

Importance of Land Administration Data in Strengthening Competitiveness and Economic Development

In preparation for the «PCC Conference jointly organized with support from CLRKEN of EuroGeographics» on 16/17 June 2020

In preparation for the PCC Conference in June 2020, a survey has been carried out by means of a questionnaire sent to all member countries of PCC and EuroGeographics. The topic of the conference will be about the importance of land administration data in strengthening competitiveness and economic developments.

The aim of the survey was to get an overview of what role **Open Data**¹ play in the member countries in the field of Land Administration, what the benefits are, and what lessons have been learned. This is in connection to the recent Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on «**open data and the re-use of public sector information**»² and the ongoing preparation of the «**Impact assessment study on the list of High Value Datasets (HVD)**». This study is mandated to a study team, who's purpose is to identify in all EU Member states specific datasets that should belong to the list of HVDs; to analyze the possible impacts of making the HVDs available for re-use free of charge; and to quantify the socio-economic benefits. More information can be found on the PolKEN EuroGeographics web page (in the member section).³

This report is a summary of the 21 replies that have been received.

¹ Definition by the Directive (EU) 2019/1024: “Open data as a concept is generally understood to denote data in an open format that can be freely used, re-used and shared by anyone for any purpose. Open data policies can play an important role in promoting social engagement, and kick-start and promote the development of new services based on novel ways to combine and make use of such information.”

² <https://eur-lex.europa.eu/eli/dir/2019/1024/oj> (formerly referred to as the PSI Directive)

³ [Meeting on 11 Feb. 2020](#), [Minutes](#), [Slides of study team](#) Please, note that these documents can be viewed only in the restricted Members area.

1. Participating Countries

Q1) Country or state for which the following answers are valid:

Country Code	Country	Answers provided by	Email-address
AT	Austria	Ernst Julius	julius.ernst@bev.gv.at
BH	Bosnia-Herzegovina	Denis Tabučić	denis.tabucic@fgu.com.ba
CH	Switzerland	Susanne Dräyer Relling	Susanne.DraeyerRelling@swisstopo.ch
CY	Cyprus	Andreas Hadjiraftis	ahadjiraftis@dls.moi.gov.cy
CZ	Czechia	Svatka Dokoupilova	svatava.dokoupilova@gmail.com
DE	Germany	Marcus Wandinger	AdV.GS@ldbv.bayern.de
EE	Estonia	Maili Hirlak Tõnu Kägo	Maili.Hirlak@maaamet.ee Tonu.Kago@maaamet.ee
ES	Spain	Amalia Velasco	amalia.velasco@catastro.minhafp.es
FI	Finland	Antti Kosonen	antti.kosonen@maanmittauslaitos.fi
HR	Croatia	Sanja Zekušić	Sanja.Zekusic@dgu.hr
IT	Italia ⁴	Arturo Angelini	arturo.angelini@agenziaentrate.it
KO	Kosovo	Korab Ahmetaj	Korab.Ahmetaj@rks-gov.net
LT	Lithuania ⁵	Bronislovas Mikūta	Bronislovas.Mikuta@registrucentras.lt
LU	Luxembourg	Alex Haag	ACT Direction <direction@act.etat.lu>
NL	The Netherlands	Dorus Kruse	Dorus.Kruse@kadaster.nl
PL	Poland	Ewa Surma	Ewa.Surma@gugik.gov.pl
PT	Portugal	Artur Seara	aseara@dgterritorio.pt
RO	Romania	Adriana Poggi	adriana.poggi@ancpi.ro
SE	Sweden	Magdalena Andersson	Magdalena.Andersson@lm.se
SK	Slovakia	Martina Behuliaková	Martina.Behuliakova@skgeodesy.sk
UA	Ukraine	Ganna Tkachenko	annatkachenko275@gmail.com

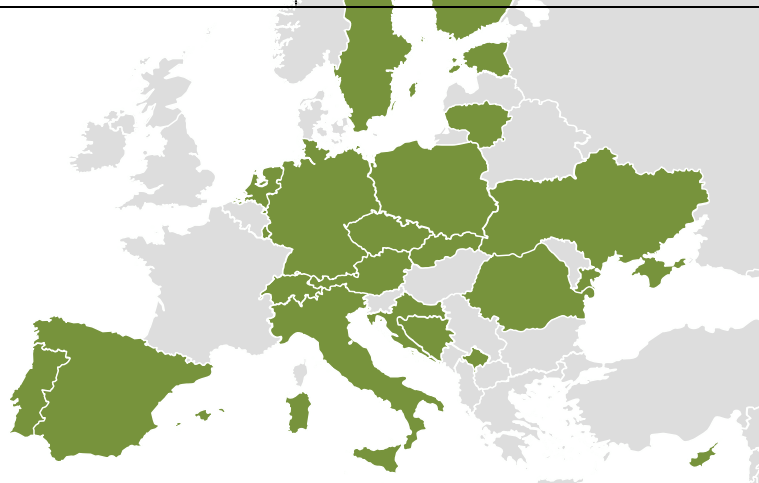


Figure 1: 21 Participating countries

⁴ IT Without the autonomous Provinces of Trento and Bolzano.

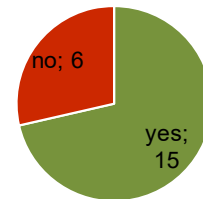
⁵ LT The Centre of Registers is the processor of the data of Real Property Cadastre and Register, Address Register and other public registers and information systems.

