



## “Role of National Mapping and Cadastre Authorities in the Resilience and Recovery Program“

Summary of questionnaire that was carried out for the preparation of the «PCC Conference jointly organized with the CLRKEN of EuroGeographics» on 10 and 11 November 2021 in Ljubljana

In preparation for the PCC Conference jointly organized with the CLRKEN, the organizers did collect input from all PCC as well as EuroGeographics member countries. A total of 25 countries replied to the questionnaire.

### Role of the National Mapping and Cadastre Authorities

The National Mapping and Cadastre Authorities in Europe were also affected by COVID-19 pandemic. Under the Slovenian presidency’s slogan “Together. Resilient. Europe.” we will strive among others to facilitate recovery and resilience of European economies and societies, to reflect on the future of Europe, to ensure the rule of the law, and to increase security and stability in economic and social terms. Lasting recovery must be ensured in all sectors; therefore, the two EU initiatives – the "Next Generation EU agreement"<sup>1</sup> and its key instrument the "Recovery and Resilience Facility"<sup>2</sup> – are very important to adopt national recovery plans as soon as possible and to accelerate the green and digital transition. One of the important conditions to achieve all this is to provide trustable and reliable authoritative data and services of the highest quality and availability. It is important to change or adapt business models to achieve a better response to the needs in a fast-changing digital context.

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<sup>1</sup> The **NextGenerationEU** (NGEU) agreement is a stimulus package designed by the EU to help repair the immediate economic and social damage caused by the COVID-19 pandemic. With these funds, Europe wants to become greener, more digital and more resilient. Its aim is to better adapt to current and future challenges. to support member states hit by the COVID-19 pandemic. Agreed to by the European Council on 21 July 2020, the fund is worth €750 billion. The NGEU fund will operate from 2021–2023, and will be tied to the regular 2021–2027 budget of the EU. (see also [https://ec.europa.eu/info/strategy/recovery-plan-europe\\_en](https://ec.europa.eu/info/strategy/recovery-plan-europe_en))

<sup>2</sup> The Recovery and Resilience Facility (also referred to as the **Facility**) is the key instrument at the heart of the NGEU as part of the Multiannual Financial Framework. It will provide non-repayable financial support and loans to Member States to support public investments and reforms, as set out in their recovery and resilience plans. (see also [https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility\\_en](https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en))

The Recovery and Resilience Facility will make available €672.5 billion in loans and grants to support reforms and investments undertaken by Member States. The Recovery and Resilience Facility is the centrepiece of NextGenerationEU, a temporary recovery instrument that allows the Commission to raise funds to help repair the immediate economic and social damage brought about by the coronavirus pandemic.

The EU will implement the green and digital transition with the following reforms and investments for achieving a public administration fit for the future.

- 1) Better policymaking and implementation, enhanced transparency, trust and integrity in the public sector.
- 2) Digital transformation of public sectors and enhanced service delivery for citizens and businesses.
- 3) An attractive and dynamic civil service delivering for tomorrow.

The aim is to foster public services that are, by default, digital, cross-border and interoperable; user-centric, inclusive and accessible; open and transparent; trustworthy and secure, and require users to supply information only once. Digital geospatial data, and also cadastral and land registry data has become a very important basis on which governments, organizations and businesses base their decisions and implement their services. Therefore, their adaption to the new situation especially in the Recovery and Resilience Facility is crucial.

Cadastral and land registry data are base registries and directly affected by activities and actions: digitisation of records; data cleansing and cleaning; updates or adaptations of data models; connection to the core services of the OOP Technical System; deployment of eDelivery Access Points; connection to eGovernment portals or platforms, facilitation platforms, data platforms or intermediaries.

The results of this questionnaire provide a first overview about ongoing activities in the different member countries.

## 1. Participating Countries: 25

Country Code	Country Organization	Name Email-address
AT	<b>Austria</b> BEV - Bundesamt für Eich- und Vermessungswesen	Julius Ernst <julius.ernst@bev.gv.at>
CH	<b>Switzerland</b> Federal Office of Topography swisstopo	Daniel Steudler <Daniel.Steudler@swisstopo.ch>
CY	<b>Cyprus</b> Department of Lands and Surveys	Neoclis Neocleous <nneocleous@dls.moi.gov.cy>
CZ	<b>Czech Republic</b> Czech Office for Surveying, Mapping and Cadastre	Svatava Dokoupilova <Svatava.Dokoupilova@cuzk.cz>
DE	<b>Germany</b> Working Committee of the Surveying Authorities of the Laender of the Federal Republic of Germany	AdV-Geschäftsstelle (LDBV) <AdV.GS@ldbv.bayern.de>; Björn Degel <b.degel@lvgl.saarland.de>
EE	<b>Estonia</b> Maa-amet / Estonian Land Board	Irja-Gea Kukk <Irja-Gea.Kukk@maaamet.ee>
ES	<b>Spain</b> Dirección General del Catastro	Amalia Velasco <amalia.velasco@catastro.hacienda.gob.es>
FI	<b>Finland</b> National Land Survey	Halme Pekka (MML) <pekka.halme@maanmittauslaitos.fi>
FR	<b>France</b> DGFIP: Direction générale des Finances publiques	Martine Caussanel <martine.caussanel@dgfip.finances.gouv.fr>

