Broadband mapping – Croatian experience

ITU-EC Regional Conference for Europe
on "Broadband Services and Infrastructure Mapping„
Warsaw, Poland
11 to 12 April 2016

AGENDA

1. INTRODUCTION
2. DATA COLLECTION AND PROCESSING
3. QUALITY OF SERVICE MAPPING
4. DATA PUBLICATION
5. CONCLUSION

AGENDA

1. INTRODUCTION
2. DATA COLLECTION AND PROCESSING
3. QUALITY OF SERVICE MAPPING
4. DATA PUBLICATION
5. CONCLUSION

INTRODUCTION

- *Croatian broadband mapping project was launched in June 2013 as 9th measure of Implementation Program of the Strategy for Development of Broadband in the Republic of Croatia in the period from 2012 to 2015 aiming to map areas with availability of broadband infrastructure which allows broadband access with download speeds of 2-30 Mbit/s, 30-100 Mbit/s and more than 100 Mbit/s.*

- *The purpose of the project is provision of initial mapping tool as a basis for public consultations process which must be conducted in order to determine if some broadband project is eligible for the state aid*
  - *Initial map + three years investment plans (expressed during public consultations) = final mapping (mapped area is „white", „grey" or „black")*

- *The result of the project is:*
  - *publicly available interactive map with polygons representing areas passed with broadband infrastructure (allowing defined speeds), interactive map presenting take up rates of defined categories of broadband access speeds in cities/municipalities*
  - *GIS application with more functionalities for internal use only.*

AGENDA

1. INTRODUCTION
2. **DATA COLLECTION AND PROCESSING**
3. QUALITY OF SERVICE MAPPING
4. DATA PUBLICATION
5. CONCLUSION

DATA COLLECTION

- *All electronic communications operators are obliged by HAKOM's decision to deliver data on all objects (at postal address level) which are passed by their own broadband network infrastructure and also, for each address, data on total number of households which are subscribed to their broadband access service (and corresponding speed category)*

- *The following set of data is required to be submitted in the form of .xls file:*
  - *Address of the object*
  - *X, Y coordinates (HTRS96/TM) of the object*
  - *Broadband infrastructure (home passed) with the following download speed available:*
    - *≥ 2 Mbit/s to <30 Mbit/s (YES / NO)*
    - *≥ 30 Mbit/s to <100 Mbit/s (YES / NO)*
    - *≥ 100 Mbit/s (YES / NO)*
  - *Type of infrastructure (technology)*
  - *Cable ducts in the building in the street available (YES/ NO)*
  - *Cable ducts to the object available (YES / NO)*
  - *The total number of households (for each address) subscribed to corresponding access speed range*

- *Mobile network operators are obliged to submit data on mobile networks indoor coverage*

DATA PROCESSING 1/3

- *First, alphanumeric data supplied by operators are paired with corresponding geo-referenced addresses (obtained by State Geodetic Administration) of the objects*

+

						Mogućnost pružanja širokopojasnog pristupa	
Županija	Grad/općina	Naselje	Ulica	kućni broj	broj korisničkih jedinica	30 Mbit/s - 100 Mbit/s [DA/NE]	više od 100 Mbit/s [DA/NE]
Bjelovarsko-bilogorska							
Bjelovarsko-bilogorska	Berek						
Bjelovarsko-bilogorska	Berek	Begovača	ulica1	1	1		
				2	2		
				3	1		
				4	3		
			ulica2	1	1		
				2	1		
				3	5		
			ulica3	1	1		
				2	1		
Bjelovarsko-bilogorska		Berek	ulica1	1	5		
				2	3		
				3	2		
				3A	1		
			ulica2	1	5		
				2	5		
				3	5		
				4	5		
			ulica3	1	4		
				2	4		
				3	4		
				4	4		
			ulica4	1	8		
				2	8		
				3	8		
				4	8		
				5	8		
Bjelovarsko-bilogorska		Gornja Garešnica					
Bjelovarsko-bilogorska		Kostanjevac					
Bjelovarsko-bilogorska		Krivaja					
Bjelovarsko-bilogorska		Novo Selo Garešničko					
Bjelovarsko-bilogorska		Oštri Zid					
Bjelovarsko-bilogorska		Podgarić					
Bjelovarsko-bilogorska		Potok					
Bjelovarsko-bilogorska		Ruškovac					
Bjelovarsko-bilogorska		Šimljana					

