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Investigating the benefits of a pan-European cadastral data strategy

Workshop on Sustainable Business Models for NMCAs
Joint workshop by EuroGeographics and EuroSDR
Leuven, Belgium 8-9 February

Hellenic Cadastre *Hara Papadaki – Panos Lolonis*

Public Sector Information - Open Data Directive - High Value Datasets

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(http://data.europa.eu/eli/dir/2019/1024/oj)

NMCAs goals and strategies worldwide

Identified strategy in most NMCAs through the years “serve the needs of governments, businesses, and the public”.

Current focus: Create “better services”

The authorities are increasingly (re)considering what are the user’s needs in the era of e-government and digitalizing societies and trying to respond to them.

More than just a trend in geospatial data management

Became Legal Requirement

- harmonized
- openly accessed
- re-usable authoritative data

Findable – Accessible – Interoperable – Re-usable

Challenges

Compliance to OD framework is likely to force changes to the business model of NMCAs, especially if they are required to generate sufficient revenue to cover a substantial part of their operating costs

Source: https://www.eurosdr.net/sites/default/files/uploaded_files/survey_sustainable_open_data_business_models_for_nmcas.pdf

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Geospatial Data owned by the HC

Open Data
Cadastral parcels
Forest maps
Land use and land cover datasets

Restricted Provision
Airphotos
Satellite images
High resolution orthophotos of several periods of time
High resolution Digital Elevation Models
National coastline

Data Provision Policy

Upon request
Provided for free but only for Hellenic Public Organizations and Hellenic Public Academic Institutions

Financing Framework

Funds to operate:
Land Registry Transactions

Funds to implement new projects:
Finaced by the State or co-financed by the European Union (e.g. The Recovery and Resilience Facility)

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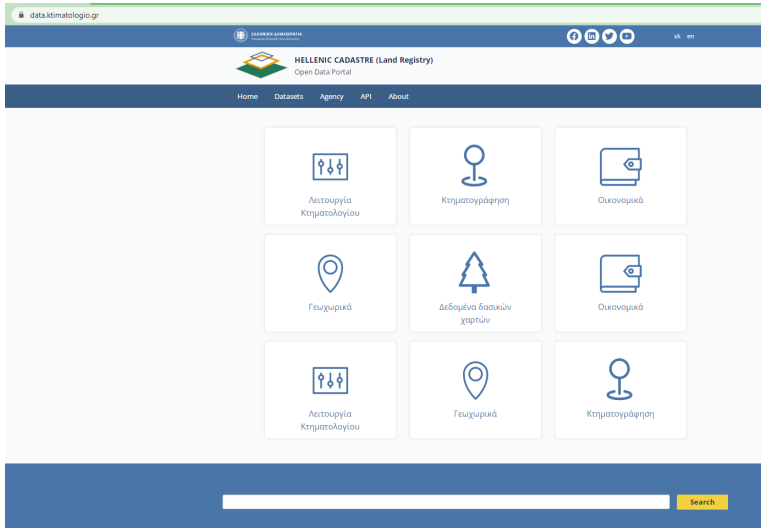
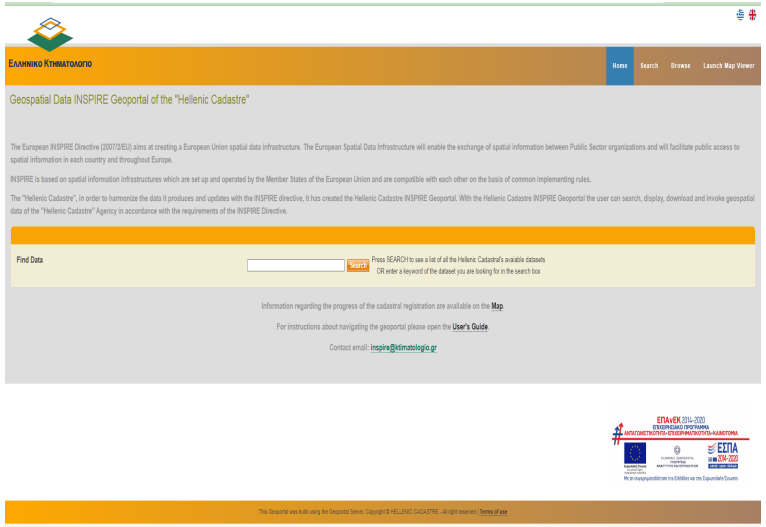
Open Data



