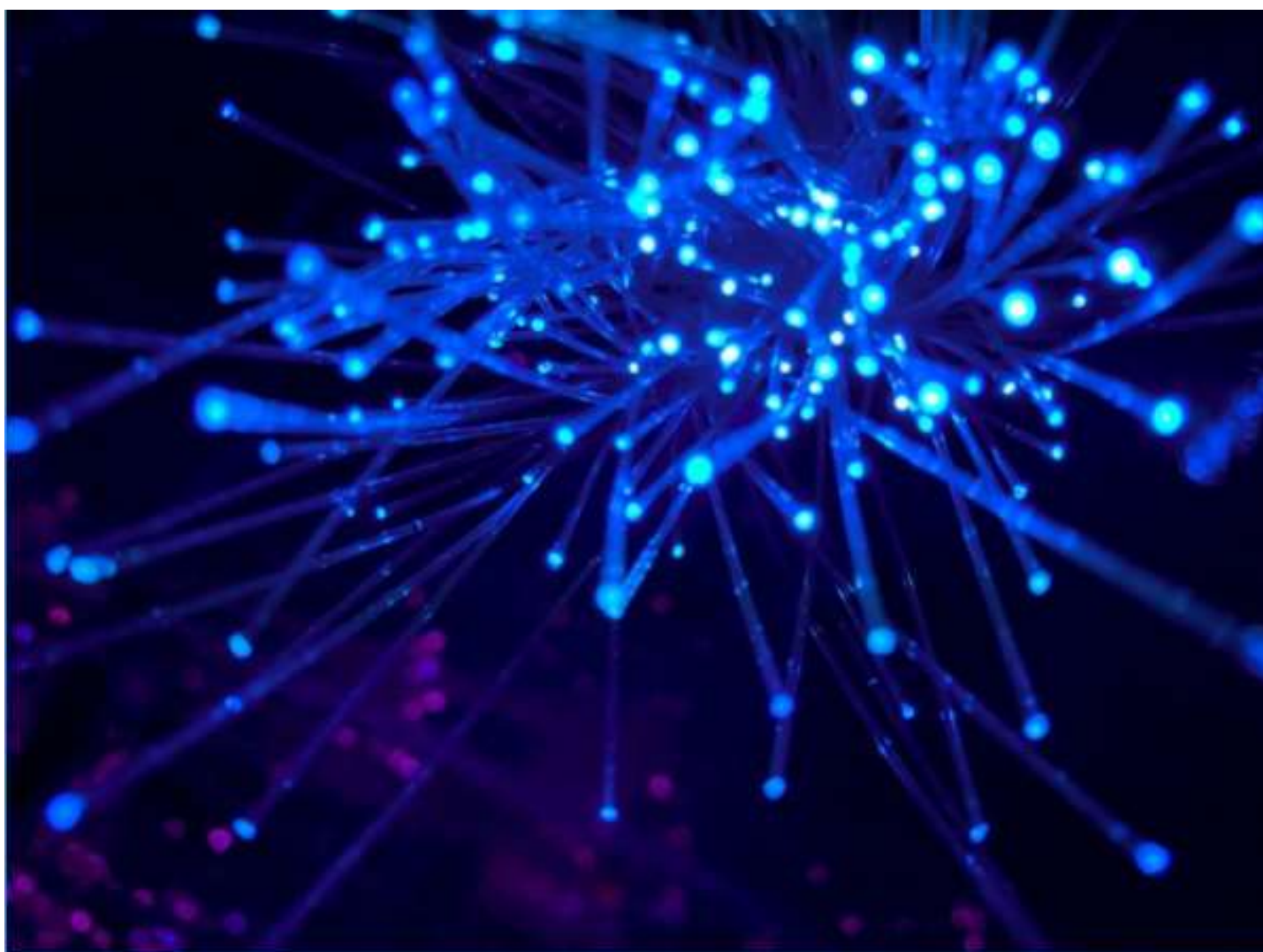




The report on the implementation of Regulation (EU) no. 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open internet access for the period from 1 May 2021 to 30 April 2022

## NATIONAL REPORT ON OPEN INTERNET



No.: 3821-4/2022

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## Table of Contents

1.	INTRODUCTION .....	1
2.	THE IMPLEMENTATION OF THE REGULATION AND THE AGENCY'S AUTHORITY .....	2
3.	STATE OF THE MARKET .....	3
3.1	CHANGES ON THE MARKET .....	3
3.2	CONNECTIVITY TO CONTENT PROVIDERS AND TO THE GLOBAL INTERNET .....	3
3.3	STATE OF NETWORK INFRASTRUCTURE .....	3
3.3.1	MOBILE BROADBAND ACCESS AT A FIXED LOCATION .....	3
3.3.2	BROADBAND ACCESS OVER MOBILE NETWORKS .....	5
4.	PROTECTING ACCESS TO THE OPEN INTERNET .....	10
4.1	ZERO RATING .....	12
4.2	TRAFFIC MANAGEMENT .....	13
3	SPECIALISED SERVICES .....	14
5.	MEASURES RELATED TO TRANSPARENCY FOR ENSURING ACCESS TO THE OPEN INTERNET .....	15
5.1	THE RIGHTS OF END USERS REGARDING CONTRACTUAL SPEEDS .....	16
6.	SUPERVISORY AND EXECUTIVE MEASURES .....	18
6.1	AKOS TEST NET MEASUREMENT TOOL .....	18

## Index of Figures

Figure 1: Market shares of fixed broadband internet access connections by operator.....	3
Figure 2: Trend of movements of fixed broadband technologies based on the number of broadband internet access connections .....	4
Figure 6: The trend of movements of FWBA connections .....	5
Figure 3: Market shares in mobile telephony by operator .....	6
Figure 4: Percentage of mobile broadband internet access users by technology: .....	7
Figure 5: Trend of changes in mobile broadband access traffic .....	8
Figure 8: The distribution of base station locations at the launch of service provision over 5G technology .....	9
Figure 9: Measurements made on mobile phones and (desktop) computers.....	19
Figure 10 and Figure 11: Measurements by mobile phone operating system and browser .....	19
Figure 12 and Figure 13: Measurement in fixed and mobile networks by operators .....	19

## Index of Tables

Table 1: Mobile technologies and user shares.....	6
Table 2: Number of base station sites .....	8
Table 3: Coverage of territory of RS with own network.....	9
Table 4: Coverage of population with own network.....	9
Table 5: Number of 5G network base station locations and cells in the 3600 MHz frequency band.....	9

## 1. INTRODUCTION

Regulation (EU) 2015/2120<sup>1</sup> establishes uniform rules for protecting equal and non-discriminatory treatment of traffic in providing internet access services and related end-user rights. The objective of the Regulation is to protect end users while also ensuring uninterrupted operation of the internet ecosystem as the innovation driver<sup>2</sup>.