Sheet2 Sheet3

DATA PROCESSING 2/3

- *Then, points representing objects with identical data are created.*

DATA PROCESSING 3/3

- *Finally, on the basis of adjacent points representing objects with identical data, polygons, representing broadband areas of corresponding available broadband speed category, are created.*

AGENDA

1. AIM AND PURPOSE OF THE PROJECT
2. DATA COLLECTION AND PROCESSING
3. **QUALITY OF SERVICE MAPPING**
4. DATA PUBLICATION
5. CONCLUSION

HAKOMetar

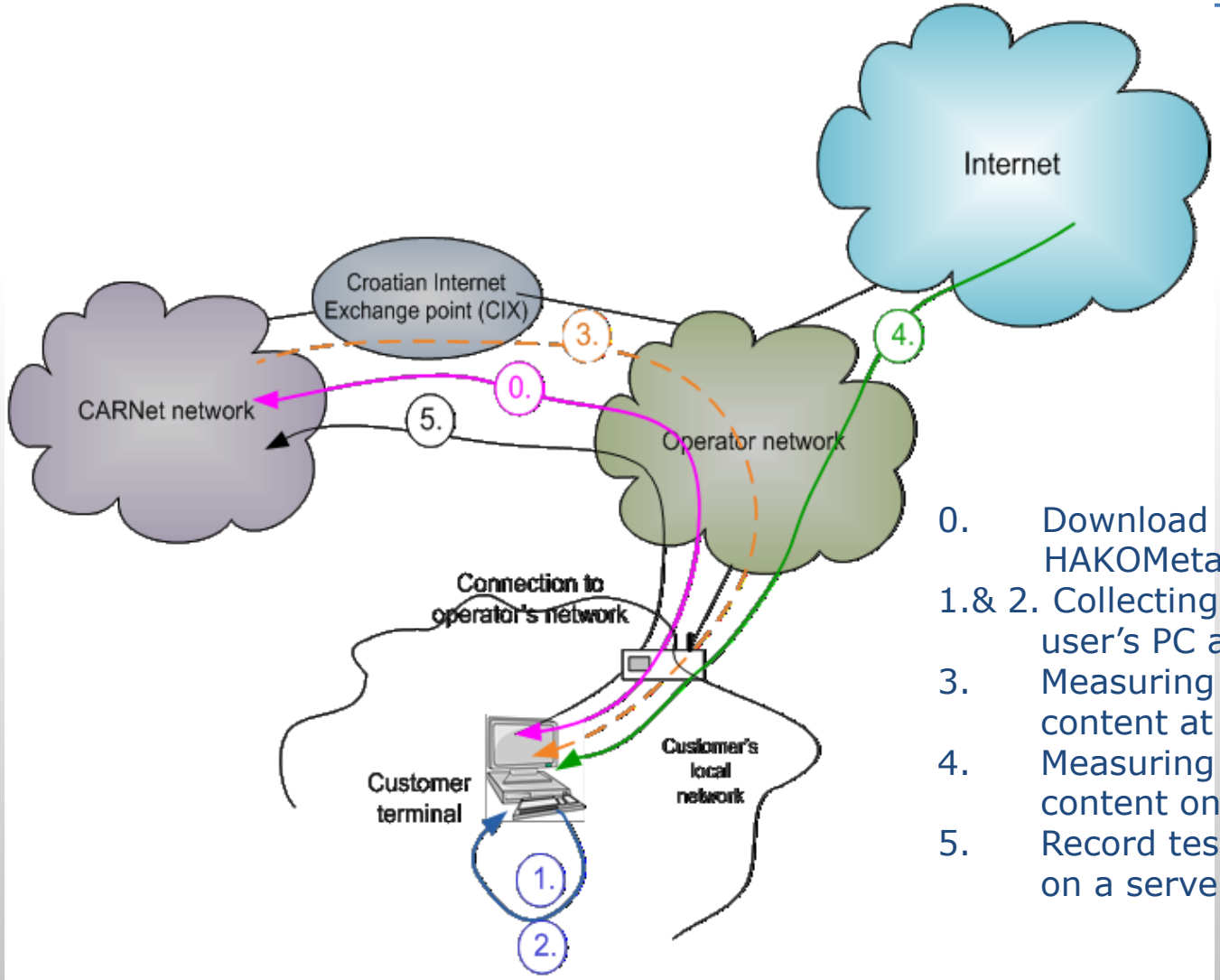
- *Collected data on availability of broadband speeds levels corresponds to advertised speed levels, but actual speed which broadband users actually can achieve is in many cases lower, resulting with rising number of customer complaints*

