end users and that it is key to explain clearly what the different coverage levels stand

for. In its Common Position on Mobile Coverage²⁸, BEREC recommends that, when providing coverage maps to consumers, NRAs use a coverage definition based on service (e.g. voice or data) availability and also encourages NRAs to provide consumers with a multi-level coverage information. In any case, easy-to-access accurate mobile coverage information should be available to the widest possible range of consumers. BEREC notes that the QoS data supporting end consumer information varies (for example, QoS-1, QoS-2 and QoS-3 information may be used).

BEREC reminds that Article 22 (6) requires MS to make information tools available to enable the choice of end-users when those are not available in the market. In BEREC's view the information provided by operators is not a substitute of those information tools (see BEREC Response 52)

Finally, BEREC agrees that the requirements of applications contained in the examples of the question 3 evolve over time. These are only examples.

RESPONSES TO QUESTION 4

Question 4

Should BEREC seek to harmonize the assumptions made by operators and NRAs throughout Europe? Should BEREC encourage NRAs/OCAs to seek this harmonization at a national level? Which assumptions should be considered to be harmonized and how? (For example, should BEREC consider data service speed coverage calculations without cell load, considering that the network is available for at least one user at a specific location at a specific time? Or should BEREC consider network load and, if so, based on which parameters?)

The majority of respondents (**ETNO, GSMA, TI, Vodafone, ECTA, Assn_DE** and **TIM**) advocate for a harmonization at national-level. This is that NRAs/OCAs must have the competence to set appropriate assumptions considering the characteristics of each country.

ETNO also admits that some harmonization at European level is necessary such as the grid size or the thresholds. However, **ETNO** asks BEREC to keep in mind the proportionality principle when considering the harmonization level. For this reason, any standardized specific mathematical models, calibration methods or tools should not be considered in these GL.

Finally, the **Dutch operators, BMVIT, and Aracil, Simic and Mähönen** defend a high degree harmonization at European level. **The Dutch operators** consider that NRAs/OCAs should harmonize the coverage and the network performance information based on QoS-1 information and spectrum license coverage requirements pursuant to ITU, ETSI, CEPT standards and recommendations.

Aracil, Simic and Mähönen point out that a common European methodology is indispensable to get harmonized data that can be useful for the State Aid procedures as well as for other policies implemented at European level. According to **Aracil, Simic and Mähönen**, agreeing

²⁸ BoR (18) 237

on the common acceptable assumptions, goals, and error bounds (reliability) that the employed methodology should reach might be enough.

BMVIT propose to use the ErlangB method that gives a rough overview to the possibilities in a given area and a given demand. Therefore, this could approximate for the use (cell load) of a cell in a mobile network. A verified method for coverage calculation is the HATA or Advanced HATA model that gives results that are sufficiently precise to estimate the mobile coverage and possible bandwidth for the customer. In general, **BMVIT** recommends discussing the thresholds for different mobile technologies too. Thereby the collected data is harmonized and comparable between MS.

BMVIT proposes to use a 10-meter height model and for characterization of the surface the Corinne Land cover classes available throughout the EU (actual CLC 2018). As a result all MSs would have a unique data set.

The **Irish Department** suggests not to harmonize assumptions made by operators before the VHCN guidelines have been finalized. However, in order to compare EU MS some harmonization should be considered, which would need to be cognizant of MS which have already implemented and agreed methodologies with operators. The transition to harmonized assumptions should be forward looking and allow sufficient time for MS to adapt.

DEA suggests a low degree of harmonization. As BEREC already has communicated, it is very complicated to perform mapping of mobile broadband. In Denmark the **DEA** has developed a mapping methodology with the Danish mobile operators, having used substantial resources in this development. The obligation to implement a new methodology would have substantial and disproportional consequences; it could also lead to a less correct mapping methodology. However, if some harmonization is necessary, it could be useful to make some common Guidelines on which elements a mobile coverage model should include, e.g. network load, GIS data and Signal-to-Noise Ratio instead of signal strength.

BEREC Response 31

First, the GL already provide for some elements of harmonization, by setting the minimal grid size, requiring that the technology information is collected across Europe with a common definition. Moreover, the revised Guidelines will incorporate two booleans to identify VHCN networks (those with fiber to the BS and those with no fiber to the BS but satisfying the relevant QoS thresholds).