2. Key Indicators

2.1 Open Data status

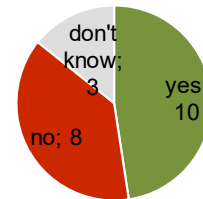
Q2) Are you familiar with the process of preparation of the above mentioned «Impact assessment study on the list of High Value Datasets»?

→ yes / no



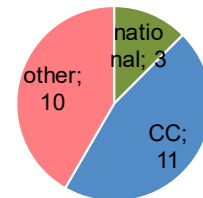
Q3) Is your institution actively involved in its preparation?

→ yes / no / don't know



Q4) What kind of licence policy is being used for your open NMCA data?

→ national open data license rules / Creative Commons (CC) license conditions and types⁶ / other / don't know



	Q2) HVD awareness		Q3) Actively involved			Q4) Licence policy used			
	yes	no	yes	no	don't know	national rules	Creative Commons	other*	don't know
AT	x		x				x	x	
BH	x			x				x	
CH		x			x			x	
CY	x		x			x			
CZ	x		x				x		
DE	x		x			x	x	x	
EE	x			x				x	
ES	x			x				x	
FI	x			x			x		
HR	x		x					x	
IT		x		x			x		
KO		x		x				x	
LT	x		x				x		
LU	x		x				x		
NL	x		x				x		
PL	x				x			x	

⁶ Creative Commons is a California based non-profit organization dedicated to building a globally accessible commons of knowledge and culture (see <https://creativecommons.org>).

	Q2) HVD aware-ness		Q3) Actively involved			Q4) Licence policy used			
	yes	no	yes	no	don't know	national rules	Creative Commons	other*	don't know
PT		X		X					X
RO		X			X	X			
SE	X		X				X		
SK	X		X				X	X	
UA		X		X			X		

* Remarks to Q4) other:

AT BEV Standard Charges and Licensing Conditions: In general, most of the BEV's data is subject to charging and licensing, although there are some exceptions, e.g. data based on predefined appointed dates or INSPIRE compliant data and services.

The BEV Standard Charges and Licensing Conditions presumably will obtain until the national transposition of the new Directive (EU) 2019/1024 (Open Data and the re-use of public sector information) will come into force. This will lead to the nearly complete loss of revenues.

Additional obligations concerning the modalities of data provision, like for instance via APIs, as a consequence of the definition of High Value Datasets (HVD) by the forthcoming EC's regulation, could require the extensive or even fundamental reconstruction of existing processes of data collection, maintenance and dissemination. This would doubtlessly be the case if the cadastral data is defined as HVD. As this would require a high amount of additional budgetary and human resources and take a long time (up to three years) for realisation the BEV is strongly arguing against the cadastral data as HVD. Besides, as the cadastral data is always connected with personal data (owners, addresses etc.) the provisions of the European General Data Protection Regulation do not allow its free and unregulated dissemination and re-use.

BH No current open data policy

DE GeoNutzV Bund (<https://www.gesetze-im-internet.de/gesonutzv/BJNR054700013.html>), Datenlizenz Deutschland Namensnennung (<https://www.govdata.de/dl-de/by-2-0>), see Q18.

EE All datasets mentioned in HVD Geospatial Thematic Area are open data and provided by the Land Board of the Republic of Estonia. There is no license needed for using the data.

ES from the organization with the characteristics of CC. But many services without License. Only the download services has license.

HR SGA has developed its own licencing conditions that are more restrictive than national open data licence (The user may not give access to the download service to any third parties without the specific consent of the SGA. The user may publicly disclose downloaded information in its original, unaltered form, and is obliged to prevent the third party from downloading the published information. The downloaded data can only be displayed on a user's website and only available as an image (raster). The user is obliged to highlight the source of data when publishing the original data. The user may use the data provided by SGA to create derivative (new) products. When publicly announcing derivative (new) products based on the SGA data, the user is obliged to disable the reconstruction, downloading and use of the original data of the SGA by a third party. The user is obliged to highlight the source of data when publishing the derivative (new) products.)

- KO Currently with Memorandum of Understanding between stakeholders.
- PL regulated by sector law.
- PT Data are subject to Licensing and are protected by national and international copyright laws. Alphanumeric data can only be provided to the respective owners. Public access to personal data information is restricted and is not provided.
For cadastral parcel data, a commitment term is issued upon request for certain use and lasts for one year. Downloading is not permitted without prior payment or authorization. The information is available via web service for consultation through a viewer.
- SK We also have our own (NMCA) licenses for some products provided free of charge.