- *Therefore, in November 2012 HAKOM, in cooperation with CARNet (Croatian Academic and Research Network), launched certified software tool for measuring the speed of the broadband Internet access - **HAKOMetar***

- *Client application measurement:*
  - *The application is available on HAKOM's website and operators website*
  - *Multiplatform app – Java based (run on most OS's)*
  - *Detailed measurements*
  - *Two ways of running application: a) WEB start java and b) standalone application*
  - *Unique ID for each started measuring cycle*

- *Using results of measurements in the process of resolving complaints, consumers have a possibility **to downgrade to a package** that is more appropriate for the actually achievable speed or **terminating the contract free-of-charge!***

MEASUREMENTS TOPOLOGY



0. Download and activation of HAKOMetar
1.& 2. Collecting data about the user, user's PC and local network
3. Measuring the availability of data content at the reference server
4. Measuring the availability of data content on the Internet
5. Record test results in the database on a server

DATA MEASURED AND COLLECTED

- *Measurement data are recorded to HAKOM's server:*

- ***Subscriber and local network data:***
  - *Name and surname*
  - *Address, postal code and city and Phone number (fixed)*
  - *Name of the operator with which the user/subscriber has contract*
  - *The contracted access speed*
  - *e-mail address*
  - *Computer network interface (IP and MAC address) wire interface is mandatory,*
  - *network interface load, active connection, ARP table, Routing table, CPU/Memory usage,……..*

- ***Broadband Access Service QoS parameters:***
  - *Measured transmission speed (Download/Upload) - parallel HTTP and FTP test*
  - *Ping, delay, Jitter and packet, loss ratio*

Measured data could be used and incorporated to the map together with data on broadband access service availability – QoS mapping?!

Yes it could, but…

…RECORDED MEASUREMENTS

are:

- ***Not representative enough*** *because measurements are usually performed (and often repeated) by the subscribers* ***having problems with Internet connection***