GR	<b>Greece</b> Hellenic Cadastre	Rokos Dimitris <drokos@ktimatologio.gr>
HR	<b>Croatia</b> Državna geodetska uprava	Zekušić Sanja <Sanja.Zekusic@dgu.hr>
IT	<b>Italy</b> Direzione Centrale Servizi Catastali, Cartografici e di Pubblicità Immobiliare	<dc.sccpi@agenziaentrate.it>
LT	<b>Lithuania</b> State Enterprise Centre of Registers	Bronislovas Mikūta <Bronislovas.Mikuta@registrucentras.lt>
LU	<b>Luxembourg</b> Administration du cadastre et de la topographie	Bernard Reisch <bernard.reisch@act.etat.lu>; Alex Haag <direction@act.etat.lu>
LV	<b>Latvia</b> State Land Service	Vents Priedoliņš <pasts@vzd.gov.lv>
MD	<b>Moldova</b> Cadastre Department, Public Services Agency	Chetraru Ala <ala.chetraru@asp.gov.md>
MK	<b>North Macedonia</b> Agency for real estate cadastre	Lidija Krstevska <l.krstevska@kattastar.gov.mk>
MT	<b>Malta</b> Land Registrar	Sapiano Claude <claudio.sapiano@gov.mt>
NL	<b>The Netherlands</b> Cadastre, Land Registry and Mapping Agency	Martin Salzmans <Martin.Salzmans@kadaster.nl>
PL	<b>Poland</b> Head Office of Geodesy and Cartography (GUGiK)	Surma Ewa <Ewa.Surma@gugik.gov.pl>
PT	<b>Portugal</b> Direção-Geral do Território	Paula Camacho <paula.camacho@dgterritorio.pt>
RO	<b>Romania</b> National Agency for Cadastre and Land Registration	Adriana Poggi <adriana.poggi@ancpi.ro>
SE	<b>Sweden</b> Lantmäteriet	Andersson Magdalena <Magdalena.Andersson@lm.se>
SI	<b>Slovenia</b> Surveying and Mapping Authority	Franc Ravnihar <Franc.Ravnihar@gov.si>
UA	<b>Ukraine</b> StateGeoCadastre	Анна Ткаченко <annatkachenko275@gmail.com>



## 2. Role of National Mapping and Cadastre Authorities in Resilience and Recovery Facility

### Q2) Relevance of the cadastral system to contribute to European Green Deal<sup>3</sup>

Q2)	How do you consider the cadastral system as relevant to achieve results or contribute to the aims of the European Green Deal? Please, rate the contribution on a scale from 1 (not relevant at all) to 5 (very relevant):					
	1	2	3	4	5	not sure
AT				X		
CH	X					
CY				X		
CZ			X			
DE			X			
EE		X				
ES		X				
FI			X			
FR					X	
GR			X			
HR			X			
IT				X		
LT				X		
LU			X			
LV			X			
MD				X		
MK		X				
MT		X				
NL			X			
PL					X	
PT				X		
RO				X		
SE					X	
SI				X		
UA			X			

**Remark from PT:** Cadastral data, as a base information, can be easily crossed with other data sources, allowing one more coherent, fair and grounded planning and decision-making that will culminate in a more consistent and efficient green transition.

<sup>3</sup> Climate change and environmental degradation are an existential threat to Europe and the world. To overcome these challenges, the **European Green Deal** aims to transform the EU into a modern, resource-efficient and competitive economy, ensuring:

- no net emissions of greenhouse gases by 2050
- economic growth decoupled from resource use
- no person and no place left behind

The European Green Deal is also a lifeline out of the COVID-19 pandemic. It will be financed from the NextGenerationEU Recovery Plan, and the EU's seven-year budget. (see also [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en))

### Q3) Cadastral systems' contribution to the NextGenerationEU agreement

Q3)	In respect to contributing to the NextGenerationEU agreement, where do you see the strengths of your country's cadastral system?
AT	public system, transparent processes, data online available, easy access with low costs, legally based permanently updated system
CH	Fully operational, digital, secure, transparent, reliable.
CY	<ul style="list-style-type: none"> <li>• Umbrella organization with all services under one roof</li> <li>• Strong title system</li> <li>• Strong and transparent procedures</li> <li>• History of high quality service to customers</li> <li>• Ease of access to data</li> <li>• Prime source of property related data</li> <li>• Fast access to services</li> <li>• Friendly e-Services</li> </ul>
CZ	Information system of the real estate cadastre is fully operational including activities such as access to spatial and non-spatial data, electronic services, electronic applications and information provision. INSPIRE eServices are fully embedded as well. Both public administration services and services for citizens are being improved continuously and provided information can be taken for granted.
DE	very high legal reliability and sustainability
EE	Digital identity and digital signature is in common use in Estonia and integrated into all cadastral operations. This enables a digital cadastral procedure to be carried out throughout the life cycle.
ES	<ul style="list-style-type: none"> <li>• Spatial continuity: contains the entire territory. Public, private; rural, urban; land and buildings.</li> <li>• Homogeneous, standard, digital and interoperable with numerous information flows</li> <li>• Multi-utility, for all use: Public funding / Protection of rights (property, environment, others) / Planning and management of public policies (urbanism, infrastructure, agriculture, aid) / Promotion of general economic activity (market efficiency, geostrategy)</li> <li>• Availability: Transparent and free information / Accessible by multiple channels</li> <li>• Officiality: Serves the general interest / Administrative register with presumption of certainty</li> </ul>
FI	100% digital and already widely used in commercial services.
FR	<p>1)- It is the only system of maps and land files which list all the real estate properties <b>at country level and located in each French municipality</b>, and which records their value in order to serve as a basis for calculating land taxes.</p> <p>2)- In terms of plot division and building representation the cadastral map is also the reference database in accordance with <b>Article L127-10 of the Environmental Code</b>. Indeed, with these 597,298 individual maps and land registries, it is a valuable land database for Plan users (Local and regional authorities with their geographical Information System (GIS), notaries, land surveyors (OGE : ordre des géomètres experts), IGN, etc.</p>
GR	We provide electronic services which we will enhance and expand utilizing RRF.
HR	All cadastral data are in digital form and used as a base for all other registers on state, regional and local level. Integrated land registry and cadastre system is fully operational as well as services for data exchange.
IT	A reliable and updated cadastral database, available in digital form, interoperable, accessible to government bodies, administrations, citizens and companies, can act as an effective support for the development of the policies and strategies aimed to land management and to achieve the goals which have been fixed by the government.