INSPIRE Geoportal



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The Open Cadastral Map

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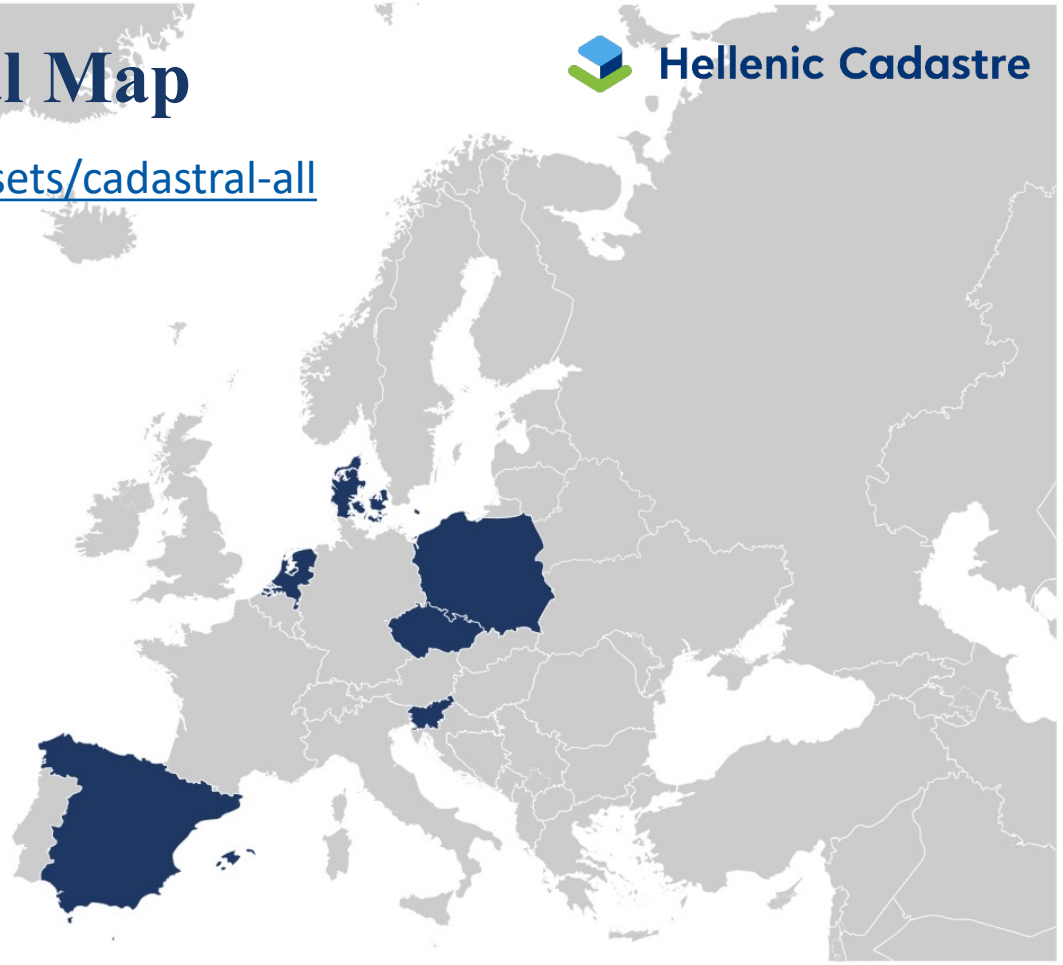
https://www.mapsforeurope.org/datasets/cadastral-all