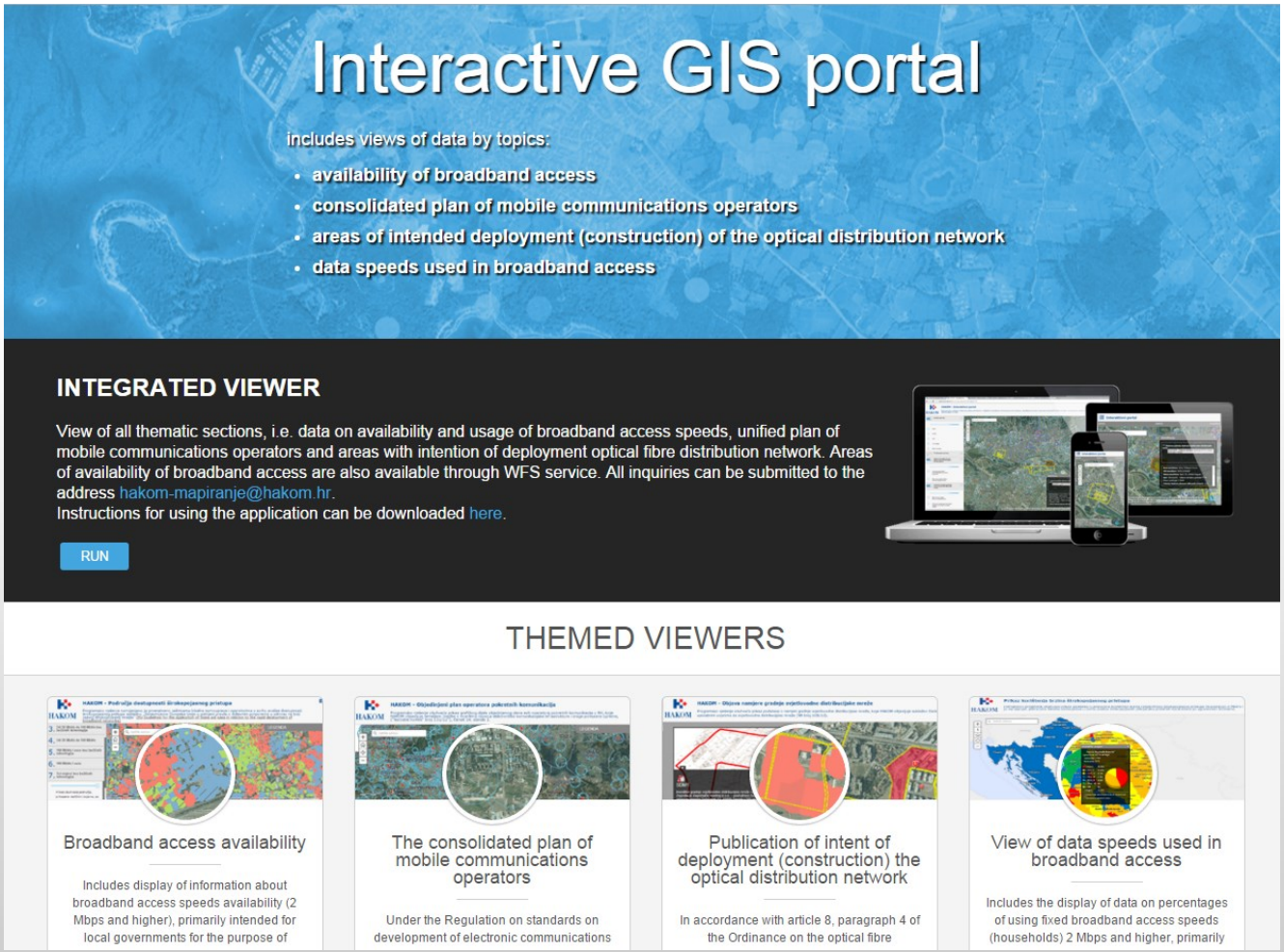
- ***Not reliable enough****, because some data (address, contracted access speed…) are edited by the subscriber*

So, it has been concluded that QoS mapping at national level, based on HAKOMetar measurements, *would be impractible and counterproductive****, but HAKOMetar measurement can be used to map QoS at local broadband project level.***

