eurogeographics

ANNUAL REVIEW 2020

CONTENT

CONNECTING YOU TO MAPS, GEOSPATIAL AND LAND INFORMATION FOR EUROPE

EuroGeographics is proud to be the voice of the European National Mapping, Cadastral and Land Registration Authorities.

We bring together national authorities from the whole of geographical Europe in a unique international not-for-profit membership association. By providing a single point of contact, we enable government, business and citizens to benefit from their official, reliable, comparable and verifiable geospatial data and collective expertise.

Today our members provide much more than traditional maps and you probably use their data and services around 40 times every day – often from your phone.

We work in partnership with members to facilitate access to authoritative information and, by integrating it into a sustainable infrastructure for the public good, our vision is to support a society empowered by the use of trusted geospatial services from official national sources.

Visit our website: https://eurogeographics.org/

LIST OF MEMBERS

ALBANIA
State Authority for Geospatial Information
State Cadastral Agency

ARMENIA
Cadastre Committee of the Republic of Armenia

AUSTRIA
Federal Office of Metrology and Surveying

AZERBAIJAN
State Committee on Property Issues of the Republic of Azerbaijan

BELARUS
State Committee on Property of the Republic of Belarus

BELGIUM
National Geographic Institute
General Administration of Patrimonial Documentation

BOSNIA & HERZEGOVINA
Federal Administration for Geodetic and Real Property Affairs
Republic Authority for Geodetic and Property Affairs of Republic of Srpska

BULGARIA
Geodesy, Cartography and Cadastre Agency

CROATIA
State Geodetic Administration of the Republic of Croatia

CYPRUS
Cyprus Department of Lands and Surveys

CZECH REPUBLIC
Czech Office for Surveying, Mapping and Cadastre

DENMARK
Danish Geodata Agency
Agency for Data Supply and Efficiency

ESTONIA
Estonian Land Board

FINLAND
National Land Survey of Finland

FRANCE
National Institute of Geographic and Forest Information

GEORGIA
National Agency of Public Registry

GERMANY
Working Committee of the Surveying Authorities of the Laender of the Federal Republic of Germany
Federal Agency for Cartography and Geodesy

GREAT BRITAIN
Her Majesty's Land Registry
Ordnance Survey
Registers of Scotland

GREECE
Hellenic Military Geographical Service
Hellenic Cadastre

HUNGARY
Lechner Non-Profit Ltd.

ICELAND
National Land Survey of Iceland
Registers Iceland

IRELAND
Ordnance Survey Ireland

ITALY
Italian Geographic Military Institute
Revenue Agency

KOSOVO*
Kosovo Cadastral Agency

LATVIA
The State Land Service
Latvian Geospatial Information Agency

LITHUANIA
National Land Service under the Ministry of Agriculture
State Enterprise Centre of Registers

LUXEMBOURG
Administration of the Cadastre and Topography

MALTA
Malta Planning Authority
Malta Land Registry

MOLDOVA
Agency for Land Relations and Cadastre of the Republic of Moldova

MONTENEGRO
Cadastre and State Property Administration

NORTHERN IRELAND
Land and Property Services

NORTH MACEDONIA
Agency for Real Estate Cadastre

NORWAY
Norwegian Mapping Authority

POLAND
Head Office of Geodesy and Cartography

PORTUGAL
Directorate General for Territory

ROMANIA
National Agency for Cadastre and Land Registration of Romania

RUSSIA
Federal Service for State Registration, Cadastre and Cartography

SERBIA
Republic Geodetic Authority

SLOVAKIA
Geodesy, Cartography and Cadastre Authority of the Slovak Republic

SLOVENIA
Surveying and Mapping Authority of the Republic of Slovenia

SPAIN
National Geographic Institute of Spain
General Directorate for the Cadastre
Territorial Commission of the Geographic High Council

SWEDEN
The Swedish Mapping, Cadastral and Land Registration Authority

SWITZERLAND
Federal Office of Topography

THE NETHERLANDS
Cadastre, Land Registry and Mapping Agency

TURKEY
General Directorate of Mapping

UKRAINE
State Service of Ukraine for Geodesy, Cartography and Cadastre

This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

PRESIDENT'S REPORT

Maps – where would we be without them?

When we're looking for somewhere, they show us where to find it; when we're buying property, they provide secure registration so our ownership is certain; and when we need help, they enable the emergency services to reach us quickly, saving time, and ultimately lives.

Whether it's geospatial or land information, data and services provided by members of EuroGeographics are a fundamental part of our everyday lives: from apps for exploring outside, to ordering food deliveries; from online gaming to ensuring we pay the correct amount of tax, and even reuniting us with lost pets thanks to microchip tracking. In fact, you probably use their information no less than 40 times a day, often without even realising.

More than maps: An infrastructure for modern society

Today our members provide much more than the traditional maps we might remember from our school days. They use cutting edge technologies to collect, maintain and deliver high quality, authoritative digital data and services to underpin the infrastructures we rely on as a modern society.

In this ever connected world, their move from database production to providing data infrastructures means members play a vital role in joining-up information from different sources using location. There are many examples in this report including supporting national responses to the global pandemic by delivering up to date, accurate data and expertise for government management and monitoring of Covid-19.

Other uses include integrating information to provide insights for realising national climate targets and biodiversity plans, using satellite positioning for smarter, precision farming and the development of autonomous vehicles; and incorporating artificial intelligence technology into production processes to improve the detail and quality of specific data, particularly for policymakers.

By connecting maps, people and policies, members are also playing a key role in the countdown to 2030 and the United Nations Sustainable Development Goals, and are contributing to the Digital Europe Programme, the European Strategy for Data, Open Data (PSI) Directive, Census 2021 and more.

As all of these need an unprecedented amount of statistical, geospatial and earth observation data that is official, reliable, comparable and verifiable, there is a clear role for our members. Like their membership association, they are driven by serving the public and realising benefits for society in general, a society that can trust us to keep data secure and act in its interest above all else.

We will continue to work in partnership with our members to facilitate access to their authoritative geospatial data and integrate it into a sustainable infrastructure for the public good. In doing so, we will take yet another step forward in our vision of a society empowered by the use of trusted geospatial services from official national sources.

The past year has been extraordinary in many ways, and we have all had to adjust our way of working. On behalf of Management Board, I would like to thank all members, and in particular our Production Management Team and our data producers, who are involved in the compilation and integration of our pan-European datasets, for their continued contribution, participation and support. I would also like to recognise the commitment and hard work of the team at EuroGeographics Head Office in swiftly moving activities online and introducing new, virtual ways for us all to remain connected.

Finally, I would like to thank Mick Cory, who retired as Secretary General and Executive Director in November 2020, for his dedication, professionalism and leadership over the past five years. In turn, we extend a very warm welcome to Léa Bodossian whose high-level representation, communication and management skills will ensure our members' roles, capabilities and concerns continue to be understood across the world.

I wish all our members, data users, stakeholders and EuroGeographics staff well in what has been, and continues to be, a challenging time in dealing with the Covid-19 pandemic.

Colin Bray
President, EuroGeographics

MORE THAN MAPS

Aerial survey	Digital transformation	Emergency responses	Location-based apps
Real-time data for pandemic response	Smarter, sustainable agriculture	Cleaner, safer, intelligent transport	Environmental monitoring & management

ABOUT US

Secretary General and Executive Director's Report

Geospatial data has never been more visible nor its value more public. In the past year, it has proved vital for responding to the global pandemic, keeping us connected and playing a central role in all our lives.

Whether you've downloaded a track and trace app, used your phone to avoid busy times on public transport, or booked your vaccination slot online, maps are helping all us to stop the spread of Covid-19.

EuroGeographics members are playing their part by delivering accurate, official land information and geospatial data and services. They have quickly adapted their datasets to meet the needs of a fast moving situation to ensure those making difficult decisions can count on them for the most up to date information available.

They will undoubtedly remain instrumental in helping to monitor and manage Coronavirus but will also be key to tackling another global challenge – climate change.

Authoritative data – the backbone of crisis recovery and climate action

Trusted, official data from National Mapping, Cadastral and Land Registration Authorities has a clear role in supporting crisis recovery and climate action.

As the world counts down to the United Nation's 2030 Agenda, trusted data is more important than ever for monitoring, managing and measuring progress towards the Sustainable Development Goals (SDGs). And, as one of the basic building blocks for digital transformation, high value, authoritative, geospatial data has already put the EuroGeographics community at the heart of Europe's digital future and economic growth. Our members across the continent are realising the enormous potential of this massive resource by embracing digitalisation to deliver modern online, streamlined and interconnected data services.

Maximising use of official information with open data

Members recognise that the value of their information lies in its use and reuse. Many have already made their data open and accessible, a trend that will continue.

In 2020, we started the Open Maps for Europe project to extend these benefits to pan-European datasets created using official map, geospatial and land information. The first free to use maps from more than 40 European countries will be available through a new online gateway in 2021. We are coordinating the project, which is co-financed by the Connecting Europe Facility of the European Union, in partnership with the National Geographic Institute (NGI) Belgium.

An advocate for members agility and ability to refine business as usual

The global pandemic has redefined business as usual – from accelerating the adoption of new technologies to refocusing resources. As a community used to constant and far-reaching change, we have a proven ability to respond strategically, as well as operationally, to these new ways of working. Together, we must ensure this agility, as well as our data, is widely recognised, understood and used for maximum impact and benefit.

More than ever before, the world needs accurate data that it can trust is up to date, definitive and detailed. We know we cannot expect users to always come to us, so we continue to find new ways of achieving its widespread use across both the European and international systems. For example, by demonstrating how it underpins all the dataspaces in the European Strategy for Data or provides secure land and property rights through the UN Framework for Effective Land Administration (FELA).

Providing certainty in uncertain times

With authoritative data central to so many national, regional and global policies and initiatives, EuroGeographics has a vital role to play as an advocate of geospatial data from official sources by continuing to promote members' contribution to the public good. In these uncertain times, the unity demonstrated through our collective activities is key to demonstrating the certainty members provide to citizens, to governments and to businesses alike, and raising awareness of their value in delivering better data for better lives.

It is an honour to have joined EuroGeographics, which has a long history of bringing organisations together to participate in joint projects, policy developments and knowledge exchange. I am thrilled to be part of an association which has a strong culture of collaboration and cooperation at its heart. In these uncertain and rapidly changing times, this unity is key to raising awareness among politicians and policymakers of our members' collective value in delivering better data for better lives.

Lea Bodossian
Secretary General and Executive Director
EuroGeographics

DATA TO PROTECT PEOPLE AND THE PLANET

Relied on by European institutions and UN, government, businesses and citizens

Crucial for rapid, coordinated responses to disasters and preventative action plans

Vital for realising 2030 Agenda for Sustainable Development and climate targets

HIGHLIGHTS
2020

FACILITATING ACCESS TO OFFICIAL, TRUSTED DATA

MEMBERS NATIONAL GEOSPATIAL, CADASTRAL AND LAND INFORMATION

Online membership map with links to national cadastral portals and geoportals

EUROGEOGRAPHICS PAN-EUROPEAN GEOSPATIAL DATASETS

Boundary, topographic and open data updated and improved through our unique data integration process in collaboration with members:

45
Data Producers

Federal Agency for Cartography and Geodesy (BKG) Germany

National Institute of Geographic and Forest Information (IGN) France

EUROBOUNDARYMAP (EBM 2020)

Official boundary data for:

55
Countries (according to ISO country code and Kosovo*)

39
Data producers

Enhanced with data from the Regional Gazetteer, enabling multilingual searches by geographical names

Used within the European Commission through our agreement with Eurostat – for example in the Statistical Atlas to visualise complex information

EUROREGIONALMAP (ERM 2020)

Official national geospatial data for:

51
European countries and territories

36
Data producers

National data validated against specifications using tool developed by The Netherlands Kadaster, Land Registry and Mapping Agency

Hydro theme completely updated including edge-matching of watercourse features along borders

EUROGLOBALMAP (EGM 2021)

Open dataset and web feature service covering:

55
Countries and territories

Data from Albania, Bosnia and Herzegovina and Montenegro added

Administrative, Transportation, Settlements and Hydrology themes updated

Used within the European Commission, the UN and by private, public and academic organisations

REPRESENTING EUROPE'S NATIONAL MAPPING, CADASTRAL AND LAND REGISTRATION AUTHORITIES

IN EUROPE

Contributing and supporting international policy and initiatives

European Strategy for Data

INSPIRE Inception Roadmap

EU Data Governance Act proposal

EU Roadmap for a Communication on Europe's Digital Decade: 2030 digital targets

Integrated Geospatial Information Framework (IGIF) Implementation Guide

UN Framework for Effective Implementation Guide of the Integrated Land Administration

Supporting the application of the Federal Republic of Germany for establishing a Global Geodetic Centre of Excellence in Bonn

IN THE UNITED NATIONS

Contributing and supporting international policy and initiatives

We are an observer organisation at the UN-GGIM Commitee of Experts

We are an observer organisation at the UN-GGIM Europe Executive Commitee

We continue to support and fund UN-GGIM: Europe Secretariat with Kadaster, Netherlands

MAINTAINING AN ACTIVE PROGRAMME OF ENGAGEMENT

Contributing and supporting international policy and initiatives

Connections

DG CNECT
DG GROW
European Environment Agency
European Global Navigation Satellite Systems Agency (GSA)
Permanent Committee on the Cadastre (PCC)
Eurostat
Group for Earth Observation (GEO)
Joint Research Centre (JRC)

Conferences

DGI Geospatial Intelligence for National Security
Smarter Data Smarter World
Third workshop on Spatial Data Quality in conjunction with EuroSDR, Cadastre (PCC)
Eurostat
Group for Earth Observation (GEO)
Joint Research Centre (JRC)

Communications

Policy briefings
Newsletters
Annual Review
Social Media

SUPPORTING MEMBERS' CAPACITY BUILDING AND DEVELOPMENT PLANS

KNOWLEDGE EXCHANGE

Well-established network of knowledge exchange and communication at the heart of EuroGeographics.