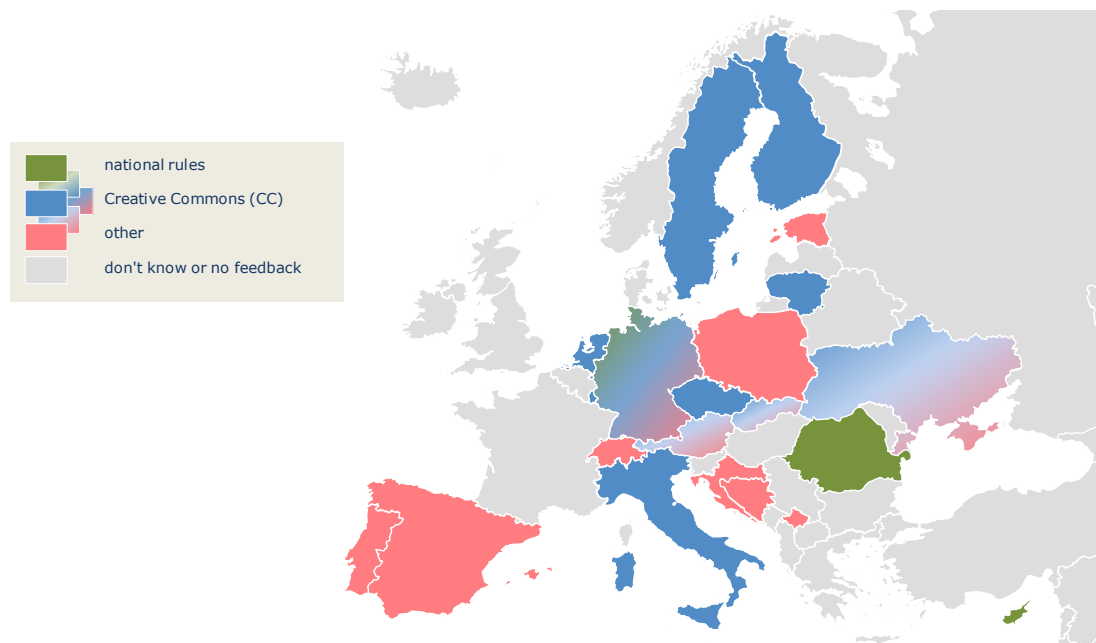


Figure 2: Licence policy being used for open NMCA data (Q4).

Q5) In the case that your NMCA uses the Creative Commons license conditions and types, what license types are being applied?⁷

Q5)		CC BY	CC BY-SA	CC BY-ND	CC BY-NC	CC BY-NC-SA	CC BY-NC-ND
AT	address data	X					
	admin. boundaries	X					
	other	X					
CZ	cadastral parcel data	X					
	address data	X					
	admin. boundaries	X					
	other: coordinate grid	X					

⁷ The six license types offered by Creative Commons are (from least restrictive to most restrictive): Attribution (CC BY) / Attribution ShareAlike (CC BY-SA) / Attribution-NoDerivs (CC BY-ND) / Attribution-NonCommercial (CC BY-NC) / Attribution-NonCommercial-ShareAlike (CC BY-NC-SA) / Attribution-NonCommercial-NoDerivs (CC BY-NC-ND). An easy to understand description can found at: <https://creativecommons.org/use-remix/cc-licenses/> or also at <https://www.youtube.com/watch?v=4ZvJGV6YF6Y>

Q5)		CC BY	CC BY-SA	CC BY-ND	CC BY-NC	CC BY-NC-SA	CC BY-NC-ND
DE	cadastral parcel data address data admin. boundaries	x x x	x x x		x x x		
FI	cadastral parcel data admin. boundaries other: <i>topo. data etc.</i>	x x x					
IT	cadastral parcel data						x
LT	cadastral parcel data land registry data	x x					
LU	cadastral parcel data address data admin. boundaries other	x (CC0) (CC0) (CC0)					
NL	cadastral parcel data address data admin. boundaries other: <i>topographic data</i>	x (CC0) (CC0) x					
SK	cadastral parcel data admin. boundaries other: <i>geographical names</i>	x x x					
UA	cadastral parcel data land registry data admin. boundaries other: <i>hydrography</i> other: <i>transport</i> other: <i>vegetation</i> other: <i>geographic names</i>	x x x x x x					

Remark to Q5):

IT Answer refers to the cartographic data, only.

SE In Sweden none of the above datasets are open data except for some small scale administrative boundaries. We use CC0 for the data that is open.

Q6) In the case that your NMCA uses national open data licence rules, can you please provide additional information.

Q6)		Main difference to CC
	Reason for national open data licence rules	
CY	Provision of free access to all HVD, thus contributing to the sustainable development of the economy.	N/A
DE	The German portal GovData recommends the use of the national open data license rule <i>Datenlizenz Deutschland 2.0</i>	Datenlizenz Deutschland 2.0 is available in two versions: <ul style="list-style-type: none"> Zero: without conditions Namensnennung: obliges the data user to name the respective data provider
ES	because we have open data since 2004 and there are no licenses	none
HR	The <i>Law on amendments to the Right to Access to Information Act regulates</i> that types and content of licences that are laying down	Open License of the Republic of Croatia, corresponds to CC-BY (free use, multiplication, distribution, remix and adapt with indication of

Q6)		
	Reason for national open data licence rules	Main difference to CC
	the conditions of re-use, in accordance with standard open licenses, shall be regulated by an ordinance. The Ordinance on the Types and Content of Permits Determining the Conditions for Reusing Information NN 67/17 stipulates the use of the Open License of the Republic of Croatia for open data or in exceptional and justified cases allows to public authorities the creation of licenses that regulate the re-use of their data.	the source and date of last modification as well as link to the original dataset).
RO	The aim was to encourage the reuse of spatial data.	There are no differences on the general conditions related to those dataset that are considered "open".

Remarks to Q6):

- EE We give our data out via services (wms, wfs), and we do not make license agreement with users for open data.
- HR SGA does not use national open data licence but since they exist, the answers above are provided.

- Q7) In the case that your NMCA uses national open data licence rules, please, indicate if:
- i) the data are free of charge for the end user and without conditions, or
 - ii) if the data are accessible to everyone, but subject to the General Data Protection Regulation by the EU (GDPR) and not free of charge, and
 - ii) since what year this is the case.

