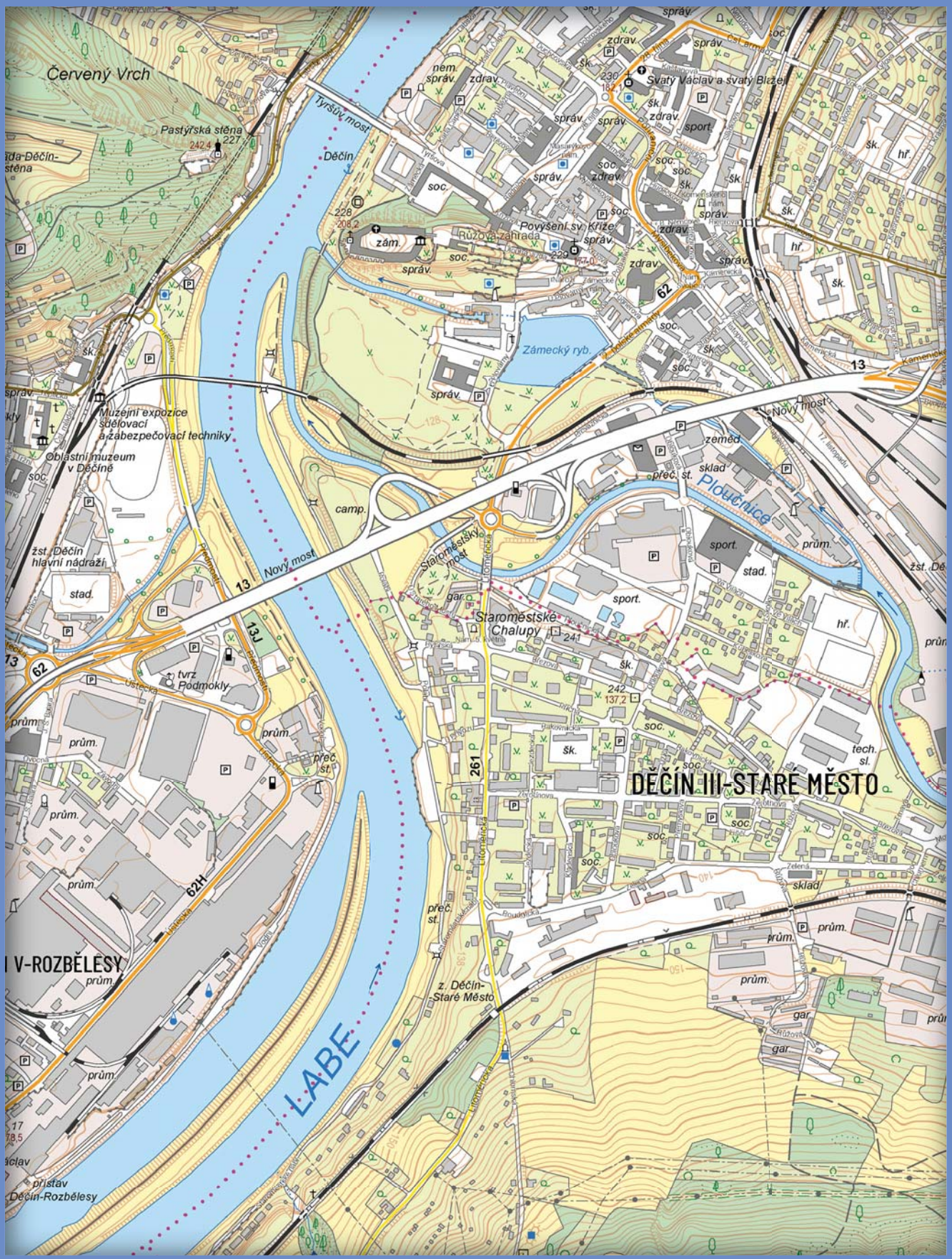
Český úřad zeměměřický a katastrální

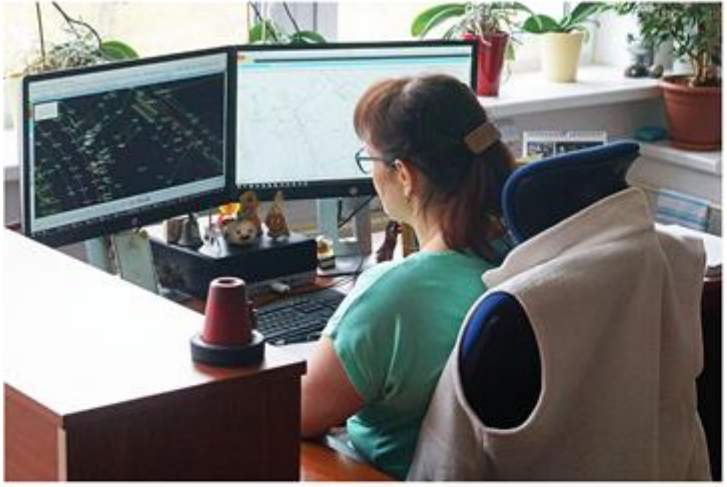


ANNUAL REPORT 2022

Annual Report
of the Czech Office for Surveying, Mapping and Cadastre
for 2022

Prague, 2023

CONTENT

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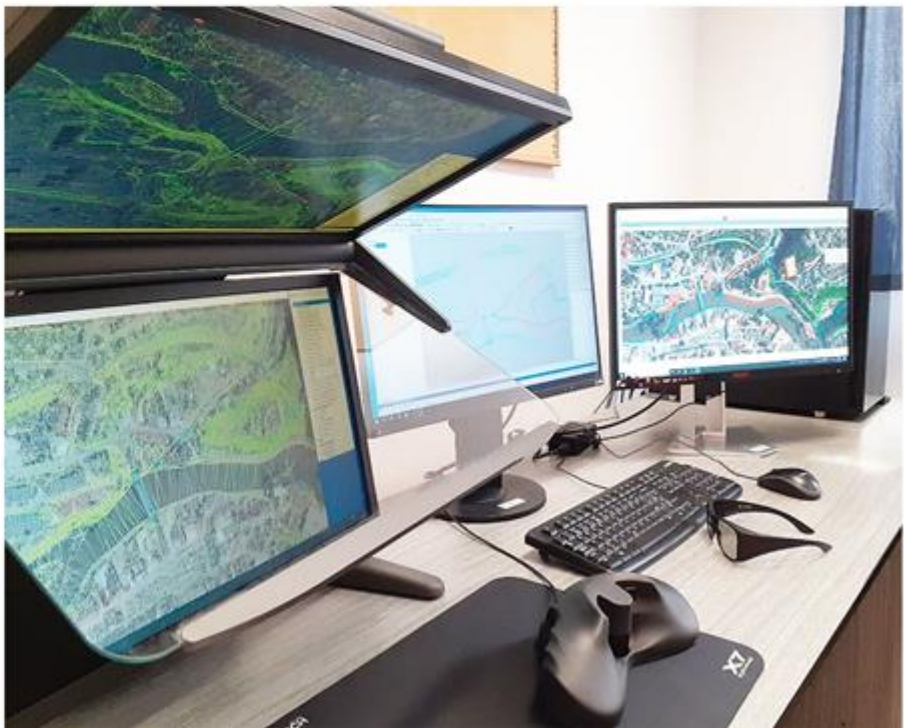


INTRODUCTION

Cadastral offices, survey and cadastral inspectorates as well as Land Survey Office in Prague managed by the Czech Office for Surveying, Mapping and Cadastre (ČÚZK) fulfilled in 2022 all tasks of the state administration of the real estate cadastre and land surveying in prescribed deadlines and in high quality. Due to the high degree of digitization of the real estate cadastre, nearly all requests for information were carried out electronically. Even the number of electronic applications for changes in legal rights and other technical information grew rapidly.

In 2022, cadastral offices performed the records of ownership and other rights to real estate without significant extension of time limits.

Cadastral offices received in total 840 490 proposals for entry of owners´ and other rights to real estate in 2022. Deadlines for registrations of rights improved slightly in 2022. Average deadlines were 22 days in all regions. The number of completed registrations or deletions based on record and notation mildly increased year-on-year to 416 796. The number of delivered requests regarding the verification of the survey sketches decreased yearly and reached 170 876. Data provision was carried out mainly in the electronic way using the remote access to the real estate cadastre. ČÚZK performed more than 19 million requests for information, representing mild increase in comparison to 2021.

In 2022, we successfully renewed the cadastre documentation by new mapping or by taking over the results of land readjustments in 281 cadastre units with very poor quality maps, and checked the compliance of technical data of the cadastre with the reality with help of revisions in 586 cadastre units.

State administration of land surveying and real estate cadastre is also responsible for important land surveying products and services, which co-create the national geoinformation infrastructure necessary for task fulfilment of the public administration. The care for existing geodetic control points went on together with all planned land surveying works on the state borders. Both continuous and periodical update of the Fundamental base of geographical data (ZABAGED®) went on and the Orthophoto ČR was updated on the eastern half of the state territory. Most products are provided via remote access from Geoportal ČÚZK.