Having said this, BEREC agrees that some further harmonization would allow more comparable information which would be useful for European policies and in the context of state aid. Yet, as expressed by the DEA and the Irish Department, any development in this sense must be cognizant of existing national approaches, and also requires a careful evaluation of its proportionality. Because of this, BEREC will consider in the future the possibilities of further harmonization.

BEREC agrees that at this stage the harmonisation of specific mathematical models or tools should be out of scope of the GL. Several suitable methods and models are used by operators to suit their needs and any requirements in this respect would be not proportionate and unhelpful.

Comments on data requirements

Aracil, Simic and Mähönen propose the following parameters as mandatory²⁹: Maximum Download/Upload speed class (95% of the time for nominal zero cell load); Normal Download/Upload speed class (95% of the time for 95th %-ile users over grid area, using peak-time cell-load); Minimum RSS in the grid (in 95% of the time in at least 95 % of grid area).

They also recommend the mandatory collection of parameters like resilience, error-related parameters, latency and its variation, to qualify a mobile network as a VHCN. **Aracil, Simic and Mähönen** consider the current proposal to collect VHCN information intransparent.

Aracil, Simic and Mähönen would request NRAs/OCAs to maintain a structured data on the physical architecture of the mobile broadband network and collect detailed infrastructure and statistical usage information per base station in order to verify operators' QoS 1 declarations³⁰.

The **Irish Department** would like to get information to know whether an area is – or is likely to be – covered by an NGA network. In addition, this Irish government demands to collect network information such as the minimum committed information rate to each user, network dimensioning, capacity information, the cell edge/cell area probability.

BEREC response 32

Regarding performance parameters please see BEREC Response 29.

Regarding VHCN information, BEREC has enriched the collection of information by including more classes, and explains that a declaration of an operator of a grid not being covered by a station served by fiber but satisfying the relevant performance thresholds (criterion 4 in VHCN Guidelines), will imply that all the relevant thresholds are satisfied as required by the BEREC VHCN Guidelines.

Regarding the information on infrastructure please see the first paragraph in BEREC Response 28. BEREC is not proposing in phase 1 GL to collect information on infrastructure location or characteristics, but in phase 2 BEREC will examine the need and proportionality to collect this information and also statistical usage information for verification purposes.

Other issues

Aracil, Simic and Mähönen recommend that BEREC requires that the data provided should provide as realistic a picture of the deployment's capabilities as possible, by insisting that the MNO use best industry practices, corresponding to the methods used in the planning and management of their networks. Besides, the GL should specify that the MNO should use realistic estimates of cell load in calculating performance data to be provided to the NRA/OCA.

²⁹ They reason that this is necessary to properly and logically characterize and map the reach of mobile broadband networks; enable qualification of the mobile wireless network as VHCN in accordance; facilitate verification of data provided by operator to the NRA; and also for consistency with fixed broadband mapping Guidelines.

³⁰ This is, for each grid relevant physical network infrastructure including: BS tower locations, sectorization and antenna pattern/downtilt; cell load statistics/estimate; 3GPP-Release of the deployed mobile technology.

This can be retrieved from statistical models of mobile broadband demand and/or MNO data on load per cell as given by the planning and/or operational network management data. Moreover, upon request by the NRA/OCA, the mobile network operator should disclose the tools, methods and assumptions used in generating the data provided to the NRA/OCA.

BEREC Response 33

BEREC accepts these suggestions and will amend the GL accordingly.

ETNO finds the recommendation on the methodology for calculating/estimating mobile coverage maps, not clear. **ETNO** wonders if the recommendation in paragraph 75 requires a) and b), or only require one of them. **ETNO** finds that data traffic demand is too volatile for integrating accurately in theoretical calculation models: it varies strongly by the time of the day or by day of the week. Consequently, **ETNO** requests for removing point a).

BEREC Response 34

BEREC clarifies that a) and b) are necessary. BEREC understand that the new reference to peak time conditions in the expected speed definition alleviates the issue of demand volatility.

GSMA, TIM, ETNO, ECTA and **BMVI** support the BEREC stance on outdoors and static environment. **ETNO** does not agree with the possibility to collect data when the users are in movement. Moreover, **GSMA, ETNO** and another contribution find the method of calculation for indoors information (paragraph 71) too simplistic and leading to unreliable results.

BEREC Response 35

BEREC GL only considers and outdoors and static environment. However, NRAs/OCAs may require additional information pursuing their needs. Paragraph 71 will be deleted.

ETNO requests a clarification on the meaning of “Other technical parameters regarding signal strength”. Another response would delate this concept because is not very clear.