Q7)		i)	ii)	iii) year
CY	cadastral parcel data	x		2015
	land registry data		x	2015
	address data	x		2015
	admin. boundaries	x		2015
EE	cadastral parcel data	x		2018
	address data	x		2018
	admin. boundaries	x		2018
	other: <i>topographic data</i>	x		2018
ES	cadastral parcel data			2004
	address data			2004
	other: <i>Buildings</i>			2004
HR*	cadastral parcel data **		x	2018
	land registry data		x	2018
	address data		x	2018
	admin. boundaries		x	2018
	other: <i>orthoimagery</i>		x	2018
KO	address data	x		2013
LU	cadastral parcel data	x		2018
	land registry data		x	2018
	address data	x		2016
	admin. boundaries	x		2016

Q7)		i)	ii)	iii) year
RO	admin. boundaries other: <i>TopRO50k, TopRO100k (Reference Topographic Map of Romania, corresponding to scales scării 1:50,000 and 1:100,000)</i>	x x		2020 2020

Remarks to Q7):

- DE Basically the data are provided under Datenlizenz Deutschland 2.0 – Namensnennung. That means they are free of charge but not without conditions. This is not covered in the selection of the questionnaire.
- HR * SGA does use national open data licence to share the data but it has developed its own license which is described in Q4. Additionally, cadastral parcel data are accessible through WMS service in an open manner (free use, multiplication, distribution, remix and adapt with indication of the source and date of last modification). On SGA Geoportal many other datasets are accessible through WMS services using SGA licence (described in Q4).
**Cadastral parcel data are open in a form of INSPIRE view service (WMS).

Q8) What were the initial arguments or driving forces to open up spatial data in your country, and what institution or government agency took the initiative to bring it on?

Q8)		Institutions
	Arguments / driving forces	
AT	PSI Directive and Open Data Lobbying by the EU	Government / Relevant Ministries
BH	No current open data policy	No current open data policy
CH	increase the use of official geodata, benefit for innovative ideas, economic benefit	Federal Office of Topography swisstopo
CY	Adoption of INSPIRE Directive	INSPIRE Management Council, Ministry of Interior
CZ	Increasing competitiveness, increasing usage of data, socio-economic impact	In the Czech Republic it is solved by the Ministry of Interior who is the guarantor of the Directive on Open data, originally PSI.
DE	political choice in certain Laender	
EE	Income from selling the data played a very little role in the Land Board's budget. Profit from open data for economy and society was the main trigger.	Estonian Land Board.
ES	The data are not property of cadastre is of everybody and it is paid by the citizens with their taxes. We are a fiscal cadastre and we found a contradiction to seek economic compensation for access to cadastral information when its public task is to collect the data anyway for purposes of fiscal control. Free data boost the economy. The quality of data improve when it is used as much as possible.	We were pioneers but the Spanish Government decided in 2007 open all governmental data following PSI directive.

Q8)		
	Arguments / driving forces	Institutions
	The management of cadastre is easier if is open and everybody uses the cadastral data as basis of any change or activity.	
FI	Fees made users to use poor quality free of charge data and quality proof governmental data was not used even in cases where it should be used.	National Land Survey of Finland
HR	According to the Policy on open data (2018), open data enables creation competitive advantages, develop innovations and create jobs. In the Republic of Croatia, the re-use of information and the opening of information for commercial and non-commercial purposes has been an obligation of public authorities since March 2013 when the Right to Access to Information Act, which transposed the PSI Directive of 2003, came into force. The law was amended in 2015 by transposing the PSI Directive from 2013.	Central Office for the Development of the Digital Society is the driving force for opening up all public sector information with support of the Information commissioner.
IT	INSPIRE DIRECTIVE (accessibility, sharing and interoperability of information)	AGID (National Institutional Digital Administration)
KO	Since Kosovo still does not have national open data license rules, still the opinion is that open data is the easiest, fastest and cheapest way to increase transparency, accountability and unlock economic potential in a country.	Kosovo Cadastral Agency by the law exchange address data free of charge.
LT	Promotion of economy	Information Society Development Committee
LU	PSI Directive, Free circulation of data, Licence-free availability of data	Cadastre and topographic administration, Digital Luxembourg initiative, government
NL	Promoting business and innovation.	Ministry of the Interior; Ministry of Infrastructure and Environment.
PL	transparency of government; more efficient utilization of country resources; fostering entrepreneurship; costs of selling data higher than income	Ministry of Digitalisation; Head Office of Geodesy and Cartography
RO	Enabling public access to the information on the Government's activities and policies.	The Government of Romania.
SE	High value for the users and more efficient providing of datasets	several agencies on their own initiative
SK	It was the way the whole society (mainly EU) was approaching the issue of Open data and their recommendation to member states (to open up all data that is prepared and provided by state institutions).	Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatization
UA	The possibility of open data utilization for a variety of purposes: scientific research, innovation, business projects, accountability and public control of governmental bodies, etc.	The Ministry of Digital Transformation of Ukraine.