Vision: Become a single point to access pan-European cadastral data and addresses the challenge of easily finding authoritative pan-European high-value geospatial data.
Currently data from 6 countries provided through the OME interface

HVD: Cadastral Parcels, Buildings, Addresses and Administrative Units

Extend: 9 additional countries by the end of 2025

Enhance: New functionalities

Common process for all countries used to integrate data

Czech Republic
Denmark
Netherlands
Poland
Slovenia
Spain

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One harmonized view coming from different national authorities

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Need for common rules:

INSPIRE sets some common regulations which help streamline the existing data from countries that comply with the Directive and thus, make the OCM possible.

INSPIRE regulations allow:

- variations in implementation
- different approaches for data formats or download services
- INSPIRE compliance to not identical solutions

OCM production process had to impose further specifications:

- INSPIRE endorsed gml schema required (*.zip)
- INSPIRE ATOM Feed Service for download
- ETRS 89 Coordinate Reference System

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Challenges Encountered

Most members understand the usefuleness of the OCM and embraced the initiative

- ✓ Some members had legal restrictions in opening their data
- ✓ Few members were already compliant
- ✓ Most members needed to make adaptations to the OCM requirements
- ✓ Many members expressed their wish for a more flexible process
- ✓ Some members recommended the migration to new forms of data and services

We work with members one by one to reach compliance

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Common Cadastral Data Strategy

Deliverable D6.2 – Pan European Cadrastral Data Strategy

Deliverable Number	D6.2	**Lead Beneficiary**	5. HC
Deliverable Name	Pan European Cadrastral Data Strategy		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	36	**Work Package No**	WP6

Description
Format: Electronic, Language: English

- Develop Support for a long term strategy in delivering of pan-European cadastral data (enhance further the awareness of the OCM)
- What members think about the potential of specifying common deliverables and applying standardization approaches in order to homogenize datasets that are going to be integrated in the OCM.
- Develop Guidelines
- Propose Best Practices
  - Auto-translation, edge-matching handling e.t.c.
- Identify current and future OCM users (public, such as European Commission and other international organizations, and private, companies and citizens
- Identify related needs

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The Open Cadastral Map beyond OME 2

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The Open Cadastral Map needs to be sustainable

In terms of finance

In terms of a well-established process that

ensures data quality, up to date, authorized, easy

to use and combine cadastral data

Adapt to members' needs and expectations

- Identify current and future OCM users (businesses, researchers, public administrations)
- Identify their needs and expectations
- Adapt respectively the process when possible.

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The UN-GGIM : Europe Strategy

Sharing Knowledge

Support the provision of geospatial pan-European datasets and derived products as a relevant input for the geospatial and statistical data integration.

Leverage the use of geospatial information and improving its national implementation.

Raising Awareness

Encourage geospatial data harmonization and quality and promote the role of official and authoritative geospatial data, including leveraging the value of geospatial information and improving its sub-national implementation.

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Strategic Leadership

Promote the value of geospatial data and its integration with statistical data. Fostering the collaboration between geospatial and statistical communities and working together with current and prospective partners and stakeholders.

Build an environment to promote a more clear multi-level model of governance on how geospatial data should be produced and managed within the European context.