BMVI asks for a definition of the term “user location” used in the paragraph 59. If not, this term should not be used.

BEREC Response 36

The revised BEREC GL do not include a reference to “Other technical parameters regarding signal strength”.

Paragraph 59 refers to a questionnaire circulated by BEREC where NRAs/OCAs expressed the characteristics they found important to assess mobile broadband. User location was not defined in the questionnaire but BEREC understands that respondents understood that this concept referred to indoor location, outdoor location or while travelling³¹.

³¹ See section 1.2 in BoR (18) 237 for reference.

Finally, **Aracil, Simic and Mähönen** object to paragraph 79 “QoS-1 speed data is only a broad qualifier used to compare data service performance... unrelated to end user experience” as QoS1 speed data is not entirely unrelated to the end user experience, and is complementary to QoS2 and QoS3 information, in mobile broadband mapping and verification.

BEREC Response 37

BEREC understands the objection and will amend the paragraph.

3.5. Comments on data and characteristics of a GIS system

With regards to small or challenger operators **ECTA** asks that BEREC explicitly refers to the possibility for NRAs/OCAs to financially support data collection, and, where applicable, data conversion into a different GIS system, so as to minimize adverse impact on ongoing business processes.

Regarding paragraphs 47/77 (and also 28, 29, 33), **ECTA** wishes to explicitly flag to BEREC that placing an obligation on smaller/challenger operators to convert their internal GIS data to an NRA/OCA GIS system, and/or require geocoding data in novel ways, may represent high regulatory/administrative burdens, and could entail high costs.

BEREC Response 38

BEREC acknowledges the difficulties that some of the smaller operators may face, in particular those with no GIS system or proper trained staff in this area. NRAs/OCAs might request the data in the simplest format in cases where specific difficulties are identified and as requested by operators, so that it is as easy to provide information as possible in these cases. NRAs/OCAs may even provide web-GIS applications to allow the data provision.

3.6. Comments on Forecasts

The Dutch operators urge BEREC to acknowledge that forecasting data are unreliable by nature, regardless of the forecasting period. According to them, the market circumstances may lead operators to change their plan and constantly and accordingly.

BEREC Response 39

BEREC has acknowledged the uncertainty in forecast data in the GL (see paragraph 87).

Purpose

Vodafone requires more clarity around the purpose and use of the forecast as those “should not serve the purpose of enabling public authorities to steer private network deployment”. ECTA also wants more clarity for the use of forecast data in market definition procedures. ECTA is worried about the interpretation of the forecast data and warns that inappropriate geographic segmentation, focused on the mere presence of infrastructures (e.g. within

municipal boundaries), without considering that they do not actually overlap, do not compete, or assumptions on future extensions of their physical build-out, are too prospective and unreliable for conducting a market analysis aimed at establishing whether there is effective competition or not, or whether there are short-term prospects for effective competition.

BEREC Response 40

The use and consideration of forecast data within market analysis is beyond scope of the GL, which focus on the data collection. Note that the provision of data at address level is important precisely to avoid overlaps.

State aid

Assn_DE, **Liberty Global**, **GSMA** and **Vodafone** ask BEREC to ensure that the rollout forecasts provided by operators are not used in State Aid procedures or are disclosed to other service providers or institutions. **Assn_DE** and **ECTA** point out that the information required in the State Aid procedure is different than the one requested in these GL. **GSMA** and **TIM** remind that the existing Broadband State Aid Guidelines (2013/C 25/01) are the specific regulation that addresses the State Aid issue comprehensively.

To avoid unnecessary administrative burdens, **ECTA** considers that the GL should include a requirement for NRAs/OCAs to align data gathering for GSs and for forecasts to the largest possible extent in order to avoid imposing additional administrative burdens on operators.

BEREC Response 41

Please see BEREC Response 3. With regard to the relation between Art 22 EEC and state aid proceedings, BEREC will make clear to the GL that NRAs can use information collected under Art 22 to assist the state aid process but may also need to collect complementary information in line with the State Aid guidelines.

Confidentiality of forecast data

A number of respondents argue for the confidentiality of forecast data or warn against the publication or sharing of these data with third parties (**Assn_DE**, **VODAFONE**, **ECTA**, **ETNO**, **TI**).

Vodafone urges BEREC to treat the planned deployments as commercially sensitive information and to exclude the forecasts plans from any end-user transparency requirement. Also, **Vodafone** asks for adequate levels of confidentiality requirements in managing and handling such information.