Q9) Tim Berners-Lee suggested a 5-star deployment scheme for Open Data (see <https://5stardata.info/en/>). Using this scheme, can you please indicate what degree of openness your data have:

Q9)		*	**	***	****	*****
		OL	RE	OF	URI	LD
AT	address data admin. boundaries other	X	X	X		
BH	cadastral parcel data land registry data address data admin. boundaries	X X X X				
CH	cadastral parcel data address data admin. boundaries				X X X	
CY	cadastral parcel data land registry data address data admin. boundaries	X			X X X	
CZ	cadastral parcel data address data admin. boundaries		X X X	X X X	X X X	
DE	cadastral parcel data address data admin. boundaries			X X X		
EE	cadastral parcel data address data admin. boundaries other: <i>topographic data, ortho-photos, elevation data, soil map, geological data, geodetic data, etc.</i>					X X X X
FI	cadastral parcel data admin. boundaries			X X		
HR	other: <i>geographical names</i>				X	
IT	cadastral parcel data				X	
KO	cadastral parcel data address data admin. boundaries	X X			X	
LT	cadastral parcel data land registry data			X X		
LU	cadastral parcel data address data admin. boundaries			X X	X	
NL	cadastral parcel data address data admin. boundaries other: <i>topographic data</i>			X X X X	X X X X	
PL	land registry data address data admin. boundaries other: <i>geographical names</i>	X		X X		X
PT	cadastral parcel data	X				

Q9)		*	**	***	****	*****
		OL	RE	OF	URI	LD
RO	cadastral parcel data land registry data address data admin. boundaries other: (<i>Reference Topographic Map of Romania, corresponding to scales scării 1:50,000 and 1:100,000</i>)*	x x	x x	x x		
SE	not applicable in Sweden					
SK	cadastral parcel data land registry data admin. boundaries other: <i>geographical names</i>	x			x x x	
UA	cadastral parcel data land registry data address data admin. boundaries other: <i>hydrography</i> other: <i>transport</i> other: <i>vegetation</i> other: <i>geographic names</i>	x	x		x x x	x x x

- * OL: data accessible on the Web under an open license, for example PDF;
- ** RE: on the web in a structured, but proprietary way, for example an Excel file;
- *** OF: on the web in a structured, but open format, for example CSV;
- **** URI: on the web, data items have an URI and can be linked to;
- ***** LD: on the web, data linked to other data, discoverable, increase its value.

Remark to Q9):

IT Answer refers to the cartographic data, only.

PT For cadastral parcel data: only representation of geometry and not personal data attributes. Data download are subject to Licensing and are protected by national and international copyright laws.

2.2 Infrastructure for data sharing

Q10) How do you share open data?

→ Distribution of data on physical media (hard disk, CD,...) / Network services

Q11) In the case of network services, what kind of portal is in use?

→ NSDI geoportal / Geoportal of your institution (if any) / Open data portal

	Q10)		Q11)		
	Physical media	Network services	NSDI portal	Own portal	Open Data portal
AT		x		x	x
BH		x		x	
CH		x		x	x

	Q10)		Q11)		
	Physical media	Network services	NSDI portal	Own portal	Open Data portal
KO	x	x	x		
LT	x	x	x	x	x
LU		x	x	x	x

CY	x	x	x	x	x
CZ		x	x	x	x
DE		x	x	x	x
EE		x		x	x
ES	x	x	x	x	x
FI		x	x	x	x
HR		x	x	x	
IT		x		x	

NL		x		x		x
PL	x	x		x	x	x
PT		x			x	
RO		x		x		
SE		x		x	x	x
SK	x	x			x	x
UA		x				x

Remark to Q11):

LT NSDI geoportal: www.geoportal.lt / Geoportal of institution: Regia.lt;
https://www.registrucentras.lt/atviri_duomenys/

Q12) Has the demand for data intensified since the data became open?

Q13) Was the existing infrastructure sufficient or did it require additional investment?

	Q12) Demand for data intensified?	Q13) Existing infrastructure sufficient or need for additional investment?
AT	Some users started automated requests against our registers being freely accessible due to the INSPIRE obligations, in order to build up twin registers on their own. The demand for the other data ranges from unchanged to moderate increase.	In general, the existing infrastructure was sufficient. In the cases of automated requests, we had to establish limiting measures in order to protect our infrastructure and to ensure an adequate performance for our clients.
BH	No current open data policy, but increase in data demand has intensified after online publishing of view services.	No current open data policy, but we do foresee significant need to invest in infrastructure.
CH	Only few data are open yet, their use has increased when opening up.	Yes, because only few data are open yet.
CY	Yes	additional investment
CZ	Yes	additional investment
DE	Yes	additional investment was required
EE	We have not found the best way for monitoring our services in a way that we could say exactly the use intensity. By temporary technical problems when services are down, we can say indirectly that services are widely used.	To open the data required no big investment, but investment is needed for more advanced and user-friendly solutions. Funding is not available for that at the moment.
ES	yes, very much	minor additional investment
FI	Yes, at least multiplied by 50	We had to develop net based self service delivery system
HR	The demand for data has intensified in the first few months since they became open.	For the data that are now open or accessible through WMS network services, the existing infrastructure was sufficient. SGA is discussing further opening of some datasets and we expect that it would require additional investment in the infrastructure.
IT	Yes.	It's not sufficient.

	Q12) Demand for data intensified?	Q13) Existing infrastructure sufficient or need for additional investment?
KO	Kosovo still does not have national open data license rules.	---
LT	Yes	The infrastructure was insufficient and requires investment.
LU	Yes	Strengthening the existing Infrastructure by staff and credits for developments.
NL	<p>→ Views on the cadastral index map have increased from 100 million (2015, only open for government) to 400 million (2016, fully open) and further to 1,6 billion (2019);</p> <p>→ Downloads of cadastral map have increased from 40.000 (2016) to 150.000 (2019);</p> <p>→ Queries for addresses and buildings database: 3 billion in 2019;</p> <p>→ Topographic maps: 4,8 billion views and 176.000 downloads in 2019.</p>	It needs continuous updating.
PL	Yes.	So far it was sufficient. However, we are opening more resources consuming datasets (e.g. orthoimagery and DEM), thus the infrastructure is being upgraded.
RO	yes	Additional investment in the IT network were required.
SE	Yes, a vast increasement.	It required additional investment but if more data is to be opened we need some more investments.
SK	We do not think so.	Small investments.
UA	Yes, it has.	Yes, it was.