In order to provide guidance and to ensure a more unified implementation of the Regulation, the Body of European Regulators for Electronic Communications (hereinafter: BEREC), namely its Open internet working group, prepared the Guidelines on the implementation by national regulators of European net neutrality rules<sup>3</sup> (hereinafter: BEREC Guidelines), which are both a recommendation and an instruction regarding how to supervise the implementation of the rules set in the Regulation.

In accordance with Article 5 of the Regulation, national regulatory bodies have to publish annual reports on monitoring and their findings every year, and submit these reports to the European Commission and BEREC. The Agency for Communication Networks and Services (hereinafter: Agency) has prepared this report in accordance with the above requirement, presenting some activities focused especially on protecting end users of open internet access services. The report includes observations about how providers are performing internet access services in Slovenia in practice, based on the information collected between 1 May 2021 and 30 April 2022.

The report is especially focused on the protection of access to the open internet (Article 3 of the Regulation), measures related to transparency (Article 4 of the Regulation), supervision and enforcement (Article 5 of the Regulation) and penalties (Article 6 of the Regulation). In order to present comprehensive conditions on open internet, the report first presents the state of the internet service provider retail market and the state of network infrastructure for both mobile and fixed networks.

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<sup>1</sup>Regulation (EU) 2015/2120 of the European parliament and the council of 25 November 2015 on defining the measures related to access to the open internet, and amendments to the Directive 2002/22/EC on the universal service and the users' rights related to electronic communications networks and services, and the Regulation (EU) No 531/2012 on roaming in public mobile communications networks in the EU (OJ L no. 310 of 26 November 2015; hereinafter: Regulation).

<sup>2</sup> As stated under Article 1 of the Regulation's introduction.

<sup>3</sup> "BEREC Guidelines on the Implementation by National Regulators of European Net Neutrality Rules", adopted on 30. 8. 2016 and amended on 11. 6. 2020; available at: [https://berec.europa.eu/eng/document\\_register/subject\\_matter/berec/regulatory\\_best\\_practices/guidelines/9277-berec-guidelines-on-the-implementation-of-the-open-internet-regulation](https://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/9277-berec-guidelines-on-the-implementation-of-the-open-internet-regulation), hereinafter: BEREC Guidelines

## **2. THE IMPLEMENTATION OF THE REGULATION AND THE AGENCY'S AUTHORITY**

The Decree on the implementation of the Regulation (EU) laying down measures concerning open internet access and retail charges for regulated intra-EU communications (Official Gazette of the Republic of Slovenia no. 35/19) appoints the Agency for Communication Networks and Services (hereinafter: Agency) as the body for implementing the Regulation, and appoints the penalty provisions and methods for dispute resolution. In relation to the Regulation and pertaining to BEREC Guidelines, the Agency adopted in 2019 the General act on internet access services and related end user rights (Official Gazette of RS no. 54/2019, hereinafter: General act) in which it detailed the methodology for measuring the technical quality of internet access services, procedures for establishing compliance with speed-related contractual provisions, rules regarding equal and non-discriminatory internet traffic treatment, and the rules regarding managing and limiting traffic in the scope of the internet access service. With the General act the Agency aimed to further unify the implementation of the provisions of the Regulation relating to ensuring internet access services, especially in relation to protecting end users, while also binding all internet access service providers (hereinafter: providers) on the territory of the Republic of Slovenia. Retaining an open and neutral characteristic of the internet is also set out in Article 203 of the Electronic Communications Act (Official Gazette of RS 109/14 with amendments, hereinafter: ZEKom-1),

In order to obtain and exchange best practices and to ensure a uniform implementation of the Regulation, the Agency also participates in BEREC's Open Internet Expert Working Group (BEREC Open Internet EWG). In 2022 the working group was focusing its work on 4 sub-groups, namely Implementation of the open internet regulation, Update net neutrality regulatory assessment methodology, Collaboration on the net neutrality measurement tool, and Update to the guidelines on the implementation of the Open Internet Regulation. The Agency has its representatives in all of them, actively participating at meetings and drafting documents, and consequently in shaping the European regulative policy.

### 3. STATE OF THE MARKET

#### 3.1 CHANGES ON THE MARKET

Between the first quarter of 2021 and the first quarter 2022, 9 new companies signed into the official registry of operators that provided broadband internet access services. The most noteworthy among them are Starlink Internet Services Limited and Deutsche Telekom Business Solutions GmbH, which signed into the official registry of operators on 1 January 2022.

During this period the Agency also received 8 applications for removal from the official registry of operators registered for providing broadband internet access services.

During this period the Agency also noted that many users switched from small operators to the big ones, which now account for nearly 96% of the broadband internet access market. Users switched from small operators that stopped offering services on the market to the big ones. During this period Telsat, d.o.o., was acquired and merged to T-2, d.o.o.

#### 3.2 CONNECTIVITY TO CONTENT PROVIDERS AND TO THE GLOBAL INTERNET

Slovenia has numerous network interconnections through local operators with other global Tier 1 internet providers that provide Slovenian users access to the content and basically the entire internet. Slovenian operators are interconnected either directly or they exchange internet traffic on the Slovenian Internet eXchange point (SIX). They are also connected to international internet exchanges (IX), such as: DEC-IX, NL-IX, VIX, CIX, BIX. Additionally, they have private links to major content providers, such as Facebook, Google, Microsoft, Netflix, Akamai, Amazon and Apple.

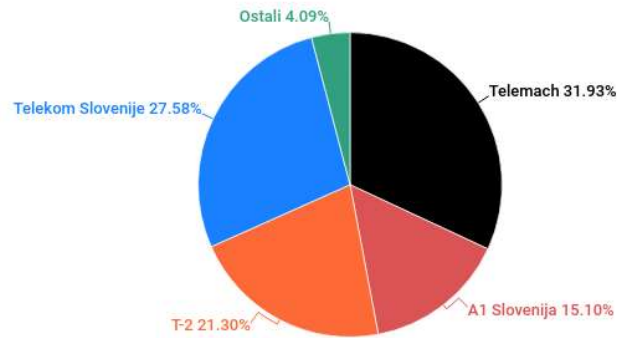
#### 3.3 STATE OF NETWORK INFRASTRUCTURE

##### 3.3.1 MOBILE BROADBAND ACCESS AT A FIXED LOCATION

At the end of the first quarter of 2022, there were 51 operators providing broadband internet access services over fixed networks in Slovenia.

As the chart below shows, the biggest market share in fixed broadband internet access connections for the first quarter of 2022 went to Telemach with 31.39%, followed by Telekom Slovenije with 27.58%, T-2 placed third with 21.30%, and A1 Slovenija fourth with 15.10%, while all other operators had a total market share of 4.04%.