ECTA warns about the potential damage to smaller/challenger operators if the investment plans are revealed to SMP operators: SMPs would react to the smaller/challenger operators' plans by announcing overbuilding plans in the same area to avoid the competition. Therefore, **ECTA** requests BEREC to create a mechanism to verify any eventual unrealistic overbuilding announcement by the SMP operators.

Additionally, **ECTA** points out that revealing investment plans to end-users will have a negative impact on the smaller/challenger operators' business. **ECTA** argues that end users might deter the hiring of smaller/challenge operators' services to wait for the eventual availability of services offered by the SMP operators.

BEREC Response 42

For issues related to publication of data and confidentiality see BEREC Response 53. Note that, as stated in paragraph 115 of the draft GL, operator's deployment forecasts may qualify as business secrets and may therefore be deemed to be confidential in the context of the GS.

Private investors

PIKE argues that NRAs/OCAs should not request information from all potential investors.

BEREC Response 43

As stated in paragraph 91, information from all potential investors (network operators, public authorities, and other investors, if relevant) will be needed in order to support tasks related to state aid proceedings or the identification of designated areas.

Resolution

The Dutch operators, Proximus, ECTA and TIM do not agree with the level of resolution proposed by BEREC in paragraph 95. These respondents find this level of resolution too much precise. **The Dutch operators** and **Proximus** suggest using a municipality-level level of resolution instead. **The Dutch operators** argue that VHCNs are rolled out in wider areas and not on grid level and thus forecast information should be requested at LAU level instead of 1,000m x 1,000m, irrespective of the 3-5 years period of the forecasted deployment as described in § 95 of the draft Guidelines. **ECTA** wants to delete any reference to the level of resolution.

BMVIT would keep the 100 m raster level set in the broadband reach section for all the network deployments expected (independently from the expected year of deployment). **BMVIT** adds that is the currently implemented.

BEREC Response 44

BEREC agrees that for the purposes for which the data are collected (state aid proceedings and the identification of designated areas), a high resolution (address level or 100x100m squares) is necessary. The GL will therefore only refer to this resolution and not to 1000x1000m or any other more aggregate resolution.

The GL will also mention that such data, in line with Article 22, only have to be provided to the extent that they are available and can be provided with reasonable effort.

Forecasting period

The forecast period recommended for the designated areas (at least three years) in paragraph 94 has received several criticisms among the respondents as well as proposal of alternatives forecasting period. **EIR, Liberty Global, ETNO, ECTA** and **the Dutch operators** express their disagreement with this forecast period. For them, this period is too long to provide credible information to the NRAs/OCAs.

Liberty Global and another contribution propose a three-month period of forecasting. **Proximus, Assn_DE** and **ETNO** advocate for a six months period for the forecasting. Alternatively, **GSMA** and **TIM** would like a one-year forecasting period. Several of these respondents point out that the roll out plans might not be very reliable, even for a much shorter period like they propose. Similarly, **Liberty Global** explains that the available information about the forecast's plans might be vague (with not much precision at the geographical level).

Moreover, Liberty Global, EIR and **the Dutch operators** think that the current forecast period for the designated area goes beyond the scope of the EECC. **EIR** reminds that the Article 22 of the EECC says "three years" not "at least three years".

In the opposite direction, **FTTHc** demands a five-year period of forecasting aligned with the market analysis procedure.

BEREC Response 45

As mentioned above, BEREC is of the opinion that forecast data should be collected at a high level of resolution (address level or 100x100m squares) so that NRAs/OCAs can use them for the purposes mentioned. At the same time, the GL will explain that such forecast data only have to be delivered to the extent that the information is available and can be provided with reasonable effort. Since high resolution forecast data is usually available only for a short to medium period, BEREC does not see a need to define a maximum or minimum forecasting period. The GL will be adapted in this respect.

Frequency

ETNO and another contribution agree with the yearly collection of the forecast data (paragraph 93). According to **ETNO**, it is a general practice among operators to review the forecasts yearly: forecasts of ongoing deployments are adjusted, and forecasts of new deployments are added.

Yet, **ECTA** explains that forecasting periods should not be generic, and forecasts should only apply if and when there is a clear justification to designate areas for public intervention (the state aid regime being separate and subject to a separate consultation in any case).

BEREC Response 46

The purposes for which forecasts may be necessary and the areas for which NRAs may want to collect forecast data are already discussed in paragraphs 88 and 92 of the GL.