Q3)	In respect to contributing to the NextGenerationEU agreement, where do you see the strengths of your country's cadastral system?
LT	<p>The main goal of the Cadastre is to improve the provision of integrated e-services, which focus on the market and other customer needs. This is established in the Strategy of the Centre of Registers. The following has been implemented and is planned to improve:</p> <ul style="list-style-type: none"> <li>• An integrated Real Property Cadastre and Register system has been developed and implemented;</li> <li>• Consolidated Real Property Cadastre and Register as well as other base state registers and IS are maintained in one state-owned enterprise;</li> <li>• Real property cadastre data is being opened;</li> <li>• Electronic services are being constantly developed that automate/optimize and transfer business processes in the field of real property cadastre into the electronic environment;</li> <li>• New technologies are used (e.g. robotisation).</li> </ul>
LU	Completeness, accuracy and timeliness
LV	Full coverage of units of land over the national territory and construction (buildings and engineering structures) data in the cadastre information system as a part of cadastre in our country.
MD	Cadastral data (administrative units, cadastral parcels, buildings) are forte points that can be the base of the maps for analysis. Overlapping with data from others INSPIRE themes (Habitats and biotopes, Bio-geographical regions, Species distribution, Natural risk zones, Atmospheric conditions, Environmental monitoring Facilities, Agricultural and aquaculture facilities, Production and industrial facilities) become an important materials for taking decisions.
MK	<ul style="list-style-type: none"> <li>• Electronic cadastre as a basic business system enables digital access to the cadastre data for professional users, citizens and business community for the whole territory of the country.</li> <li>• National NSDI Geoportal facilitate the access, sharing, use and distribution of the standardized spatial data/services in an efficient, effective and harmonized manner in order to meet the needs of the private and public sector, as well as of the citizens.</li> </ul>
MT	The Land Registry may help by linking to other organizations.
NL	By providing a nationwide coverage of all properties, the cadastre is a powerful instrument in executing measures related to issues to resilience and recovery programs. Being fully digital the cadastre is a logical partner in linking up with other agencies and helping to solve (spatial and property related) issues.
PL	The geometry of cadastral parcels and buildings are available free of charge along with the basic attributes for users.
PT	<p>The National Cadastral Information System through the online availability of cadastral information in formats that can be used by any citizen and crossed with other data sources, interoperability with other systems and institutions, the existence of a single point of contact between the citizen and the State (within the scope of cadastre and registration of property rights) and the decentralization of competences for municipal authorities and for Cadastre Technicians allows it to be an asset under the NextGenerationEU agreement.</p> <p>(Reforms and investments are grouped in the NextGenerationEU agreement around three structuring dimensions: Resilience, Climate Transition and Digital Transition.</p> <p>Under the design of territorial resilience, it is intended to ensure a competitive and cohesive territory that meets the territorial base conditions necessary to promote economic competitiveness and, in a complementary way, foster conditions for adaptation to the climate transition due to the effects exacerbated by the changes felt in the climate.</p> <p>The dimension of the climate transition results from Portugal's commitment and contribution to the climate goals that will allow the achievement of carbon neutrality by 2050.</p>

Q3)	In respect to contributing to the NextGenerationEU agreement, where do you see the strengths of your country's cadastral system?
	It includes a set of investments and reforms related to the Sea, Sustainable Mobility (metro networks and similar), to Energy Efficiency in Buildings, the Decarbonisation of Industry, Hydrogen and Renewables and the Promotion of Sustainable Bioeconomy. The digital transition assumes undeniable importance as one of the essential instruments of the country's development strategy, ensuring the existence of effective digital structures and networks that allow the dematerialization of learning, transactions and processes and, where appropriate, enable remote work, accelerating, in an inclusive way, the digital transformation that was ongoing. It is a process that will allow important structural efficiency gains, namely in terms of context costs for companies and people.)
RO	The Romanian cadastral system is an integrated system (technical + legal); 99% computerized; centralized; it is working in real time; a system open to its partners and customers.
SE	<ul style="list-style-type: none"> <li>• Access to spatial geodata information for the whole of Sweden, e.g. laser scanned data.</li> <li>• A complete real property register. The real property register includes plans, land regulations and land use as well as general information and information on ownership.</li> <li>• Co-operation and co-ordination between authorities; e.g. with municipalities, Environmental Protection Agency, the Swedish Agency for Marine and Water Management, Maritime Administration, County Administration Boards and so forth. Lantmäteriet is chair of the Swedish Geodata Council.</li> <li>• On-going digitalization of a smarter planning and building process</li> <li>• The possibility of using a so called Geocell set-up in case of e.g. forest fires</li> <li>• On-going investigation looking into Lantmäteriet as a part of a contingency agency set-up.</li> </ul>
SI	<ul style="list-style-type: none"> <li>• The cadastral system (real estate records) of the Republic of Slovenia records data that reflect the actual situation (data on plots, data on buildings, parts of buildings) or space occupancy (data on economic public infrastructure) and data on spatial units (e.g. municipalities, settlements, house numbers)</li> <li>• The records also contain data on the planned use of space (land use from spatial plans at the state and local level)</li> <li>• Data are geolocated in the national coordinate system D96/TM, based on the European coordinate system (ESRS - European Spatial Reference System)</li> <li>• The data is mostly in digital form</li> <li>• Data is publicly available and free of charge</li> </ul>
UA	As Ukraine is not a member of the European Union there cannot be proper estimation of that point.

