



Bosna i Hercegovina
Regulatorna agencija za komunikacije
Босна и Херцеговина
Регулаторна агенција за комуникације
Bosnia and Herzegovina
Communications Regulatory Agency



Broadband Mapping in Bosnia and Herzegovina

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Universal Connectivity for a Post-Pandemic Digital Europe
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Topics of the presentation

Background of broadband mapping

Infrastructure and service mapping in Bosnia and Herzegovina

Future developments



Broadband mapping as a cornerstone for any regulatory framework

▪ **ITU GSR Best Practice Guidelines 2021**

„Data is the silver bullet of digital regulation“

▪ **„European Electronic Communications Code“**

Focus on measures that aim to provide incentives for investment in high-speed broadband networks

- ARTICLE 20 on „Information request to undertakings“
- ARTICLE 22 on „Geographic Surveys on network deployments“
- ARTICLES 64 to 67 on „Market analysis and SMP“
- ARTICLES 84 to 92 on „Universal service obligation“

▪ **EU Guidelines on State aid for broadband**

Service and Investment Mapping

▪ **Cost Reduction Directive**

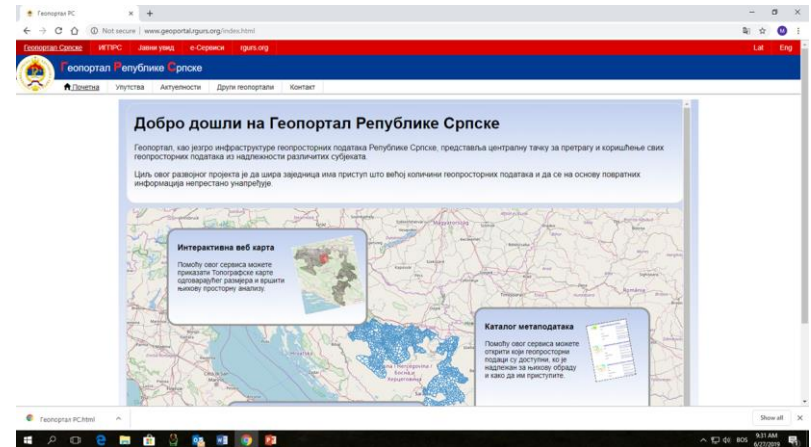
Infrastructure mapping



Infrastructure mapping

Based on **INSPIRE** obligations two geoportals have been created in Bosnia and Herzegovina, corresponding with internal structure of the State:

- **GEOPORTAL OF REPUBLIC OF SRPSKA** operated by **REPUBLIC ADMINISTRATION FOR GEODETIC AND PROPERTY AFFAIRS** of **REPUBLIC OF SRPSKA**
<http://www.geoportal.rgurs.org/geoportal>



- **GEOPORTAL OF FEDERATION OF BOSNIA AND HERZEGOVINA** operated by **FEDERAL ADMINISTRATION FOR GEODETIC AND PROPERTY AFFAIRS**