More information on results of work of land surveying and cadastral offices in 2022 brings this detailed annual report.

1. Surveying, Mapping and Cadastre Sector in the Czech Republic

The real estate cadastre of the Czech Republic is a set of data about real estate in the Czech Republic, including their inventory and description and their geometric specification and position. Parts of it are records of property and other material rights and other legally stipulated rights to real estate.

State administration of land surveying ensures chosen land surveying products and connecting services from the whole territory of the state as stipulated by the Act No. 359/1992 Coll., on Land surveying and cadastral bodies and by the Act No. 200/1994 Coll., on Land surveying.

Administration authorities in the branch of land surveying and cadastre are based on the Act No. 359/1992 Coll., on Land surveying and cadastral bodies, which specifies their subject matter and territorial competence. ČÚZK governs 14 regional cadastral offices (KÚ), 7 survey and cadastral inspectorates (ZKI), the Land Survey Office (ZÚ), and is the founder of the Research Institute of Geodesy, Topography and Cartography, p.r.i (VÚGTK, v.v.i.).

Cadastral offices execute state administration of the real estate cadastre with territorial scope of the single regions; KÚs have their branch offices in large cities, number of which is now 94. ZKIs control cadastral offices and supervise some commercial activities, whose results are applied to the real estate cadastre and state documentation funds and have usually the territory scope of two regions. Land Survey Office, which focuses on other land survey activities that are provided in the public interest, has the national coverage.

2. Administration of the Real Estate Cadastre

Current Czech real estate cadastre was established in 1993 by the Act No. 344/1992 Coll., on the Real estate cadastre of the Czech Republic, and integrates the function of Land Registry Book (registration of rights) and former Cadastre of Lands (records of real estate) into one tool. On January 1, 2014 the Act No. 256/2013 Coll., on the Real estate cadastre (Cadastral Act) came into force, having replaced not only the Cadastral Act No. 344/1992 Coll., but also the Act No. 265/1992 Coll., on Registration of rights into the real estate cadastre. Both issues - real estate cadastre and registration of rights to the cadastre - are now regulated in one act.

Since its adoption, the Cadastral Act has been amended thirteen times, but it was mostly a minor change due to the adoption of other laws. In 2022 one amendment of the Cadastral Act occurred.

Act No. 240/2022 Coll. was a follow-up to the amendment of the Act on the Implementation of International Sanctions to supplement the Financial Analysis Office among the entities, based on whose notification or decision notes are entered in the cadastre. Further, it took into account the fact that preliminary measures in administrative proceedings are taken in the form of a decision, not a resolution.

In 2022, there was also a significant amendment to the cadastral decree, namely Decree No. 346/2022 Coll., effective as of January 1, 2023. This is the third amendment to the cadastral decree, while so far this decree has been substantially amended only once, namely in 2017. Since then, there has already been a further shift and development of technical practice and expert opinions and court jurisprudence, especially in the field of application of the Civil Code. After another five years of the decree's effectiveness, situations were identified for which the cadastral decree offered no solution, or the solution resulting from the current wording was inappropriate. The amendment incorporated the requirements of the cadastral authorities and the professional public to specify certain procedures when entering data into the real estate cadastre, and took into account the changes resulting from new legal regulations that came into force during this period. These were following:

- Act No. 51/2020 Coll., on the territorial and administrative division of the state and on the amendment of related laws (Act on territorial and administrative division of the state),
- Act No. 364/2021 Coll., amending some laws in connection with the implementation of European Union regulations in the area of invasive non-native species,
- Act No. 88/2021 Coll., which amends Act No. 44/1988 Coll., on the protection and use of mineral wealth (the Mining Act),
- Act No. 481/2020 Coll., which amends Act no. 139/2002 Coll., on land adjustments and land offices,
- Act No. 229/1991 Coll., on the adjustment of ownership relations to land and other agricultural property.

Real estate cadastre in the Czech Republic is administered with help of the information system. The Information system of the real estate cadastre (ISKN) is an integrated information support system for state administration of the real estate cadastre and for providing user services of the cadastre.

Since 2012 ISKN has been interconnected to the Information system of territorial identification (ISÚI) together representing the key agenda information systems serving for editing of the Register of territorial identification, addresses and real estate (RÚIAN), which is one of the four basic registers of state administration. Launch of the system of basic registers has brought tangible results into the administration of real estate cadastre particularly in the area of checking up data on physical and legal persons compared to the registries of inhabitants and persons so as in the possibility of taking over the data changes from these registries (changes of addresses, surnames etc.).

ISKN is interconnected via web services to other registers, f. i. to insolvency register, which enables verification of the participants of the proceeding. ISKN also uses interconnection with Document management system (DMS) in which both electronic and scanned paper documents used for registration to the real estate cadastre have been stored.

2.1. Main Tasks of Cadastral Offices and Their Statistics

Main task of cadastral offices is recording of proprietary and other rights to real estate and other data.

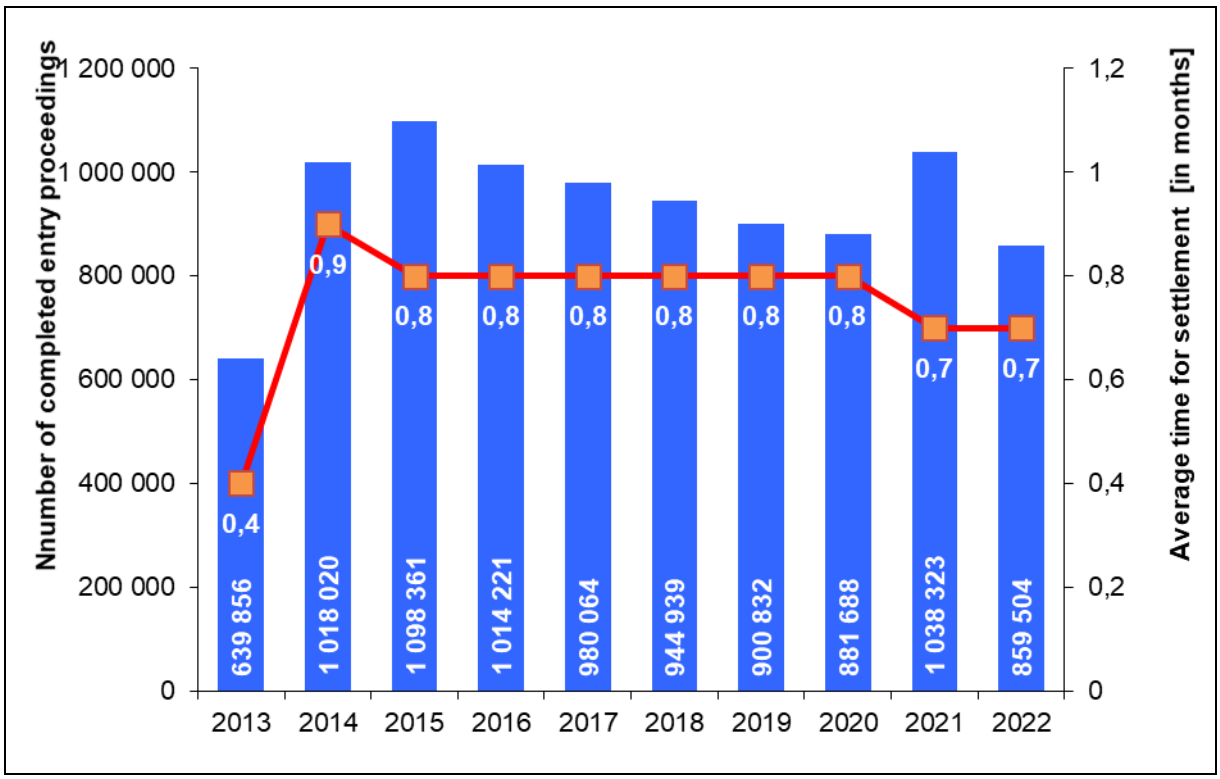
Entries of Proprietary Rights into the Real Estate Cadastre

Registration of all material rights, rights agreed as material so as lease and tenure are being performed in the way of entry regardless of its constitution – based on either the contract, or other way.