**Q4) Contribution to digital transformation and EU's Recovery and Resilience Facility programme**

Q4)	Where do you see room for improvement for your national cadastral system to contribute to the digital transformation and to the EU's Recovery and Resilience Facility programme
AT	expand database to be more flexible for the users (e.g. online check for status of application by users,...); improve process to update land cover information of the cadastre
CH	to provide better and more central user access
CY	<ul style="list-style-type: none"> <li>• Continuous additions and new e-Services to be provided</li> <li>• Two large scale strategic IT upgrade projects currently running</li> </ul>
CZ	Long-term strategy nowadays is to increase the quality of cadastral maps, completing land consolidation and renewal of the cadastral documentation as well as going on with

Q4)	Where do you see room for improvement for your national cadastral system to contribute to the digital transformation and to the EU's Recovery and Resilience Facility programme
	registration of public restrictions into the RÚIAN (Registry of territorial identification, addresses and real estates).
DE	improved networking with SDI's
EE	To develop event-based digital services so that less data entry is required in cadastral proceedings.
ES	<ul style="list-style-type: none"> <li>• From this year we are going to have an official reference value of real estate for local, regional and state taxes. Until now the cadastral values were mainly linked to local financing, from 2022 it will be used for regional and state taxes.</li> <li>• Coordination with the Land Registry. Becoming also a legal cadastre and providing digital tools for the flow of information between citizen-notary-registry.</li> <li>• Given the growing demand for cadastral data: we will offer new data and new digital services for public and private uses.</li> <li>• Linkage with environmental policies, sustainable development and demographic challenge.</li> <li>• Transparency and reuse of our information that it is recognized as high value public information.</li> <li>• Digital transformation. New applications for the management of cadastral data and services to citizens.</li> <li>• Participation and collaboration in European and international initiatives.</li> </ul>
FI	Wider deployment of the existing data interface services (APIs), which are already available for customers and research organizations to get up to date data from cadastral system.
FR	Two pilot projects are now underway : 1)- Quality improvement of the cadastral map in order to achieve the continuum between cadastral maps at country level 2)- Creation of a single platform with pooling of cadastral data
GR	Digitizing old registry records (over 600.000.000 pages) and providing the information with digital services.
HR	Not all data in cadastre and land registry are up to date. Main activity of responsible institutions (SGA and Ministry of Justice) is improving the data and digital business processes implementation.
IT	Italian cadastral system might be furtherly improved, in the next future, by creating a new database centred on the logical entity " <i>Building</i> ", in addition to the existing ones, referred to parcels and urban real estate units. This additional innovative database could be shared with other public administrations, to achieve a completely digital and integrated management of administrative procedures, involving constructions, buildings and real estate units, in order to implement the " <i>once only</i> " principle, at the beginning of each administrative procedure.
LT	Digital cadastre data bank is being expanded; new services are being created for the customers. Value added is being created with the opening of cadastre data to the population, businesses and public institutions. Some activities are planned: <ul style="list-style-type: none"> <li>• Automated submission of documents for registration of structures (buildings);</li> <li>• Automated change of land use purpose;</li> <li>• Creation of 3D cadastre;</li> <li>• Full digitisation of paper documents stored in the Real Property Cadastre archive.</li> </ul>
LU	Parcellisation of public domain areas (Watercourses, roads)
LV	Increasing the relevance of cadastre data according to the situation in the area, including more active data exchange with other national information systems. Also, we see the

Q4)	Where do you see room for improvement for your national cadastral system to contribute to the digital transformation and to the EU's Recovery and Resilience Facility programme
	room for improvement to use data in nationally important processes, as has already been done in the context of limiting the covid-19 pandemic, when the information on buildings from the cadastre information system was useful for the adoption of various decisions.
MD	<ol style="list-style-type: none"> <li>1. very important: whole country have to be covered with cadastral data (parcels, building, administrative boundaries of localities and addresses) - regarding this in country runs the project Land registration and property evaluation;</li> <li>2. data should be available in easier and more comfortable way.</li> </ol>
MK	<ul style="list-style-type: none"> <li>• Improving the quality of the real estate cadastre database. Institutional re-organization is needed, that will be in line with the processes of digitalization of the public sector.</li> <li>• Giving a legal opportunity to open data for the business sector in order to be able to create innovative applications and products for the market.</li> </ul>
MT	Our new online system will help in the digital transformation.
NL	Moving towards a 3D-cadastre as policies and decisions will increasingly be made in a digital environment.
PL	Possible extension to include owner information.
PT	As a legislative reform in the area of cadastre is in progress, it will be possible to foresee the inclusion of mechanisms and procedures for processing in an exclusively digital format. The training and requalification of staff, together with the modernization of existing technology in the institutions with interoperability implementation between systems, will also decisively contribute to the success of the digital transformation and the EU's Recovery and Resilience Facility programme.
RO	Simplification; shifting the processes as close as possible to its beneficiaries; integration; opening.
SE	<ul style="list-style-type: none"> <li>• Further highlighting the connections between cadastre and environmental and water information, e.g. in the area of climate adaptation activities.</li> <li>• Further co-operation between neighbouring countries, facilitate digital information exchange between countries.</li> <li>• Overview of legislation in regard to digitalization, e.g. the Law on Real Property Register.</li> <li>• Further information and communication activities as to how the data can be used, its quality and so forth.</li> </ul>
SI	<ul style="list-style-type: none"> <li>• Introduction of 4D coordinate system</li> <li>• Digitization of data that are still in analog form (e.g. vectorization of analog floor plans of buildings) - establishment of a 4D cadastre)</li> <li>• Data management in one database (Cadastre Information System) and harmonized processes of recording individual contents (plots, buildings and economic public infrastructure)</li> </ul>
UA	Even though Ukraine is not a member of the European Union and there cannot be proper estimation of that point we may say that in 2020 the law on NSDI in Ukraine was adopted by the Parliament which amongst other provisions includes the one which envisages compliance of our geospatial data to the INSPIRE directive. Considering the Directive entered into force in the EU in 2007 we have a huge room for improvement.