<http://www.fgu.com.ba/en/572.html>

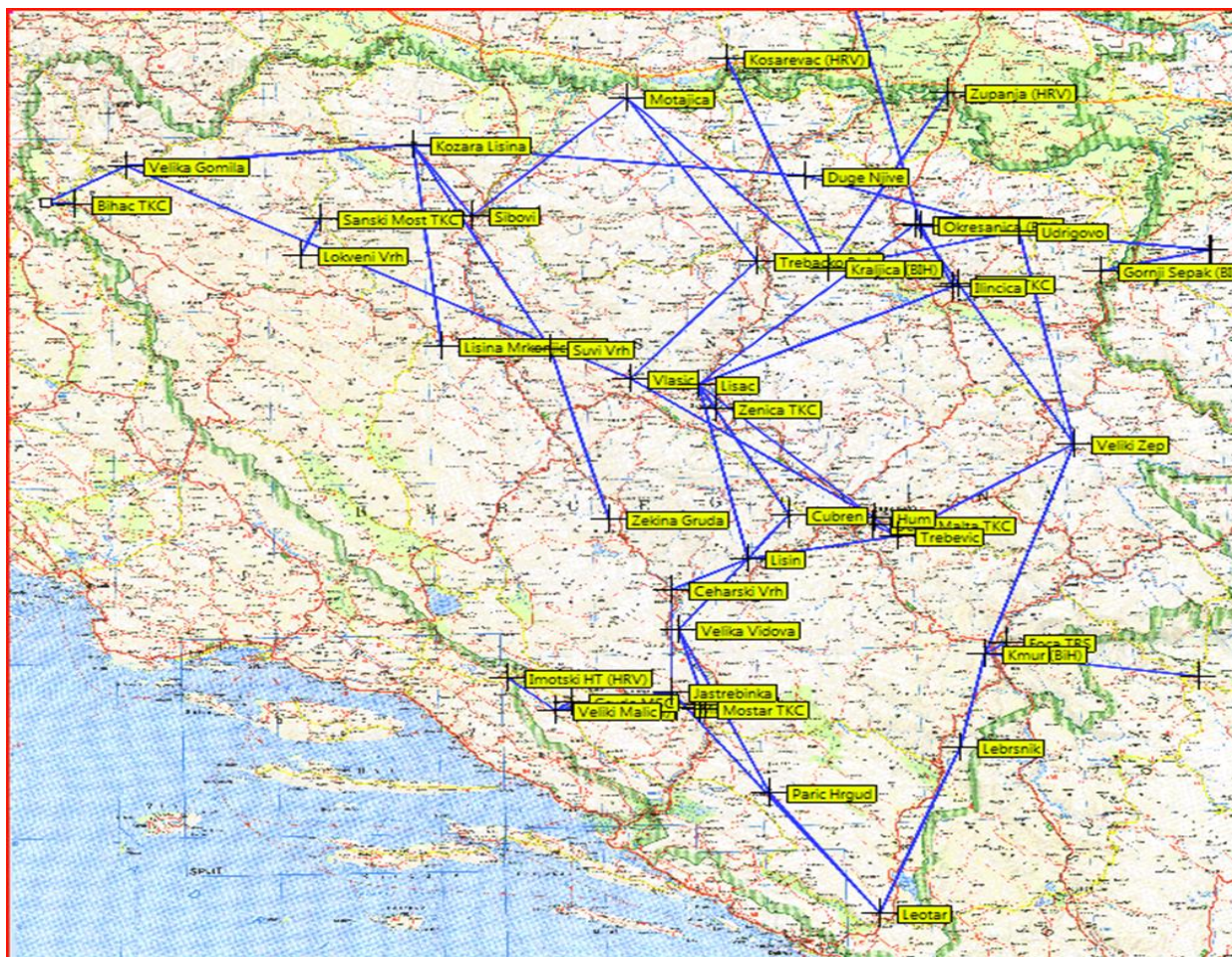
Geoportals enable transparent and useful method for access to ‘spatial data’ (any data with a direct or indirect reference to a specific location or geographical area)



Infrastructure mapping – Example of digital map locally available (low voltage power grid and cable TV network)



Infrastructure mapping – CRA database (map of radio links)