The Strategy is supported by three pillars

UN GGIM four pillars

A European strategy for data

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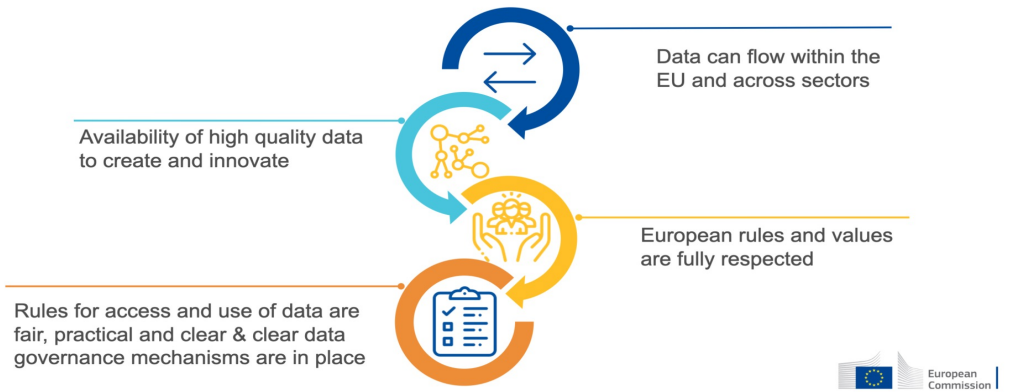
https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0066

The European data strategy aims into turning EU a leader in a data-driven society and ensure that Europe's digital transition happens according to European values and principles. The data strategy sets out the vision of creating a single market for data, where data can flow freely within the EU and across sectors.

- Enabling access to competitive, secure and fair European cloud services
- Support progress on data technologies



- The availability of data is essential for training artificial intelligence systems, with products and services rapidly moving from pattern recognition and insight generation to more sophisticated forecasting techniques and, thus, better decisions.
- A European way for handling data will ensure that more data becomes available for addressing societal challenges and for use in the economy, while respecting and promoting European shared values.

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Pan-European Cadastral Data Strategy

Define the technology, processes, people and rules required to manage NMCAs information assets.

Outline the long-term vision for collecting, storing, sharing, and usage of the information assets.

Make working with cadastral data easier for everyone who needs it.

Data engineers / Scientists / Analysts/ Business managers
Specific guidelines for geospatial data in Europe
Overcome existing technical barriers to data sharing
Focus on FAIR data

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Pan-European Cadastral Data Strategy Principles

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Some Good Practices to Investigate

URI strategy

Dereferenceable URIs are a good practice for identifiers. They can be looked up (dereferenced) to provide useful information about the resource that the URI identifies, which in turn refers to other URIs, and so on.

Data Model strategy

The so far experience shows that there is a need for a technology that enables data merging even if the underlying schemas differ. RDF model is suggested as a good practice. SPARQL is the language for querying RDF data.

Ontology strategy

Make use of same vocabulary/semantics

guidelines recommended by the documents of w3.org and INSPIRE

ontology-name = "http://inspire.ec.europa.eu/ont/" + app-schema-code

https://schema.org/

Use of Artificial Intelligence and Machine Learning to handle multi language issues or edge-matching

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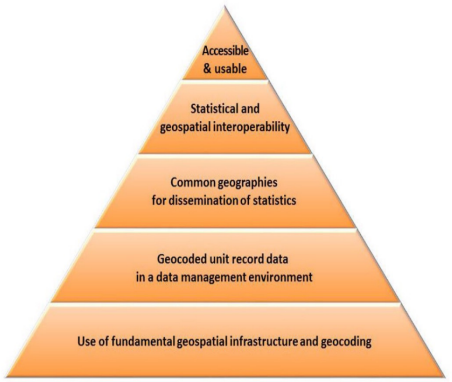
Some examples of combining cadastral data with other cross-discipline data

BIM and Cadastral data integration

Examples: it can be used for evacuation plans from public buildings or to assist the Building Control Governmental Authorities ensure that the construction of new buildings, extensions or renovation projects meet the legal requirements.