#### Q5) Opportunities for cadastral data for delivering innovation<sup>4</sup>

Q5)	Can you assess the opportunities for cadastral data to be used by businesses and other organisations for delivering new and innovative applications, products, and services?
AT	very high potential in cadastral data
CH	cadastral data are key for geospatial data infrastructures, to be used by many other official agencies, such as land-use planning, agriculture, forest, urban planning and management, municipal administrations, etc.
CY	Very high opportunities both in the short term, as well as in the long term. Data is our key strategic asset as an Organization.
CZ	Cadastral data can be used in many branches such as urban planning, land consolidation projects, nature preservation projects, risk management, flood predictions etc. Their use as a basic documentation for various applications is enabled by the WMS.
DE	Depends on national data protection legislation (personal data!).
EE	Open cadastral data through API services.
ES	<ul style="list-style-type: none"> <li>• Every day offers new utilities for public management and private use</li> <li>• Management of other public policies and services</li> <li>• Security, Emergencies and Civil Protection</li> <li>• Monitoring of the territory: environmental etc.</li> <li>• Geomarketing and other private uses related to location. (Addresses linked to uses and other data)</li> <li>• Geostatistics</li> <li>• Geostrategy: Productive efficiency / Smart territories / Smart cities / Fight against depopulation</li> </ul>
FI	Digital data resources can already be used as such if some uncertainties regarding data quality are considered. Quality improvements are ongoing. Legislation needs to be changed to allow for more flexible ways to facilitate digital service delivery with partner organizations, e.g. fluent on-line sales and ownership transfer registration of real properties.
FR	--
GR	<ul style="list-style-type: none"> <li>• We have opened the cadastral database for free research by all professionals involved in the real estate market.</li> <li>• We provide open geospatial data to all by web services from our INSPIRE portal and our open data portal.</li> <li>• We build interoperable web services to interact with other public authorities.</li> </ul>
HR	Cadastral and land registry can assist with resolving property legal and cadastral status in the area that are of specific interest to business and other organizations.
IT	Cadastral data can be useful to all companies and organizations working for the management of territory, such as defence against natural and anthropic risks, urban development, management of the housing stock and the development and monitoring of public policies.
LT	The data of the Real Property Cadastre stored at the State Enterprise Centre of Registers are provided to the responsible organisations and institutions, which perform supervision and accounting of construction, territorial planning, engineering infrastructure as

<sup>4</sup> To digitalise and support businesses is one of the key areas for investment and reform that the Commission would like to encourage in the Member States, it also comprises developing adequate digital opportunities and supporting the labour market.

Q5)	Can you assess the opportunities for cadastral data to be used by businesses and other organisations for delivering new and innovative applications, products, and services?
	well as to business entities, statistics, agriculture and forestry, research, for various activities of municipalities and citizens. Applications, e-services are developed using the data of the Real Property Cadastre.
LU	Somewhat high (e.g. Urban farming, solar cadastre, etc.)
LV	The data in the cadastre are fully structured and usable in different data exchange services.
MD	Taking into account that the data held are administrative units, addresses, parcels and buildings - these are basic data at creating maps to find the necessary location. These data can also be used to assess the needs of building commercial, educational or health objectives in certain places.
MK	Digitized, updated cadastre and geospatial data and services are an advantage for business sector to deliver new, innovative products and services.
MT	Land Registry data may help institutions by having access to our system.
NL	Cadastral data are already used in domains related to issues addressed in the green deal and energy transition in the Netherlands. It is important to realize that cadastre provides only part of the solution, as societal issues address various components.
PL	Data release (the geometry of cadastral parcels and buildings) stimulates economic growth by creating new jobs and encouraging investment in industry and business.
PT	Yes, it is one of our goals. In this sense, we seek to develop products and services aimed at the user and meeting their requests.
RO	High
SE	<ul style="list-style-type: none"> <li>• The opportunities for cadastral data to be used by business and other organisations for delivering new and innovative applications, products and services are generally very good in Sweden. Our cadastral data is standardized following international standards and is accessible through both standardized APIs and bulk download. However, you have to pay a fee to access the data. The Swedish Mapping, Cadastral and Land Registration Authority is partly financed through user fees. To get access to cadastral data you also have to have the right purpose of reuse when you apply to the Swedish Mapping, Cadastral and Land Registration Authority.</li> <li>• For geodata co-operation and use of information within the culture, research and education sector where are special agreements as to the use.</li> <li>• For municipalities there are special agreements including e.g. data being up-dated by them (addresses, buildings, topography) as well as for the municipal real property formation authorities.</li> </ul>
SI	<p>With the Access to Public Information Act, the Republic of Slovenia transposed into its legal order the Directive on Public Access to Environmental Information and the Directive on the Reuse of Public Sector Information and the Spatial Information Infrastructure Directive (INSPIRE) with the Spatial Information Infrastructure Act.</p> <p>In accordance with these two laws, the Surveying and Mapping Authority offers a wide range of freely available, free surveying data, which is accessible through insights, downloads and online services. Metadata descriptions are also provided for databases as well as for services, specifications, etc. All public data is freely available and offered to companies for reuse.</p> <p>Consequently, we estimate that the possibilities of using cadastral data are great both within the public sector (use and integration of data between ministries, public agencies for the provision of services for citizens and the economy), as well as in the economy (infrastructure, construction,...).</p>

Q5)	Can you assess the opportunities for cadastral data to be used by businesses and other organisations for delivering new and innovative applications, products, and services?
UA	The cadastral data provide huge opportunities for business as it facilitates access to land resources and can be used for emergency response services, navigational applications and land market-related businesses.