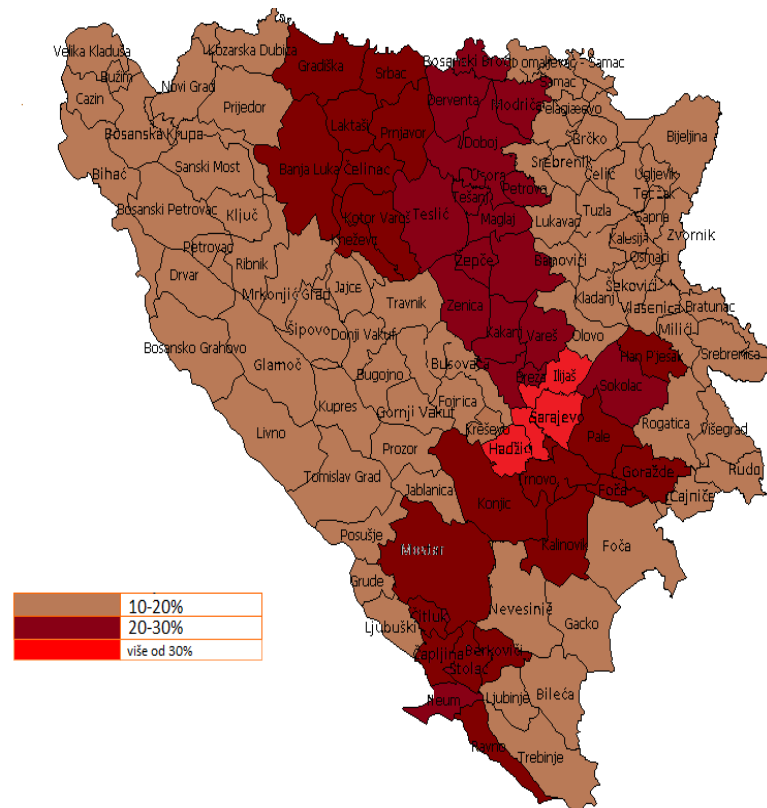


Included in the ITU Interactive Transmission Maps

Service mapping - CRA (ICT Indicators)

Fixed broadband penetration by municipalities

Canton/ Region	Number of Inhabitants	ISP Number	Dial-up	Broadband	Total Number of Subscribers
Central Bosnia ⁸	251,434	7	0	51,954	51,954
Posavina ⁹	42,044	4	0	5,580	5,580
Zenica- Dobojo ¹⁰	360,093	14	0	83,110	83,110
Sarajevo ¹¹	418,542	19	0	137,083	137,083
Canton 10 ¹²	81,350	4	0	11,650	11,650
Tuzla ¹³	441,902	18	0	102,752	102,752
Herzegovina- Neretva ¹⁴	218,473	8	351	53,349	53,700
Una- Sana ¹⁵	270,299	10	0	50,208	50,208
Bosnia- Podrinje ¹⁶	23,360	4	0	4,961	4,961
West Herzegovina ¹⁷	93,696	3	0	16,459	16,459
Brčko District	93,028	8	0	14,864	14,864
Mrkonjić Grad ¹⁸	30,323	5	0	4,751	4,751
Banja Luka ¹⁹	357,981	13	0	89,574	89,574
Prijedor ²⁰	128,535	6	0	25,743	25,743
Dobojo ²¹	166,237	10	0	34,407	34,407
Šamac ²²	19,588	4	0	2,418	2,418
Bijeljina ²³	132,343	6	0	28,437	28,437
Zvornik ²⁴	103,631	6	0	14,770	14,770
Istočno Sarajevo ²⁵	65,246	5	0	15,191	15,191
Foča ²⁶	58,918	4	0	8,615	8,615
Trebinje ²⁷	62,621	4	0	14,548	14,548