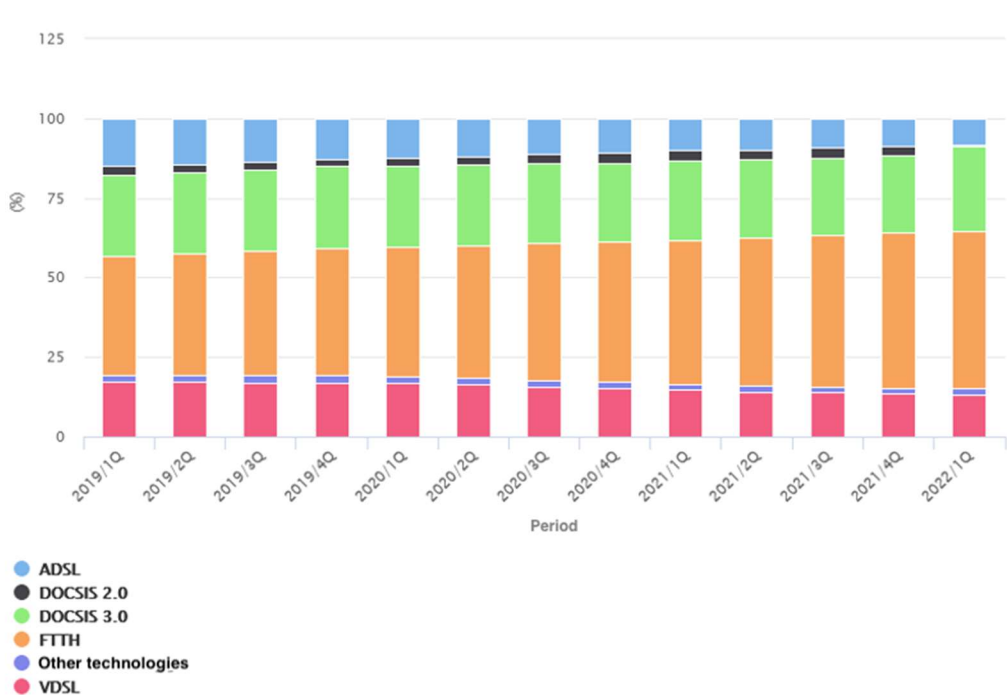
*Figure 1: Market shares of fixed broadband internet access connections by operator*



Source: AKOS, June 2022

The trend of movements on the market of fixed access connections shows that over the past year fibre optics connections grew the most, by nearly 5%. The number of xDSL technology based connections is slowly declining, while the number of connections based on cable DOCSIS technology increased by a good percent. Figure 2 depicts the development of fixed broadband access and shows that a growing number of cable networks have been upgraded to DOCSIS 3.0 technology.

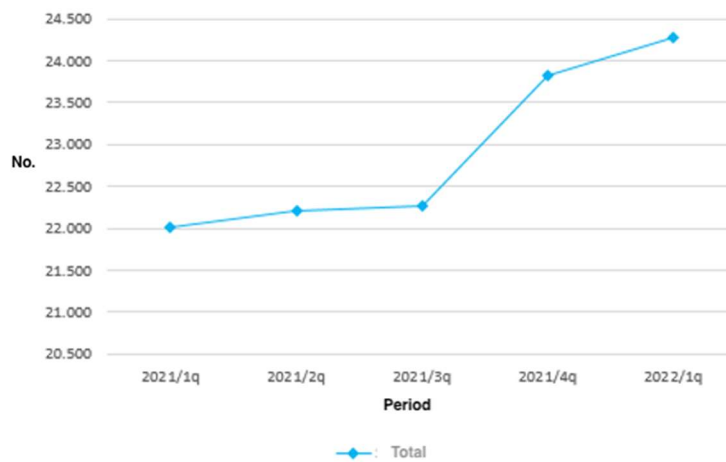
*Figure 2: Trend of movements of fixed broadband technologies based on the number of broadband internet access connections*



Source: AKOS, June 2022

The data in the chart *Trends of movements in the number of FWBA connections* that use wireless networks shows a sudden increase of these connections compared to the year before. FWBA connections<sup>4</sup> are provided by three operators: A1 Slovenija d.d., Telekom Slovenije d.d and Telemach d.o.o. The number of FWBA connections compared to the previous year is especially higher at the expense of increased number of connections with A1 Slovenija and Telemach. Growth of FWBA connections is expected to continue in the future, as they provide broadband internet access in the areas where there is (thus far) no physical infrastructure that would provide end users with broadband access.

*Figure 3: The trend of movements of FWBA connections*



Source: AKOS, June 2022

### 3.3.2 BROADBAND ACCESS OVER MOBILE NETWORKS

At the end of the first quarter of 2022, there were 7 operators providing broadband internet access services over mobile networks in Slovenia.

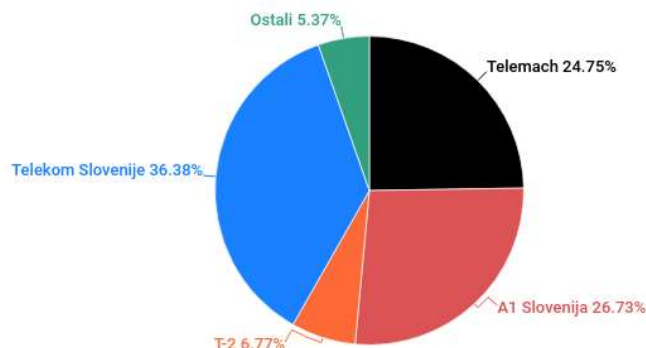
The biggest market share on the mobile networks by users in the first quarter of 2022 went to Telekom Slovenije with 36.38%, followed by A1 Slovenija with 26.73% and Telemach with 24.75%, while T-2 held a 6.77% share over this period, and all other operators a total of 5.37%.

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<sup>4</sup> FWBA access (Fixed Wireless Broadband Access) is broadband access to electronic communication services at a fixed location using wireless technologies.