**Q6) User requirements in relation to the digital transformation<sup>5</sup>**

Q6)	How does your organization capture, measure and fulfil user requirements in relation to the digital transformation?
AT	permanent discussion with stakeholders (surveyors, notaries,..), questionnaires
CH	operation of and participation in think tanks, on-going communication with cantons and private sector
CY	Close relations with our stakeholders and main customers and continuous feedback from them. Post pandemic changes in the property market are closely tracked which have ended up in changing major policies and procedures in the provisory of our services.
CZ	<ul style="list-style-type: none"> <li>• development of existing information services</li> <li>• helpful and clear communication with clients</li> <li>• support within creation of the application for the registration into the real estate cadastre</li> <li>• improvement of the quality of technical data</li> <li>• including as much as possible recording public restrictions into the state registry RÚIAN</li> <li>• creation of the digital technical map of regions with support of regions</li> </ul>
DE	---
EE	We conduct regular customer satisfaction surveys. We monitor the use of digital services.
ES	User requirements related to data quality has been always taken into account. We have a system to get the feedback of users and we try always to fulfil users' demands (if they are legal and possible).
FI	<p>NLS Finland is currently assembling a Digital Transformation Roadmap, which will list our efforts to affect digital transformation in our services and activities.</p> <p>User requirements need to be assessed based on actual situations where people need services of cadastre authorities. Often the services are provided in collaboration with banks, real estate agents etc. so we need to assess the requirements and plan the service value chain with these operators. Real digital transformation means that use of the services is made as fluent as possible and can take place in the background via APIs from cadastre authority point of view.</p>
FR	Within DGFIP, we set up working groups with OGE, notaries, IGN, local authorities, CNIG, network operators.
GR	We are in continuous communication with all the professional organisations to assess their needs and to adjust our products and services.
HR	In development of e-services and contributing in drafting of the laws and sub-laws in jurisdiction of other institutions.

<sup>5</sup> To fulfil the important role of the cadastral system in the digital transformation and in the Resilience and Recovery Facility in general, user requirements related to data quality must be taken into account.

Q6)	How does your organization capture, measure and fulfil user requirements in relation to the digital transformation?
IT	Italian revenue Agency supervises the ways in which external users (i.e. citizens, professionals, land surveyors, etc.) interact with services made available. This, first of all, is achieved by maintaining a strong interaction with national professional associations and foremost stakeholders. At the same time, specific analysis of real use of services is regularly carried out. As a consequence, implementation of online channels has been strongly encouraged, recently: proper instructions have been given to reduce fruition of services directly in the offices, too.
LT	The State Enterprise Centre of Registers collects information on the requirements of customer activities, analyses it and plans to create a certain number of new electronic services or improve the existing electronic services. Later, the Centre of Registers performs surveys and research of the implemented e-services.
LU	Through the NSDI Infrastructure
LV	Developing our services to make it as easy as possible for customers to initiate services, minimizing the need to enter customer centres.
MD	<ul style="list-style-type: none"> <li>• Can be used WMS service from NSDI portal (free access without concluding any contracts);</li> <li>• indsThrough "abonament" (monthly subscription) to access and download data (public authorities and private companies use this method);</li> <li>• Through document (contract or project doc) regarding providing necessary information.</li> </ul>
MK	Regular meetings and other communication tools with professional Chambers were used.
MT	n/a
NL	The cadastre is already fully digitized and has restructured itself as a data-centric organisation. We see that the digital transformation requires steps in (further) improving the quality of our data (for interoperability semantics are increasingly important), the step towards 3D, linking up with other domains (such as the built environment and subsoil) and reassessing the ethical ways of data use in a digital world.
PL	GUGiK do not collect such data. GUGiK try to provide users with various useful tools e.g. portal BDOT10k < <a href="https://bdot10k.geoportal.gov.pl/">https://bdot10k.geoportal.gov.pl/</a> > for visualization and analysis.
PT	DGT provides online contact forms where users can request and suggest the supply of specific products. DGT creates services and provides direct access to cadastral information (access may be free or upon payment of service fees). Likewise, it has been dematerializing processes, making it possible to process them totally in digital format, and eliminating face-to-face contact between citizens and DGT.
RO	At this moment, the level of sophistication of the system is "4" (digitalization). The transition to level "5" (digital transformation) is underway, based on concrete plans and strategies in this regard. The organization appreciates digital transformation as a mandatory, timely and tangible target.
SE	<ul style="list-style-type: none"> <li>• Customer Index</li> <li>• Geodata council</li> <li>• Seminars, meetings and workshops with interested parties; e.g. in the area of a smarter planning and building process</li> <li>• Different roles in the organisation; e.g. the geodata co-ordinators</li> </ul>
SI	We do not conduct special customer satisfaction surveys, but user help is available, where users can always report their requests and which we also largely fulfil. If necessary, we also work more closely with larger users or organizations.

Q6)	How does your organization capture, measure and fulfil user requirements in relation to the digital transformation?
UA	We have developed the NSDI geoportal and have had long in place the Public Cadastral Map Geoportal where the data has metadata as it is provided by laws on NSDI and State Land Cadastre.