Number of Internet subscribers in cities and regions B&H 2020

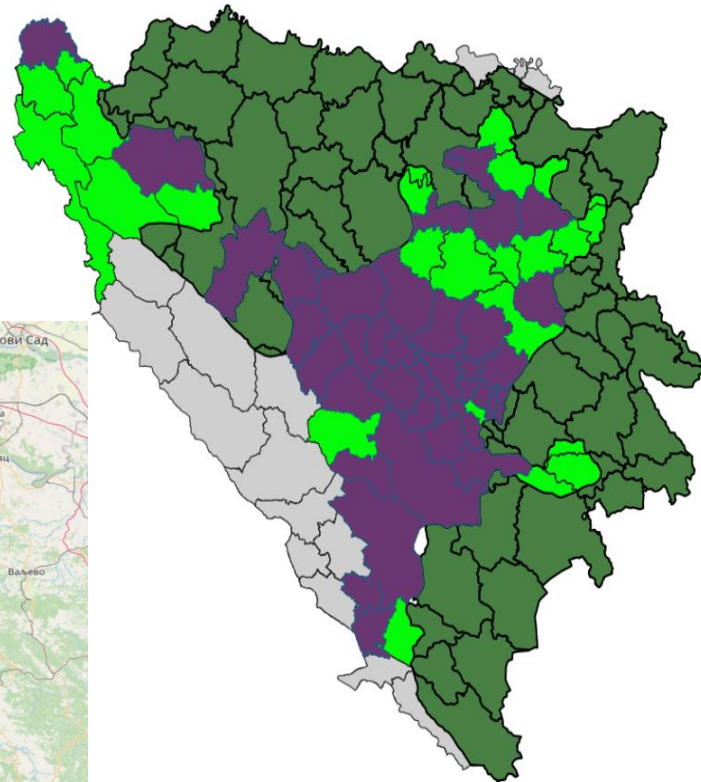
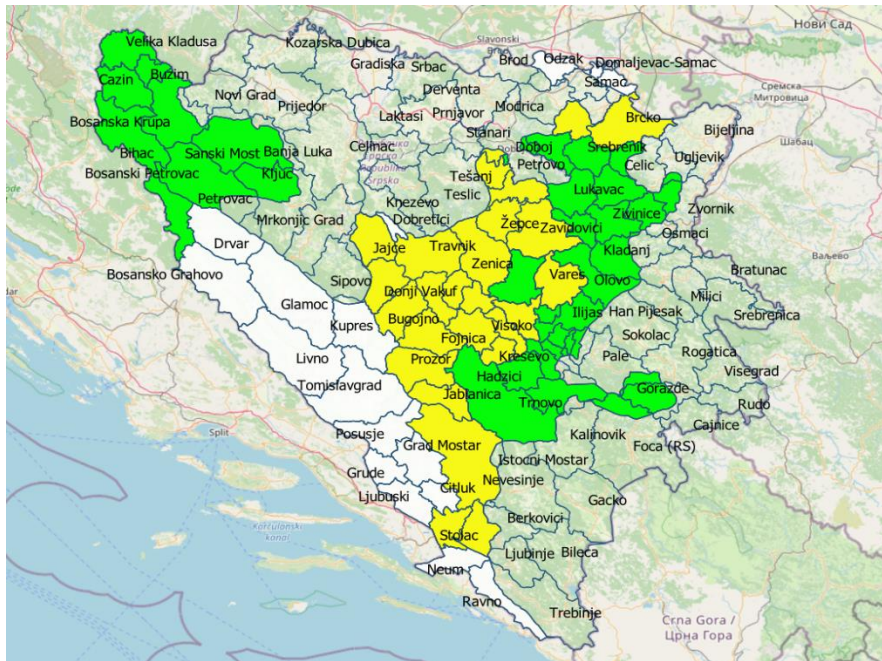
Annual Survey of CRA licence holders for providing Internet services in BiH for 2020. www.rak.ba



Service mapping – CRA (Market analysis)