2.3 Open Data benefits and implications

Q14) Benefits

- Do you have any documents/studies that investigate the benefits of open data for society?
- What is the main conclusion of the document regarding the benefits?
- What is your assessment of the benefits for your institutions?

	Q14 a) Documents / studies	b) Conclusions re. benefits	c) Benefits for your institutions
BH	No studies have been done	No studies have been done	No studies have been done
CH	"Wirtschaftliche Auswirkungen von Open Government Data" (2019): < https://www.bfs.admin.ch/bfs/de/home/dienstleistungen/ogd/dokumentation.assetdetail.11147089.html >	From an economic perspective, Switzerland would benefit from the introduction of OGD. The federal administration would obtain efficiency gains if the compensation for federal offices can be established. Whether OGD should be introduced is subject to political	---

	Q14 a) Documents / studies	b) Conclusions re. benefits	c) Benefits for your institutions
		decision making, which may take place later in 2020.	
CY	https://www.data.gov.cy/?language=en http://www.geoportal.gov.cy/MOI/DLS/geoportal/geoportal.nsf/page11_en/page11_en?OpenDocument	Multiple benefits, which significantly affect positively the economy.	Better management of geo-spatial and other data, providing easy access for all processes, thus improving services to the public and any interested organizations.
CZ	ČÚZK did not create any own studies, because they are carried out on the national level. Their conclusions are reflected in strategic documents f.i. "Digital Czechia".	The documents are not public, they are owned by other institutions.	With regard to the fact that ČÚZK is mainly the basic data producer and as such does not use much data for its own use, it does not profit from the open data in the role of the user. As a data provider, we can state that the cost for data provision decreased. Data are used many times more.
EE	Land Board has Open data since 1st of July 2018 with regular automatic updates (cadastral data – 1 day, topographic data and addresses – 1 week, administrative units and place names – 1 month, DTM's and DSM's – 1 year). However, our data has been free of charge for everyone via public web map view services since 2001 and via public WMS since 2008. At the same time, file based data has been free of charge to public and academic sector institutions. Open data added instant access to file based data, therefore it's less time consuming for public and academic sector institutions and of course a good new possibility for private sector. As we have long history of half-open data, it is not so big change for society – we haven't made that kind of study.		
ES	Yes, several, from 2004. Now it is a overcome topic	A study from KPMG, conducted under the auspices of the Spanish presidency of the EU in 2010, undertook a cost and benefits analysis. It estimated that the cadastre's online access and digital certifications provision was saving Spanish tax-payers at least EUR 157 million a year, which is much more than the cadastral budget of EUR 118 million in that year. Another study conducted by RSO and Cap and Gemini for the EC went much further since their CBA showed the Cadaster's electronic office was saving about EUR 7758 million to the tax payer.	Transparency, more secure real estate conveyance, well known by users, less corruption, very much valued by government and users. The government invest in us because recognised us as an important part of the basic infrastructure of the country. Users check our data and tell us the errors.....therefore the quality improved a lot.
FI	The Impact of open data – a preliminary study, Ministry of Finance publications – 15b/2015 < https://vm.fi/julkaisu?pubid=5202 >	It is important to assess appropriate means to disseminate and promote efficient utilization of information on the best practices of open data reuse in different organizations.	The data and services we maintain are now widely utilized in both government and the private sector
HR	No	N/A	The main benefit of opening data for our institutions is the widespread usage of official

	Q14 a) Documents / studies	b) Conclusions re. benefits	c) Benefits for your institutions
			data in all institutions and organisations, which indirectly leads to improving data quality.
KO		No.	
LT	<p>There is no specifically dedicated document or study on this issue, nevertheless it is discussed in some of the following documents:</p> <ul style="list-style-type: none"> • https://ivpk.lrv.lt/uploads/ivpk/documents/files/IVPK_leidiniai/Galimybiu%20tyrimo%20ataskaita_atviri%20duomenys%202015.pdf • http://kurklit.lt/wp-content/uploads/2018/09/saule-gabriele-petraityte_atviru-duomenu-ekosistemas-modelis.pdf • http://kurklit.lt/wp-content/uploads/2018/09/0011.pdf 	Open data means a huge stimulus to innovation and economy. Nevertheless, there is no free data and somebody has to pay for it	Improves the quality of services provided to citizens and contributes to economic growth, as well as promotes entrepreneurship, innovation and research and development, thus contributing to job creation
LU	Yes	Benefit for society as a whole	Less work for distributing data, better quality because of feedback. Increase of popularity and visibility of the institution.
NL	Yes, there has been a study for each of the three years after the topographic maps were released in 2012 (summary attached).	Usage of the data by companies and citizens has risen substantially; economic effects on businesses is at least EUR 13.5 million after two years.	Benefits are improved public perception, more possibilities for innovation, reduced costs of administration and marketing.
RO	No	Not applicable, as we have no study on the assessment of benefits.	Open data contribute to the improvement of public services' efficiency. Thus, by data exchange between public institutions, the unnecessary expenses are avoided and the society can benefit from transparent information.
SE	In our current work with high value datasets in Sweden we are finalizing a benefit analysis – will be available after May 8th	Already in this early stage we can see massive benefits	see answer under a)
SK	Not at our institution	N/A	We hope people will start using more our data than other non-authorized data.
UA	Study: "Economic potential of open data for Ukraine" (Authors: Artur Kovalchuk, Viktor	Ukraine has made significant progress in publishing open data and building an ecosys-	→ growth of data quality; → growth of requests for receiving data;