**Q7) In your country, is cadastral data included in the list of HVD (High Value Datasets) and in what ways is the national law reflecting this<sup>6</sup>.**

Q7)	Included in HVD	Reflection in the Law
AT	No	according to PSI we offer a download service in a special platform with cadastral data free of charge (data is not completely up-to-date, but at least 1 month old; up-to-date data is available online at low fees)
CH	Yes	National Act on Geoinformation (2008).
CY	Yes	Reflected in the Open Data Law, as well as in all the major cadastral / land registry related laws.
CZ	Yes	only the theme cadastral parcel – still in discussion
DE	---	no information available yet
EE	Yes	The cadastre is one of the ten critical databases in Estonia. The highest security and storage requirements are ensured for cadastral data.
ES	Yes	norma española UNE 148004:2018 «Información geográfica - Datos geográficos abiertos» < <a href="http://www.aenor.es/aenor/normas/buscadornormas/buscadornormas.asp?">http://www.aenor.es/aenor/normas/buscadornormas/buscadornormas.asp?</a> >
FI	No	--
FR	Yes	According to the law, Article 14 de la loi pour une République numérique and the implementing decree related to the public service of making reference data available, décret d'application 2017-331 du 14 mars 2017 (relatif au service public de mise à disposition des données de référence), our computerized cadastral map PCI : plan cadastral informatisé) is included in the list of HVD. The Etalab department, in charge of the data.gouv.fr portal, lists all the reference datasets. It develops tools that can be shared, in particular on improving data quality.
GR	---	The HVDs have not been defined in Greece yet.
HR	Yes	In accordance to the Governmental Conclusion that defines the Address register, Cadastre and Land Registry as basic registers in RoC SGA drafted Amendment to the Law on land survey and cadastre with article that eliminate the cost of accessing the all cadastral data through network services. Today the Cadastral data (cadastral parcel and cadastral municipalities) are accessible free of charge through INSPIRE WFS network service.
IT	Yes	A specific draft of the legislative decree necessary for fulfilling the requirements of Directive (EU) 2019/1024, regarding the opening of data and the re-

<sup>6</sup> According to the Directive on Open Data, organizations will have to make available High-Value Datasets (HVDs) that are free of charge, in machine-readable format and accessible via APIs and where relevant as a bulk download. This will improve the availability and accelerate the use of cadastral data.

Q7)	Included in HVD	Reflection in the Law
		use of public sector information, is now under examination by the Commission at the Chamber of Deputies < <a href="https://www.camera.it/leg18/682?atto=284&amp;tipoAtto=Atto&amp;idLegislatura=18&amp;tab=1">https://www.camera.it/leg18/682?atto=284&amp;tipoAtto=Atto&amp;idLegislatura=18&amp;tab=1</a> >
LT	Yes	The Real Property Cadastre and Register is the base state register. This is established by legal acts, e.g. the Law on Management of the State Information Resources. Article 16 "The main registers" of the said Law establishes that "The main registers shall be state registers registering: 1) legal entities; 2) residents; 3) real property and rights of ownership to it; 4) addresses of the objects, the geographic position of which does not change; 5) legal acts; 6) mortgage of rights in rem and property rights."
LU	Yes	none so far
LV	Yes	There are no laws that directly prescribe that the cadastre data sets are HVD, but the registration of data in the cadastre is reflecting by the <u>State Immoveable Property Cadastre Law</u> and the <u>Geospatial Information Law</u> . In addition, we point out that the cadastre data is considered to be the basic data of geospatial information at national level.
MD	No	<p>According law nr.254/2016 cadastral data are included in NSDI. Entities have to ensure the complete content, quality and availability of data, network services and metadata.</p> <p>According to Government Decision 254/2018 the data sharing possibilities are:</p> <ul style="list-style-type: none"> <li>• network viewing and downloading services (using the machine-machine principle);</li> <li>• other services, that offer the possibility to view and download data;</li> <li>• through electronic data storage (if it is impossible to grant access to the services or data).</li> </ul> <p>Option of access to data sets and services can be:</p> <ul style="list-style-type: none"> <li>• public (which offers users the possibility to access data sets and services without the need to obtain a username and password);</li> <li>• secure (which requires a username and password to obtain access).</li> </ul> <p>But the goal of our entity is to transform our data in available High-Value Datasets (HVDs) (free of charge, in machine-readable format and accessible via APIs, and with possibility to bulk download).</p>
MK	No	<p>In February 2014, the Law on Use of Public Sector Data was adopted, which was the result of transposition of the EU Directive on the re-use of public sector information. The law defines the obligation of the government institutions to publish data (in open format) which they create, in order to enable usage of data by individuals and legal entities for creation of new information, content, applications and services.</p> <p>Under this law, all institutions are obligated to continuously publish public data in open format if they have technical possibility to do so.</p>
MT	No	--
NL	Yes	This is currently limited to the cadastral index map (in compliance with INSPIRE). A transposition to national law has not been executed, as the current open data policy of the Netherlands' is already much in sync with the HVD-policies.
PL	Not yet	It is not defined yet, because an Implementing Regulation was planned during 2021 which will be define the agreed list of specific high-value data sets.

Q7)	Included in HVD	Reflection in the Law
PT	Yes	It is a goal to achieve, so that several of the recently published laws in the scope of land registration and territorial planning, provide mandatory inclusion of cadastral information.
RO	No	--
SE	Not yet	<ul style="list-style-type: none"> <li>Building- and address information as well as information on real property boundaries have been suggested to be included as HVD, but the decision has not been made by the Commission yet. It is anticipated that a decision will come during winter 2021/2022.</li> <li>In the Swedish Law on Open Data it is stated that HVD data sets should be free of charge, but the actual data sets have not been pinpointed due to that the decision has not yet been made on an EU-level.</li> </ul>
SI	Not yet	<p>The Open Data Directive has not yet been transposed into the legal order of the Republic of Slovenia.</p> <p>The key part of the high-value data is the data provided by the Ministry of the Environment and Spatial Planning with the bodies within it (the Surveying and Mapping Authority of the Republic of Slovenia is a body within the Ministry).</p>
UA	No	Such classification is not provided by the Ukrainian legislation.