Online programme of webinars to complement successful Knowledge Exchange Networks (KENs).

Cadastre and Land Registry KEN, Policy KEN, Quality KEN and INSPIRE KEN + two knowledge forums: State Boundaries of Europe and Positioning.

E-learning material and customised reading lists created in collaboration with EuroSDR

GENERAL ASSEMBLIES

■ Members chance to help us focus and tailor the benefits we deliver to best meet needs and expectations

■ An opportunity for as many members as possible to join this flagship event, and benefit from this unique opportunity for knowledge exchange and learning

■ Focuses on key strategic issues relevant to Heads of member organisations

■ Enables exchange of knowledge and experience through member presentations and panel discussion

■ Opportunity to question guest speakers

WEEKLY MEMBER WEBINARS

857
Participants

45
Member organisations

Showcased member case studies

Supporting Continuing Professional Development (CPD)

DELIVERING OPEN MAPS FOR EUROPE

MEETING EU OBJECTIVES

Making more data available

Removes integration costs from users

Reducing costs of data to increase its re-use

Improving re-usability of data from a technical perspective

Ensuring a level playing field for all reusers

"The proposed Action's relevance is very good and it's fully aligned with objectives of the Call. It builds on outcomes of previously CEF funded Open ELS action, covers a priority domain and well addresses generation of cross-border and cross-domain data and support for the deployment of new cross-border and cross-domain services."

CEF Evaluation Panel

Free to use maps from more than 40 countries, available.

Supports Open PSI Directive by encouraging use of official geospatial open data to drive innovation, market development and economic growth

Promotes national open data beyond national borders

First datasets ready in summer 2021 via interface developed by thinkWhere

Project coordinated by EuroGeographics, partnered by National Geographic Institute (NGI) Belgium.

75% funded by Connecting Europe Facility (CEF) grant

Co-financed by the Connecting Europe Facility of the European Union

Thank you to BKG Germany, General Directorate for the Cadastre Spain, NGI Belgium, IGN France and Registers of Scotland for supporting this project.

**MEMBER
CASE STUDIES**

ARMENIA

Spatial data at centre of key initiatives in Armenia

"The spread of the Covid-19 pandemic has led to unpredictable consequences in the world, however our cooperation with EuroGeographics has been very smooth with virtual events ensuring we remain connected. Our friendly and mutually beneficial relations will continue and have consistent development. Let me thank the Management Board, Secretary General and Executive Director and the entire staff of EuroGeographics for their best efforts in these difficult conditions to achieve the goals set by the organisation."

Suren Tovmasyan, Head of the Cadastre Committee of the Republic of Armenia

Specialists from the Center of Geomatics subdivision of the Cadastre Committee have supported the creation of electronic maps for the state to prevent and control coronavirus.

The maps use population figures to divide the country into zones with a responsible hospital. The corresponding subdivisions of the appropriate authorities were then separated for each zone. These electronic maps have contributed to the national response to Covid-19 and helped the relevant state bodies organise their work.

Creation of a unified address database

The Center of Geomatics geospatial data management unit is standardising both old and new addresses to create a unified platform for the address system.

As a result of intensive cooperation with the local self-governing bodies, geographical names for the areas located inside settlements are being corrected.

Benefits

- Simplification of the address provision and registration process in the territory of the Republic of Armenia.

- Public awareness of the creation of address maps for each settlement.

- Contributes to creation of navigation system and maps in the future.

- Availability of address registry through an automated information system.

Launch of National Spatial Data Infrastructure

The concept of an integrated cadastre was approved by the Government in May 2019 and envisages the launch of National Spatial Data Infrastructure (NSDI) standards by 2023. The Cadastre Committee has already started work on the NSDI strategy and has developed a list of basic and custom (thematic) spatial data layers. Work is also focusing on developing standardisation documents for the NSDI, elaborating the integrated Cadastre strategy and the conformance of spatial data with the standards.

Benefits

- Facilitates the collection, processing and use of common spatial and cadastral data necessary for good governance.

- Contributes to the implementation of effective programmes for the economic development of marzes (provinces) and communities.

- Eliminates duplicate and conflicting cadastral data used in various sectors of the economy.

- Facilitates the process of creating backups of spatial data, increases operational efficiency and reduces costs,

- Ensures accessibility to spatial data and provides access to information for the public.

- Promotes the processes of developing internal mechanisms ensuring completeness, accuracy and reliability of data.

- Reduces time and working resources for provision of comprehensive spatial information to relevant bodies due to the availability of real-time access.

NATIONAL SPATIAL DATA INFRASTRUCTURE

AUSTRIA

Precision farming with the Austrian Positioning Service

"The use of APOS in automatic steering systems for Austrian agriculture has become essential. BEV takes the next step towards innovative solutions by transmitting correction data (RTK correction signal) via mobile internet. Also, we are working on delivery of free correction data via broadcast systems for all users. This step should be realized by the end of 2021 and will thus ensure cm-accurate positioning even for the mass market."

Wernher Hoffmann, President of Federal Office of Metrology and Surveying (BEV), Austria

The Federal Office of Metrology and Surveying (BEV) is expanding the APOS (Austrian Positioning Service) satellite navigation service to serve real-time kinematic (RTK) signals to a large user base. In a first step, Austrian agriculture is using the RTK signal for precision farming.

APOS is a multi GNSS positioning service which utilises GPS, GLONASS and GALILEO. The reference station network used by APOS consists of 37 GNSS reference stations throughout Austria. Additionally, all border GNSS reference stations of neighboring countries are included. APOS is the RTK positioning service for Austria, providing nationwide homogeneous 3D coordinates in the European Terrestrial Reference System (ETRS89) with cm accuracy. In order to provide RTK signals to the masses, it was necessary to completely redesign the APOS system and the central IT infrastructure.

In a first step, the RTK correction signal from APOS will be made available to the agricultural sector free of charge. The utilisation of APOS for agriculture and forestry was defined in an agreement between the BEV and the Federal Ministry of Agriculture, Regions and Tourism. The use of automatic steering systems is one of the most widespread digital applications in Austrian

agriculture. In order to use APOS for automatic steering, in addition to the required hardware, the transmission of correction data (RTK correction signal) via mobile internet to the agricultural machine is necessary. Using APOS a lane accuracy of approx. 2cm can be expected.

In addition to the use of APOS by the agricultural sector, the BEV is working on enabling free correction data transmission via broadcast systems for all users. This step should be realised by the end of 2021 and will provide cm-accurate positioning for the mass market. As a government infrastructure, APOS forms a foundation for supporting and promoting the innovative strength of Austrian companies in the implementation of a large number of future applications. The area of smart cities or the Internet of things, are just some examples where APOS can be utilised.

Fotos/Copyright: Gerald Pfabigan

BELGIUM

Contributing to Belgian National Access Point for multimodal transport information

"With the NAP, we encourage convenient and more environmentally friendly passenger transport by making the (geo)information needed for innovative travel information apps accessible in one place."
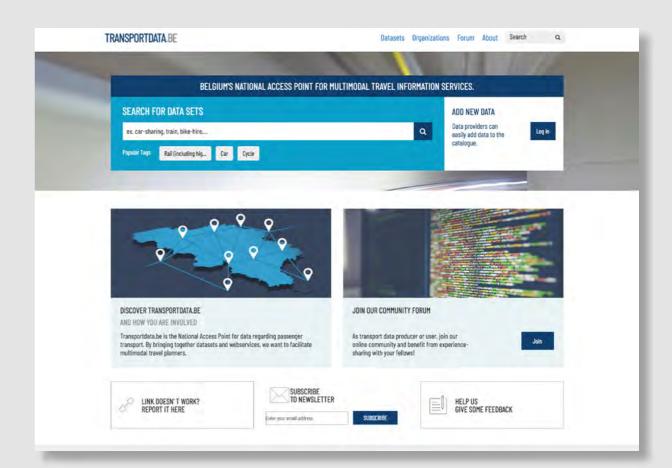
Ingrid Vanden Berghe, Director, National Geographic Institute (NGI), Belgium
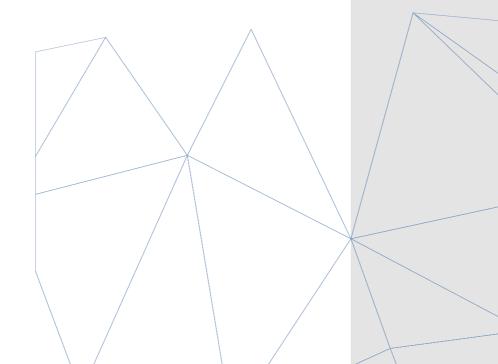
The National Geographic Institute (NGI) is responsible for the development of the website Transportdata.be that was created to align Belgium with the European Delegated Act 2017/1926. This requires all member states set up a National Access Point (NAP) for multimodal transport information to enhance the development of multimodal travel information services.

The Belgian NAP – www.transportdata.be – is a metadata portal on which all travel data concerning passenger transport must be registered. To promote the 'modal shift', it enables the exchange of data between data providers, such as transport authorities and operators, and developers of multimodal travel information services. In this modal shift, the personal car is replaced by more environmentally friendly and multimodal alternatives, thereby providing a better service to travellers. Furthermore, it is an essential step into lowering CO_2 emissions as described in the climate ambitions of the Paris Agreement, as the transport sector is responsible for more than 20% of the global CO_2 emissions.

Benefits

- Stakeholders (national and international) know where to find travel and traffic related information.

- A common access point for data enhances the use of common standards by the data owners.

- By simplifying the access to the relevant information, the threshold is lowered for the development of door-to-door travel information services.

- The transportdata.be-forum gives the different stakeholders the opportunity to exchange experiences and ask the community questions.

- Passenger transport can be organised in a more efficient and environmentally friendly manner.

BOSNIA AND HERZEGOVINA

Establishing a Spatial Data Infrastructure in Bosnia and Herzegovina

"Various projects in the field of land registration and administration have been implemented in the Federation of Bosnia and Herzegovina (FBiH), resulting in a large amount of geospatial data. Data is kept in different institutions, which complicates access, as well as obtaining complete and specific information. For the faster connection of institutions, and thus the information they have, the FBiH decided to follow European experience in creating a common legal and technical framework for data integration – the establishment of a Spatial Data Infrastructure in accordance with the INSPIRE Directive."

Željko Obradović, Director & President of SDI Council, Federal Administration for Geodetic and Real Property Affairs (FGA), Bosnia and Herzegovina

Bosnia and Herzegovina (FBiH) continues to take significant steps forward in the development of its Spatial Data Infrastructure (SDI).
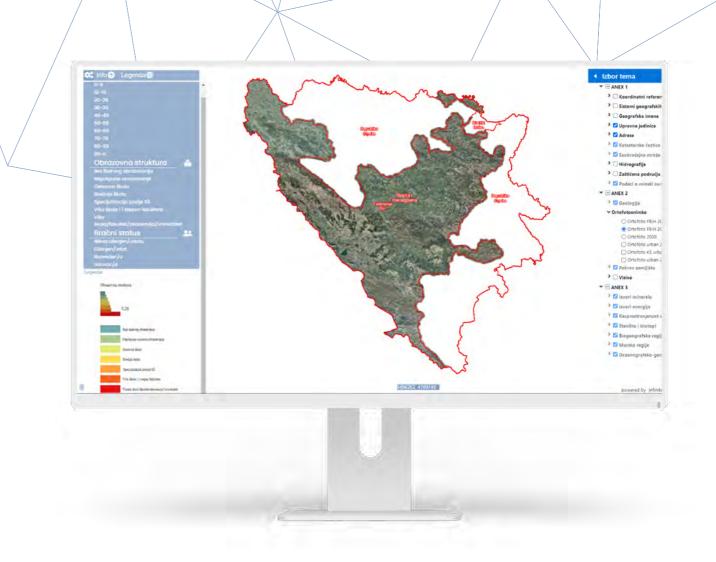
Together with the Council and Working Groups, the Federal Administration for Geodetic and Real Property Affairs (FGA) is responsible for establishing and maintaining the SDI.

The establishment of the SDI is a long-term process that will enhance the modernisation and efficiency of public administration, provide a basis for economic development, and enable easier data manipulation, use and availability.

It is planned to further harmonise data, improve cooperation between state institutions, as well as knowledge, skills and improve capacities for the dissemination of spatial data, and to provide high-level hardware and software components.

Adoption of the new law on SDI is currently in the adoption phase and will represent the legislative framework of the SDI, and ultimately contribute to easier accession to the European Union.

Benefits

- Data for 12 datasets has been harmonised according to INSPIRE standard.

- GIS Browser of the SDI Geoportal was published with the support of the Government of the Federation of BiH.

- The GIS Browser, together with the Catalogue of Metadata, the Register of IPP Sources and Subjects, as well as the SDI website, form one unit that represents the SDI Geoportal of the Federation of BiH.

- The metadata catalogue contains all metadata about the displayed spatial data, with 19 metadata entered so far.

- 54 SDI subjects and 109 data sources have been registered in the SDI Registers.

- All applications are accessed through the official website: https://ippfbih.gov.ba/.