Figure 4: Market shares in mobile telephony by operator



Source: AKOS, June 2022

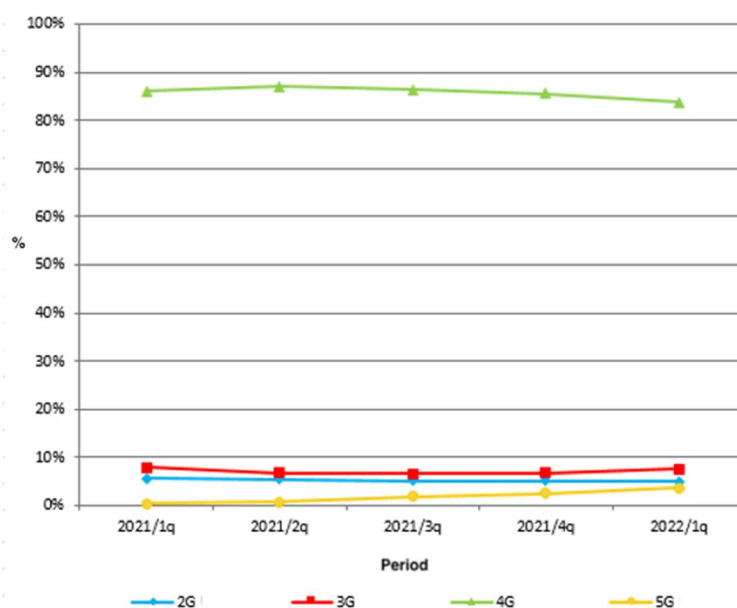
Table 1: Mobile technologies and user shares

	2021/1q	2021/2q	2021/3q	2021/4q	2022/1q
<b>2G</b>	<b>5.64%</b>	<b>5.44%</b>	<b>5.19%</b>	<b>5.22%</b>	<b>4.91%</b>
A1 Slovenija	2.07%	1.99%	1.89%	1.96%	1.79%
Softnet	0.02%	0.02%	0.02%	0.02%	0.02%
Telekom Slovenije	3.46%	3.36%	3.22%	3.18%	3.05%
Telemach	0.08%	0.07%	0.06%	0.06%	0.05%
<b>3G</b>	<b>7.99%</b>	<b>6.80%</b>	<b>6.54%</b>	<b>6.71%</b>	<b>7.55%</b>
A1 Slovenija	0.87%	0.80%	0.74%	0.67%	1.89%
T-2	0.84%	0.09%	0.31%	0.63%	0.63%
Telekom Slovenije	2.56%	2.40%	2.25%	2.18%	2.03%
Telemach	3.73%	3.51%	3.25%	3.23%	3.00%
<b>4G</b>	<b>86.01%</b>	<b>86.98%</b>	<b>86.41%</b>	<b>85.48%</b>	<b>83.80%</b>
A1 Slovenija	26.38%	26.42%	26.38%	26.29%	25.34%
HoT mobil	4.92%	5.08%	5.37%	5.43%	5.53%
Mega M	0.38%	0.39%	0.40%	0.41%	0.42%
Softnet	0.11%	0.11%	0.11%	0.11%	0.12%
T-2	4.61%	5.48%	5.33%	5.17%	5.26%
Telekom Slovenije	27.64%	27.22%	26.62%	26.62%	25.80%
Telemach	21.99%	22.28%	22.19%	21.44%	21.33%
<b>5G</b>	<b>0.36%</b>	<b>0.77%</b>	<b>1.86%</b>	<b>2.59%</b>	<b>3.74%</b>
Telekom Slovenije	0.36%	0.76%	1.30%	1.31%	1.88%
Telemach		0.00%	0.56%	1.28%	1.86%

Source: AKOS, June 2022

The *Mobile technologies and user shares* table shows types of mobile technologies utilised by providers across the territory of Slovenia, and the shares of users by operators using these technologies. The table shows the data for the shares of individual mobile network generations used by individual operators. At the end of the first quarter of 2022 the biggest share of users were connected to 4G networks. The 5G networks are still being built, and consequentially have the lowest share.

*Figure 5: Percentage of mobile broadband internet access users by technology:*

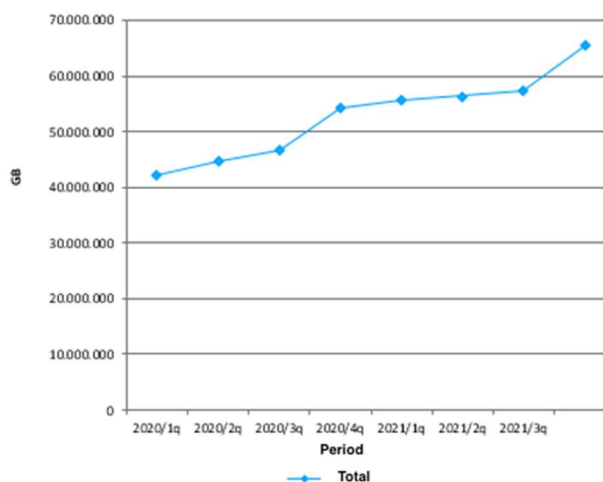


Source: AKOS, June 2022

Based on the data that the operators report to the Agency, at the end of the first quarter of 2022 fourth generation of mobile networks was used by 83.8% of users, while 3.74% used fifth generation, and 12.46% of users relied on the two older technologies, with their market share declining. The chart shows the growth of users connecting to 5G networks, mostly at the expense of users who connect to 4G network, which is also the main reason that the latter fell by a percent.

The below chart *Trend of changes in mobile broadband access traffic* shows constant growth of data traffic throughout the whole previous year. Compared to the previous year it increased by 27.3%.

Figure 6: Trend of changes in mobile broadband access traffic



Source: AKOS, June 2022

The Agency received the data on the condition of base stations and the data on the total number of all radio cells by technology from A1 Slovenija, d.d., Telekom Slovenije, d.d., Telemach, d.o.o., and T-2, d.o.o., and it is listed in the table below.

Table 2: Number of base station sites

Operator	No. of base station sites	GSM and DCS	LTE	UMTS
A1 Slovenija	1106	1080	1092	928
Telekom Slovenije	1263	1236	1247	880
Telemach	918	917	915	917
T-2	130		120	130

Source: AKOS, data for the month of June 2021

Based on the analysis of the obtained data the Agency calculated using its tools how mobile operators cover the territory of the Republic of Slovenia with their own networks by individual technology. Where operators do not have their own networks, they lease the network from other operators. The estimates of the coverage of the territory of RS and population by operator and by technology are presented in the tables below.

*Table 3: Coverage of territory of RS with own network*

Type of signal	Telekom Slovenije	A1 Slovenija	Telemach	T-2
LTE	97.0%	93.1%	91.6%	18.6%
UMTS	71.3%	93.1%	94.7%	23.8%
GSM	98.9%	98.1%	96.7%	/

Source: AKOS, data for the month of June 2021

*Table 4: Coverage of population with own network*

Type of signal	Telekom Slovenije	A1 Slovenija	Telemach	T-2
LTE	< 99%	< 99%	< 99%	53%
UMTS	94%	< 99%	< 99%	59%
GSM	< 99%	< 99%	< 99%	/

Source: AKOS, data for the month of June 2021

In June 2021, after the public auction, the Agency issued the decisions for awarding radio frequencies. It required those holders who obtained the 700 MHz FDD and/or 3600 MHz priority bands to begin offering services to end users over 5G technology on at least one of the obtained frequency bands in at least one major town or city until 15 September 2021 the latest. The data received from the operators shows that all three holders of decisions began offering services over the 5G network during this period on the awarded radio frequency band, and the number of individual base station locations and cells is presented in the table below.