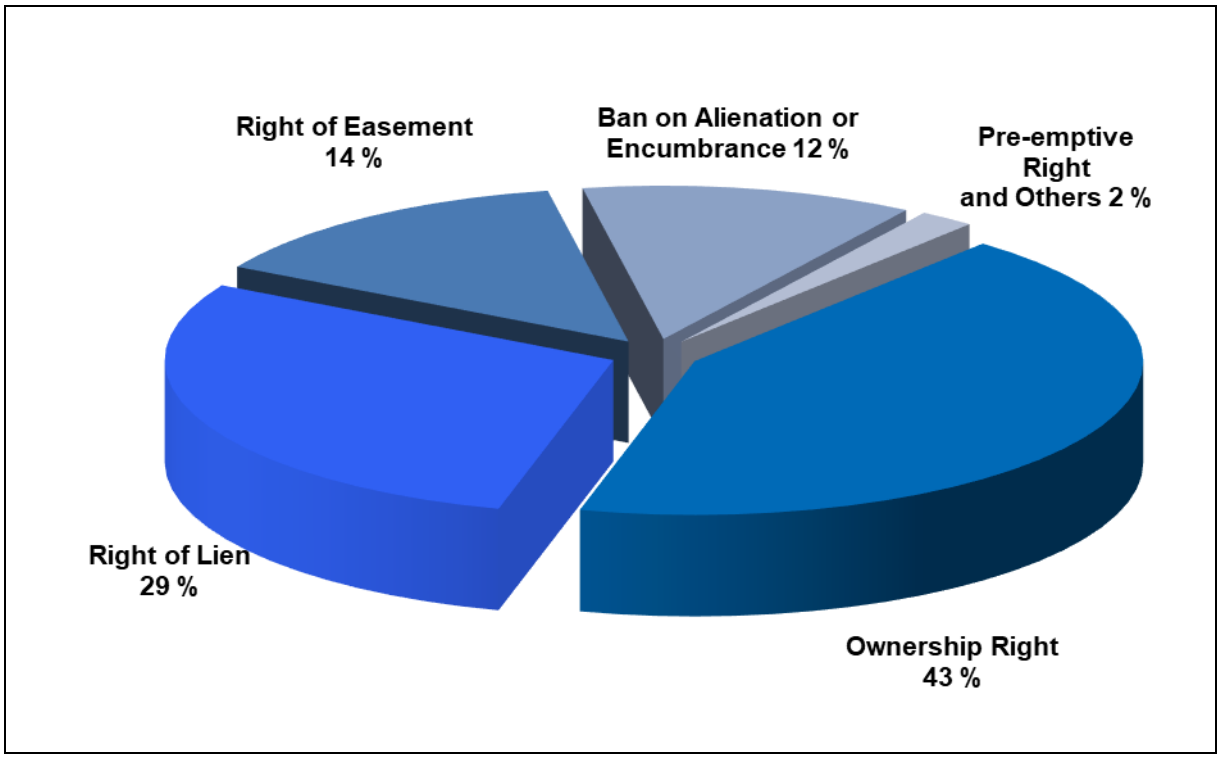
In 2022, the number of accepted proposals for entries of rights by cadastral offices was 840 490, which means significant decrease of 19 % in comparison to 2021. The share of mortgages on the total number of entries did not change year-on-year. Number of completed proposals for entry of proprietary right was 859 504 and yearly average time for completing of application for entry decreased mildly (from 23 to 22 days).

From the total number of yearly requests for entry in 2022, 98 % entries of rights were approved, the rest of administrative proceedings were refused or interrupted. In 2022, the number of refused entries mildly decreased, as you can see in Fig 3.

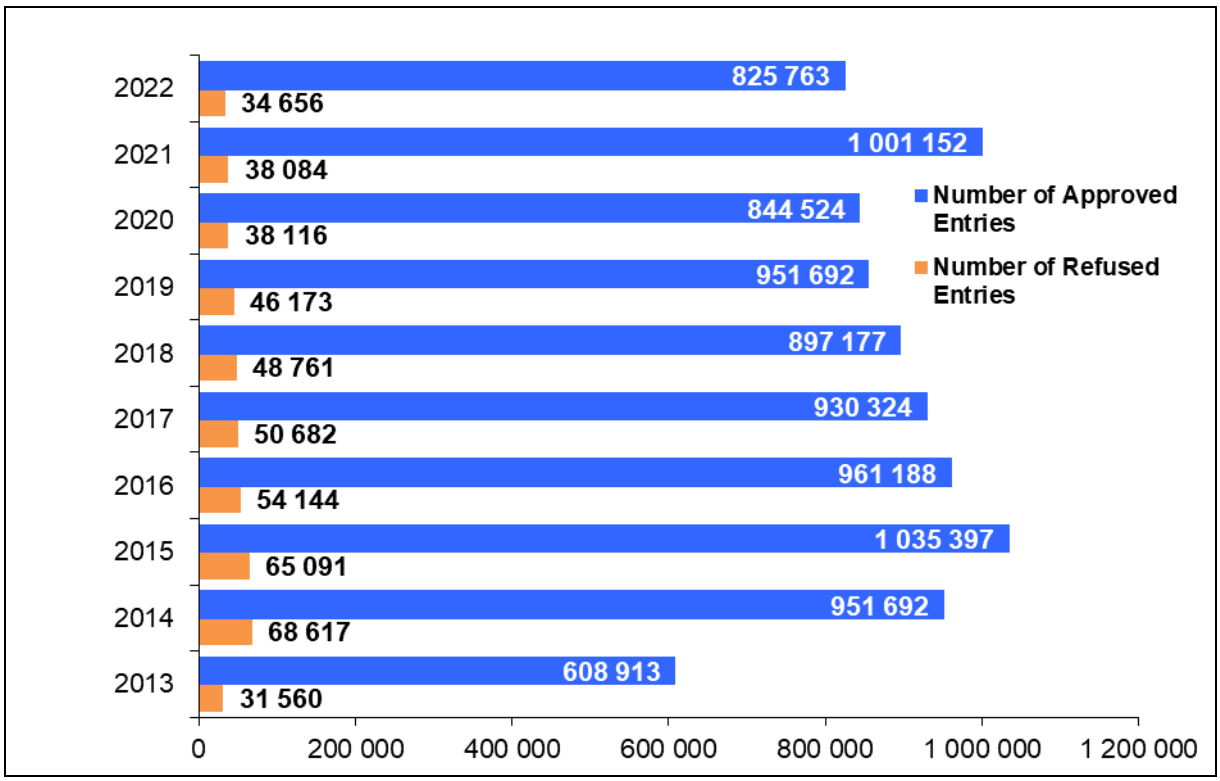
Registration of Rights to the Cadastre (Fig 1)



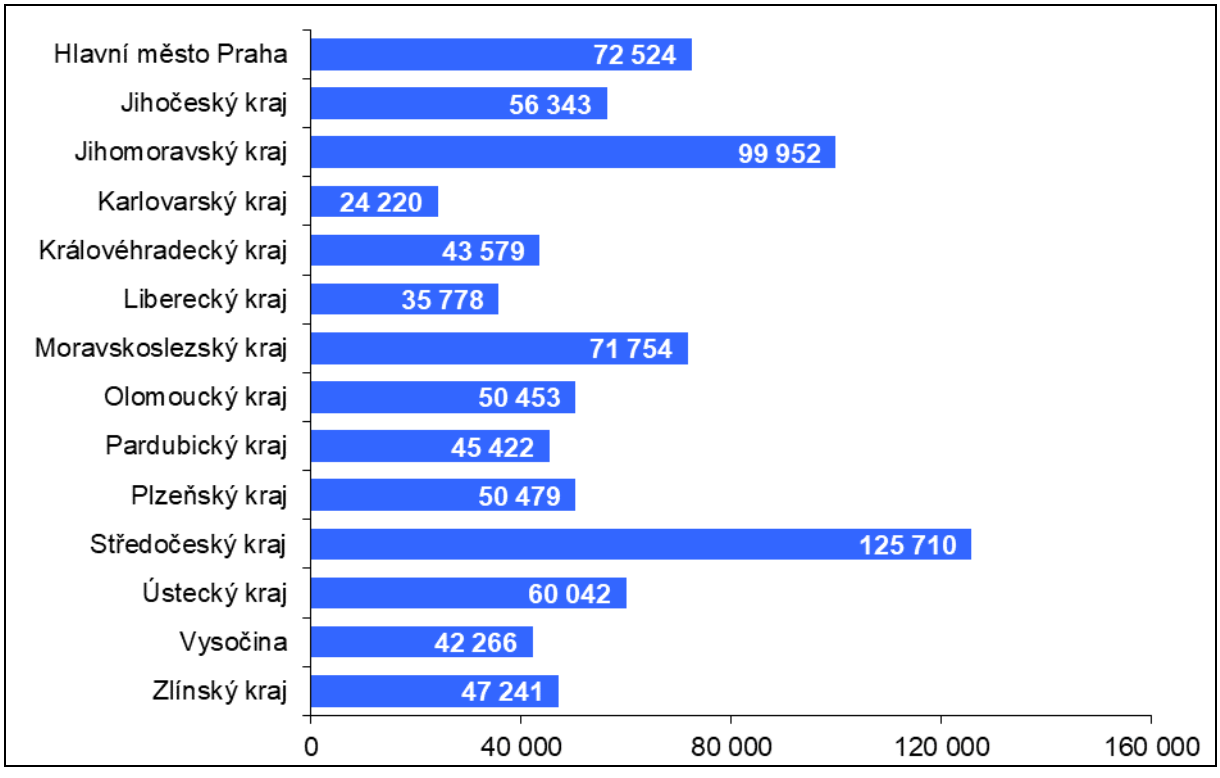
Share of Different Types of Rights Recorded by Entry into the Cadastre (Fig 2)



Development in the Number of Approved and Refused Entries (Fig 3)