- Address data have been published for the first time on the SDI Geoportal with accompanying metadata for one third of municipalities that completed the establishment of the Address Register, which is established in cooperation with local self-governments and supported with donations from the Swedish government.

- Simple and flexible integration with user data.

CROATIA

Delivering indispensable infrastructure and spatial data to manage disasters

"Digital services pre-developed by the State Geodetic Administration have proved indispensable to Croatia's response to the coronavirus pandemic, as well as two devastating earthquakes. After the Croatian Government declared a state of disaster in the earthquake-stricken areas in and around Zagreb, the State Geodetic Administration in cooperation with the Central State Office fo r the Development of Digital Society, the Faculty of Geodesy and the Civil Protection Headquarters, established the Headquarters' network geoinformation system for dealing with the consequences of the disaster. This system is based on NSDI data, the infrastructure cadastre and spatial unit register."

Damir Šantek, State Geodetic Administration of the Republic of Croatia

Ensuring availability of data on existing infrastructure

Using a grant from the European Regional Development Fund, the State Geodetic Administration established an information system to function as a single information point (JIT) and infrastructure cadastre (SKI).

The system records utility lines and other facilities belonging to electricity, electronic communications, hot water, gas, oil, water supply and drainage infrastructure, and contains data on the types, basic technical characteristics, current use and location of existing infrastructure. By providing access to basic information to all other users under proportionate, non-discriminatory and transparent conditions, the aim is to allow the management, storage and distribution of infrastructure cadastre data. The system was put into operation in August 2020 for the areas of jurisdiction of two counties.
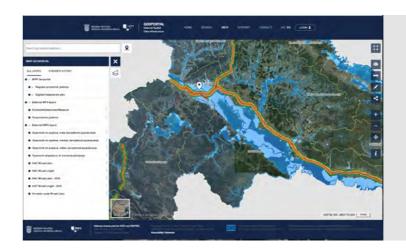
The single information point (JIT) constitutes the public part of the system available, allowing external users to search for infrastructure cadastre spatial data and metadata, provide notifications on ongoing or planned construction works, submit requests for data and public documents, and receive official documents. In addition, users will be able to submit infrastructure geodetic report to competent cadastral offices for review and confirmation electronically.

Benefits

- Maximises the use and efficiency of existing infrastructure

- Reduces costs and removes obstacles in executing new construction works.

- Reduces costs incurred by direct and indirect damages done while executing construction works.

- Ensures the sharing of information on infrastructure digitally to all users who need data on infrastructure in their business processes.
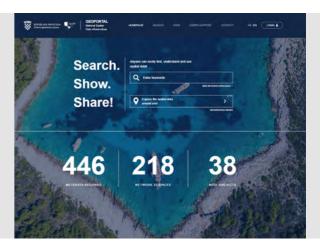

Accessing spatial data sources

The State Geodetic Administration serves as the National Spatial Data Infrastructure (NSDI) Contact Point and is, among other things, in charge of establishing, maintaining and developing the NSDI Geoportal, the starting point for accessing spatial data sources.

The National Geoportal was created in 2014, and in September 2020, an improved and visually redesigned version was publicly released.

Benefits

- Greatly improves the user experience and interface.

- Enables access to 446 metadata items (218 of which are related to network services) on various sources under the jurisdiction of 38 institutions.

- Provides a simple and intuitive data viewer for professional users.

- Enables the additional manipulation of JIT displays based on network services, including both those already present on the NSDI Geoportal and external ones, which users can add themselves.

- Modernises the Metadata Catalogues and facilitates system configuration through the administration interface using the open source cataloguing application GeoNetwork 3.4.4.

CYPRUS

Cyprus DLS-Portal, a model for geospatial innovation

"This innovative online platform is based on an Integrated Land Information System which includes more than 350 ISO regularly monitored and certified procedures. It is a focal point in the history of modern cadastre and geospatial information, and the culmination of a long time effort of the Department to provide e-services to citizens and integration of geospatial information"
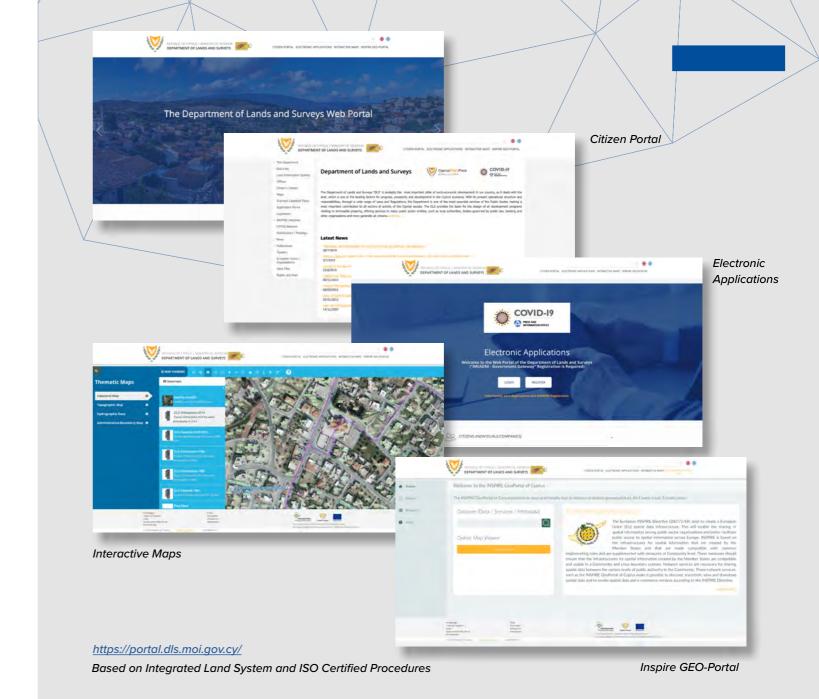
Andreas Hadjiraftis, Chief Lands Officer, Member of EuroGeographics Management Board.

DLS-Portal is a pioneering online services platform developed by the Department of Lands and Surveys (DLS), which has received one of Cyprus' highest distinctions, and was named best Public Sector Innovation by the Federation of Employers and Industrialists (OEB) Innovation and Research Awards.

DLS-Portal is the first and largest online electronic library of geographic and descriptive information in Cyprus, and is considered to be one of the best European Cadastral and Geospatial information provider. It provides access to the Department's information and enables citizens to submit online applications, export data and catalogues, directly access and download maps, subscribe to services, and more. At the same time, it is a model for the implementation of INSPIRE Directive and collects a variety of geospatial data from several Departments and Services of the State.

DLS-Portal consists of four main pillars:

- Citizen Portal: Dynamic front page providing a variety of information and services.

- Electronic Application Submission and Tracking System.

- Interactive maps providing the ability to navigate to properties and geospatial features through a free online application, providing the flexibility to select any combination of information from a great variety of available GIS layers.

- INSPIRE Geoportal.

Citizen Portal

Electronic Applications

Interactive Maps

Inspire GEO-Portal

https://portal.dls.moi.gov.cy/
Based on Integrated Land System and ISO Certified Procedures

Benefits

- Whole concept is based on a 24/7 fast and friendly service.

- Provides a variety of information and services, including the electronic submission and tracking of applications, via the dynamic front page of the Citizen Portal.

- Access to interactive maps allows users to navigate to properties and geospatial features and select any combination of information from the GIS layers.

- Contributes to the delivery and expansion of open data.

- Saves resources and time for the Department and citizens by eliminating time-consuming bureaucratic procedures.

- Provides an infrastructure for fast COVID-19 monitoring, and emergency services response.

- Improves public service transparency, reduction of bureaucracy, and promotion of equal treatment.

- Strengthens market and economic development.

- Builds on interoperability of data between IT applications.

CZECH REPUBLIC

Continuing to provide services and deliver projects throughout the Covid-19 pandemic

"The pandemic has tested our ability to respond to changing conditions. We have found new ways to maximise our activities and continue to provide services that are important to the public and to the Czech economy."

Karel Večeře, President, Czech Office for Surveying, Mapping and Cadastre (ČÚZK)

The Czech Office for Surveying, Mapping and Cadastre (ČÚZK) has continued to provide registration and information services to the public throughout the Covid-19 pandemic.
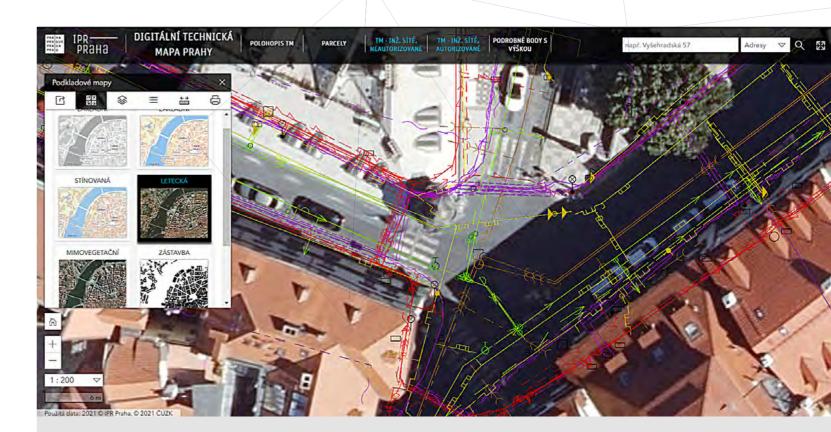
Activities continued without major restrictions and problems, with progress also being made in important development projects. ČÚZK's multi-annual plan for the systematic updating of cadastral documentation technical data with revisions and new mapping was successful. Approximately 1.5% of cadastral areas are revised in this way every year to ensure accuracy.

The digitisation and automation of territorially-oriented projects of the public administration, in particular in the area of spatial planning and construction proceedings, also continued. One such project is delivering digital technical maps of regions (DTM). ČÚZK is the creator of the legislative framework and of the technical

specifications for all regions to ensure a uniform approach to this nationwide project. It is also administrator of the digital map portal of the public administration (DMVS) where the DTM of regions, together with cadastral maps and Orthophoto CR, will be available. Basic viewing, downloading and processing services will also be provided.

Benefits

- Uniform creation, administration and updating of information on the technical and transport infrastructure in the regions.

- Administered in single regions but shared as database information within the Czech public administration.

Example of the DTM of Prague combined with Orthophoto

In accordance with the DTM and DMVS projects, an amendment to the Land Surveying Act was prepared in 2020. This not only creates the basic legislative framework for them, but also regulates some principles of land surveying activities.

Benefits

- Implements EU Directive on open data and the re-use of public sector information.

- Delivers graphic data of the real estate cadastre, including indexes, as open data.

- Increases datasets available as open data in the future – the basic database of geographical data, generalised geographical data at scales of 1:50 000 and 1:250 000, high-resolution Orthophoto CR (12.5 cm) and a full range of digital raster equivalents of topographic maps.

DENMARK

Increasing efficiency with new ways of working during Covid 19

"The Danish Geodata Agency's (DGA) employees have been incredibly professional and have quickly adapted to the new reality of working from home. The success is based on the digital transformation in property registration that has been going on since the 1980's and infrastructure was prepared for it."

Pia Dahl Højgaard, Director, Danish Geodata Agency (DGA)

The Danish Geodata Agency (DGA) has significantly reduced the backlog of cadastral changes to be registered, despite employees working from home as a result of Covid-19.

Due to its well-developed digital infrastructure and qualified employees, the quick and efficient transition to homeworking was completed in just one day. Resources were allocated to provide all employees with a well-functioning IT workplace in their home. Although not physically present in the office, people remain connected and continue to share knowledge through virtual meetings.

DGA has fully digitised its property registration and formation management. As a result of this transformation to full digital management, the cases and data for updating the cadaster are now fully digital and exchanged digitally between DGA's employees, the registered land surveyors and the municipalities.

Benefits

- The case processing time has decreased from 101 days (as of January 2020) to 37 days (as of January 2021).

- The number of backlog cases waiting to be processed is significantly smaller.

- Citizens and companies experience faster processing of cadastral cases, which benefits the whole society.

- Full digital exchange of cadaster update information.

- Virtual meetings focus on joint problem-solving and knowledge sharing among employees, tremendously increasing competence.

Decrease in case processing time

DENMARK

The Danish Agency for Data Supply and Efficiency integrates government data across sectors

"Being in the core data business, we are committed to use our data and knowledge to support policy development. We are working to support the 2030 Agenda and the Paris Agreement with specific national initiatives. Our new strategy considers the challenges of climate change and addresses the need to modernise public administration to keep up with the challenges. To support the major transitions happening in society, we believe that data must be interoperable and freely available for use and reuse across public authorities and sectors."

Kristian Møller, Director General, Agency for Data Supply and Efficiency (SDFE)

The Danish Agency for Data Supply and Efficiency (SDFE)'s commitment to deal with important societal challenges, supported by its new strategy, leads it to public sector programmes outside of the geospatial domain, while building on its geospatial 'heritage'. This has resulted in a close cooperation with the energy and utility sector, and two recent examples showcase its role as data integrators across the public sector.

Supporting the Danish Climate Act on reducing carbon emission by 70% in 2030, SDFE has brought data and knowledge to the table, and through a combination of core data and sector specific data, created new instruments to deal with climate change.

In 2020 a new Utility Portal which provides easier access to utility data across Denmark, was launched in a cooperation between the Ministry of Climate, Energy and Utility and the three data owners. SDFE is responsible for the operation of the portal. It will collect a number of different data about and from the utility sector. Initially, economic key figures for electricity distribution and water utility as well as technical data on energy-producing units. The portal will be extended with more datasets on the utility sector on an ongoing basis.