*Table 5: Number of 5G network base station locations and cells in the 3600 MHz frequency band*

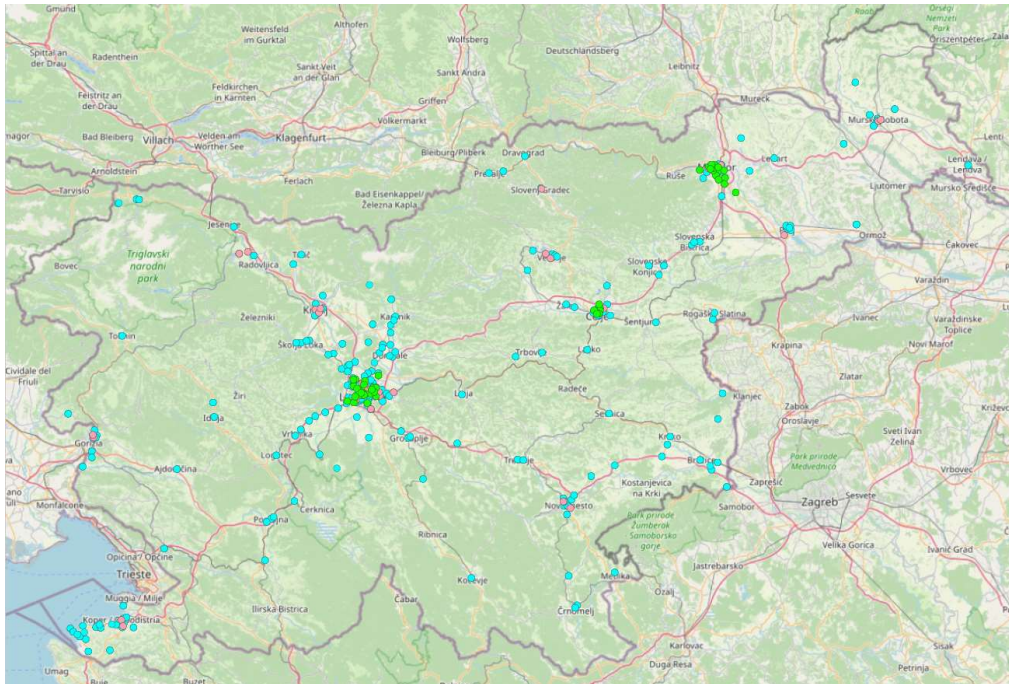
Operator	Number of locations	Number of cells
A1 Slovenija	45	134
Telekom Slovenije <sup>5</sup>	7 <sup>6</sup>	10
Telemach	53	152

Source: AKOS, operator data of 15 October 2021

*Figure 7: The distribution of base station locations at the launch of service provision over 5G*

<sup>5</sup> Telekom Slovenije provides 5G coverage also in the 2600 MHz FDD band at 273 locations.

<sup>6</sup> In two cases this provides indoor coverage.



Source: AKOS, operator data of 15 October 2021

As the above figure shows, 5G base stations have already been installed in all 11 major towns and cities from the list of DARF obligations, namely: Celje, Maribor, Ptuj, Koper, Murska Sobota, Slovenj Gradec, Kranj, Nova Gorica, Velenje, Ljubljana and Novo Mesto.

#### 4. PROTECTING ACCESS TO THE OPEN INTERNET

In the first paragraph of Article 3 the Regulation defines the rights of end users and the obligations of the providers, namely:

*“End-users shall have the right to access and distribute information and content, use and provide applications and services, and use terminal equipment of their choice, irrespective of the end-user’s or provider’s location or the location, origin or destination of the information, content, application or service, via their internet access service.*

*This paragraph is without prejudice to Union law, or national law that complies with Union law, related to the lawfulness of the content, applications or services.”*

The Agency has verified adherence to these obligations by obtaining freely available information (checking the providers’ websites and general terms and conditions), analysing end users' complaints and requests for supervision procedures, and by performing network

capacity and quality measurements. In order to verify whether the obligations are fulfilled in accordance with the General act, the Agency sent a questionnaire on fulfilling obligations from the General act (hereinafter: questionnaire) to all the operators in the beginning of 2022, and performed an analysis of the received response, with findings presented below.

The second and third paragraphs of Article 3 of the Regulation lay down the following:

*Agreements between providers of internet access services and end-users on commercial and technical conditions and the characteristics of internet access services such as price, data volumes or speed, and any commercial practices conducted by providers of internet access services, shall not limit the exercise of the rights of end-users laid down in paragraph 1.*

*Providers of internet access services shall treat all traffic equally, when providing internet access services, without discrimination, restriction or interference, and irrespective of the sender and receiver, the content accessed or distributed, the applications or services used or provided, or the terminal equipment used.*

*The first subparagraph shall not prevent providers of internet access services from implementing reasonable traffic management measures. In order to be deemed to be reasonable, such measures shall be transparent, non-discriminatory and proportionate, and shall not be based on commercial considerations but on objectively different technical quality of service requirements of specific categories of traffic. Such measures shall not monitor the specific content and shall not be maintained for longer than necessary.*

*Providers of internet access services shall not engage in traffic management measures going beyond those set out in the second subparagraph, and in particular shall not block, slow down, alter, restrict, interfere with, degrade or discriminate between specific content, applications or services, or specific categories thereof, except as necessary, and only for as long as necessary, in order to:*

- (a) comply with Union legislative acts, or national legislation that complies with Union law, to which the provider of internet access services is subject, or with measures that comply with Union law giving effect to such Union legislative acts or national legislation, including with orders by courts or public authorities vested with relevant powers;*
- (b) preserve the integrity and security of the network, of services provided via that network, and of the terminal equipment of end-users;*
- (c) prevent impending network congestion and mitigate the effects of exceptional or temporary network congestion, provided that equivalent categories of traffic are treated equally.*

#### 4.1 ZERO RATING

During this period the European Union Court of Justice (ECJ) issued three rulings<sup>7</sup> that had a significant impact on the open internet, especially on providing mobile data services with a zero rating. In three procedures against Telekom Deutschland GmbH and Vodafone GmbH the court verified the legality of using the tariff option called ‘zero rating’, with which the traffic created in special apps (categories) is not counted towards the data allowance of the user’s basic plan. ECJ ruled in all three cases that “Article 3 of the Regulation should be interpreted in such a way that limiting sharing an internet connection<sup>8</sup>/limiting the use of data traffic during roaming<sup>9</sup>/limiting bandwidth<sup>10</sup> because of the activation of the tariff option called ‘zero rating’ is not compatible with the obligations that are defined in paragraph 3 of this article.”