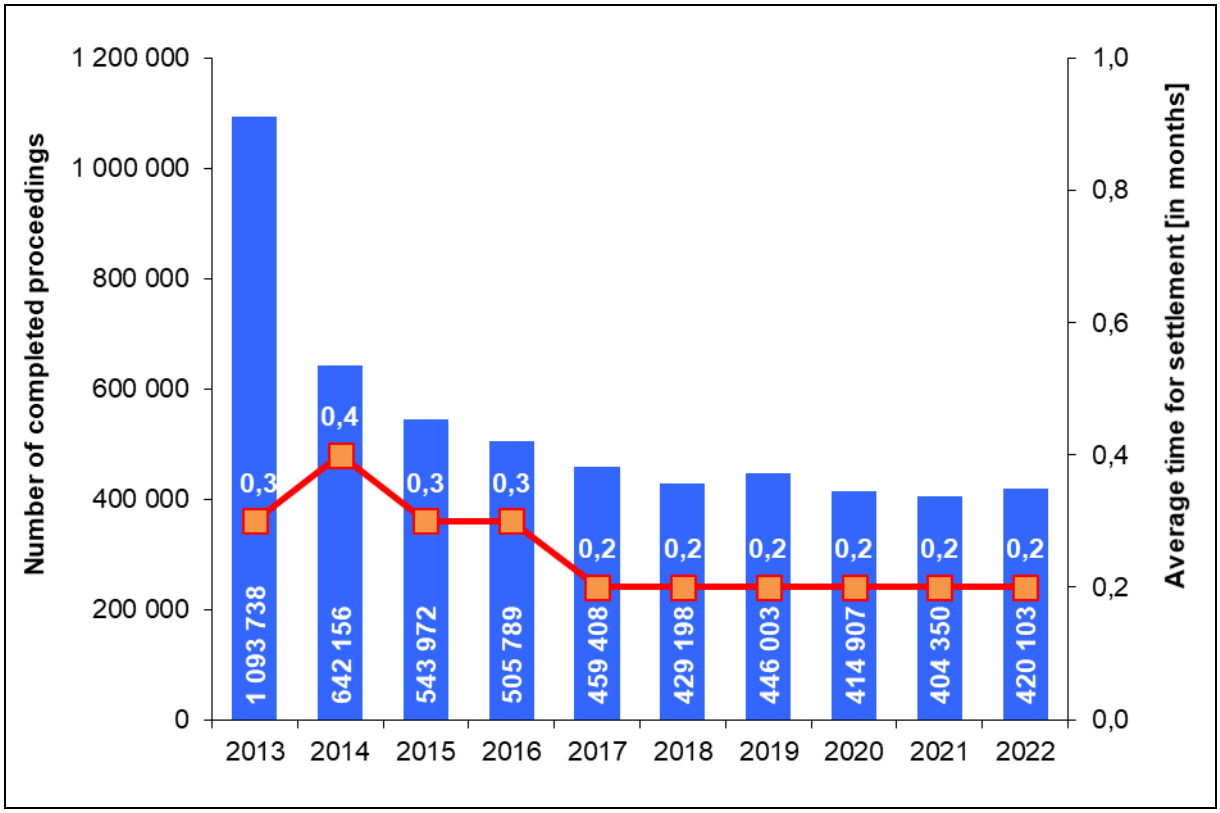
Number of Entries in Single Regions of the Czech Republic in 2021 (Fig 4)



Registration by Record and Note and Others

Cadastral offices performed also other registrations into the real estate cadastre. In 2022, in total 416 796 submissions for registration by record and by note were delivered to cadastral offices, which means that the number of these records increased yearly by 4 %. In total 420 103 submissions were completed, and the average time has slightly decreased year-on-year.

Number of Completed Submissions for Registration by Record and Notes (Fig 5)



Data Acceptance from the Basic Registers of the Public Administration

Part of other registrations into the real estate cadastre previously carried out based on submissions from owners and other authorized persons has been since 2014 taken over from the basic registers of public administration. These are mainly changes of the data on individuals, which are taken from the Basic register of inhabitants (ROB) and about legal entities that are taken from the Basic register of persons (ROS). In 2022, in total 129 164 changes in addresses of permanent residence and registered offices of legal entities and changes in names were taken from ROB and ROS. Furthermore, in 2022, 225 281 participants of administrative proceedings were verified in ROB and ROS and the data on them were used in the real estate cadastre. From the Basic register of territorial identification, addresses and real estate, 622 755 changes in real estate data were taken over in 2022, mainly due to the real estate cadastre revisions. This number is significantly higher than in 2021 because of taking over of 600 000 data about the mode of building using.

Provision of Information from the Real Estate Cadastre

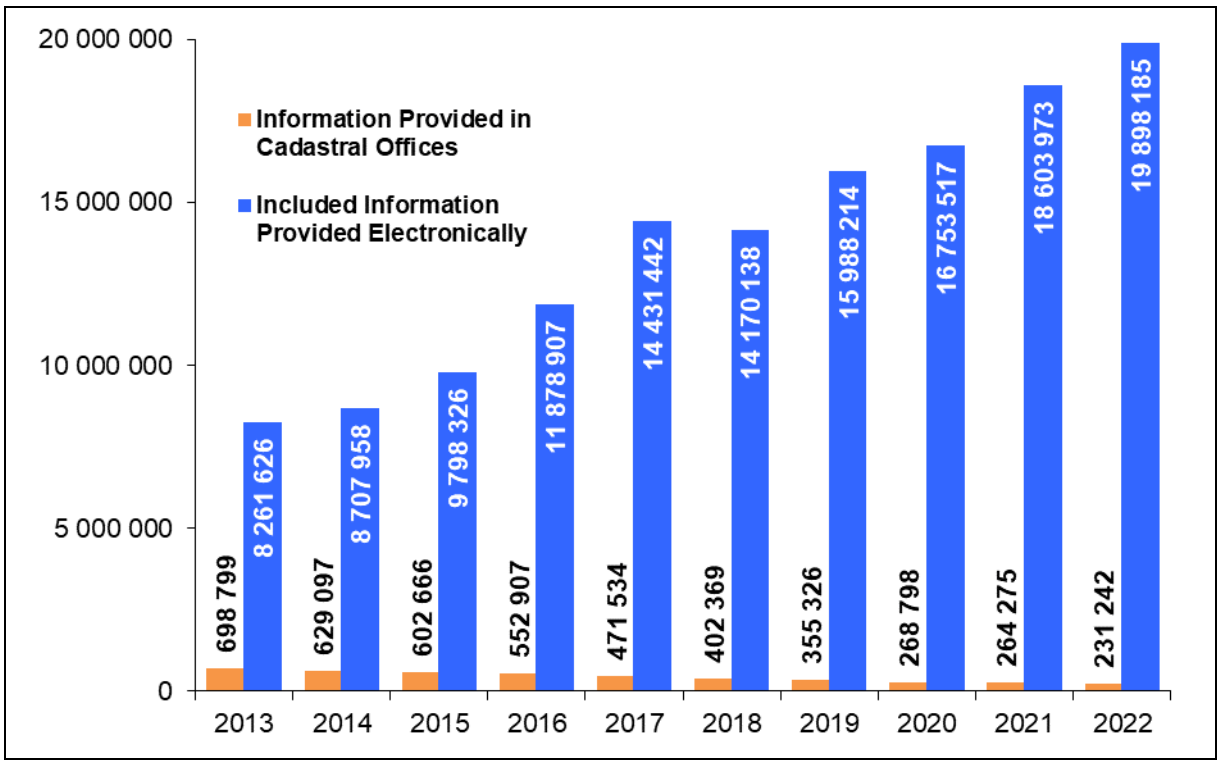
Individual workplaces of cadastral offices provide clients with information from the cadastre over the counter during office hours. All outputs from the cadastre (extracts from the real estate cadastre, copies of cadastral maps, copies of documents stored in document funds in case they are digitized) are provided by cadastral branch offices from the complete state territory. Since 2001, internet services have been made available allowing outputs from the cadastre by remote access, without visiting the cadastral office. Outputs provided with an electronic seal, for which it

is necessary to prove the identity of the applicant, can be obtained from the second half of 2021 using identification through the Portal of the National Point for Identification and Authentication (https://www.identitaobcana.cz). These services satisfy today most of continually growing demands for information from the real estate cadastre.

The number of completed requests for information provision at the counters of cadastral offices has slightly decreased in 2022, whilst the number of applicants for information from the real estate cadastre increased in 2022 again – more than 99 % applicants received the information by electronic services. Big share on this high number of electronically provided services have permanently court executors, notaries, municipalities, regions and governmental bodies, because of free of charge remote access to the data from the real estate cadastre.