Benefits

- The portal will improve transparency in the utility sectors through better access to data in a common format, while at the same time facilitating the tasks of the authorities by a single access to data.

- For authorities the portal will be a significant contribution supporting their endeavor to coordinate and optimise utilities across Denmark.

- The open distribution of utility sector data will also help to create a breeding ground for innovation and new business models in both the public and private sectors.

Another recent initiative is the Building Hub, which aims to collect and disseminate data on buildings and their energy consumption in order to create a stronger basis for the implementation of energy efficiency improvements in buildings. Information on energy consumption, building construction and weather will be part of the data collected for calculations.

Benefits

- The Hub will directly support energy efficiency in society as well as in public buildings, utilisation of flexible consumption and reduction of the buildings' climate footprint. The value in a socio-economic perspective is estimated up to €50 million per year.

- The citizens (building owners) get easier access to data via the hub, providing information on how to make the building more efficient and what potentials the building has to offer in relation to flexible energy consumption.

- Companies can use data for targeted offers for the implementation of efficiencies for building owners, as well as better data for developing new solutions for energy efficiency and climate improvement of buildings.

- Authorities will be able to create better framework conditions for promoting energy efficiency in society in general as well as for public buildings – reducing carbon emissions.

FINLAND

Laser scanning research generates benefits for society in Finland

"Autonomous vehicles often include a large number of on-board sensors to observe the dynamic environment all around the vehicle. When practically all vehicles will be equipped with high-quality mapping sensors in the future, remarkable amounts of data could be acquired from urban, traffic and road environments on a continuous basis. If these big data can be exploited beyond the real-time processes of each car, completely new possibilities will open up in the field of dynamic modelling of the 3D road and traffic environment."

Arvo Kokkonen, Director General, National Land Survey (NLS) of Finland

National Land Survey (NLS) Finland has developed its own autonomous car within the Academy of Finland-funded Centre of Excellence of Laser Scanning Research (led by Prof. Juha Hyyppä) and started to research autonomous big data as a possible way to provide road environment data for mapping in the future.

NLS Finland built a research platform for autonomous driving, named ARVO (Autonomous Research Vehicle Observatory). ARVO is a Ford Mondeo Hybrid equipped with DataSpeed ADAS Kit allowing the car to be controlled by signals programmed from Robotics Operating System (ROS).

The car is already equipped with perception sensors, such as Velodyne VLP-128 LiDAR, located in the centre of the roof. Four other laser scanners, radars, sonars, GNSS-IMU navigation system and various cameras are located at the windscreen. The concept architecture for ARVO is that it can process/store all data inside the car in two ways: using post-processing scenarios and using near-real-time scenarios.

Autonomous driving will influence societies and human life globally, altering the ways of working and living, and thus presents open questions for us all to solve.

Benefits

- Autonomous fleets will be able to carry out about 75% of the tasks related to mapping in the 2030s, increasing the resource efficiency of mapping, keeping data updated and influencing resource-wise decision-making.

- Increases the frequency of national geospatial information updates, which has an impact on enhancing decision making with real-time information gathered from the road.

- Fosters knowledge-based growth in Finland with demos for the Finnish industry using the data, and models acquired for various civil engineering applications.

- Data acquisition via autonomous vehicles significantly lowers the costs of applying 3D mapping in the smaller communities that typically have been outside the scope of 3D city modeling.

- The project allows Finland to improve the national awareness, knowledge and adaptation in this area.

The NLS Finland own-built autonomous car is seen here on the left with the high-definition mapping car on the right.

FRANCE

'Geo-common' strategy supports major LiDAR and land use projects in France

"The fact that IGN's data are free of charge since 1 January 2021 reinforces IGN's mission of pooling public players in the field of sovereign data. The challenges for IGN are thus to produce data useful to public players, by bringing them together in joint projects, such as the national LiDAR HD programme and large-scale land use. The code name 'Geo-common' refers to this strategic orientation of IGN as a common resource, pooling and working with communities according to a participatory logic."

Sébastien Soriano, Director General, National Institute of Geographic and Forest Information (IGN) France

As part of its 'Geo-common' strategy, National Institute of Geographic and Forest Information (IGN) France has launched major new land use and LiDAR projects to support public policies. These include the national high-density LiDAR coverage programme and the national soil artificialisation observatory.
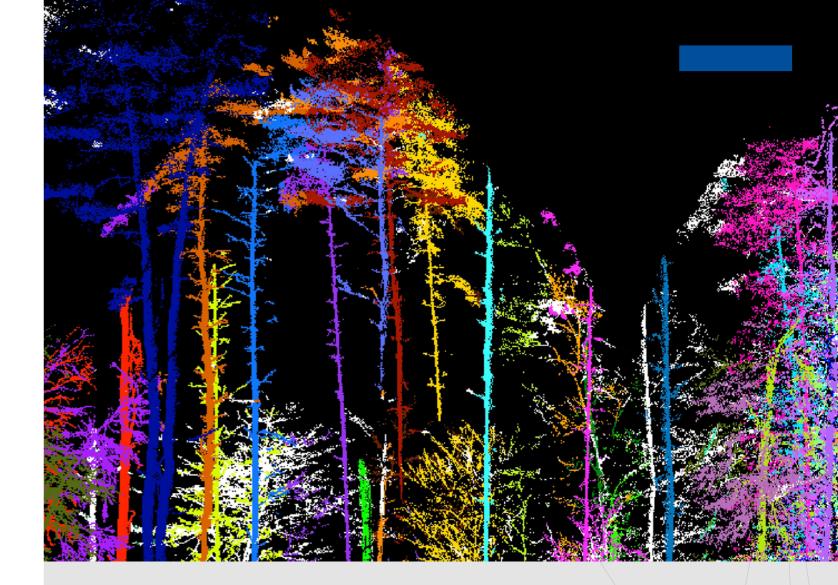
At the same time, the IGNfab incubator aims to accelerate startups' digital geoservice projects that use location data and land description. Indeed, usages of innovative data such as high-definition LiDAR data have to be supported and fostered. As part of its last theme-based call for projects, dedicated to "Energy and climate change" and issued in 2020, IGNfab helps and supports the developments of 5 projects linked to building energy renovation.

National LiDAR programme

In the framework of its brand new national LiDAR programme, IGN France will acquire, compute, host and broadcast LiDAR point clouds at high density (10 points per square meter). The French public bodies responsible for natural risks prevention, forest management and agriculture are providing the first case studies.

Benefits

- Enables fine, quasi-synchronous and homogeneous three-dimensional knowledge of the topographic soil, artificial topsoil and vegetation between 2021 and 2025.

- Generates classified LiDAR point clouds and very precise Digital Terrain Models (DTMs) and Digital Surface Models (DSMs).

- Can be used for a wide range of applications in a variety of public policies, such as spatial planning, agriculture, forest, energy, biodiversity, and climate.

National soil artificialisation observatory

The Ministry for Ecological Transition requested a project of large-scale land use and land cover for the measurement of soil artificialisation. This project aims to produce a reference framework for land occupation and use throughout the national territory, through automated processes based on artificial intelligence. The objective is to disseminate open data on soil artificialisation.

Benefits

- Enables the State and the territories to combat urban sprawl, which reduces the capacity of agricultural land to feed us, increases the distances travelled by individuals, increases expenditure on networks (roads, electricity, sanitation, etc.), accelerates the loss of biodiversity by fragmenting spaces and, due to soil sealing in particular, increases the risk of flooding.

- Provides an essential brick in reaching the 'Zero net artificialisation' objective, recalled by the President of the Republic before the Citizens' Convention for the Climate on 29 June 2020.

- Delivers objective data to public (State, local authorities) and private (consultancy firms, urban planning agencies, etc.) players for combating soil artificialisation.

- Promotes a shared diagnosis of the process of soil artificialisation for the preservation of biodiversity, food autonomy and the fight against global warming.

GERMANY

German geotopography becomes smart

"The Smart Mapping products will make the official geotopography sustainable and fit for the future. The innovation of Smart Mapping lies in the implementation of a modular development platform for a fast, agile and economical generation of almost all cartographic products."

Tobias Kunst, Chair of the Working Committee of the Surveying Authorities of the Laender of the Federal Republic of Germany (AdV)

To address the challenges of digitalisation of governmental processes within the German mapping authorities, the AdV recently launched the project 'Smart Mapping'.

The aim of this project is the further development of the well-known AdV standard products, as well as to test and deploy new technology for future cartographic products, such as the new basemap.de, a web map service based on vector tiles technology.

Smart Mapping develops new processes, software and services at all levels of geospatial data processing for the deployment and integration of survey data with other sources. The project team members are state and federal government domain experts and software developers working together in a distributed agile environment.

Benefits

- Combination of official German survey data with other open geospatial data sources.
- Technical platform for agile development, continuous integration and deployment based on cloud technologies.
- Use of Free and Open Source Software.
- Simple user oriented data model for geospatial data and easy re-use options for users.
- Fully automated production processes for highly up-to-date products.
- New mobile web maps.
- High resolution printed maps on demand in any scale.
- Simple and flexible integration with user data.

GERMANY

The importance of geoinformation in crises – Services provided by BKG during the COVID 19 pandemic

"From tracking infections and healthcare capacity, to guaranteeing the supply of protective equipment, data visualisation by using BKGs geospatial information is key to knowing where and how the situation is developing. In addition, BKG is responsible for delivering location data about the pandemic situation in Germany, for instance about important infrastructure, such as hospitals and laboratories. BKG also developed analysis between population structure and vaccination centres, which can be quickly integrated into applications for specific users, including the government, authorities and police. This way, BKG provides important assistance to users at federal level to clarify the national situation."

Professor Paul Becker, President Federal Agency for Cartography and Geodesy (BKG)

By enabling decision-makers to ensure clearer and faster connections between COVID-19 and the local spread, information and other data about the predominated situation is needed. Geospatial information from the Federal Agency for Cartography and Geodesy (BKG) is therefore at the heart of Germany's pandemic response.

The COVID-19 dashboard of Robert Koch Institute (RKI), the government's central scientific institution in the field of biomedicine, shows the advantages of web-based (map) applications, especially in exceptional situations: information can be made available and updated quickly for everyone and is available regardless of location and device. BKG data not only forms the cartographic basis

for the RKI COVID-19 dashboard, the Agency also has an important role advising the government on how to maximise the benefits of geographic information. For example, introducing its network of private and public sectors contacts to the Federal Institute for Population Research (BiB) to help its use of anonymous mobility data to calculate the spread of COVID-19 in a forecast model.
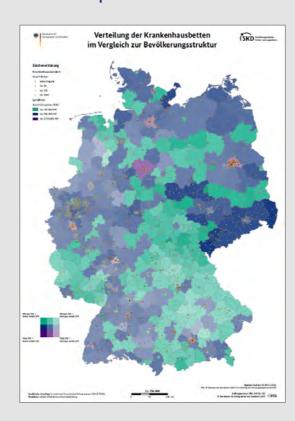
Building on the experience gained during the development of the RKI COVID-19 dashboard, BKG is building a similar technical solution – the new BKG GeoHub which will use interactive map displays and diagrams to help users easily understand complex spatial analysis. This will be available to the entire federal administration, its partners at the federal and state levels and the public in 2021.

Benefits

- Fulfils a permanent advisory function on the potentials but also the limitations of geospatial information in conjunction with other technical information in order to make informed decisions.

- Develop individual maps for German security services (e.g. Federal Police) to ensure the transport of vaccination doses to the local vaccination centre.

- Helped to meet demand for hospital beds by analysing healthcare capacity against population demographics at district level.

- Enabled management of border closures and dynamic response to congestion by monitoring at crossings using high-resolution satellite images.

- Supported planning and construction of temporary logistics centres and test stations.

- Provided route planning capability to facilitate transportation of protective equipment.

- Determined where alternatives to the supply of protective equipment to Germany may be required by identifying potential supply bottlenecks in Asian region.

- Lays foundations for new cloud-based BKG GeoHub which uses interactive map displays and diagrams to enable easier understanding of complex spatial situations.
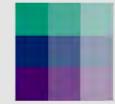
Individual products: Covid-19

District

Number of residents:

- up to 150,000
- up to 750,000
- up to 3,750,000

Few residents +
High proportion over 70

Few residents +
Low proportion over 70

Many residents +
High proportion over 70

Many residents +
Low proportion over 70

GREAT BRITAIN

Using trusted data as the foundation of underground asset registers

"Ordnance Survey was delighted to be a partner in this unique and ambitious project. The Geospatial Commission's NUAR pilots have clearly demonstrated the value of bringing together multi-stakeholder data into a single register through which data can be shared and exchanged – delivering an immediate reduction in risk and a broader increase to efficiency. The importance of trusted geospatial data being at the foundation of the initiative has been widely recognised and builds on decades of valuable collaboration with the utility sector."

David Henderson, Chief Geospatial Officer, Ordnance Survey

Together with the Geospatial Commission and the Greater London Authority, Ordnance Survey developed a communal register prototype integrating different types of underground asset data owned by utility companies. As UK utility providers are private companies, often in competition with each other and reluctant to share data, this will help them to operate more efficiently, reduce accidents, such as strikes on underground pipes and cables, and ultimately make data-sharing across organisations less challenging.

The UK's Geospatial Commission, responsible for national geospatial strategy, invested in two pilot projects aiming to evaluate the feasibility and value of a National Underground Asset Register (NUAR) in enabling better data-sharing of trusted information across the utilities sector.