Information to be requested

ETNO welcomes that BEREC identifies the performance indicator relevant for the forecast, which is the maximum download speed. NRAs/OCAs should refrain from requesting additional data on performances beyond the maximum download speed.

Aracil, Simic and Mähönen suggest collecting more information in the forecast's requirements. They propose: percentage of premises to be served per grid; normally available speed, upstream from the distribution point at the serving location, distance to the closest, traffic concentration and O/E conversion units, where applicable, the media specification (cable/fiber) from the distribution point at the serving location up to the closest traffic distribution point.

BEREC Response 47

Table 3 in the draft GL included the technology code and an indicator on VHCN. The indicator on VHCN will be split into several classes to capture the different types of VHCN according to the EECC. The other indicators suggested do not seem necessary and proportionate to BEREC.

Areas

The Dutch operators and PIKE defend that operators should not provide forecast information for all the territory of the MS. In their view, if there is no market failure in a particular territory, there is no need to report forecast information on this area. Similarly, **PIKE** advocates to only report forecast information for the areas subject to the state aid procedure.

BEREC Response 48

The purposes for which forecasts may be necessary and the areas for which NRAs may want to collect forecast data are already discussed in paragraphs 88 and 92 of the GL.

Verification

ECTA finds the *ex-ante* verification for all the operator's forecasts too burdensome for the smaller/challenger operators. In its view, the main objective of the NRAs/OCAs shall be enhancing the effective competition by, mainly, monitoring the operators with SMP not the smaller/challenger operators.

Aracil, Simic and Mähönen recommend that BEREC develops Guidelines so that NRAs keep a record of operators that repeatedly fail to provide accurate information.

BEREC Response 49

BEREC already stresses that the GL only list "a series of possible verifications". Which forecasts to verify, which verification methods to use and whether to record or not repeated failures to provide accurate information should be a choice of the NRA/OCA.

Penalties

Liberty Global fears that operators can face penalties if the forecasts plans are not met. **Liberty Global** asks for an explicit statement explaining that operators cannot face any kind of penalties. Similarly, another response notes that forecasts can only be non-binding. **Vodafone** wants to ensure that if an operator provides unreliable forecast information, this is considered for any delivery of state aid to that operator.

TIM adds that a delay in the implementation of plans due to delays in the permit granting should always be considered a justified deviation.

BEREC Response 50

Penalties are dealt with in Article 29 EECC and therefore are not in the scope of this BEREC GL.

Other issues

The Dutch operators opine that forecasting may take place on the basis of reporting coverage obligations attached to the rights of use for radio spectrum or market analysis and may hold a forecasting period on the basis of other relevant legislation. Any forecasting period should be in line herewith. **(the Dutch operators)**

BEREC Response 51

As explained in paragraph 88, the GL focus on forecasts that may be useful for state aids and designated areas. The GL do not deal with other kinds of forecasts used in the context of other functions, as those respond to specific national needs.

Moreover, BEREC considers that it is beyond of this GL to align forecasting periods of different forecasts foreseen within the EECC.

3.7. Comments on Publication, confidentiality issues and aggregation of data to provide information to third users

3.7.1. Publication of data

ECTA is concerned that publicising data on highly digitalized industries may not be desirable with regard to the promotion of competition and security. **ETNO** highlighted that mobile networks are to be considered as critical national infrastructure and that detailed information must be restricted for reasons of public safety and national security.

ETNO mentioned that the GL omit to reconcile the transparency objective with the prohibition to exchange strategic information. It highlighted that there is a real risk that BEREC contributes to an alignment between providers, which is contrary to the European Internal Market.

Liberty Global agrees that commercially sensitive information should not be accessible to operators, nor should they be able to 'reverse engineer' anything that is published to determine the footprint or build plan of a competing provider. To the extent (..) information should not, for example, provide public access to a bulk coverage database.

Fastweb discusses that data can be made available to the end-users only if the information tools are not available on the market and the relevant information is not subject to commercial confidentiality. This excludes business secrets and data not strictly relevant for the end user's purpose of choosing the right provider that should be classified as confidential. In **Fastweb's** view, operator's website are appropriate tools for end-users to gather all the relevant and updated information to choose the products and providers which suit their needs best.

The Dutch operators remind that in the Netherlands, as in many other MSs, relevant information is already widely available on the market. Also, independent market players offer comparison tools for end-users with more information than network performance. As a result, the GL should instruct NRAs/OCAs not to request information with the proposed level of detail if the information is already available in the market. The data may still be collected for the other purposes or functions of Article 22 as set out in paragraph 3.