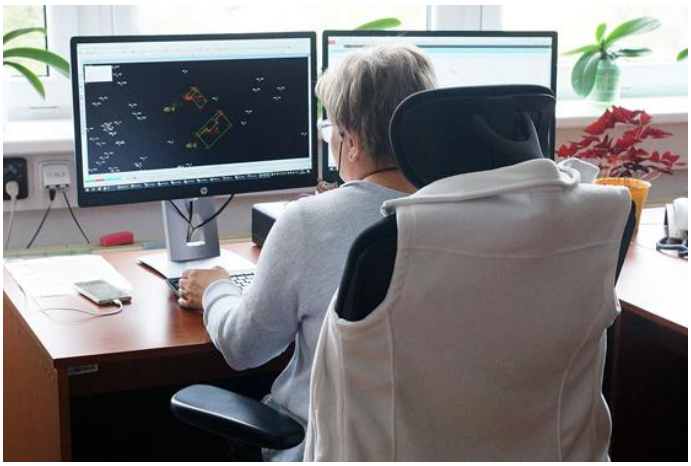
On contact points of public administration, (Czech POINT), nearly 137 thousands outputs from the real estate cadastre and more than 6.8 thousands map copies were issued in 2022. Another 61 thousands outputs were created via the CzechPOINT@office service. At present, it is possible to publish the following verified outputs on CzechPOINTs: an extract from the real estate cadastre, an overview of the rights registered for a specific person and a snapshot of the cadastral map. The electronic statements from the real estate cadastre are since 2006 marked with an electronic mark and considered as public documents.

Information Provision from the Cadastre (Fig 6)



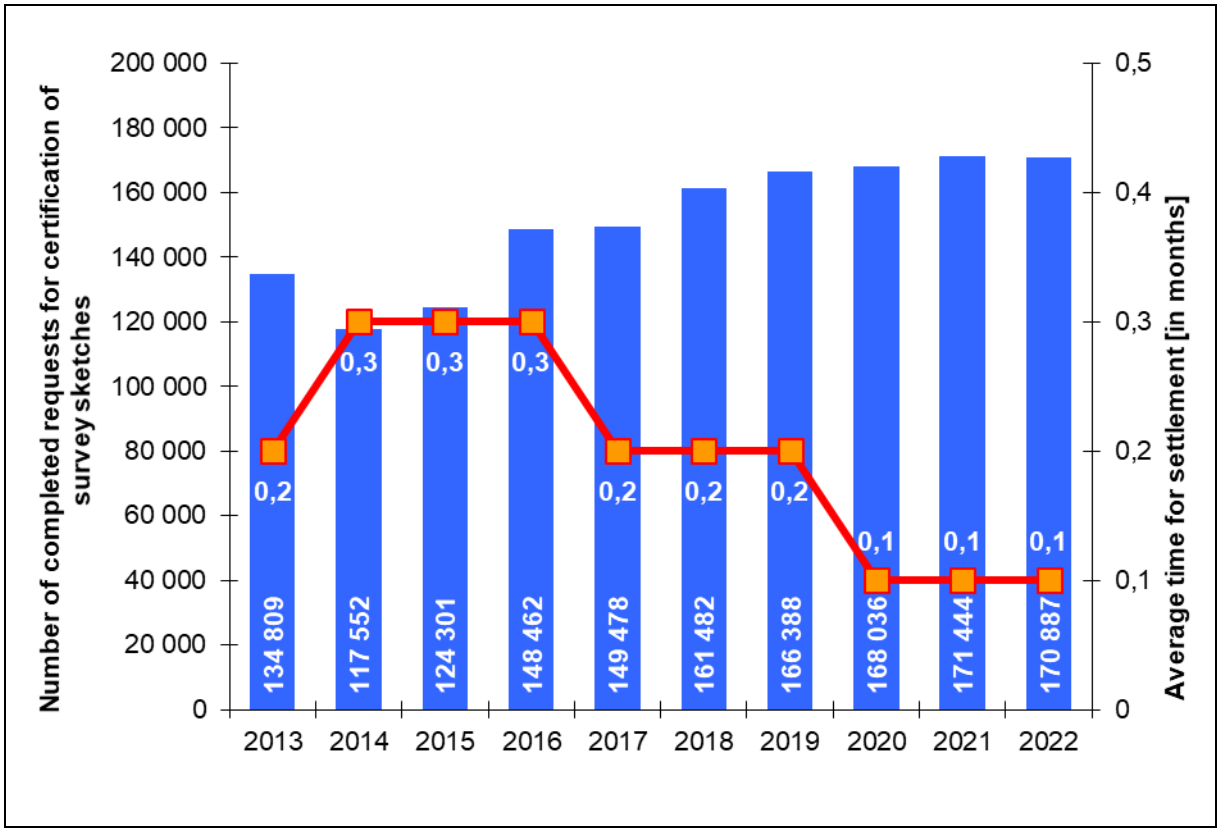
Certification of Survey Sketches

Survey sketches represent land parcel division, position of a building or change of its external outline in the real estate cadastre and some other changes depicted in cadastral maps. Solely private geodetic companies make them. They create important part of documentation for maintaining of cadastral maps, thus every survey sketch has to be certified by an authorised surveyor who is officially authorised to certify the results of surveying activities by the ČÚZK under Section 14 of Act No. 200/1994 Coll., on Surveying and mapping. Survey sketch is created in electronic form; for the purpose of document creation the paper counterpart is created according to the before mentioned Act on Surveying and mapping.



The number of survey sketches is still very high in the Czech Republic (in 2022 mild decrease in comparison to 2021) and despite it, the average time for checking and certification of survey sketches by the cadastral offices mildly increased in comparison to 2021. Since 2016, web services are available enabling automatic acquisition of documentation for survey sketch creation, which has to be delivered into ISKN in electronic form.

Development in the Number of Requests for Certification of Survey Sketches (Fig 7)



2.2. Digitization of the Real Estate Cadastre

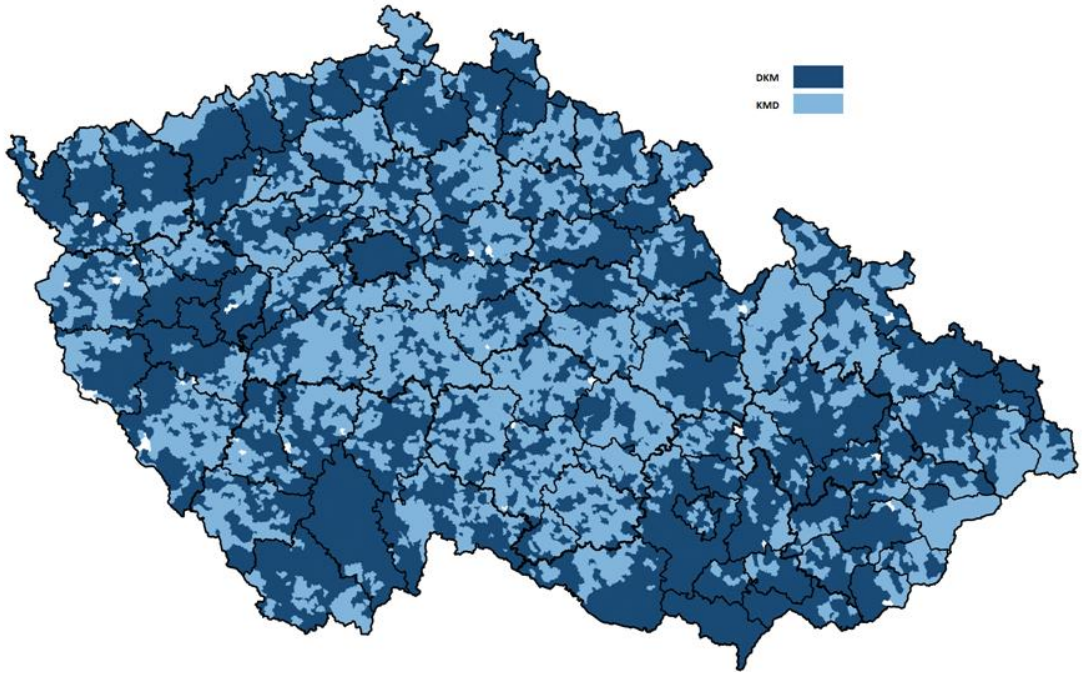
Digitization of the real estate cadastre is a basis for effective operation and administration of the real estate cadastre and for operative satisfaction of the users of the cadastral information. Cadastral maps in digital form are fundamental for administration and area decision-making. They serve not only for overview on the territorial range of material rights, but they are important as a basis for creation of information systems and applications relating to the territory as f. i. digital technical maps, spatial plans, price maps etc.

Development of Digitization of Cadastral Maps between 2011-2022

Year	till 2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Digitization Completed	7 939	1 127	1 074	910	877	622	349	25	23	24	19	15
Total in Digital Form	7 939	9 064	10 166	11 121	11 990	12 612	12 954	12 972	12 995	13 019	13 038	13 054
Yearly Growth from the Total of 13 076 c.u.(%)		8,7	8,4	7,0	6,7	4,7	2,7	0,2	0,2	0,2	0,1	0,1
% from the Total Number	61,0	69,6	77,9	84,9	91,6	96,3	99	99,2	99,4	99,6	99,7	99,8

By December 31, 2022, the digital form of cadastral map was not at disposal only in 22 cadastral units, which is 0.2 % from their total number of 13 076. Since 2018, the cadastral maps have been digitized, as a rule only on sites where renewal of cadastral documentation by means of new mapping or land consolidation is ongoing, will be completed in a very short time and replace then the existing cadastral map.