Ordnance Survey led the delivery of a pilot project across national and regional utility providers and local authorities in North East England. This included the design, development and configuration of a data sharing prototype, enabling stakeholders to view a comprehensive integrated map of underground assets and associated data. The technical solution provided a single, high-quality, accessible view of this trusted information, and complied with data sharing principles, ensuring the legal and technical security of data owners' contributions. A bespoke data model was created to ensure interoperability.

The aim is to show underground assets from all relevant utility providers in a single area in relationship to the detailed national OS MasterMap, in an accessible solution that is easy for onsite excavation teams and construction workers to access on mobile phones, tablets and toughbook computers.

Benefits

- A data sharing platform on which all relevant parties share trusted underground data will reap significant operational and health and safety benefits in utilities, construction, local government and for citizens, including improved accuracy, usability and evidence-based decision-making.

- The Geospatial Commission estimated a £1.2 billion economic cost per year from accidental strikes on underground pipes and cables. This platform will help support the avoidance of future utility strikes and subsequent inconvenience caused to the public.

- Early trials have already identified where efficiency savings and safe working practices can be enhanced in back-end planning and operational response.

- A major utility provider commented 'as a high-level estimate that they could save £1 million annually just on streamlining the planning process for obtaining utility plans'.

- In the future, NUAR will enable engineers to see what assets are underground which means less trial holes being dug, decreasing the margin for error and subsequent costs. NUAR would also contain additional utility assets and a user can widen the search area; this will assist the tracking of a leak and identify any potential escape routes – e.g. water flowing through a telecommunication duct before surfacing.

- Incident responders have highlighted increased confidence levels in putting safety first for their excavator teams, as they receive an instant integrated and reliable map view of all critical utility assets.

GREAT BRITAIN

Scotland uses long-established expertise to create a modern mapping platform for the future

"Mapping underpins everything we do and everything we aspire to as we look to the future and a data-driven Land Register. To become a reality, Registers of Scotland (RoS) needed the right tools to enable our plans team to capture mapping extents as data and not pictures. Our 5-year plan has now delivered on that vision and is being rolled out into the business."

Kenny Crawford, Business Development Director, Registers of Scotland (RoS)

Registers of Scotland (RoS) are building a modern mapping platform to enable them to work with structured data, develop new strategies to deliver information from the Land Register, adapt to improvements in geospatial and location technology and quickly answer questions such as 'Who owns Scotland'?

The Cadastral Map is the product RoS are building to bring to life a spatial data infrastructure and web-based tools to support the Scottish Land Registration process.

Delivering these improvements requires the migration of 1.9 million registered titles and their 10 million individual data entities into a new data structure defining Scotland's land register and cadastral map for the next 400 years.

RoS's technological development incorporates open standards, utilises open-source software and is influenced by developing innovative approaches to service and product design and is underpinned by our adoption of the Land Administration Domain Model (LADM ISO19152).

Benefits

- Improved transparency and accessibility of mapping data.

- Simplified and improved journeys for registration service journeys.

- Mapping tooling and data is at the heart of both its staff and customer experience. The flagship citizen portal, ScotLIS, is underpinned by mapping.

- Supports commitment to the UK and Scottish government agenda of open data.

- Mapping products are designed to enable the cartographic function of RoS to be performed in a more efficient way and accessible to staff who are neither experts in registration or have a mapping background.

- By taking a data-first strategy RoS have developed new systems built on the foundations of the historical Sasine register, namely openness and transparency.

- Enables diversification so RoS learns more and discovers new ways to use land and property information and respond better to customers' needs.

GREECE

Launch of Hellenic Cadastre INSPIRE Geoportal gives access to free, online cadastral maps

"This has been a long-awaited service. Geoinformation specialists, engineers, planners, administrative officials, and many other professionals had been constantly asking for a flexible and uninhibited access to cadastral maps. Now, through the INSPIRE Geoportal, that service is available to them online and on a 24/7 basis. All the wealth of information that is embedded into those maps is unleashed and made available to them to solve problems, develop plans, implement policies, and make decisions."

Prof. Dimitrios Stathakis, President of the Board of Directors, Hellenic Cadastre

Benefits

Geoportal's data and services are used to:

- Plan new investment activities involving real estate.
- Develop urban zoning and city plans.
- Support provision of services.
- Design and implement rural development plans.
- Protect and monitor the environment.
- Manage natural hazards and natural disasters.

Free, online cadastral maps are now available to the public after to the launch of the Hellenic Cadastre's new INSPIRE geoportal.

The new service not only fulfils Greece's obligations with respect to the cadastral thematic layer of the INSPIRE Directive, but also satisfies long-standing user demand for better access to geospatial data. Since its launch, the geoportal has received approximately 6,000 daily requests for Web Feature Services (WFS) and Web Map Tile Services (WMTS), 10,000 daily requests for Web Map Services (WMS), and 5,000 daily requests for data download services.

In addition to cadastral maps, users can also find metadata information about all other datasets that are available from the Agency. This information is provided in Greek and English, enabling both local and international users to benefit from the services.
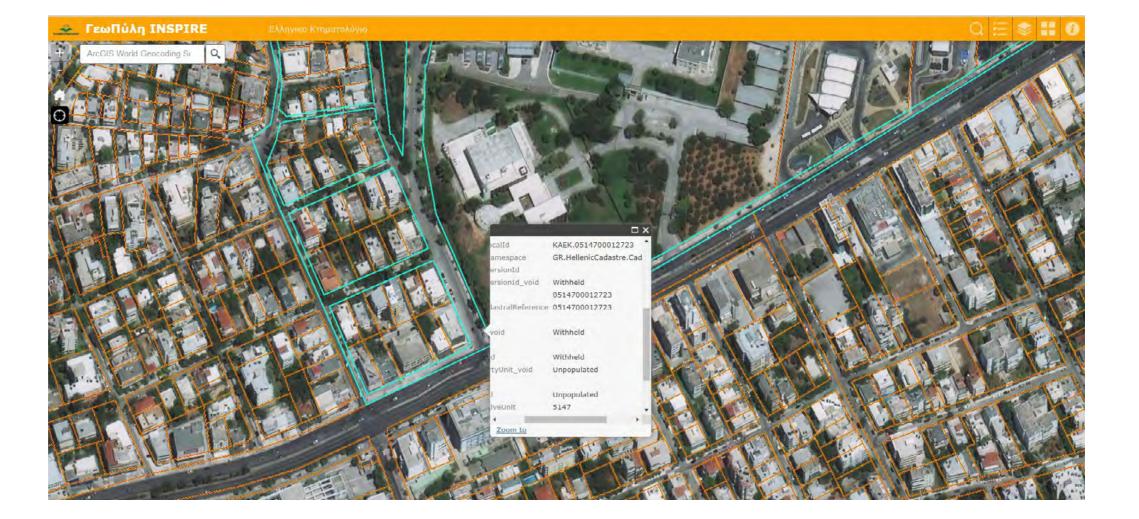
The geoportal was developed using co-financing from the Operational Program 'Competitiveness, Entrepreneurship, Innovation' within the NSRF 2014-2020. The implementation of the geoportal was completed at the beginning of 2020 and became fully operational in September of the same year. In the near future, additional data and more services will also be provided.

GREECE

Development of Covid-19 Track and Trace System with real-time data

"The Hellenic Military Geographical Service (HMGS), consistent with its socially responsible role, developed real-time geospatial applications in support of state entities that battle COVID-19. These applications facilitated the decision making process and assisted in mitigating the spread of the pandemic by offering statistical analysis tools and qualitative data."

HMGS Commander Col. Kalenterides Kimon, Hellenic Military Geographical Service

The Hellenic Military Geographical Service has developed a geospatial recording and monitoring system that relays Covid-19 data in real-time to scientific collaborators.

With the outbreak of the SARS-CoV2 pandemic, the Region of Attica in cooperation with the Athens Medical Association decided to conduct diagnostic sample testing. Samples were taken by mobile units consisting of medical and nursing personnel. The initial design was such that the mobile units that carried out sampling, recorded their results in an Excel sheet, meaning that personnel had to stay in potential hotspots for large amounts of time. Additionally, a substantial amount of time was needed to process the data.
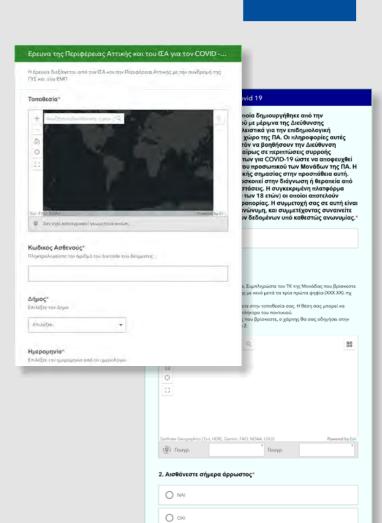
To improve the data collection process by the mobile units, the Hellenic Military Geographical Service, in cooperation with the Athens Medical Association and the Region of Attica, developed a geospatial recording and monitoring system for Covid-19 cases.
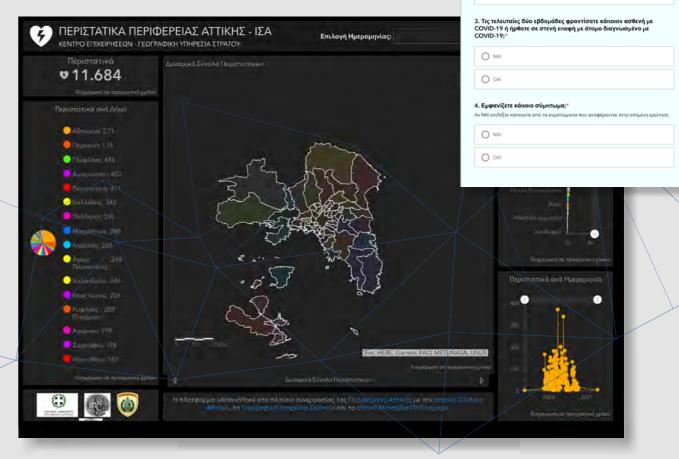
The object of the application, used by medical personnel in the mobile units, is quick data collection and real-time relay of the data to scientific collaborators, so that appropriate measures can be taken.

Benefits

- Increases safety of medical and nursing personnel by reducing the time spent in outbreak hotspots.

- Reduces processing time for questionnaires given and collected by personnel.

- Any data put into the application is available in real-time to the Operations Center of the Athens Medical Association.

- Offers a wide range of tools for statistical data analysis.

- Supervision of viral spread and epidemiological monitoring of the pandemic is achieved.

- Potential viral hotspots are viewed on a cartographic background.

Statistical Analysis of Covid-19 Data

HUNGARY

Covid-19 drives increase in use of Hungary's online services

"The Lechner Knowledge Center (LTK) is a professional background institution to the Prime Minister's Office specialising in architecture, real estate records and GIS. The company's mission is the digitisation and promotion of the wide range of public services it provides relating to the built environment and spatial data. The company's activities also include remote sensing, regional planning, and smart city services, as well as tasks involving geodesy, earth observation and cartography. We have managed to fulfill our mission even in the face of the extra challenges posed by COVID-19, which is well demonstrated by the results presented here."

Jozsef Kolossa, General Director, Lechner Ltd

Due to the spread of COVID-19, online services provided by the Lechner Knowledge Center (LTK) in Hungary became even more significant and widely used in 2020.

The Land Administration Systems served over six million data requests from more than 560,000 users and received more than 250,000 new registrations.
In addition, around 75 % of all total customer service actions were conducted through the geoshop.hu geoportal. More than 16,000 images were scanned and uploaded to the fentrol.hu Digital Aerial Photo Archive with downloads reaching 23,000.
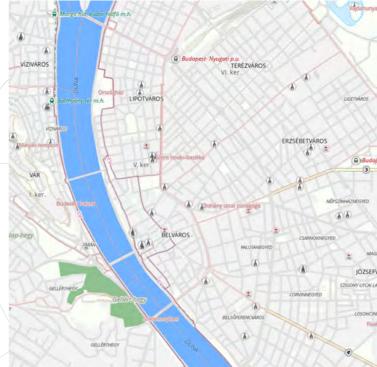
Launch of first online national base map

The first online national base map, the National Geospatial Map of Hungary (NGMHu), was launched at the beginning of 2021. The first version (NTA 1.0) of NGMHu 1.0 runs on a dedicated website which makes it possible to browse the map without a need for additional software. The OGC Web Map Tile Service (WMTS) can also be accessed directly using GIS.

Benefits

- Enables governmental and private stakeholders to access a continuously maintained, reliable geospatial data service free of charge.

- Incorporates basic thematic national data such as administrative boundaries, generalised blocks of land parcels, buildings derived from a cadastral database available at LTK, geonames, transport or hydrography networks (created by LTK based on remote sensing data).

- Contains general land use/land cover information for Hungary.

- Uses a standardised, easy-to-understand style, a legend similar to topographic and other widely used maps, and predefined known scales (e.g. 1:10,000, 1:20,000, etc.) in the Hungarian projection system (EOV).

Preventive Crime Statistics Database (PRE-STAT)

Completion of the GIS web application, Preventive Crime Statistics Database (PRE-STAT) was also achieved in 2020. Basic data content is obtained from the databases of Robotzsaru ('RoboCop'), ENyÜBS (unified criminal investigation and prosecution crime statistics system) and TeIR (national territorial development and spatial planning information system).

Benefits

- Enables the creation of thematic maps:

  - On the level of settlements, police departments, townships, counties and regions.

  - From absolute and relative economic, social (TeIR) and criminal data (ENyÜBS).