AGENDA

1. INTRODUCTION
2. DATA COLLECTION AND PROCESSING
3. QUALITY OF SERVICE MAPPING
4. **DATA PUBLICATION**
5. CONCLUSION

DATA PUBLICATION



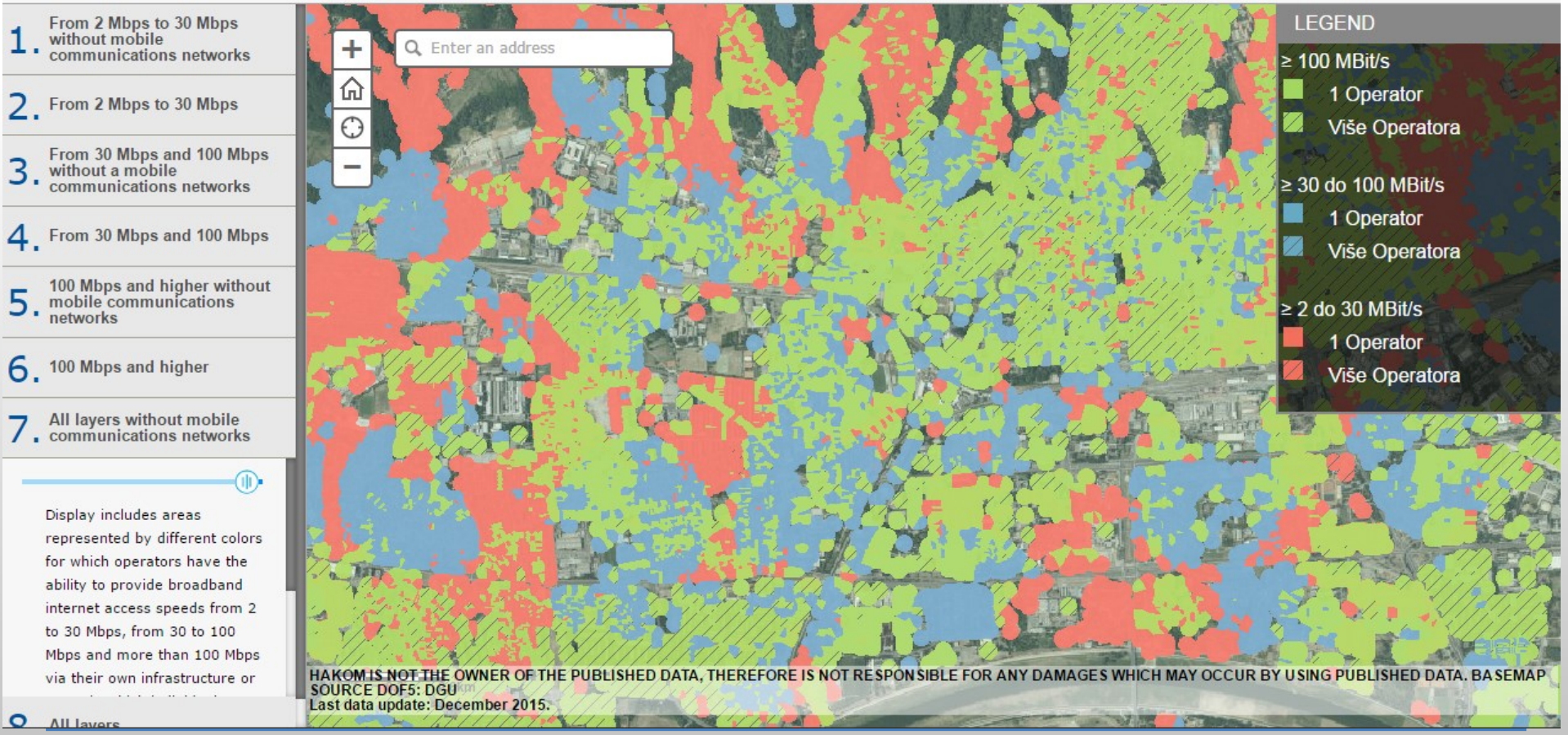
- *Data are publicly available in form of an interactive map at HAKOM's web site (http://bbzone.hakom.hr/)*