Fixed network coverage by the operators

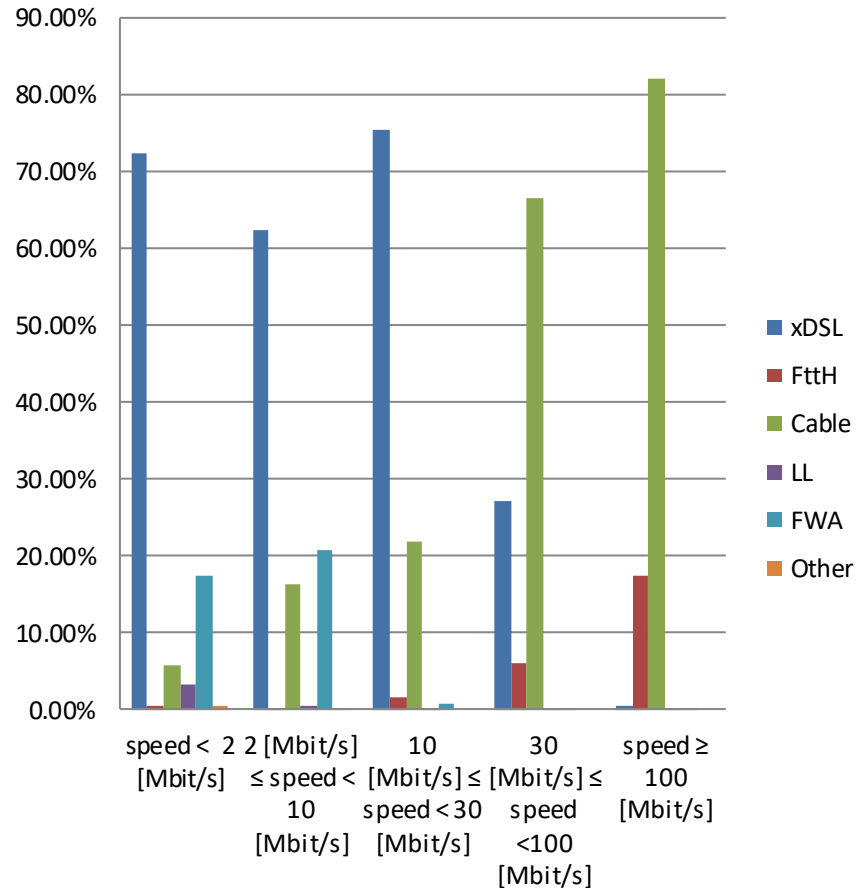
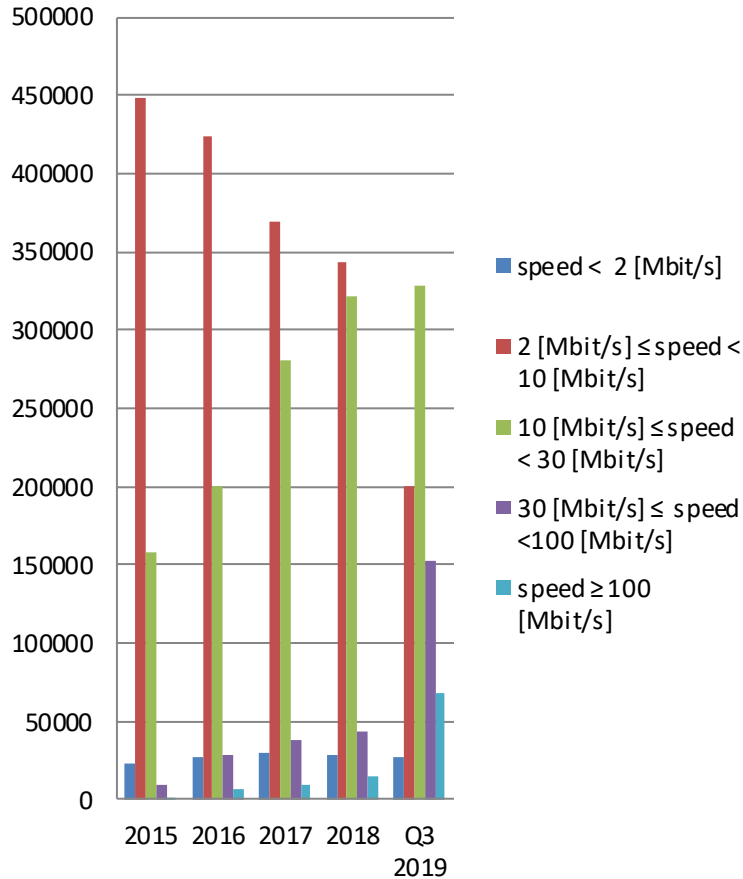
Presence of the operator's network at municipality level