DEA suggest to make the addition as a separate bullet of “Interactive address lookup published in a dynamic web application” (paragraph 110).

BEREC Response 52

BEREC welcomes the inputs from respondents and understands their concern about confidential or strategic information being made publicly available. In this regard, BEREC adheres to the principle that GS data gathered by national regulatory and other competent authorities should be publicly available, except in so far as it is confidential in accordance with national rules on public access to information and subject to Union and national rules on commercial confidentiality.

BEREC took note of the stakeholders' concerns regarding the risk of alignment between operators, based on) published GS data on the (individual) existing infrastructure. In this respect, BEREC is of view that the risk of anti-competitive effects mainly exists at the expense of small network operators. Indeed, only SMP operators have incentives to engage in strategic network overbuild in order to force an emerging competitor out of the market. By contrast, the publication of data on the existing footprint of an SMP or large operator is unlikely to conduce to an anti-competitive coordination of the behaviour other SMP or large operators. Besides, tools for end-users are already available on operator's websites in order to gather all the relevant and updated information about the existing service availability. Therefore, BEREC considers that the publication of coverage maps on the existing infrastructure of individual SMP operators are unlikely to constitute strategic information in the sense of the guidelines on Horizontal Cooperation. BEREC mentioned in the draft GL the need for national regulatory and other competent authorities to assess confidentiality in view of the mentioned risks and to therefore consider the appropriate resolution and aggregation levels in order to protect small network operators.

BEREC recognises that independent market players offer comparison tools for end-users and that information tools are sometimes available on the market, sometimes at the initiative of operators. For instance, operators usually provide information on their service availability on their website. However, BEREC is of the view that these tools cannot be regarded as independent comparison tools allowing end-users to compare objectively the quality of service of various operators. Operators might use various methodology to publish their information and end users have to consults several sources in order to make a comparison. The added value of NRAs or OCA's information tools to support end users' choice therefore remains, even if operators or other market players are already providing their own tools. Note that Article 22 (6) and Recital 62 of the EEC, request NRAs and OCAs to provide for this information, in the absence of relevant tools that enable choice.

Finally, BEREC accepts the DEA's proposal and will include a reference to "Interactive address lookup published in a dynamic web application" in the relevant paragraph.

3.7.2. Confidentiality

ETNO asks for aligning the definition of business secrets (paragraph 113) in the GL with the definition of business secrets of the European Commission.

ETNO and **Proximus** note that there is a real risk that BEREC contributes to the alignment between providers of electronic communications networks/services, which is contrary to the European Internal Market by publishing information (especially forecasts). **ETNO**, **Proximus** and **Assn_DE** agree that BEREC needs to observe a higher and more stringent standard to the confidentiality of the collected data. For **Proximus** a particular concern relates to the publication of coverage maps of individual operators, which give strategic information on competitive presence in the market (especially for fixed networks): GL should advice against the publication of individual operator maps for fixed coverage in markets with several infrastructure competitors.

Liberty Global warns that network coverage information, and particularly planned deployments, is highly sensitive and its disclosure would result in significant legal and investment uncertainty. **Liberty Global** also sees a significant risk of market distortion and gaming by rival providers and consider it of utmost importance that this information is considered confidential. If competitors become systematically aware of a provider's roll-out/new build plans, this could lead to loss of first-mover advantage, distortion of competition and reduce the profitability of investments. The consequence of the current BEREC proposal is that it creates a requirement to maintain a high resolution inventory with a common data structure, with a potential for this to be shared with competing enterprises, who would be able to use analytical techniques to infer patterns from anonymized data; hence promoting outcomes potentially sub-optimal for market development.

Assn_DE suggest that information on infrastructure or infrastructure elements normally contains the most stringent protected business and commercial secrets of the undertakings into which they can be consulted only in exceptional cases (e.g. due to a legal obligation). **Assn_DE** and **Liberty Global** both agree that as a general rule, all data collected for GSs, may only be made available in a properly protected form (such as aggregated and anonymised).

It is unclear for **Assn_DE** who and under which conditions the collected data can be viewed. The conditions for viewing the data can only be determined by the implementing party of Article 22.

Fastweb also considers that it is of the upmost importance that, before making data available to the end-users, the NRAs assess with the operator involved its confidentiality.

ETNO, **Proximus** and **EIR** agree that the operators providing data (and not the NRA/OCA) should decide on its confidentiality. In case that the NRA/OCA would not agree, it would have to demonstrate that the concerned data is not confidential and would need a legal basis to require the publication or the transfer to third parties of such data.