BROADBAND ACCESS AVAILABILITY

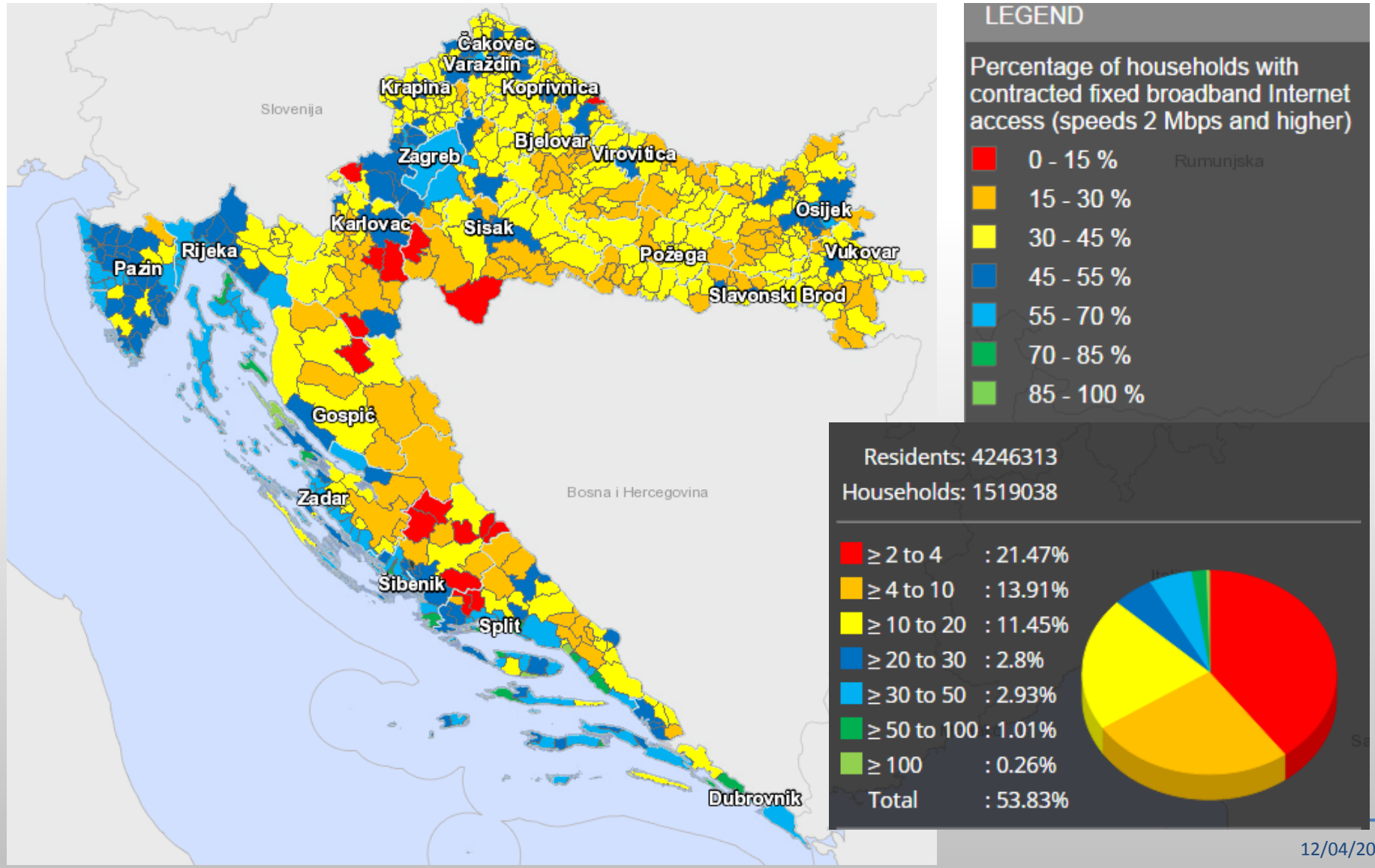
HAKOM

Areas with the availability of broadband access

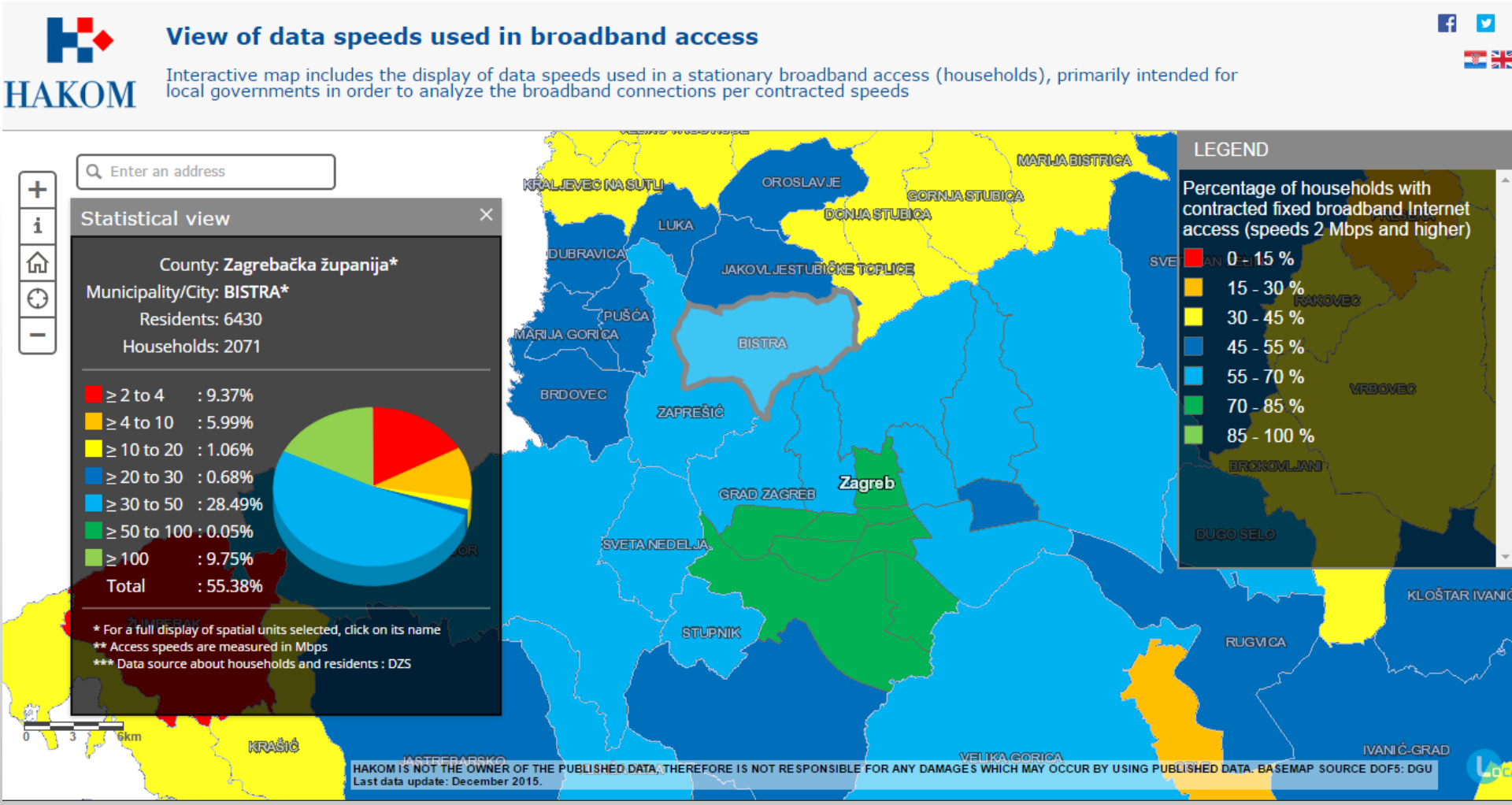
Interactive map is intended primarily for local governments and operators for the purpose of analysis of the availability of broadband access speeds in accordance with the "EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks" (EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks)



VIEW OF USED BROADBAND ACCESS SPEEDS



VIEW OF USED BROADBAND ACCESS SPEEDS



AGENDA

1. INTRODUCTION
2. DATA COLLECTION AND PROCESSING
3. QUALITY OF SERVICE MAPPING
4. DATA PUBLICATION
5. **CONCLUSION**

CONCLUSION

- *Although there is a room for upgrade, the Croatian broadband map can already be used for identification of "white", "grey" and "black" areas*

- *It can be upgraded (next step) with quality of service (QoS) data,*
  - *We have considered to map Quality of Service using already existing HAKOmetar measuring data, but it was concluded that these data are not representative enough*

- *Establishing national GIS database and visualized on an interactive map which would provide an insight into electronic communications infrastructure (and other utilities infrastructures) such as cable ducts routes, pipes, manholes, locations of antennae masts, will be more challenging*

  - *One of the most important challenges is that data on the existing infrastructure are not available, or if available they are not reliable or they are in an unsuitable format.*

Mladen Sikirica (mladen.sikirica@hakom.hr)
Vesna Gašpar (vesna.gaspar@hakom.hr)

HAKOM
CROATIAN REGULATORY AUTHORITY
FOR NETWORK INDUSTRIES
ROBERTA FRANGEŠA MIHANOVIĆA 9
HR-10110 Zagreb, CROATIA
Tel: +385 (0)1/7007 007
Fax: +385 (0)1/7007 070
www.hakom.hr