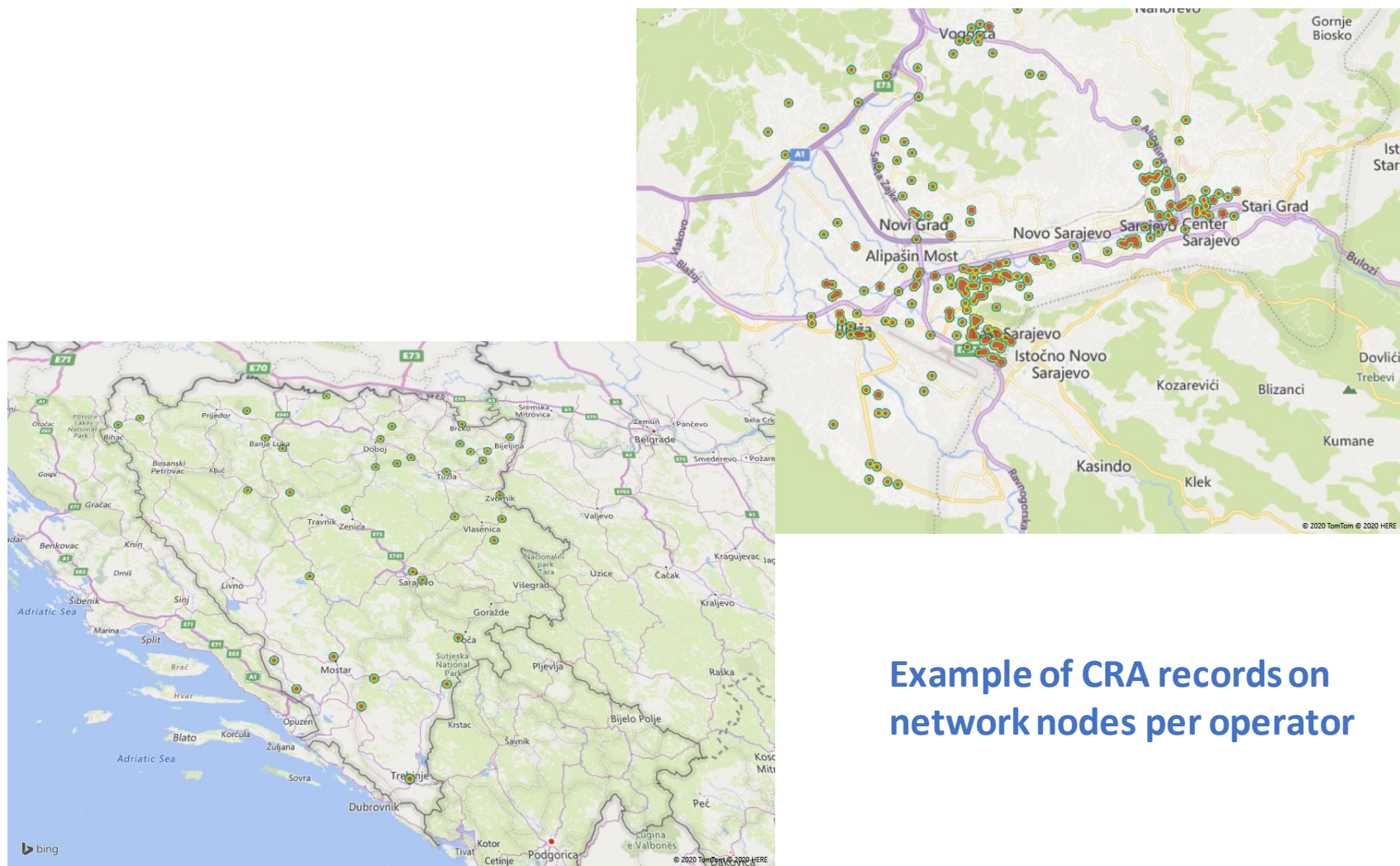
- TELEMACH**
- MTEL a.d. Banjaluka**
- BH Telecom d.d. Sarajevo**
- JP Hrvatske telekomunikacije d.d. Mostar**



Service mapping – CRA (Market analysis)