State of Digitization of Cadastral Maps on 31. 12. 2022



2.3. New Cadastral Mapping and Cadastre Revision

In the area of the technical data of the cadastre, it is gradually following up on forthcoming completion of digitization of cadastral maps with further innovations. The users of cadastral information are pointing to two areas of shortcomings of existing real estate cadastre at present. The first one is lack of accuracy of the parcel boundaries in those areas where cadastral maps digitized (KMD) based on original maps with geometry from the 1st half of the 19th century are still used and the second one is insufficient updating of registered technical data as f. i. nature and mode of land use or real estate protection.

Lack of boundaries accuracy complicates construction preparations to investors so as the activity of construction offices in the territorial or construction proceeding. It also brings problems in real estate transactions because of unclear area, which is important parameter for setting the price and does not help to keep good neighbour relations regarding the boundary surveying in the field – the discrepancies can be in some cases in meters. Obsoleteness of technical data complicates the use of cadastral data, especially in some decision-making processes of public administration, in property valuation and administration of property taxes.

The tools embedded in the existing Cadastral Act can solve before mentioned insufficiencies, by the renewal of cadastral documentation based on new mapping and cadastral revisions, thus procedures not being used in practice sufficiently in previous years because of the digitization priority.

New Mapping and Use of Land Consolidation Results till 2023

During the renewal of the documentation by the new mapping, the existing boundaries are marked in the field and then precisely surveyed. At the same time updating of further cadastral information (such as mode or nature of land use) is carried out following the negotiation with the owners and with particular public institutions. In 2022, the digital form of cadastral map was at disposal at 99.8 % of cadastral units or at major part of them. Only in 22 cadastral units (out of 13 076) digital cadastral map has not been completed at the whole cadastral unit. Nearly all cases refer to cadastral units with land consolidation in rural areas in process or in those places, where the renewal of cadastral documentation will be in progress based on the new mapping,

and where the bad quality of original maps did not enable mere digitization. Cadastral offices follow the progress in land consolidation and excluded parts will renew by new mapping.

In further 204 cadastral units the digital maps have to be completed in smaller parts of them. It relates to areas touched recently by land consolidation where either land consolidation will have to be completed or the renewal by the new mapping finalized in parts of cadastral units excluded from land consolidation, and thus within next years.

Cadastral office for	Total number of c. u.	Without digital map		Digital map only at a part of c. u.	
Prague-City	112	0	0,0 %	0	0,0 %
South Bohemia region	1 625	2	0,1 %	42	2,6 %
South Moravia region	892	0	0,0 %	29	3,6 %
Karlovy Vary region	566	1	0,2 %	2	0,4 %
Hradec Králové region	961	0	0,0 %	4	0,4 %
Liberec region	508	2	0,4 %	9	1,8 %
Moravia-Silesia region	616	0	0,0 %	6	1,0 %
Olomouc region	769	2	0,3 %	6	0,8 %
Pardubice region	790	1	0,1 %	12	1,5 %
Plzeň region	1 396	9	0,6 %	41	2,9 %
Central Bohemia region	2 075	4	0,2 %	26	1,3 %
Ústí region	1 060	0	0,0 %	9	0,8 %
Vysočina region	1 263	1	0,1 %	14	1,1 %
Zlín region	443	0	0,0 %	4	0,9 %
Total	**13 076**	**22**	**0,2 %**	**204**	**1,6 %**

New Mapping and Use of Land Consolidation Results – Long-term Outlook

Digitization of cadastral maps enables wide accessibility of maps, ensuring full conformity with descriptive data on real estates. High comfort in work with map was achieved included combination with other maps via web services. Nevertheless, approximately 50 % of the territory of the Czech Republic will still be covered by cadastral map originated from the Stable cadastre surveying in the first half of the 19th century after 2023. Neither continuous adding changes nor realized digitization did not improve the accuracy of most boundary break points in comparison to national coordinate system, which remained on the level of 1 to 2 meters. In these cadastral units, it will be necessary to perform gradually new cadastral mapping. The new mapping will cover virtually all built-up areas and forest complexes, thus areas excluded from the land consolidation. Those parts of cadastral units already solved during land consolidation are renewed based on their results. This method enables to reach needed accuracy of all cadastral maps in comparison to national coordination system, which is characterized by the coordinate positional accuracy m_{xy} = 14 cm.

Long-term plan will be carried out supposing that land consolidation will proceed in the present range of approximately 200 cadastral units per year so as new cadastral mapping should. This work amount can be financed without extra budget claims, provided the expenditure of state budget dedicated to these activities remains at the same level.

The result of renewal of cadastral documentation by the new mapping will be the cadastral map depicting accurate parcel boundaries surveyed in the field with owners´ participation. Real estate owners´ involvement enables to use the renewed cadastral documentation even for property settlement of various discrepancies (not solved changes of communications location and

parameters, watercourses regulation, water constructions or small constructions registered in the cadastre). Updating of nature and mode of land use will be carried out in the frame of new mapping and so the cadastral map can better serve for many decision-making processes of the public administration regarding the territorial administration.

Cadastral Revision

Real estate cadastre is based on the principle of data registration according to the submitted documents. Moreover, the constitutional principle applies for registration of legal rights (the right arises only after registration) as well as Bona fide protection is applied on these registrations and so the owners´ motivation not to postpone the registration is very strong. For other records (nature of land, its mode of use, preservation), only simple registration principle applies and so up-to-datedness of this information is negatively influenced because real estate owners do often not fulfil their notification duty. Sometimes it is even more advantageous for the owners not to update this information in the cadastre (f. i. because of lower property tax). It limits use of the cadastral data for many activities, which should reflect the situation in the terrain. During cadastral revision, cadastral offices find the discrepancies between cadastral data and real situation in the terrain, and remove them in cooperation with relevant public institutions and owners.

In 2022, the cadastral revision was completed in 586 cadastral units and more than 180 thousands discrepancies were improved. The most often discrepancies were merging of superfluously registered parcels and changes in the mode and nature of land use. Information about another 24 thousands found discrepancies was recorded into the cadastre in 2022, because the owners did not submit necessary documents to the cadastral office. Information about these discrepancies are published on internet free.

It would be possible to complete revisions in all cadastral units not included in renewal of the cadastral documentation by new mapping or based on land consolidation results by the end of 2030. Time schedule will be designed focusing on territories with greatest development.

Updating of Tax Data and Real Estate Data Protection

Real estate cadastre contains at present some data regarding the property tax, the real estate evaluation so as some selected data on real estate protection (protection of monuments, spas protection, nature conservation).Registration of this data is based on documents from the public administration authorities responsible for these land specifications. In practice, this notification duty seems to be not very practical and does not ensure sufficient consistency of registered data and real state. For example, comparison of the real estate cadastre data and database of the Nature Conservation Agency of the Czech Republic showed that only at low number of parcels with stated nature conservation this information has been registered. To improve this situation, it is necessary, to implement more efficient procedures for this data updating. It could be carried out with help of the basic register for territorial identification, addresses and real estate. Its launch in 2013 created the technical conditions for crucial innovation of these registration procedures. The public authorities responsible for tax data or real estate conservation can directly register these changes into the RÚIAN. Any possible taking over of these data into the cadastre or its provision from RÚIAN in one output together with the cadastral data is technically manageable.

3. Electronic Services of the Real Estate Cadastre

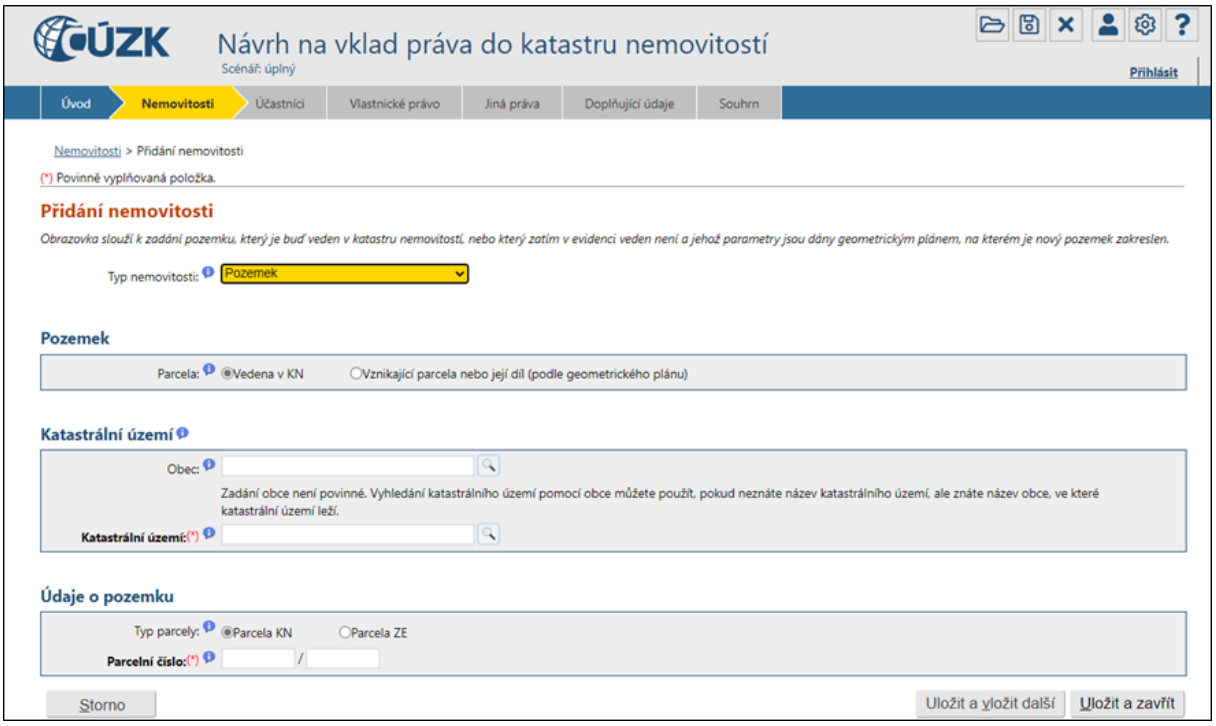
Many eServices have been launched in the area of the real estate cadastre, which are both free of charge services, as well as paid services providing verified documents serving as public documents. To facilitate the access to cadastral data to users´ a new login portal was put into operation https://login.cuzk.cz/rozcestnik.do.