	Q14 a) Documents / studies	b) Conclusions re. benefits	c) Benefits for your institutions
	Khanzhyn, Yaroslav Kud-latskiy_Kyiv School of Economics).	tem around that data to encourage its productive use. Much of this development is a result of close cooperation between government and civil society. During recent years, an unprecedented amount of public data has become open, including business and court registers and public transactions. This has resulted in efficiency gains and cost savings, new and better services, new business models and more efficient markets.	→ reduction of time for coordination and decision-making.

Q15) Were there also notable drawbacks for society and for the competent institutions?

	Q15) Drawbacks for society	Drawbacks for institutions
AT	Uncertainty regarding the authenticity and reliability of data; problems in connection with the liability of re-used data; discomfort because of assumed abuse of personal data.	Overutilization of the institutions' infrastructure; loss of identity of the data collecting and maintaining institutions for the benefit of data re-users and consequently loss of political relevance; this presumably will get worse after completion of the transposition of the new OD and PSI Directive in the year 2021.
BH	no current open data policy.	no current open data policy.
CH	none	none
CY	No	Significant investments needed.
CZ	implementation of new technologies	---
DE	disadvantage, it needs to be refinanced by higher taxes	different in each of the 16 Laender
EE	We have detected a small amount of misuse of open data. For example the use of cadastral data (parcel boundaries data) for restoration of boundary markers by persons who do not have the expertise or license. For example the use of cadastral data (parcel boundary data) for cutting down forest disregarding real boundary markers on the ground.	---
ES	none	none
FI	Not noted	Some financial drawbacks
HR	No drawback for the society was noticed.	No drawback for the institution was noticed.
IT	Not directly known.	Not directly known.
LT	Appropriate literacy and IT knowledge are required to use open data.	Additional resources are required for data opening.
LU	no	no (adjustments of internal workflows)
NL	no	less sustainable funding (government budgets)

Q15)		
Drawbacks for society		Drawbacks for institutions
PL	I can't identify any.	Slightly decreased income.
RO	If spatial data would not be open, the ones who have an interest in this data could search under different sources, which could be outdated, and this could be considered a drawback.	If spatial data would not be open this could affect the feedback on their updating.
SK	Do not know.	For changing normal data to Open data some institutions need to upgrade their information systems and obtain more manpower for carrying out the process. So basically the transition needs money, time and people.

Remark to Q15):

SE It is of importance to maintain the funding of data for maintaining the quality of data.

Q16) What was the budgetary implication, when the concept of open data has been introduced? And how was it compensated?

Q16)		
Budgetary implications		Compensation
AT	up to now moderate extra spending because of the creation of additional (free of charge) products; minor loss of income,	none
BH	no current open data policy	no current open data policy
CH	less income	has to be approved by the parliament
CY	Less income. The budget needs to be adjusted accordingly.	Savings in human resources, and positive effects in sustainable development.
CZ	infrastructure enlargement, necessary data modification	own sources
DE	Governmental budget needs to be appropriately increased	Savings in personnel, savings in customer service
EE	EUR 30,000	no compensation
ES	In 2011 we open the service to download WFS and other massive services. Then we did the following study: The annual costs of the digital service provision and the visualization of the portal infrastructure was about EUR 1.1 million per year, which was financed from the cadastre's public budget. On top of that, there were two additional costs to be considered. There were an estimated 11 FTE who provided and facilitated the electronic service and its PSI re-use, who cost about EUR 650,000 a year. And there was an additional EUR 450,000 estimated for the system maintenance. In total, re-use facilitation costs about EUR 2.2 million (or only about 2% of the total budget of the cadastre in 2011).	It was an investment of the government.
FI	EUR 1.5 million	None.

Q16)		
	Budgetary implications	Compensation
HR	There is a small number of open data and there was no visible budgetary implication. With opening new datasets, we expect lower income in the state budget and additional investment in the infrastructure.	There is was no compensation made.
IT	Investments for the implementation and maintenance of the own Geo-Portal.	None.
LT	Opening of data means that some data is provided free of charge and results in losses to the budget.	Some compensation from the State budget has been received nevertheless not all losses incurred to the opening of data are compensated.
LU	EUR 0.5 million per year	Augmentation of hourly rates for surveying and other specific works accomplished by the administration.
NL	for topographic maps: approx. EUR 0.5 million for cadastral maps: approx. EUR 2 million	for topographic maps: approx. EUR 0.3 million for cadastral maps: none
PL	No, Income from data sell was so small, that costs of selling the data (e.g. invoicing, copying data to data storage devices, etc.) were higher than the income.	No compensation was offered.
RO	We did not have.	It is not the case, as we did not have budgetary implications.
SE	The report of May 8th will also include budgetary implications and suggested finance solution will be finalized in June 12th.	
SK	So far, we opened only some type of data, which do not have major impact on our budget.	No compensation. Our institution is 100% state funded.

2.4 Lessons learned

Q17) What were the lessons learned since the concept of open data has been introduced?