PIKE urges that the GL indicate the obligation to maintain the confidentiality of data constituting the operator's business secret, in particular regarding forecasts and quality data which need not be published under the law of the MSs. Another response agrees that forecasts should be confidential. **EIR** agrees as well and explains that information on deployment plans would not generally be disclosed except at a very high level and upon the determination of the operator with regards to generating public awareness of its investments.

ECTA endorses BEREC's proposal in paragraph 115/118 on what could qualify as business secrets and encourages BEREC not to put it in conditional.

EIR thinks that "case by case" creates an unnecessary level of regulatory uncertainty and the potential for arbitrary decision making. **ECTA** warns that case-by-case assessment can only occur once the clear principles are published. Both the principles and any case-by-case assessment need to be open to appeal at the NRA/OCA, as well as judicial review, prior to any information deemed confidential could leak, notably to the SMP operator, where that operator has an incentive to engage in strategic overbuild to nip an emerging competitor in the bud.

ECTA has serious issues with paragraph 114. **ECTA** insists that: (i) clear principles on the confidential treatment of forecasts need to be established well ahead of any forecasts being made, not to mention published; (ii) these principles need to indicate, ahead of time, how – in substance and in procedural terms – confidentiality will be ensured or potentially overridden, (iii) there must be a clear system for recourse/appeal available to operators, prior to any unilateral publication by an NRA/OCA.

BEREC Response 53

BEREC acknowledges that national regulatory authorities and other competent authorities must respect European and national rules on commercial confidentiality. The latter usually already provide a system for recourse and appeal available to operators, as well as judicial review. There is therefore no need for BEREC to further specify precisely in the GL what GS data shall de facto be considered as confidential and what procedures shall be put in place in order to take into the operators' point of view regarding the confidentiality of the provided GS data prior to its publication or sharing.

In drafting the GL, BEREC used the definition provided in the Guidance on the preparation of public versions of EC Decisions adopted under the Merger Regulation. This definition is in line with other sources from the European Commission, such as the Guidance on confidentiality claims during EC antitrust procedures.

3.7.3. Data aggregation

The Dutch operators explain that an appropriate level of aggregation of data for publication is essential to safeguard the business interests of operators and that there should be a single level of aggregation in view of confidentiality towards all third users of information for the purpose or function of the GS, taking into account potential anticompetitive effects to information that can be re-engineered to individual operators.

ECTA has difficulty making sense of BEREC's proposals for data aggregation as expressed in paragraphs 124 and 125, particularly as to whether the implication should be that in the context of grid-based data collection only the broadband reach of the operator with the highest coverage rate would be published for a given location (by technology). **ECTA** is hesitant about the overlap between different access technologies provided by the same operator in this context and is not fully convinced that the criterion of population density will always be evaluated in the same manner by operators, notably when there are important differences in socio-economic characteristics and consumption patterns that may lead to different prioritisations towards geographical fringe customers.

According to **FTTHc**, population density is a very important parameter that is largely ignored by BEREC. This parameter gives a good first indication of where VHCN networks have a favorable cost profile for construction.

With respect to paragraphs 121 and 122, **the Irish Department** considers that further guidance should be developed to assist in determining a percentage threshold of coverage that is needed to establish whether an area should be considered white or grey, white NGA or grey NGA in a state aid context.

BEREC Response 54

First, regarding the comment on aggregation in a state aid context, it should be noted that GL should not be confounded with State Aid Guidelines and that the issue pointed at is out of the scope of GL (see BEREC Response 3) that simply provide for a set of minimal information that is relevant within the state aid context.

Second, concerning **ECTA's** comment, BEREC agrees that other characteristics (on top of density) matter for network deployment, however, it is also true that generally when an area is attractive for deployment, it is so for several operators and that density is a crucial driver of attractiveness, both from a cost and demand perspective. Moreover, note that to avoid the issue of overlaps in grids, the only solution is for operators to provide address data, which is why the GL favor this option.

Third, it is for NRAs/OCAs to decide on the level of aggregation suitable to every need (either their own or of other authorities).

Finally, BEREC agrees that population density affects the cost of deployment. NRAs/OCAs may wish to include socio-demographic and economic data in their broadband mapping initiatives. However, this does not imply that this information can substitute the operator's declaration of current or future network reach, as the declaration of VHCN areas must be based on these evidences.