It is immediately clear from the introductory signpost whether the application is available for entering even without a login. If login is chosen, the application offers all available methods. Some of provided services are available anonymously, access to other applications or outputs is

allowed only after logging in via the Portal of National Point of Identification and Authentication (NBIA - https://www.identitaobcana.cz) or via a registered account with ČÚZK. Information about registration into the real estate cadastre is also available on the Citizen´s portal for the Czech citizens (https://obcan.portal.gov.cz).

Entry Proposals

The application serves for creation of the Proposal for entry in both interactive and WebServices form. The application is very intensively used; in 2022, more than 800 thousands entry proposals were created via it, 630 thousands out of them were then used for carrying out the proposal. WebServices were enlarged and support for getting information from the Registry of Inhabitants enabling easier filling in the proposals was added.



Service for Monitoring of Changes

The Service for monitoring of changes in data about real estates is provided by ČÚZK according to § 55, art.6 of the Cadastral Act, to those persons who have real right to particular real estate or to participants of proceeding about such a right. The service automatically informs the user about the fact, that there occurred a change in the real estate cadastre regarding the monitored real estate. Number of its users reached already 38 780 in 2022.The service is used not only by some natural persons but also by legal persons or banks because of the information about those real estate transactions securing the provided mortgages.

Remote Access to the Real Estate Cadastre http://katastr.cuzk.cz/

Remote access (DP) enables to get the data from the real estate cadastre from the whole territory of the Czech Republic via internet. Outputs from the real estate cadastre, such as extract from the real estate cadastre and other compositions provided in this way, are formally and materially identical to the documents issued with the same timestamp by the cadastral office and are considered public documents.

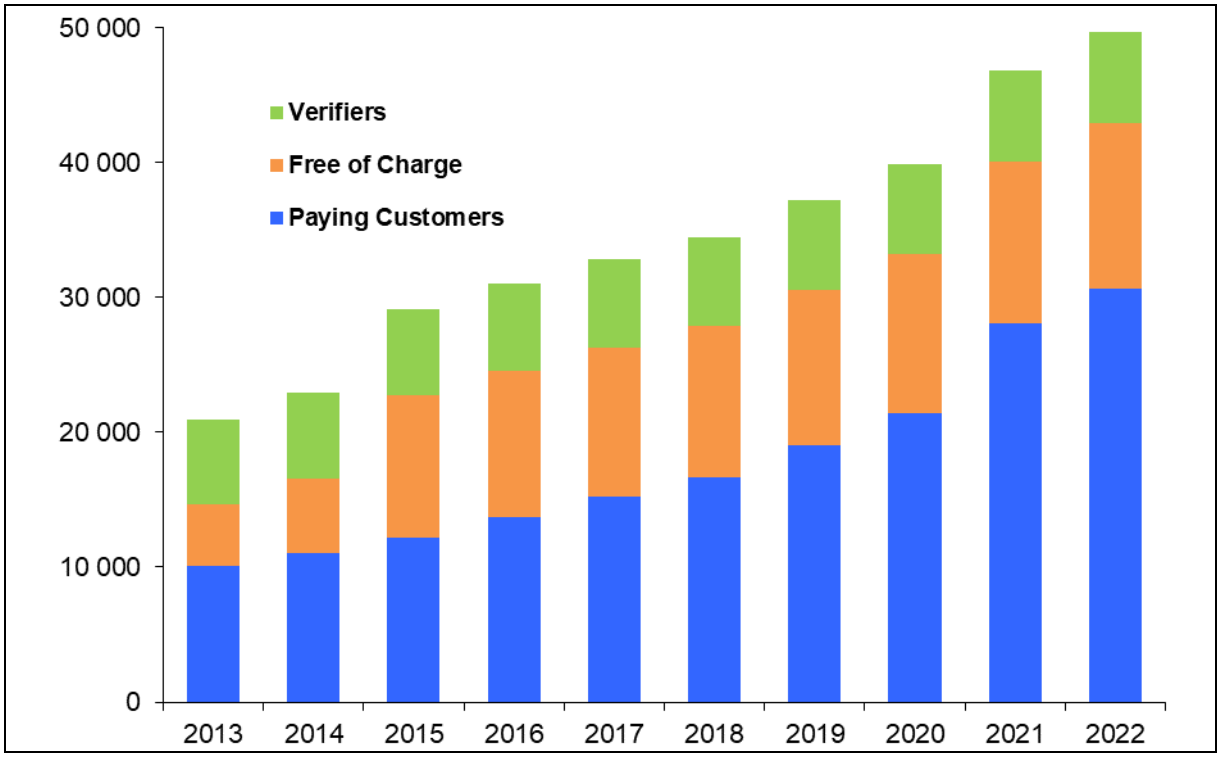
The application enables provision of outputs not only based on input of basic parameters but it also supports the visual search based on digital cadastral maps, both with help of Orthophoto CR and topographic maps as navigation tools.

The outputs are charged, but numerous groups of users from public and local administrations receive the information from the real estate cadastre in this way free of charge. Since its launch in 2001, the number of customers actively using it has been constantly growing. The yearly increase of users was nearly 6 %. The number of accounts for users was 49 724 by December 31, 2022, 12 289 out of which were free of charge and 6 786 accounts were for verifiers, particularly in the frame of CzechPOINT project.

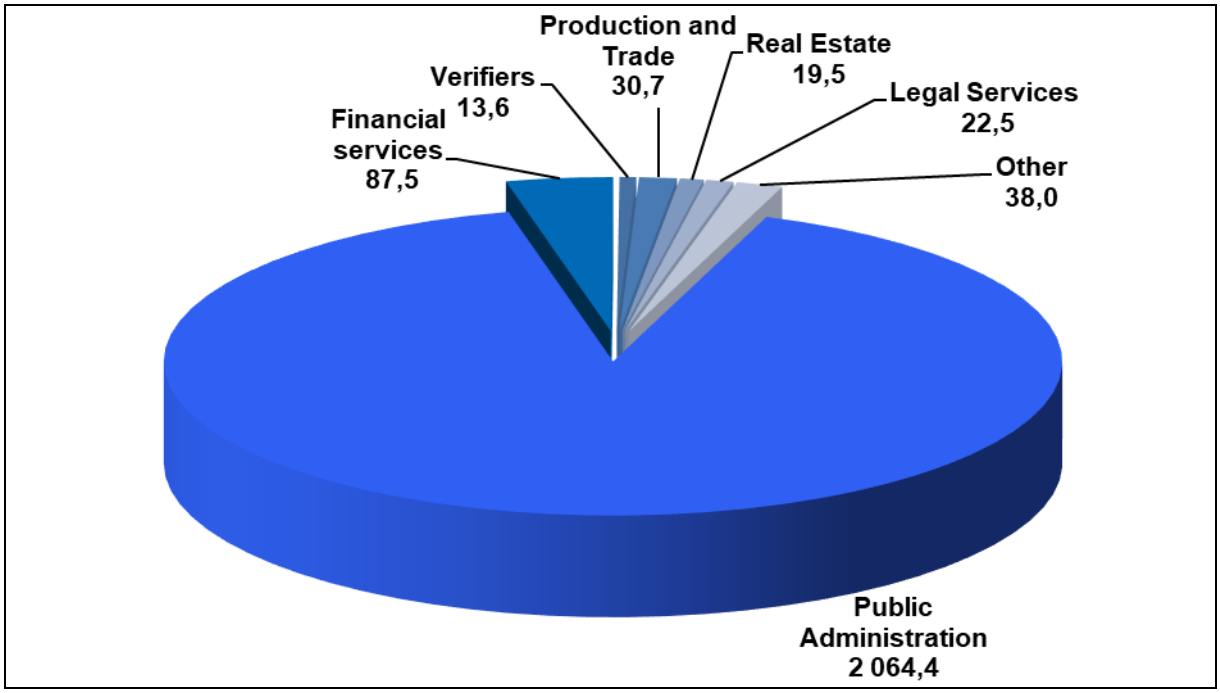
From January 1, 2016, it is possible to provide the documents from the file of documents via DP. In 2022, more than 949 thousands documents were downloaded via this application, in total from its launch it was more than 4.9 million documents. Digital part of the file of documents contains more than 25.2 million documents at disposal (completely available are documents from years 2014 - 2022). In case the document has not been scanned yet, it is possible to ask for it via inquiry form. Since 2016, more than 342 thousands of such requests have been solved. This process enables to deliver the document in digital form to the applicant within 2 working days.