  - Based on a certain time or the change within a given time period.

- Displays crime data (Robotzsaru) on a street-level dot density map.

- Creates its own indicators, saving completed maps.

- Displays data on diagrams and compares the values of different territorial units.

- Displays surveillance camera data on the street-level map of District VIII, Budapest.

IRELAND

Ordnance Survey Ireland puts data sharing platform at heart of national response to Covid-19

"When we look back in months to come, there will doubtless be many lessons that we can learn, as a country, from our experiences with COVID-19. However, we can already appreciate the key role that geospatial data and apps have played in keeping people informed about a fast-changing situation, revealing patterns and trends and giving people the information they need to make confident, though difficult decisions."

Colin Bray, CEO & Chief Survey Officer, Ordnance Survey Ireland (OSi)

When a rapid response to the Covid-19 pandemic was required, the national mapping agency, Ordnance Survey Ireland (OSi) was ready with data – and an easy way for everyone to access it.

GeoHive is an interactive, online platform that provides easy access to OSi data. By putting it at the heart of Ireland's Covid-19 data hub, it enables vital collaboration through data sharing, visualisation and analysis.

The public dashboard receives an average of 10,000 hits per day and is updated daily to provide a visual overview of number of cases and deaths, as well as hotspots. A secure dashboard for users such as the National Public Health Emergency Team, Chief Medical Officer, and the Prime Minister's office, provides daily insight on key indicators needed for critical decisions.

Benefits

- Collects, standardises and analyses COVID-19 data from a variety of sources to reveal insights, patterns and trends.

- Saves time and costs – data is collected once, updated daily and used many times.

- Delivers the data people need, in a format that they understand.

- Easy to use, visual overview of number of cases and deaths, as well as hotspots – receives an average of 10,000 hits public per day.

- Secure dashboard for Government and Public Health Services provides daily insight on key indicators for critical decisions.

- Enables people to take action to ensure their safety by seeing and understanding local risks.

- Enables the coordination and targeting of community support for vulnerable people by providing key data such as calls concerning social isolation.

- Reassured Government of the declining risks associated with reopening retail businesses and supports Ireland's Roadmap for Reopening by showing the locations of retail units, their type, size and number of employees.

LITHUANIA

Open Address Register data – new opportunities for the public and private sector

"Having assessed the economic and social benefits of open data and taken further steps towards openness, renewal and change, we have opened the Address Register data to the public. It is a tool for the public and private sectors to improve their services and deliver them more efficiently, to develop new, high value-added products and to contribute to the progress of all of us."
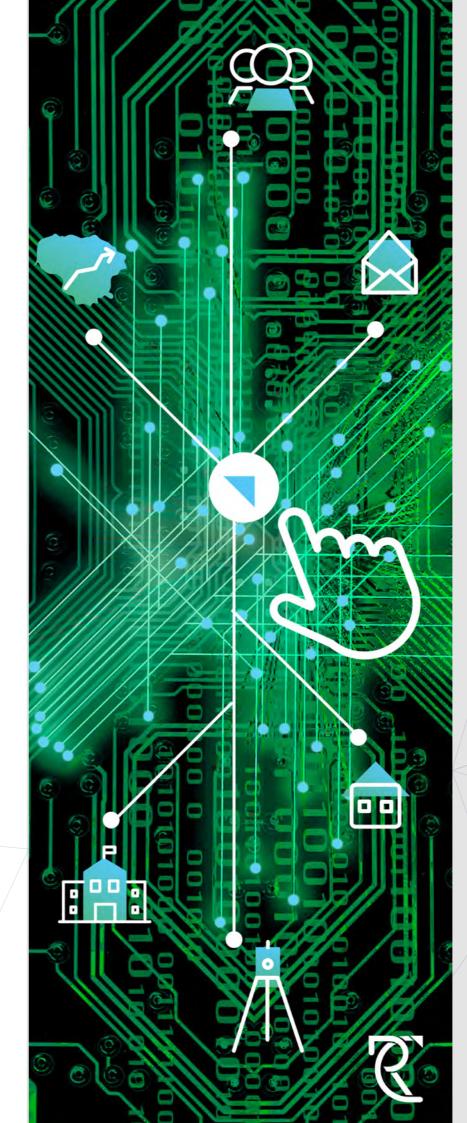
Saulius Urbanavičius, Director General, Centre of Registers, Lithuania

In October 2020, all data in the Lithuanian Address Register were opened to the public to use for free – a total of 2.1 million unique addresses and more than 1 million address points that can be marked on the map. As a result, public and private sector organisations can use a single standard of address information in their systems and ensure smooth data exchange.

The Address Register was created in 2004 and contains textual and spatial data on the following Register objects: counties, municipalities, wards, residential areas, streets, addresses and names given to a building, structure or other object. Address and street data is provided to the Address Register using an address allocation application.

The whole process of registering, changing or annulling an address or street takes place in the electronic environment. In 2020, 50,037 addresses and 1,406 streets were registered. In addition, the boundaries of residential areas, wards, municipalities and counties are constantly updated.

Benefits

- Enables the smooth exchange of data using a single address standard.

- Integrates with other state registers and information systems to enable real-time use of spatial and textual data, thereby avoiding mistakes and saving time and money for all participants.

- Supports a wide range of activities including planning of services and logistics, operational and emergency services, delivery of tax notices, goods, postal and courier services.

- Encourages and supports development of new products based on open address data, for example a geographic search algorithm which allows searches for geographical location by address, place name, name of organisations or other keywords.

NORTHERN IRELAND

Supporting effective national emergency planning, response and recovery in Northern Ireland

"I am delighted that OSNI has been able to assist Northern Ireland's emergency preparedness group through the provision of its data and expert GI services. This has been made possible by the combination of the Northern Ireland Mapping Agreement and Spatial NI, OSNI's integrated mapping platform. It has been encouraging to see the innovative and strategic use of spatial data underpinning the work of emergency planners and responders in the current global crisis."
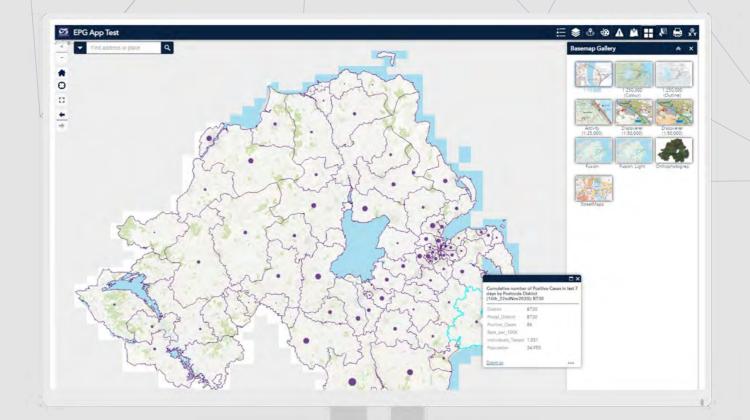
Jim Lennon, Chief Survey Officer, Ordnance Survey of Northern Ireland (OSNI)

The Emergency Preparedness Group for Northern Ireland (EPGNI) leverages Ordnance Survey of Northern Ireland (OSNI) data and services through the Northern Ireland Mapping Agreement (NIMA) to develop and support an integrated spatial data infrastructure for effective national emergency planning, response and recovery.

Emergency planning is at the core of multiple public sector organisations in Northern Ireland (NI), each with a specific role and remit and working together through the EPGNI to deliver a coordinated national response to emergency events. In times of crisis, such as the ongoing COVID-19 global pandemic, access to

authoritative spatial information is fundamental to situational awareness and effective decision making. By leveraging NIMA, EPGNI members are able to fully utilise OSNI's mapping data, draw on the expert services of OSNI's GI specialists, and harness the technology of Spatial NI – OSNI's web-based spatial data infrastructure – to ensure an integrated and holistic approach to emergency planning, response and recovery in NI.

Benefits

- OSNI's GI specialists advise on and work with EPGNI member organisations on best practices for data collection and management to facilitate accuracy and suitability of information.

- In collaboration with EPGNI staff, OSNI's GI specialists develop bespoke spatial datasets to augment and enhance existing information streams.

- OSNI's GI specialists advise on and support the development of data sharing and dissemination processes within EPGNI organisations so information is disseminated and accessible to appropriate stakeholders, including the public, when needed.

- All EPGNI member organisations and their staff leverage OSNI's mapping data products and, because of NIMA, the data is free at the point of use thereby reducing barriers to data access.

- OSNI's Spatial NI platform collects and shares necessary datasets to EPGNI members on demand and in an easily digestible format, facilitating better understanding and use by staff with varying levels of technical expertise.

NORTH MACEDONIA

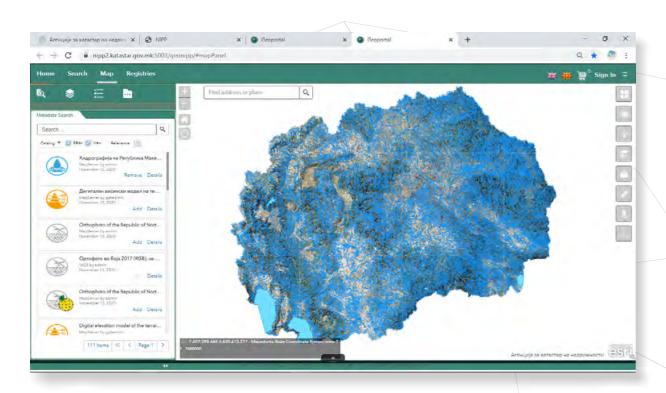## Providing access to national geographic information for a wide range of uses

"We have a mandate as national provider of geographic information to provide all users with geospatial data for the Republic of North Macedonia. We contribute to higher transparency and use of the geospatial information in the central and local government, where spatial data is required for spatial planning, social services, and transport networks as well as forming the basis for various other activities."
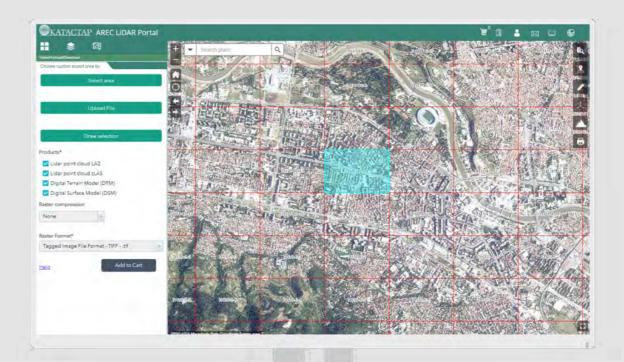
Boris Tundzev, Director, Agency for Real Estate Cadastre, Republic of North Macedonia

The Agency for Real Estate Cadastre, Republic of North Macedonia in 2020 redesigned the national geoportal.

Enhancements to the national spatial data infrastructure geoportal enable the review and use of spatial data through web-oriented services and interoperable infrastructure. More than 160 metadata services and 79 web services, including 82 collections of spatial data can be accessed following the redesign, which took into account the products available, the needs of users, administrative and business aspect, and strategic goals.

LiDAR scanning data is also available through the LiDAR portal. Products covering 46% of the Republic of North Macedonia are created using the data from LiDAR scanning. The portal offers options for visualising Digital Terrain Models (DTM), Digital Surface Models (DSM), Hillshade DTM, Hillshade DSM, raster models for the slope of the terrain, and also metadata of the products. The second phase of the LiDAR project to prepare products for the rest of the territory of the country is now underway with the support of the Norwegian government.

Benefits

- Promotes use of national spatial data via online services and interoperable infrastructure.

- Gives access to the services.

- Provides various possibilities for visualising LiDAR data in different coordinate systems, selecting locations for purchasing LiDAR products, and other spatial data management tools.

- Realises benefits for crisis management, environmental protection, spatial planning, engineering geodesy, agriculture, defence and other areas where geospatial data is used.
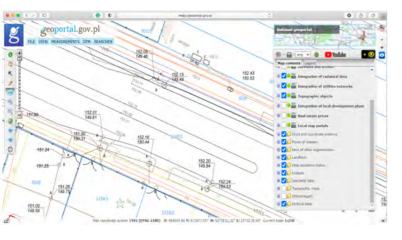
POLAND

Putting open data on the map to stimulate economic growth in Poland

"We provide data from the Central Geodetic and Cartographic Resource free of charge and without any restrictions. Data release stimulates economic growth by creating new jobs and encouraging investment in industry and business."

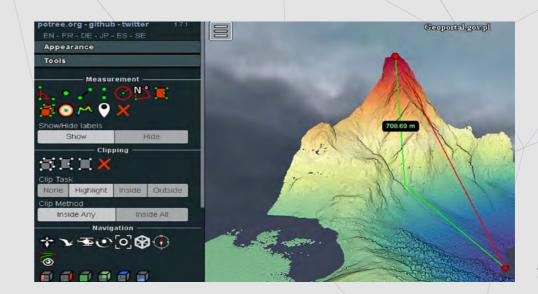*Waldemar Izdebski, Surveyor General of Poland, Head Office of Geodesy and Cartography*

Significant changes, including the launch of new open data, were acheived as a result of the amendment of the Polish Geodetic and Cartographic Law.

Data from the Central Geodetic and Cartographic Resource is now freely available for download from www.geoportal.gov.pl. Open datasets include topographic data (BDOT10k), orthoimagery, digital elevation model (DEM), laser scanning (LiDAR), digital terrain model (DTM), geodetic control networks data, basic data on parcels and buildings. Users can download any required data, without any limitations. The opening of spatial data improves data availability for citizens and boosts the development of businesses using authoritative spatial data. By shortening the time needed to update data in the land and buildings registers, the amendment also helps to faster implementation of the investment project.