ECJ ruled in these three cases that zero rating violates the general obligation of equal treatment of traffic in accordance with the third paragraph of Article 3 of the Regulation. The rulings state that the reason for this violation is in the fact that zero rating differentiates internet traffic based on commercial reasons, so that the data traffic of a partner app is not counted towards the data allowance from the subscription plan. Because incompatibility remains regardless of the form and nature of the terms and conditions of use, ECJ did not assess individual limitations, as any type of limitation is incompatible with the obligation of equal treatment from the third paragraph of Article 3 of the Regulation just by activating zero rating. According to ECJ’s explanation, zero rating options are therefore deemed incompatible with the obligation of equal treatment, as traffic is not treated equally. ECJ did not limit its interpretation of the third paragraph of Article 3 of the Regulation to zero rating options related to measures for traffic management. Contrary, ECJ stated that the violation of the general obligation of equal treatment of all traffic stems from the nature of such a rating option. The obligation of equal treatment is therefore used also for zero rating options where there is no technical discrimination.

Because this position represents a step away from the current position also presented in the BEREC Guidelines, BEREC performed a detailed analysis of the rulings during this period, and in line with the findings prepared updated Guidelines, which were published on 9 June 2022<sup>11</sup>, following a public discussion.

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<sup>7</sup> Rulings SES C 34/20 – Telekom Deutschland, C-854/19 – Vodafone and C-5/20 – Vodafone of 2 September 2021; hereinafter: ECJ rulings.

<sup>8</sup> C-5/20

<sup>9</sup> C-854/19

<sup>10</sup> C-34/20

<sup>11</sup> Available at:

[https://berec.europa.eu/eng/document\\_register/subject\\_matter/berec/regulatory\\_best\\_practices/guidelines/10280-berec-guidelines-on-the-implementation-of-the-open-internet-regulation](https://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/10280-berec-guidelines-on-the-implementation-of-the-open-internet-regulation)



With regard to the content, the Agency not only actively participated in preparing the updated Guidelines, but was also in close contact with local operators that offer zero rating options aiming at removing such offers from the market as soon as possible. By analysing the data from the questionnaire, the Agency finds that the operator that included zero rated options in its offer had already stopped offering them. Existing users of these plans are gradually switching to the new and improved plans that include unlimited data, regardless of the apps they use.

#### 4.2 TRAFFIC MANAGEMENT

The analysis of responses to the questionnaire showed that during this period there were no major changes in traffic management compared to last year. In certain cases operators block traffic over individual communication ports, because they assess that these represent security threats for either network integrity or the security of service for end users. Operators generally the port blocking by the end user request; however, this shifts the risks and the related potential damage that would be caused by a malicious act of abusing this security vulnerability to the end user.

The operators' responses to the Agency's questionnaire show that on the fixed network most of the big operators block internet-bound traffic on port 25, NetBIOS and SMB services (ports 135-139 and 445), and for residential users with a dynamic IP they also block traffic bound for port 53 (DNS services). On the fixed network some providers are also blocking traffic on ports 19 and 161/162, however, this does not apply to users with static IP addresses.

The operators' responses make it clear that all providers of internet access over the mobile network limit the traffic to the user, i.e., all traffic that originates in the internet and is addressed directly to the mobile device. Some operators (not yet all) also offer exceptions, providing a special profile (mobile plan), where all the traffic is transparently open, but the user also takes all risks related to this fact. If a user requires transparent access and the option of disseminating information and content from their mobile device for any special reason, they would have to switch to this plan. The analysis also showed that some operators also block port 25 (sending email through port 25 outside of operator's network) and port 1900 (SSDP).

A major change in traffic management during this period happened based on point (a) of the third subparagraph of Article 3 of the Regulation that pertains to the provision of measures.

*"...and only for as long as necessary, in order to:  
(a) comply with Union legislative acts, or national legislation that complies with Union law, to which the provider of internet access services is subject, or with measures that comply with Union law giving effect to such Union*



*legislative acts or national legislation, including with orders by courts or public authorities vested with relevant powers ...”*

On 1 March 2022 the European Union adopted the Council Regulation (EU) 2022/350 of 1 March 2022 amending Regulation (EU) No 833/2014 concerning restrictive measures in view of Russia's actions destabilising the situation in Ukraine, which in Article 1 adds Article 2f to Regulation (EU) No 833/2014<sup>12</sup>:

*It shall be prohibited for operators to broadcast or to enable, facilitate or otherwise contribute to broadcast, any content by the legal persons, entities or bodies listed in Annex XV, including through transmission or distribution by any means such as cable, satellite, IP-TV, internet service providers, internet video-sharing platforms or applications, whether new or pre-installed ...”*

This provision imposed on the operators to cease the transmission of programmes, websites, platforms or apps or other types of content transmission of subjects from Annex XV, meaning that operators had to cease the transmission or block access to providers, such as: Sputnik, RT – Russia Today English, RT- Russia Today UK, RT – Russia Today Germany, RT- Russia Today France and RT – Russia Today Spanish.

As part of the BEREC OI working group, the Agency collaborated on the preparation of the list of domains and subdomains that are to be blocked in accordance with the above Regulation 2022/350 by all European operators. At informal meetings with operators, it then proactively urged operators to comply, contributing to the fact that operators providing services in Slovenia acted in accordance with Regulation 2022/350. The Agency will carefully monitor this field, and will continue to strive to ensure that operators on the Slovenian market remain compliant.

### 3 SPECIALISED SERVICES

Regulation, fifth paragraph of Article 3:

*Providers of electronic communications to the public, including providers of internet access services, and providers of content, applications and services shall be free to offer services other than internet access services which are optimised for specific content, applications or services, or a combination thereof, where the optimisation is necessary in order to meet requirements of the content, applications or services for a specific level of quality.*

*Providers of electronic communications to the public, including providers of internet access services, may offer or facilitate such services only if the network capacity is sufficient to provide them in addition to any internet access services provided. Such services shall not be usable or offered as a replacement for internet access services, and shall not be to the detriment of the availability or general quality of internet access services for end-users.*

<sup>12</sup> Hereinafter: Regulation 2022/350.

Typical cases that BEREC also classifies among specialised services include voice over LTE (VoLTE) and fixed networks (VoIP), and linear television services (IPTV) with specific QoS parameters. With the General act the Agency has imposed on providers an obligation to explain in the agreements in a clear and understandable manner, how the use of these services will affect internet access services with regard to the capacity of their connection and the number and quality of ordered specialised services. End users must also be expressly informed of the internet access speed that will be available to them when simultaneously using all the services they ordered (including specialised services).

The questionnaires and the review of the data from providers operating on the market show that there were no major changes compared to the same period of last year.