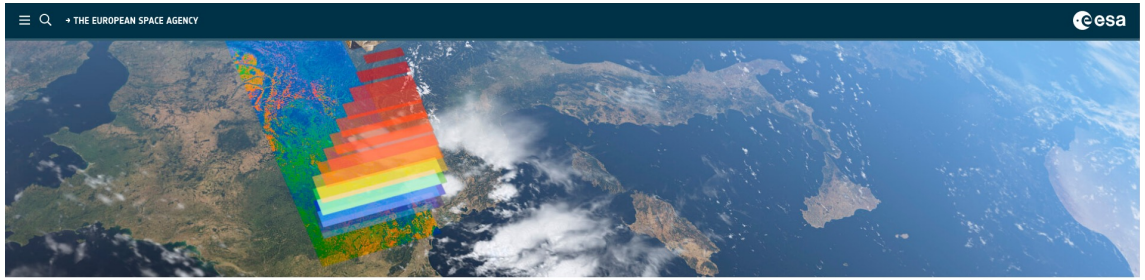
The cadastral data that NMCAs own include information such as the geometry of the property boundary, the land use, the road geometry, the building footprint, etc. This information could be integrated with BIM information regarding for example the geospatial relation of the entities (e.g. the distance of the building from the property boundary, the differences of declared building dimensions with the as built, etc).

Geospatial and Statistical Data



Source: Australian Bureau of Statistics (ABS)/ UN-GGIM.

Earth Observation Data and Environmental Vector Data



AGENCY

Earth Observation Programmes

7593 VIEWS · 9 LIKES

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Expected Benefits

Value of data goes beyond the relatively narrow perspective of influencing profitability. Data can contribute to “social welfare” by focusing on providing monetary as well as nonmonetary benefits, such as environmental monitoring, disaster risk reduction and management.

- Value is often realized when location data is combined with other datasets - Once a location dataset is linked with other subject-specific data, it provides new insights and opportunities that inform decisions and operations.
- Cadastral Data combined with other structured data from several disciplines eventually become more useful as it serves the needs of a larger number of users than they initially did.
- The data sharing landscape is therefore evolving to enable more complex data transactions.

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Information Assets and Asset Management Concepts

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Data is an asset and needs to be managed as such

(Source: https://www2.deloitte.com/lu/en/pages/investment-management/articles/data-as-investment.html)

Mapping some of the most important AM principles

References: ISO 55000 (2018), ISO 55013 (2024)

Assets are **possessing value to an organization**

The organization gains value out of data assets when they are combined with other assets and increase their usefulness

Assets are **uniquely identifiable**

Data asset following standard structures such as the INSPIRE Directive's endorsed schemas or the Linked Data principles are defined by uniquely identified dereferenceable URIs. They can be looked up (dereferenced) to provide useful information about the resource that the URI identifies, which in turn refers to other URIs, and so on.

Assets **have useful life**

A data asset doesn't necessarily have a useful life in the way a physical asset does. Data assets don't deteriorate with use, on the contrary the more data assets are re-used the more their useful life increases.

Assets **undergo lifecycle activities**

Acquisition, Operation, Maintenance, Renewal, Disposal

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Action Plan for developing a pan-European Cadastral Data Strategy

Tasks in Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Develop a pan-European Cadastral Data Strategy	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25
Design of the plan of action																								
Development of the supporting information																								
Presentation and consultation of the strategy options with stakeholders																								
Collection and assessment of input provided during consultation																								
Drafting of the strategy document																								
Presentation of the result to various fora																								
Collection and assessment of new input																								
Incorporation of the input to the document																								
Delivery of the final outcome																								

D6.2 Pan-European Cadastral Data Strategy

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Conclusions

Cadastral authorities should :

- Take advantage of the opportunities provided by PSI, open data and HVD initiatives to raise their prominence of their role in modern times
- Be core agents in the development and implementation of international activities (e.g. UN-GGIM IGIF)
- Prove their eagerness and competence to work and collaborate at a trans-national and trans-sectoral scale
- Sense the changes that take place at the international level and adjust their goals, operations, business models.
- Have an active involvement in developing the pan-European strategy for opening-up their data and services

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Thank you for your attention!

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