Example of integrated KIEG, KIUT and KIBDOT service

Benefits

- Significantly improves geodetic and cartographic activities and allows wide access to spatial data.

- Eliminates bureaucracy in geodetic activities such as licence applications and supplementary declarations.

- Improves the data update process in the land and buildings registers.

- Reduces time needed to complete procedures related to geodetic works, enabling earlier completion of the investment project.

- Significantly increases use of geoportal.gov.pl website, which had 5.46 million users in 2020 – 38 % more compared to 2019. The website is ranked 3rd most visited government portal.

- Achieved record use of the integrated service KIEG, which provides cadastral data (cadastral parcels and buildings) – in 2020 there were 2.14 billion calls, an increase of more than 40% compared to 2019.

- The geoportal.gov.pl service provides a LiDAR point cloud viewer.

- More than 320 TB data have been downloaded since the spatial data was released. Instructions for downloading data can be found on the Head Office Geodesy and Cartography YouTube channel. It is possible to easily download this data via WMS service through geoportal.gov.pl

Example of LiDAR point cloud visualisation, Wawel Hill in Cracow

Example of LiDAR point cloud visualisation

PORTUGAL

Revealing new insights about the Portuguese landscape

"As the National Reference Center for Land Cover, we have been producing the flagship land use and land cover map of Portugal based on visual interpretation of orthophotos. Whilst these maps are widely appreciated and used by the public and private sectors, we are also pioneering new methods of map production as a response to the ever-growing need for information on land cover. Based on Sentinel-2 images and automatic methodologies, we are starting a new annual series of land cover maps which we hope will also become a milestone in terms of innovation and quality in the coming years."

Fernanda do Carmo, General Director, Directorate General for Territory, Portugal
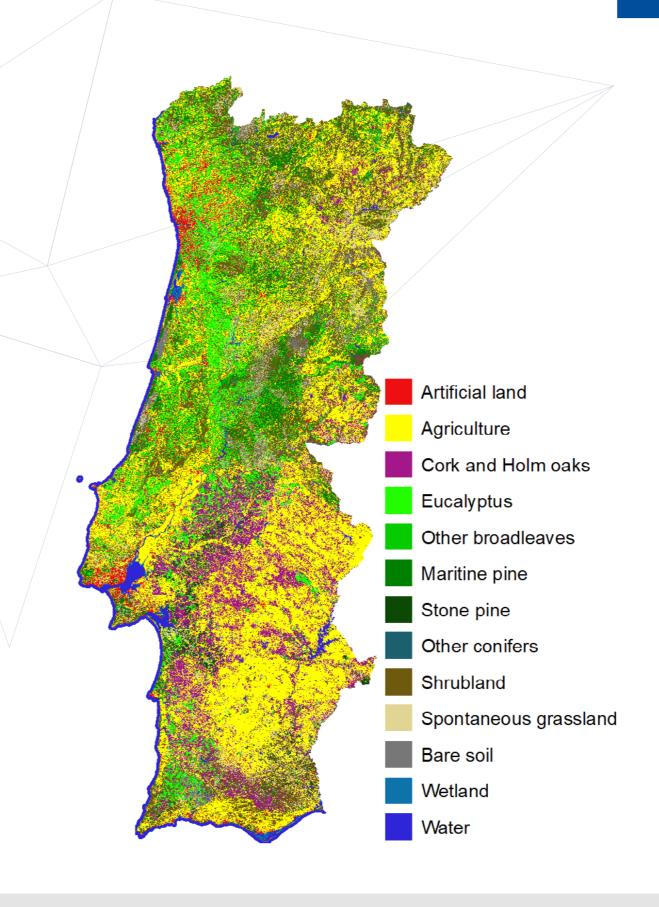
The Directorate General for Territory has started production of an annual land cover map series of Portugal based on satellite imagery.

A new land cover map for mainland Portugal – COSsim – was produced using Sentinel-2 data automatic classification. Using the reference year of 2018, it depicts the Portuguese landscape in raster format at high spatial resolution with the aim of initiating a series of maps that will be updated every year.

The new map builds on the supervised classification of Sentinel-2 data with machine learning classifiers and the automatic extraction of training data from auxiliary datasets, such as official crop records and Copernicus High Resolution Layers. The supervised classification is refined by integrating expert-knowledge rules related to species distributions, agricultural practices, vegetation recovery after wildfires and so on.

The methods deployed form an end-to-end and reproducible semi-automatic workflow based on open source software for providing reliable and transparent new information to society.

Benefits

- Reveals new insights about the Portuguese landscape that emerge from the high spatial resolution.

- Provides relevant information for public and private stakeholders that need fine spatial data, such as decision-makers, researchers, and entrepreneurs.

- Offers opportunities for monitoring the territory over time.

- Already adopted in real applications on wildfire spread modeling and spatial planning.

- Meets the ever-growing need for information about land use and land cover.

Artificial land / Agriculture / Cork and Holm oaks / Eucalyptus / Other broadleaves / Maritime pine / Stone pine / Other conifers / Shrubland / Spontaneous grassland / Bare soil / Wetland / Water

ROMANIA

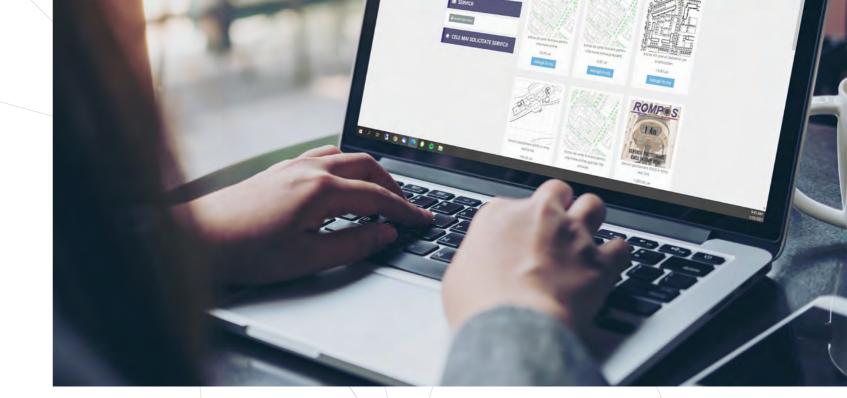## Supporting Romania's digital transformation

"Our motto, not only for this period, but also for the future is: no papers, no cash, no counter! By means of a constant dialogue with our partners and following a carefully developed strategy, we continued the process of shaping/transformation of our business into a modern one, bringing on the market digital services and products essential for this period."

Laurențiu Alexandru Blaga, Director General, National Agency for Cadastre and Land Registration of Romania

Digitisation is enabling the National Agency for Cadastre and Land Registration of Romania to manage the challenges of Covid-19, whilst also strengthening its services for the future.

As a result of the unprecedented impact of the pandemic, the Agency has accelerated its digital transformation. By adopting new technologies, both basic applications and IT systems have been enhanced and services have been streamlined. The Agency believes that digitisation is a 'safety belt' solution that not only enables it to work in safety but is also an opportunity to make its operations stronger.

Benefits

- Enables agency partners (licensed surveyors, notaries public, bailiffs, judicial experts) to work 100% online.

- Allows online e-signatures using a qualified certificate.

- Enables card payments for agency services.

- Reduces bureaucracy.

- Responds to and meets customer needs.

- Contributes to and supports the digital transformation of Romania.

RUSSIA

Digital transformation puts access to data at the centre of Rosreestr services

"Rosreestr has continued to support the real estate market in Russia throughout the Covid-19 pandemic. Nowadays about 30–35% of applications for registration are received in e-form, while the share of e-mortgages has grown to almost 40%. This is four times as many as at the beginning of the year."

Oleg Skufinskiy, Head of Rosreestr, Russia

During the COVID-19 pandemic, Rosreestr continued providing real property registration and cadastral services on a daily basis. In the meantime, it also needed to meet user requirements and demand for electronic services, which nearly doubled.

Rosreestr has fully completed the transition to the Unified State Register of Real Property (EGRN) in all regions of Russia. It was a complex engineering process, which included data migration and work-flow adjustment with multifunctional centres of public services and notaries.

Every day EGRN receives up to 120,000 applications for state registration of rights and/or cadastral registration, as well as 500,000 requests for information. In addition, 200,000 new data records are put in the system on a daily basis. However high demand for information e-services increases the risk of misuse of EGRN data by illegal intermediaries. Last year, Rosreestr implemented efforts to crack down on spoof websites and managed to reduce their number by more than 40%. Moreover, Rosreestr initiated necessary amendments to the legislation to prevent further misuse.

In December 2020, Rosreestr approved the Departmental digital transformation programme to continue further electronic services development and data quality improvement.

Benefits

- Development of a single data marketplace, which will provide the data from the main information systems of Rosreestr to external information systems in online mode (e.g. to the State Unified Portal of Public Services).

- Transfers provision of up to 96% services online.

- Development of new customer services to speed up cadastral work, registration of mortgage transactions and real estate market analysis.

Together with the Ministry of Digital Development, Communications and Mass Media of the Russian Federation, Rosreestr has launched an initiative to create a single information resource about land and real property. The purpose is to integrate information systems about land and real property from several federal agencies, State Space Corporation 'Roscosmos' and regional authorities. In addition, Rosreestr continues to create a Unified Digital Cartographic Framework of Russia, which is a systematised network of spatial data produced as digital topographic maps (plans) and digital orthophotomaps of different scales.

By focussing on customer needs and analysing feedback, Rosreestr is committed to increasing customer satisfaction with the quality of its services. In 2020, it has strengthened interaction with credit institutions, developers, notaries and cadastral engineers. For example, 'e-mortgage in one day' initiative was carried out in three pilot regions (Novosibirsk Region, the Republic of Udmurtia, Novgorod Region) in cooperation with banks.

Rosreestr's e-services in 2020

Registration of Real Property Rights and Cadastral Registration

	Registration activities	Registration of mortgages
Total	26 234 101	1 996 567
In electronic form	8 041 732	747 366
% of e-services in 2020	30,65%	37,43%
For comparison: % of e-services in 2019	21,17%	9%

SLOVENIA

Promoting trust in the accuarcy of authoritative data

> *"Cadastral plans are an important element of land administration in most countries, including Slovenia, but we often take them for granted. Cadastral plans are integral to the procedures used in the recording and management of real estate, rearrangement and division of land, land improvement, real estate valuation, land taxation, and as tools for the rational management of land and buildings."*

Tomaž Petek, Director-General, Surveying and Mapping Authority of the Republic of Slovenia
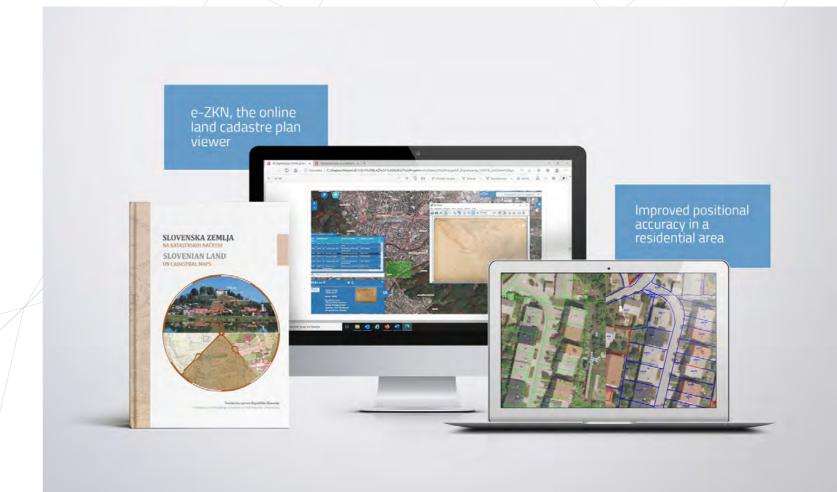
A project to improve positional accuracy of the cadastral index map (ZKP) is delivering uniform topologically correct data used for land administration in Slovenia.

The Surveying and Mapping Authority is using the latest technology and methods to update the data, which was first collected in the first half of the 19th Century, to maxmise its use in of spatial planning, building construction and real estate management.

The ZKP remains unchanged but the land cadastre plan (ZKN) was supplemented/amended with land cover points, which received eastern and northern coordinates in the improvement and thus became a uniform graphical layer. All the activities are presented and described in Slovenian Land on Cadastral Maps.

Benefits

- Meets the needs of users through continuous and improved positional accuracy.

- Ensures the first production of the ZKN as a uniform graphical layer for the whole of Slovenia.

- Provides a better understanding of the history of the changes to data.

- Mathematical-statistical analyses, facilitated by the method used, provide an effective tool for detecting gross errors in observations in the land cadastre database.

- Benefits a wide range of uses in implementing land administration tasks such as: the production of municipal spatial planning plans; the regulation of conditions for protected farms; the granting of agricultural subsidies; the calculation of forest road fees; the implementation of new spatial planning and building legislation; the regulation of rights to social transfers; and the formulation of tax policies.

- Demonstrates the contribution of the State Surveying and Mapping Authority, as well as of the surveying profession as a whole, to modern society.

e-ZKN, the online land cadastre plan viewer

Improved positional accuracy in a residential area

SLOVAKIA

Provision of topographic and real estate cadastre data for 2021 Population and Housing Census

"The integration of geographical and demographic data is an important opportunity to strengthen the use and interpretation of data collected for statistical purposes. For the first time, the Population and Housing Census in Slovakia is using existing administrative data sources in the form of reference registers and only with minimal inquiries of the population."