Slovenian providers of fixed and mobile networks perform traffic engineering for telephone (VoIP, VoWiFi, VoLTE) and video (IPTV, VoD) traffic in order to ensure appropriate quality of picture and sound, and the related user experience. The providers generally transfer this content over a separate logical channel, which is managed differently from other internet traffic and also terminates on a specific device (STB, VoIP terminal or mobile phone). All major providers also offer television services over the internet, i.e., OTT television (e.g., Telekom Slovenije's NEO, Telemach's EON, A1's XPLORE TV Go, T-2's TV2GO). Operators also offer additional services over internet access, such as Office 365, smart home, gaming, security services and parental control. The responses show that the operators do not manage such traffic/services differently from the rest of internet traffic.

## **5. MEASURES RELATED TO TRANSPARENCY FOR ENSURING ACCESS TO THE OPEN INTERNET**

In the first paragraph of Article 4 the Regulation states:

*“Providers of internet access services shall ensure that any contract which includes internet access services specifies at least the following:*

- (a) information on how traffic management measures applied by that provider could impact on the quality of the internet access services, on the privacy of end-users and on the protection of their personal data;*
- (b) a clear and comprehensible explanation as to how any volume limitation, speed and other quality of service parameters may in practice have an impact on internet access services, and in particular on the use of content, applications and services;*
- (c) a clear and comprehensible explanation of how any services referred to in Article 3(5) to which the end-user subscribes might in practice have an impact on the internet access services provided to that end-user;*

*(d) a clear and comprehensible explanation of the minimum, normally available, maximum and advertised download and upload speed of the internet access services in the case of fixed networks, or of the estimated maximum and advertised download and upload speed of the internet access services in the case of mobile networks, and how significant deviations from the respective advertised download and upload speeds could impact the exercise of the end-users' rights laid down in Article 3(1);*

*(e) a clear and comprehensible explanation of the remedies available to the consumer in accordance with national law in the event of any continuous or regularly recurring discrepancy between the actual performance of the internet access service regarding speed or other quality of service parameters and the performance indicated in accordance with points (a) to (d).*

*Providers of internet access services shall publish the information referred to in the first subparagraph."*

The same conditions are also defined *mutatis mutandis* in the General act, which along with the above information also requires providers to publish the following on their websites:

- time and duration of peak hours
- link to the text of the General act
- link to the AKOS Test Net measurement tool
- interactive coverage map of the Republic of Slovenia, and
- potential security risks that result from using internet access services and using the terminal equipment without the required protection

With the questionnaire and a review of individual providers' websites the Agency finds that operators do formally adhere to the provision of publishing the required information; however, access to this information is in some cases made difficult, as users can have a hard time finding them. In some cases it was discovered they are not available. Most major operators offer their users a portal where they can manage their services, meaning get the insight into the usage, get an option for switching the plan, activation or deactivation of certain apps, blocking services, changes to certain settings and even invoice payment. There is still room for improvement, and the Agency will actively approach towards improving the current state.

## 5.1 THE RIGHTS OF END USERS REGARDING CONTRACTUAL SPEEDS

In the fourth paragraph of Article 4 the Regulation states:

*"Any significant discrepancy, continuous or regularly recurring, between the actual performance of the internet access service regarding speed or other quality of service parameters and the performance indicated by the provider of internet access services in accordance with points (a) to (d) of paragraph 1 shall, where the relevant facts are established by a monitoring mechanism certified by the national regulatory authority, be deemed to constitute non-conformity of performance for the purposes of triggering the remedies available to the consumer in accordance with national law."*

The General act defines the methodology for measuring speed and maximum permissible derogations by type of internet access. The service operation is considered as poor if – when taking into account all the prescribed conditions for taking the measurements – the average result of all the measurements is lower than the contractually agreed generally available speed, with the highest and lowest speed measurement excluded. The service is also deemed as poor if the measured speed with at least three measurements is lower than the contractually agreed minimum speed. The General act also defines the provider's obligations to provide at the user's request free expert speed measurement at least once per billing period in order to establish the actual state of the connection and to prove whether it is suitable with regard to the contractually defined speeds. The provider is obligated to inform the user within 30 days of the results of the measurements. If the derogations (or errors), are discovered operator must fix them or adjust the contract speed, otherwise the user can start a dispute at the Agency.

If a significant discrepancy, continuous or regularly recurring difference, between the contractual and the actual speed or quality of internet access is detected, the end user also has the following options:

- switch to a subscription plan with a lower transfer speed free-of-charge,
- receive a compensation in the amount of at least 50% of the monthly subscription fee for internet access, if the provider does not offer a subscription plan with lower speeds,
- terminate the contract without paying the early termination fee, if the user does not agree to switching the plan or receiving a compensation.

During the relevant period the Agency received 8 disputes related to significant constant or recurring discrepancies between the contractual and actual speeds, which is almost 60% less compared to the previous period. Approximately half of these disputes did not conclude with a meritorious decision because the application was incomplete or the end user withdrew it. The remaining disputes ended either with a decision in favour of the end user or both parties came to agreeable solution in a mediation procedure. The Agency also attributes the decline of such disputes to the fact that in most cases operators approve end users' justified requests already during their complaint resolution process. As the analysis of the questionnaires shows, the operators on average received about 100 user complaints, with most of them resolved in favour of the users. In the other cases operators state that the issues with the poor service were related to the user, namely faulty home wiring, software issues or a difference between the advertised and actual speeds, and not between the maximum/generally available and actual speeds.

## 6. SUPERVISORY AND EXECUTIVE MEASURES

The first paragraph of Article 5 of the Regulation lays down:

*National regulatory authorities shall closely monitor and ensure compliance with Articles 3 and 4, and shall promote the continued availability of non-discriminatory internet access services at levels of quality that reflect advances in technology. For those purposes, national regulatory authorities may impose requirements concerning technical characteristics, minimum quality of service requirements and other appropriate and necessary measures on one or more providers of electronic communications to the public, including providers of internet access services.*

The Agency strive for ensuring the open internet. The main activities focus on supervising and executing the obligations laid down by the Regulation and the General act. At the same time it is also important to monitor the end user complaints and analyse the state of play on the market with the help of the annual questionnaire.

As explained above, during the relevant period some changes took place at the European level, which had an important impact also on the Agency' activities. The Agency actively participated in BEREC's working group analysing the ECJ rulings and with the preparation of the updated Guidelines. The Agency also actively participated in the discussions on the method for implementing the Regulation 2022/350. With the aim of ensuring a consistent implementation of these changes it also organised several group and individual consultations with operators.