#### Q8) Use of new Technologies

Q8)	What new technologies (such as Artificial Intelligence, Blockchain technology, etc.) are in use or intended to be used in maintaining the national cadastral system? <sup>7</sup>	
	New technologies in use	Technologies intended to be used
AT	none	in discussion
CH	web portals	BIM, 3D, underground facilities, georegisters (key registers), concept of ecosystems
CY	AI and Blockchain are currently in Pilot.	AI will be used in running AI models for the identification on new buildings from aerial photography. Blockchain technology is still at a very early stage to be used for land registry / cadastral purposes. Its use will be limited and may not be applicable or have any added value for us, as compared to our enhanced e-services and our strong title system procedures.
CZ	0	do not know
DE	Artificial Intelligence (Change Detection)	Artificial Intelligence (Neuronal Networks; Cop4All based on Copernicus data)
EE	---	Chatbot's, Text analytics tool ( <a href="https://en.kratid.ee/kratijupid">https://en.kratid.ee/kratijupid</a> ), Automatic cadastral unit boundary changer based on topography data.

<sup>7</sup> An important pillar in The Recovery and Resilience Facility is the transformation of the public administration thanks to the use of new generation digital tools that will improve administrative processes and facilitate online interactions with citizens and businesses. Such a transformation is also of interest to the justice and other systems.

Q8)	What new technologies (such as Artificial Intelligence, Blockchain technology, etc.) are in use or intended to be used in maintaining the national cadastral system? <sup>7</sup>	
	New technologies in use	Technologies intended to be used
ES	APIs, artificial intelligence and big data...	linked data (mainly statistics).....
FI	<ul style="list-style-type: none"> <li>• Crowd Sourcing with a mobile-friendly web application is being piloted to increase accuracy of boundary marks. The application uses gamification to raise interest in spotting missing or mislocated boundary marks. We are currently assessing the reliability of information gathered by these means.</li> <li>• Automatic registration of mortgages, where NLS get applications via data interface (API) direct from the banks.</li> </ul>	Machine Learning has been identified as a potential area for improving processes. Utilizing ML and robotization will help reduce time spent in routine or error-prone manual tasks.
FR	--	One of our important projects is the use of the Artificial Intelligence, with the aim to detect properties, which are not taxed, and to detect buildings not present on the cadastral map.
GR	None	None
HR	None	None
IT	nowadays, AI and Blockchain technologies are not used in maintaining the national cadastral system.	Italian revenue Agency is evaluating whereas the adoption of AI and Blockchain technologies, in the cadastral field, may be useful to fulfil institutional goals.
LT	Robotisation of some activities/processes is currently implemented.	A customer-driven Self Service System is being developed; the portal REGIA (regional geoinformational environment service) and business processes are being modernised; registration of areas with land use restrictions in the cadastre; there are also plans to create 3D cadastre.
LU	none	none
LV	---	The use of artificial intelligence in a light detection and ranging (LiDAR) data to detect the construction of new buildings and the redevelopment of existing buildings.
MD	---	In the near future, we focus on completing cadastral data, improving their quality and reengineering of the information system.
MK	---	n/a
MT		GIS based system
NL	Both in the registration process (extracting information from deeds) as in upgrading the cadastral map to a 1:1 map that can serve as an authoritative source on geometric boundary information.	---
PL	In Poland, there are 380 poviats where the land and building register is stored (cadastral database). It is not a central system. In the second half of 2018 GUGiK integrated the	

Q8)	What new technologies (such as Artificial Intelligence, Blockchain technology, etc.) are in use or intended to be used in maintaining the national cadastral system? <sup>7</sup>	
	New technologies in use	Technologies intended to be used
	<p>publication of land and building register data from the counties in aggregate services. The purpose of the project was to provide commonly available web services to enable the use of land and building register data in the national information systems and systems created by commercial companies. The services in question include:</p> <ul style="list-style-type: none"> <li>• KIEG – (National Integration of Land Records) – a WMS service, which allows users to generate land and building register maps for any area of the country.</li> <li>• ULDK – (Cadastral Parcel Location Service) – a service for the location of cadastral parcels, which enables spatial location of a specific parcel based on its identifier, district name and parcel number, or based on X,Y coordinates of any point within it.</li> </ul>	
PT	none	in some applications development, based in AI and Blockchain Technology, applied to cadastre information with other sets of information, for example, land user and cover map.
RO	---	Blockchain
SE	AI and ML, chatbot to answer questions on real property information. Test activities as to blockchain technology in the land registration area.	AI for managing older documents, texts. Ideas on testing crowdsourcing for collecting property boundaries in order to improve quality.
SI	<p>The basic source for maintenance is the requirements of customers (owners). The requirements are accompanied by studies of geodetic services (e.g. arrangement of the parcel border, parcelling, registration of the building, ...) or other forms of evidence of changes in the actual situation.</p> <p>Part of the data is taken over by the Surveying and Mapping Authority of the Republic of Slovenia from other producers (e.g. real estate owners, actual land use, planned land use).</p> <p>Part of the data is obtained using advanced technologies - the use of aerial imagery and automatic detection of changes in the state of nature - e.g. for newly constructed or modified buildings.</p>	
UA	<p>In use: in October 2017 to ensure reliable data synchronization, which prevents their substitution as a result of external intervention, as well as allows for public control over the system in the automated system of the State Land Cadastre blockchain technology was introduced for transactions "Land Registration" and "Information from the State Land Cadastre" with the formation of a hash card when forming an extract from the State Land Cadastre about the land plot. The possibility of searching for a document by details has been implemented through the electronic services of the StateGeoCadastre (<a href="https://e.land.gov.ua">https://e.land.gov.ua</a>). An excerpt from the State Land Cadastre found through a hash card can be downloaded for viewing.</p>	

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