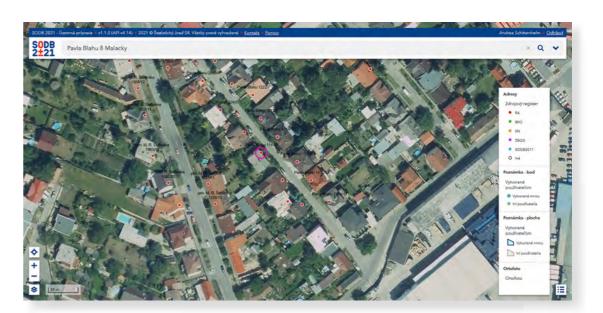*Ján Mrva, president of the Geodesy, Cartography and Cadastre Authority of the Slovak Republic (UGKK SR)*

The Geodesy, Cartography and Cadastre Authority (UGKK SR) in Slovakia is providing data for the preparation of the 2021 Population and Housing Census.
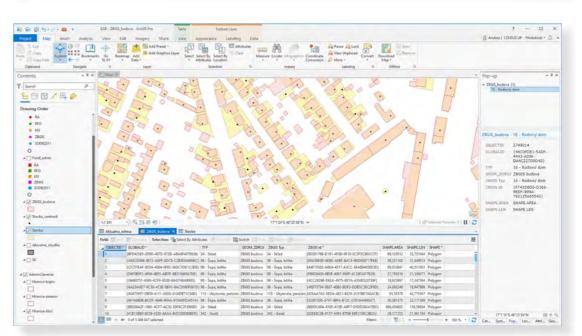
UGKK SR is delivering spatial data layers from the real estate cadastre and topographic database to the

Statistical Office for the integrated and fully electronic census. The information will be used to identify all possible inhabited and habitable objects. It is also directly integrated to the Address Register and forms a spatial basis up to the level of the address point for the Population and Housing Census.

Benefits:

- Contributes to territorial preparation data which is used during data collection, monitoring and processing after the implementation of 2021 Population and Housing Census.

- Spatial topographic layers enriched with layers of cadastral plots and the Orthophotomosaic enables quick orientation in the field using web and mobile applications for those conducting the Census.

- Flats from the real estate cadastre identified within the Housing Census are assigned to address points enabling residents to confirm their flat number during the Population Census.

- Topographic and real estate cadastre data contributed to the identification of all possible inhabited and habitable objects.

SPAIN

Adapting and pioneering services to minimise face-to-face contact

"The COVID pandemic forced us to make a major technological changes, to quickly redesign our communication channels; our face-to-face appointments, internet services and hotline, and to implement new products and services."

Fernando de Aragón, CEO, Spanish Directorate General for Cadastre

The Spanish Directorate General for Cadastre has responded to the Covid-19 pandemic by adapting its services to citizens to minimise face-to-face contact.

It was already immersed in a strategic plan to evolve towards a new customer service model, redesigning its processes and reorganising provincial offices. By developing new products, services and channels, the aim was to avoid unnecessary travel by improving telephone and internet services.

When the Spanish State decreed the state of alarm and confinement of citizens, the Directorate General enabled a contingency plan to readapt its processes and services. For the first 6 weeks, the offices remained closed with staff teleworking. When offices were partially reopened, hygienic measures and social distancing installations were implemented.

Appointments are now made via telephone or internet, and enquiries are answered by telephone, videoconference and exceptionally in person in offices.

Benefits:

- Pioneering service for the resolution of doubts by videoconference.

- Virtual assistant guides citizens and administrations in making declarations to the cadastre.

- Online graphical assistant enables the declaration of physical alterations of real estate.

- Virtual assistant helps users to navigate the electronic office.

- Allows the request of certificates by telephone and the submission of documentation and declarations via internet without the need for a digital certificate.

- Establishes new identification models (soft keys) that ensure data protection and access to information under the conditions established by the legislation.

SWITZERLAND

Helping pupils to develop real-life skills by putting map-making into practice

"swisstopo promotes the use of federal digital maps in the classroom, as well as knowledge of geoinformation and official Swiss maps across all school levels."

Dr. Fridolin Wicki, Director, Federal Department of Defence, Civil Protection and Sport, Federal Office of Topography, swisstopo

Switzerland's sCHoolmap platform has been developed by swisstopo and other federal offices to help pupils develop their map-related skills.

sCHoolmap is accessed via geo.admin.ch and provides a broad range of teaching ideas and examples for working with the map viewer for almost every school year. The basis for working with these digital (school) maps is the official federal map viewer, map.geo.admin.ch which enables easy access to a broad range of map topics from different federal sources, covering all subjects taught in primary school. Functionwise, pupils

can interact with maps , e.g. calculate height differences and walking distances, and annotate maps using the 'draw' function. Historical maps and aerial imagery are among the most used topics in school.

Half[1] of all Swiss teachers now use sCHoolmap, which is accessed free of charge and without the need to register.

Benefits

- Makes mapping fun and working with geodata attractive for the next generation.

- Enables pupils from Year 4 onwards to develop their map-related skills by learning how to work with official online maps.

- Brings a wide range of map-related activities to life with practical examples, including planning for school outings, working out the best route to school, tracing the location of old town walls, or even organising an 'orienteering challenge selfie'.

- Supports teachers in finding clever ideas for interdisciplinary education and developing and implementing their own themes and ideas.

- Provides an insight into the past with an integrated virtual time travel function showing what the location of their home or school building looked like a hundred years ago, as well as geological changes such as glacier retreat.

- Supports Syllabus 21 by promoting an understanding of the correlations between economic, ecological and social processes using geography as a common link.

[1] Survey conducted by the lernetz.ch in 2019: 70% awareness and 50% use of map.geo.admin.ch at Swiss schools | (schoolmaps.ch)

Copyright swisstopo/Béatrice Devènes

THE NETHERLANDS

Kadaster provides policy-makers with vital information for energy transition

"The transitional change to a sustainable energy system is perhaps the most challenging policy goal of our time. It requires not only an industrial approach, but also a major effort of innovation in all related fields of expertise. In the past year, we have seen how geodata can contribute to an effective planning and concrete measures in the case of solar energy potential in the built-environment. In combination with administrative data, this provides the required realistic insights the policy makers need. With state of the art deep learning techniques, we are now able to update and monitor the transition related to the policy goals and projects where unused potential can be found. This is a telling example of how geodata is rapidly becoming an important factor in an effective approach to the greater obligations we are facing."

Frank Tierolff, Chair, Executive Board Cadastre, Land Registry and Mapping Agency The Netherlands

The Netherlands Cadastre, Land Registry and Mapping Agency (Kadaster) created a database of information related to solar potential, (available space on roof tops including detecting existing solar PV installations) which is very useful for the Regional Energy Strategy (RES) regions to reach their targets related to the Climate Agreement.
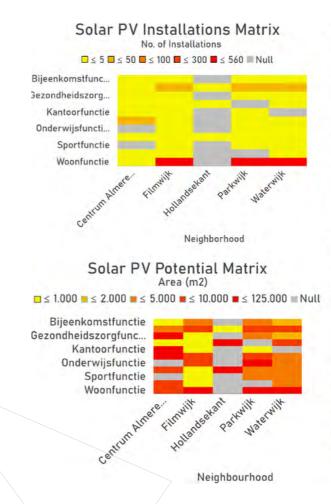
High resolution elevation data was used to create solar potential models and deep learning techniques were employed to detect existing solar panels from very high resolution aerial images for the whole of the Netherlands. Data pre-processing and post-processing were customised to achieve automation, high accuracies in the results and to be able to match them with building information. This is a good example of GeoAI, where the best of both the worlds is combined to help tackle large geographic datasets for energy transition.

Benefits:

- Helps policy-makers to speed up the energy transition by providing? information on where and how much space is available to generate solar energy. At the same time, the data is easy to understand and visualise.

- Provides an insight on not only where the potential lies, but also categorises it by building and owner type, which is much more useful to the policy-makers.

- Provides information on locations of currently installed solar PV with high quality. This is especially useful to update the Production Installation Register which is largely, but not entirely complete, for small installations in homes and businesses.

- Deep learning algorithms enable fast and fairly easy updating of the solar installation database at regular intervals for the entire country.

- Presents a realistic insight on solar potential of building rooftops which is useful in urban planning applications.

- Many more possibilities are opened up by the development and testing of the solar potential models for rooftops, for example calculating solar potential for parking lots where solar panels could be placed on carports or on building facades.

After calculating solar potential and detecting solar panels, the data can be extracted to different levels to support policy makers.
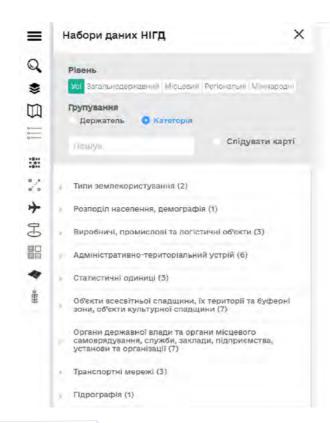
UKRAINE

Ukraine achieves long awaited step forward in NSDI development

"2020 can be considered as the year of geospatial data in Ukraine with the Ukrainian geospatial community facing a historic moment of digitalisation. We have introduced a 'single window' for natural resource management, which will help to save budget funds and develop territories, strengthen public control over the activities of state bodies and increase public confidence in the government."

In April 2020, Ukraine's law on the National Spatial Data Infrastructure (NSDI) was finally adopted by the Ukrainian Parliament after more than 10 years and 4 attempts. Although Ukraine is not an EU Member State, the law is fully in line with INSPIRE and also reflects the main principles of EU open data policy.

The Council on National Spatial Data Infrastructure has been established to provide the advisory support on NSDI implementation, which is of critical national importance. Together with the Research Institute for Geodesy and Cartography, StateGeoCadastre has developed the portal for the NSDI pilot project. This provides online integration of national, regional and local level geospatial datasets from 5 cities, 2 oblast administrative areas and 75 amalgamated territorial communities which can be accessed by the public.
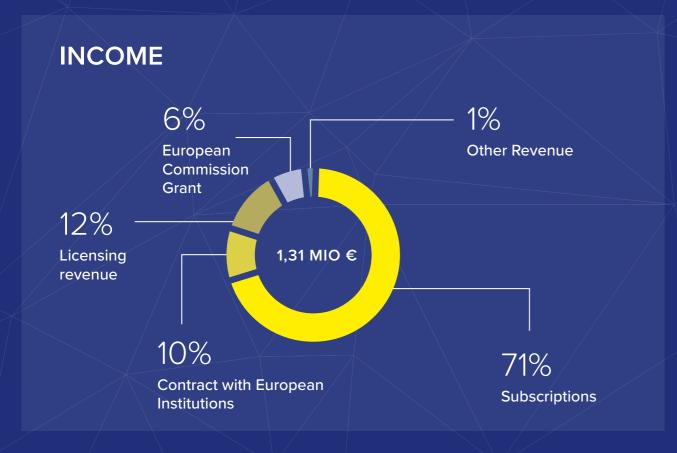

Benefits
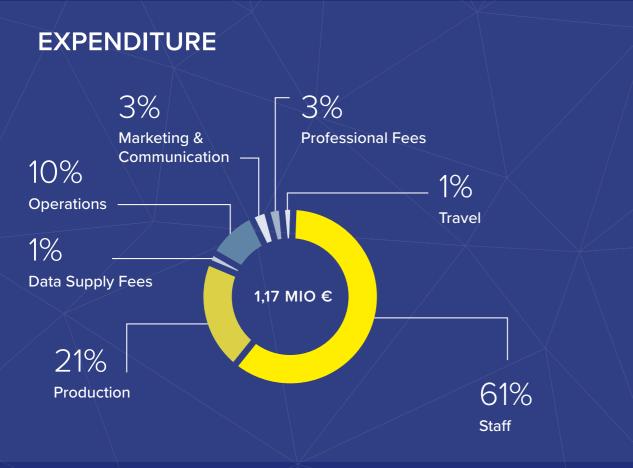
- Gradual full digitisation of all processes and data in Ukraine.

- Maintenance of a single topographic base.

- Avoids duplication of financial and human resources for similar work, reducing budget costs at national, regional and local levels.

- Provides a complete electronic picture of Ukraine in one place.

- Ensures effective public administration and public control.

- Deregulation of existing procedures, disclosure of information and creation of added value.

- Stimulates the investment climate through the integration of all geospatial data in the one single, user-friendly portal.

- Enables integration of Ukraine to the European and Global Spatial Data Infrastructure.

FINANCES

INCOME

6%
European
Commission
Grant

1%
Other Revenue

12%
Licensing
revenue

1,31 MIO €

10%
Contract with European
Institutions

71%
Subscriptions

EXPENDITURE

3%
Marketing &
Communication

3%
Professional Fees

10%
Operations

1%
Travel

1%
Data Supply Fees

1,17 MIO €

21%
Production

61%
Staff

2020 ANNUAL ACCOUNTS

EXPENDITURE

Staff costs	713,066 €
Travel costs	15,212 €
Professional Fees	39,131 €
Marketing & Communication	29,692 €
Operations Costs	117,741 €
Data Supply Fees	13,218 €
Production Costs	239,341 €
Total Costs	**1,167,402**

INCOME

Subscriptions	930,827 €
Contract with European Institutions	125,642 €
Licensing revenue	158,064 €
European Commission Grant	82,358 €
Other Revenue	8,868 €
Total Income	**1,305,759 €**
Final Result	**138,357 €**

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