### 6.1 AKOS TEST NET MEASUREMENT TOOL

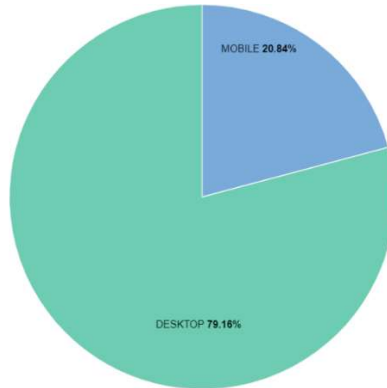
The Agency developed AKOS Test Net, which is Agency's own tool for measuring speeds and the quality of broadband networks on fixed and wireless networks. It measures various parameters, such as speed of data traffic, latency, availability of network services, etc. The Agency constantly ensures that the AKOS Test Net measurement tool operates without interruptions. During the period several regular software upgrades on measurement and control servers were performed. A few patches were issued for the Android app, especially improving the detection of 5G NSA networks on the Android 12 operating system. The Agency upgraded all the components of AKOS Test Net measurement tool to 100 GbE, and upgraded its link to SIX to 100 GbE.

In the second half of 2021 and the first half of 2022, 1,436,456 measurements were made using the AKOS Test Net tool, nearly 12% fewer than in the same period last year. Of these, 62,534 end users made 295,728 measurements, while the rest were made by the Agency automatically on its own testing connections.

Of the 295,728 measurements made by end users, 233,747 were made using a web browser,

and 30,645 using the app on WiFi networks and 31,336 using the app on mobile networks.

Figure 8: Measurements made on mobile phones and (desktop) computers

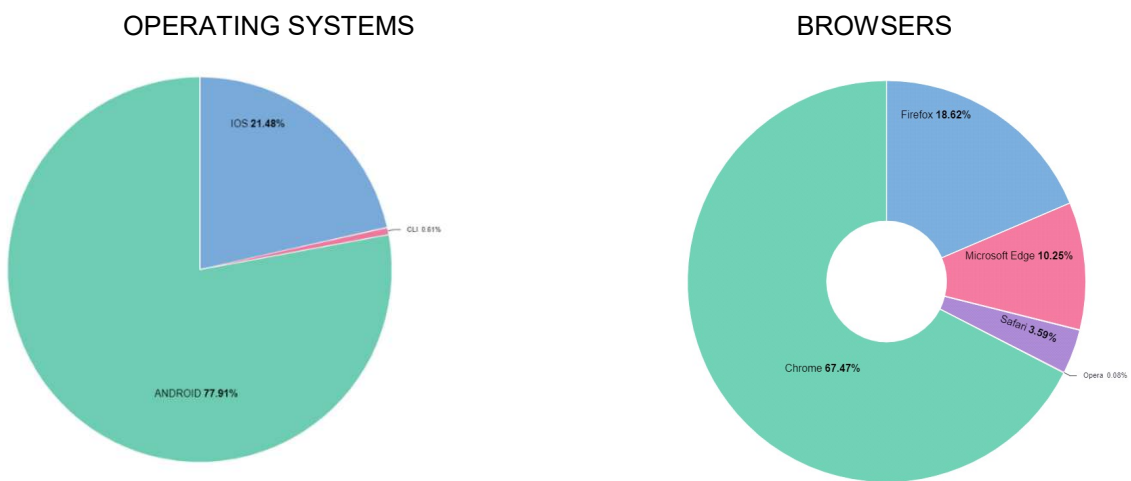


Source: AKOS, June 2022

The maximum measured speed on fixed networks was 9.273 Gb/s (Telemach), and the maximum measured speed on the 5G network was 1.632 Gbps (Telemach).

On fixed connections using a LAN connection, there were 271,558 measurements made. Among the web browsers used for making the measurements on fixed connections, Google Chrome is prevailing (172,167 measurements), followed by Firefox (53,797 measurements), Edge (20,592), Safari (13,470) and other browsers. Among the mobile phone operating systems that were used to take the measurements, the Android app is dominant with 77.91% of measurements, while 21.48% of measurements were taken using phones powered by Apple’s iOS operating system, and the remaining 0.61% of measurements were made by using the CLI client.

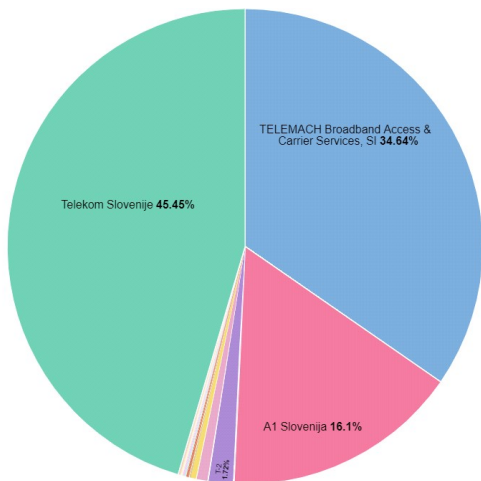
Figure 9 and Figure 10: Measurements by mobile phone operating system and browser



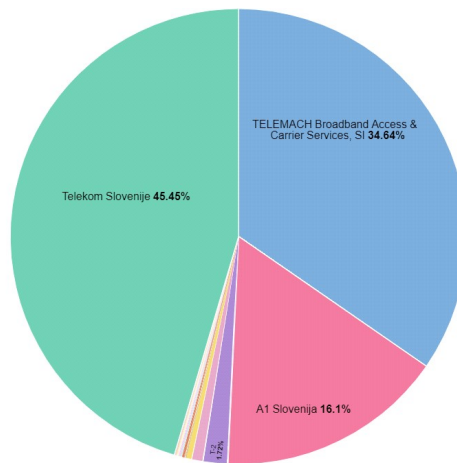
Source: AKOS, June 2022

Figure 11 and Figure 12: Measurement in fixed and mobile networks by operators

## MOBILE NETWORKS



## FIXED NETWORKS



Source: AKOS, June 2022





## INSTEAD OF CONCLUSION

### PROTECTION OF ACCESS TO THE OPEN INTERNET

Agency's activities:

- verifying available information
- analysing complaints
- reviewing requests for supervision of end users
- measuring network capacity and quality
- analysis of collected data



### TRAFFIC MANAGEMENT

Port blocking:

- fixed: ports 25, 135-139, 445, 53, 19, 161/162
- mobile: ports 25, 1900
- broad interpretation of exceptions
- Regulation 2022/350 (limiting access to Sputnik, RT content)

### SPECIALISED SERVICES

- fixed network: IPTV, VoIP
- mobile network: VoLTE



### MOBILE TECHNOLOGIES AND THEIR SHARE OF THE USERS (2022/Q1):

# 5G

## 3,74%



Maximum speed measured on the 5G network in June 2022 reached 1.6 Gbps.  
Maximum speed measured on fixed networks in this period reached 9.237 Gbps.

# 4G

## 83,80%



# 3G

## 7,55%



### ZERO-RATING

- Rulings of the European Court of Justice
- updated Guidelines
- prohibition of ZR offers