Q17)	
	Lessons learned
AT	Free access and unrestricted re-use encourage professional re-users and organisations to build up and maintain copies of entire registries on their own. This leads to: <ul style="list-style-type: none"> ongoing online data requests against the providing institutions and consequently to capacity overloads and disturbances; existence of parallel (public) registries with the risk of inconsistencies and misunderstandings (possible source for subsequent damages) or even intentional abuse; enormous increase of avoidable data traffic. Necessity to protect the data providing institutions against capacity overloads and to create special data products which are available for the re-users without accessing the original databases. Open data reduce or even abate revenues for the institutions whereas their costs due to necessary security and capacity measures increase. Furthermore, budgetary compensation cannot be expected.
BH	No current open data policy.
CY	Open data contribute significantly to the sustainable development and competitiveness of the country. Transparency is also improved.
CZ	work with new technologies, bulk (large volume) data provision in real time

Q17) Lessons learned	
DE	budgetary negotiation needs to start as early as possible
EE	<ol style="list-style-type: none"> 1. The workflow of licensed surveyors has been significantly simplified after introduction of open data. 2. A large number of data users are educational institutions from Estonia as well as from abroad (Singapore, South Korea). 3. The use of open data and following decisions made by persons who do not fully understand the content and quality of the data has appeared to be a problem. Society needs more “enlightenment” in this regard. 4. Investment is needed for more advanced and user friendly solutions to share open data.
ES	→ see in Annex
FI	There should be investments also for customer support and ease of use.
HR	Since SGA has a small number of open data we cannot draw any conclusion yet. But opening the data increases its usage and hence raises the data quality. The institutions have to invest more in the infrastructure.
IT	Data accessibility to everyone (open) stimulates a constant increase of data quality. License Policy would be increased.
LT	The public must be properly prepared by doing its homework, namely needs to understand what open data is and knows the possibilities of using open data, as well as prepared to receive and use open data. Appropriate targeted funding is needed for high-quality data opening and support for opened data, because without proper targeted funding the process of data opening and its support is very complicated.
LU	data are essential, paper maps are less and less important
NL	<ul style="list-style-type: none"> → Eye-opener was the boost of innovation (mainly in topographic data, a.o. in automatic generalisation and 3D-development) → Continuous growth of use requires adequate infrastructure and funding structures; we are now considering to reintroduce charges for large scale use of data services → Never had any issue regarding licensing → Need other mechanisms to stay in contact with users: users forum, hackathons, user meetings
PL	In general, opening spatial data is considered a good move. Resources dedicated to data sell can be relived and moved to other tasks e.g. data acquisition. Consequently, more datasets will be opened soon.
RO	The open data policy represents a benefit, as it leads to transparency, efficiency and economic growth.
SE	to make it easily accessible and to communicate with users of the open data. It is more difficult to have a relationship with users when the agreement is no longer necessary
SK	For us it is mainly technical issue – we need to upgrade our information systems, for which we need money from the government and skilful people, which we are not going to get. So the process will be probably very slow. We also do not know if people will use our data more and what are the actual benefits for society. Do people think that open data is as reliable and good as data they have to pay for?
UA	Provision of datasets to be published in open data format have to be improved.

4. Remarks or suggestions

Q18) Do you have any other general remarks or suggestions (to this questionnaire, to the topic in general, or for the planned conference):

Q18) Other general remarks	
AT	We have to realize that even so-called Open Data are not free of cost. Somebody or any institution has to pay for it, although nowadays nobody seems to accept this fact. Anyway, in order to keep existing data collection, maintenance and provision by public institutions alive in a sustainable manner, those who are propagating Open Data should honestly also communicate to the policy- and decision-makers that Open Data needs additional public financial resources.
BH	No current open data policy.
DE	Due to the federal structure of Germany, each Land is responsible on how to provide its data. AdV as an umbrella organisation is trying to keep uniformity throughout its member authorities namely in the 16 Laender NMCA's that are competent for cadastre and other geospatial questions. If one Land has CC license conditions, the other one may have national open data rules. As of today, there are 6 Laender having free and open data access in Germany.

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Annex

Answer from Spain to Q17) What were the lessons learned since the concept of open data has been introduced?

Many new users and re-users, different of the normal collaborators (notaries, land registries, municipalities etc...) started them to collaborate and use the cadastre. In terms of examples on the type of re-users, these include among others:

- Real estate agents.
- National, regional and local governments.
- Businesses commercialising products and services based on the PSI in the market.
- Organisations and citizens using the PSI for non-commercial purposes.

Other than the typical re-users such as notaries or local administration, the Spanish cadastre is encountering increasing number of examples of new companies, applications and reuses of their PSI. Generally the use of the data can help large companies and SMEs to generate new jobs which open up new lines of products or services. A publication entitled 'monográfico usuarios de la información catastral' included many examples of these uses. For instance there are new geo-marketing possibilities emerging thanks to the use of the cadastral PSI. For instance a SME selling swimming pool products is able to target only those houses with a swimming pool, since this data is embodied in their cadastral database. Other efficient uses include a faster infrastructure deployment (up to 40% improvement in some cases) in the case of fast train AVE, or an electricity line system deployment.

Other innovative uses include the online real state service, as for example 'Idealista', which uses their database to identify and describe more accurately properties in their database.

The information is very much used today, which is due partly to our increasing efforts making it available for free online in accessible formats and with many services, and partly due to the increase pervasiveness of ICT which is helping all members of Society to be ready to use the digital information in their benefit.

As I told you, all this was new in 2011 but now it is all very much overcome and no one discuss about it. All is open and very much used....:

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