3.7.4. Access to information by public authorities

ETNO points out that it is important that in relation to section 2.7.5 regarding access to information by public authorities the sharing entity (NRA/OCA) strictly ensures the confidentiality at all times and ensures this happens under a strict legal system. It is also

important that any request by public authorities that are not entitled to collect data, is duly justified and respects the principle of proportionality.

EIR argues that although deployment information may be shared with relevant authorities upon request and within their legal remit, this represents disclosure of confidential information in a very specific circumstance and it is of the utmost importance that such information is further shared on the basis of a decision of a regulatory body alone.

The interplay between different types of authorities, and notably the framework for data sharing between them, would benefit from greater elaboration in the GL document. The survey process can operate in an optimal manner and administrative burdens for operators be reduced to the minimum possible only if the already available information is effectively and efficiently used. In **ECTA's** view, this must be a constant objective for the use of the GS.

According to **Liberty Global**, operators should always be consulted if an authority is considering publishing data arising from the GS, regardless of the level of detail and format envisaged. **The Dutch operators** think that operators should also be informed in advance about data requests of third parties.

BEREC Response 55

BEREC welcomes the comment that available information should be effectively and efficiently used by different types of authorities. Article 22 (5) clearly states that public authorities with nominated responsibilities³², must take into account the results of the GS and that MS shall ensure that authorities conducting the GS supply the results to other authorities, ensuring the same level of confidentiality. BEREC will ensure that the GL reflect this.

Moreover, Article 22 (5) also requires NRAs/OCAs to inform operators when GS information is provided to another authority. BEREC also reflects that NRAs/OCAs must abide by national legislation in the sharing of data with third parties. Therefore, there is no need for BEREC to further specify any requisites or procedures regarding the sharing of information.

3.7.5. Annex 3: speed classes

BMVIT addresses annex 3: It is not clear why BEREC has decided to use the 300 Mbit/s category. From a technological point of view, a 500 Mbit/s classification would be preferable since it would separate DOCSIS 3.0 and DOCSIS 3.1 as well LTE-A (Rel. 11) and 5G-NR.

BEREC Response 55

BEREC considers that is important to have at least one split between 100Mbps and 1Gbps in order to assess broadband development and ensure a better understanding of what different technologies deliver³³. Indeed, having information on a more informative range of data rates

³² Allocation of public funds for the deployment of electronic communication networks, for the design of national broadband plans, for defining coverage obligations attached to the use of radio spectrum and for verifying availability of services falling within the universal service obligations in their territory.

³³ For example, modern cable networks allow for speeds above 300 Mbps. However some part of the network still need to be modernized. Therefore, the 300Mbps would make this visible, and could help to promote infrastructure investment.

will enable to assess the picture of the evolution of the reach of broadband network across Europe.

LTE Release 8 currently supports up to 300 Mbit/s of download speeds, thus this threshold was considered relevant. BEREC acknowledges BMVIT's comment, as several splits may be relevant in separating different technologies. However, in order not to create excessive burden, BEREC is opting only for a few classes. Every NRA/OCA can further split the speed categories if they find this suitable for their needs.

Note however, as stated in the GL, that these speed categories may change at the time of the publication of the Guidelines, following any update of the work undertaken by BEREC on the definition of VHCN.

Annex 1

List of received contributions

Name of the contributor	Country	No. of pages
APKT	Czech Republic	2
Bird & Bird on behalf of Dutch telecom operators	The Netherlands	8
CETIN	Czech Republic	1
Danish Energy Agency	Denmark	4
Department of Communications, Climate Action & Environment of the Irish Government	Ireland	2
Dr. Javier Aracil (Universidad Autónoma de Madrid)	Spain	20
ECTA (European Competitive Telecommunications Association)	Belgium	18
EIR	Ireland	3
EOLO	Italy	2
ETNO		16
Fastweb	Italy	5
Federal Ministry of Transport and Digital Infrastructure	Germany	3
Federal Ministry Republic of Austria: Transport, Innovation and Technology	Austria	5
FTTHc Europe	Belgium	16
GSMA	Belgium	4
KIKE (National Chamber of Ethernet Communications)	Poland	2
Liberty Global	The Netherlands	11
Linkem S.p.A	Italy	2
Marco Forzati	Sweden	1
Open Fiber	Italy	6
PIKE (Polish Chamber of Electronic Communications)	Poland	4
Proximus	Belgium	4
SFR	France	4
Telecom Industry Association Denmark	Denmark	2
TIM	Italy	6
Assn_DE	Germany	11
Vodafone	The United Kingdom	4