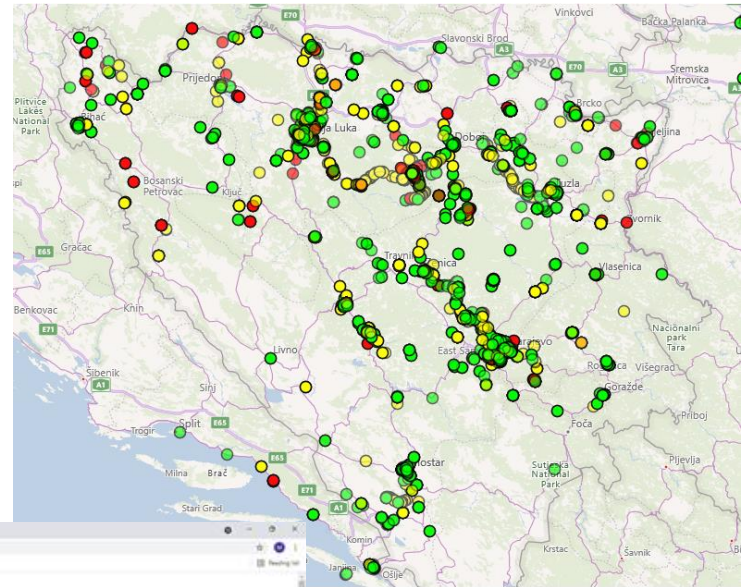
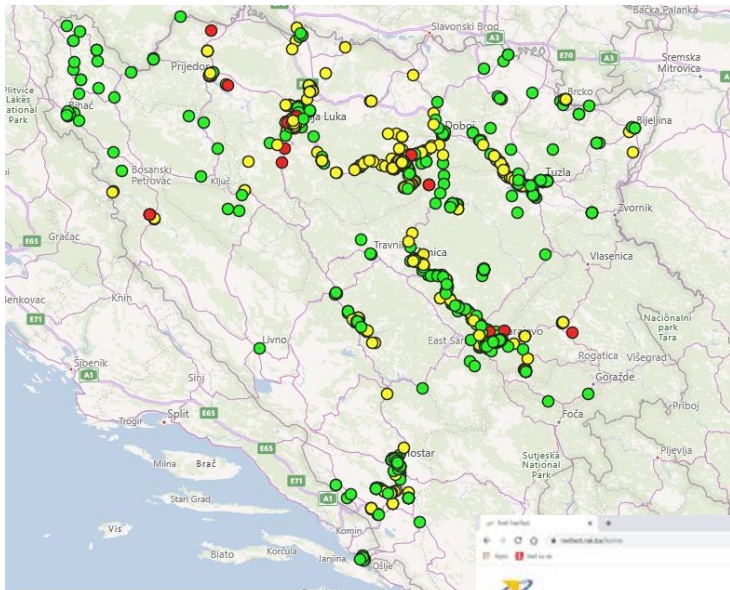
Service mapping – CRA database (Reports)



Example of CRA records on network nodes per operator

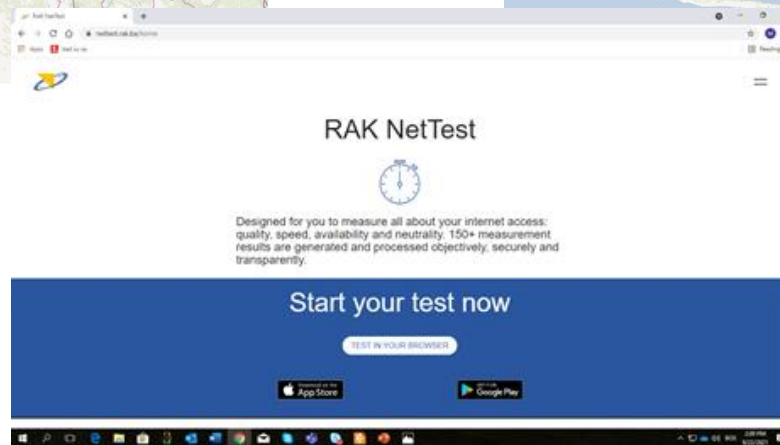


Quality measurements – RAK NetTest



Speed measurement results - mobile network

Speed measurement results - fixed network



Challenges

- *Elements of broadband mapping scattered by different applications and projects*
- *Lack of cooperation between stakeholders*
- *No correlation of data*
- *Not all data are georeferenced*
- *National BB development strategy to be adopted*



Future activities

ITU - BiH technical assistance project - collaboration with AKOS

Broadband Policy Paper for Bosnia and Herzegovina: „Enabling Environment for Broadband Mapping in Bosnia and Herzegovina“

- Country wide assessment of existing data
- Regulatory assessment
- Responsible authorities
- Scope of BB mapping (service/infrastructure/investment)
- Data format
- Technical solution and use case for Bosnia and Herzegovina



Thank you for attention!

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