The number of DP users has been growing constantly, unlike the income for data provision via DP service. Income of the state budget from charged customers reached in total CZK 224.9 million in 2022. The biggest charged user of DP service is the bank sector, which uses it for acquiring of necessary documentation for mortgage provision. However, 87 % of data were provided to the public administration. Free of charge DP is at disposal not only to municipalities and regions for performing their competency but also to governmental bodies, notaries and executors carrying out the distrains so as to insolvency administrators. The executors were provided with outputs for CZK 928 million in 2022. This range of service use by the executors is obviously disproportionate to the agenda they provide, but unfortunately, effective measures have not been taken yet to reduce it.

Development of the Number of DP Users as for the Type of Account (Fig 8)



The Biggest DP Users – as for the Data Value in CZK Million (Fig 9)



Remote Access to the Real Estate Cadastre for Unregistered Users http://dpn.cuzk.cz/

The application was launched in the middle of 2021 and enables acquiring the extract from the real estate cadastre, ownership overview of an individual, outputs from the collection of documents of the real estate cadastre and other electronic documents. The application does not require previous registration at ČÚZK unlike the DP to the real estate cadastre. Nevertheless, some outputs are available only after proving the identity of the applicant via NBIA.

Viewing the Real Estate Cadastre http://nahlizenidokn.cuzk.cz/

The Viewing application enables to acquire chosen information about real estates and proceedings and contributes in a significant way to increasing the transparency of the individual administrative proceedings.

The application serves also for data provision to creators and verifiers of survey sketches – enabling them access to previous surveying results – recording of detailed surveying of changes (ZPMZ). In 2022, more than 479 thousands ZPMZ were downloaded (more than 2.6 million documents since its launch).

Viewing the cadastre is one of the most visited websites of the Czech state administration. In 2022, the number of accesses decreased mildly in comparison to 2021 to more than 51 million visits.

Web Map Services for Cadastral Maps http://wms.cuzk.cz

Web map services for cadastral maps enable further possibility of work with cadastral maps; the user can combine the cadastral maps layer in his computer with other datasets. In that way he gets access to brand updated data via internet and has to take care neither about the storage of map copies in his data storage nor about their updating. This service is also free of charge.

Web Services for Survey Sketches

Web services for creators and verifiers of survey sketches (WSGP) represent programme interface enabling access to cadastral data to creators of survey sketches (GP). It enables them to ask for documentation for creation of GP via internet and GP verifiers can send the verified GP directly to the particular cadastral branch office for its authorization. 1 707 customer´s accounts for these free of charge services were created by December 31, 2022.

User Support

The branch Helpdesk in the form of a call centre and web form ensures user support. Helpdesk solved approximately 3 100 requests from external users in 2022. Which was 1000 requests less than in 2021.

4. Register of Territorial Identification, Addresses and Real Estate (RÚIAN)

https://www.ruian.cz

ČÚZK is the administrator of the Register of territorial identification, addresses and real estate, which is one of the four basic registers of the public administration. The content of basic registers is defined in the Act No.111/2009 Coll., on Basic registers, stating also rights and obligations connected with creation, use and operation of basic registres. RÚIAN is edited by ČÚZK in cooperation with municipalities, building offices, Czech Statistical Office (ČSÚ) and cadastral offices. Editing takes place through the agenda information systems ISÚI (Information system of territorial identification) and ISKN.

In the first half of 2022, the development was focused on ISÚI/RÚIAN modifications caused by the amendment to the Act on Basic Registers, specifically the introduction of referencing technical-economic attributes of building objects, modifications resulting from the abolition of the Prague district and requirements resulting from the Cyber Security Act.

Development in the second half of 2022 was mainly focused on the creation of a new VDP application (Public Remote Access - https://vdp.cuzk.cz/) with a responsive design, with the addition of the display of purpose-built territorial elements (ÚÚP) and a number of other functions. Furthermore, the ISÚI prepared to take over changes in territorial jurisdiction from the RPP (register of rights and obligations), instead of cancelled records in the ICU (Single Identity Space). Users of the ISÚI were further enabled to use the service to find out the number of registered entities at an address. In connection with the introduction of the ÚÚP into RÚIAN, the possibility of introducing a negligible buffer and confirming the links of the ÚÚ was added.

The development of RÚIAN in the area of implementing other ÚÚP is a continuous matter. In 2022, it was possible to introduce two new purpose-built elements into RÚIAN: Mining Areas (announcement date 1.4.2022) and Protected Deposit Areas (announcement date 30.11.2022). Other legislatively approved ÚÚP are estimated pedologic-ecological units (planned announcement 1.6.2024), Nature, and Landscape Protection Elements (planned announcement 1.3.2025).

In 2022, the education of ISÚI editors continued through practical training. ČÚZK continues to provide support for users and clients via the ČÚZK Helpdesk https://www.cuzk.cz/ruian/RUIAN/Uzivatelska-podpora.aspx. Detailed information about the RÚIAN project, including detailed methodological instructions for editors, is published and continuously updated on the project website https://ruian.cuzk.cz .

ČÚZK went on in 2022 in checking of the RÚIAN data quality. The results of chosen inspections for municipalities and building authorities are published at the https://kontrolyruian.cuzk.cz/ .

The number of errors is continuously successfully decreasing. The number of address points without definition points and the number of buildings without identification parcel decreased by

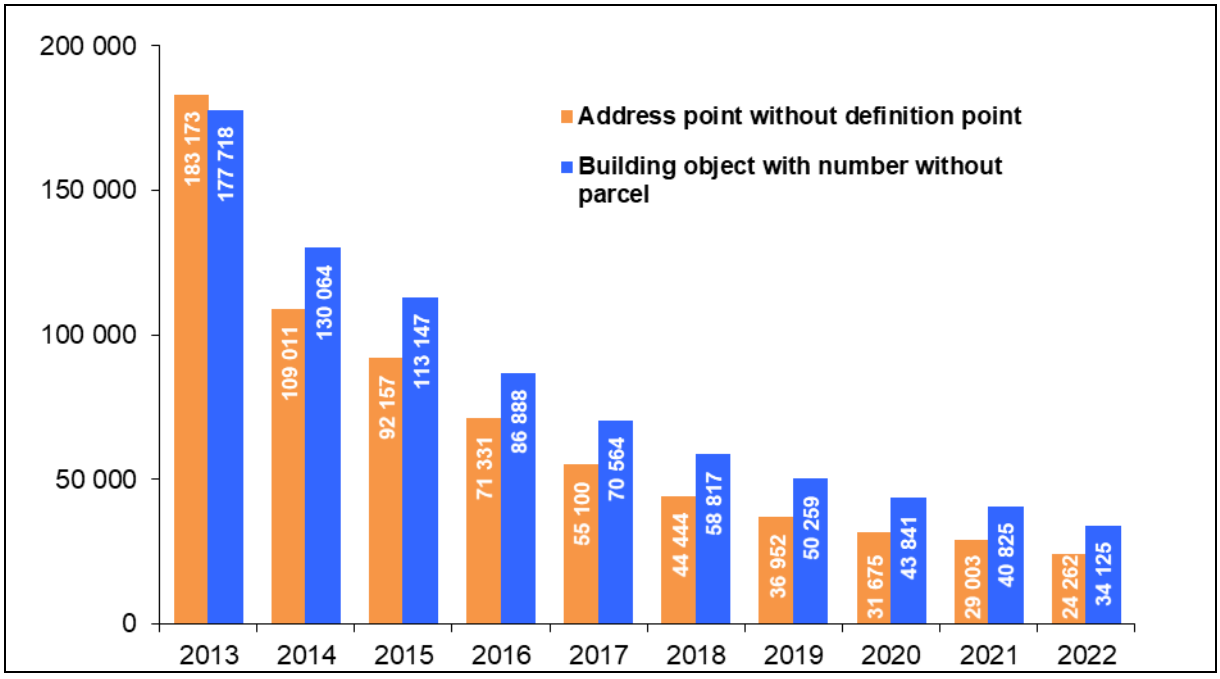
16 %. Furthermore, the register administrator continuously analyses the data and prepares an enlargement of the published controls for next year.

Users of RÚIAN complaint forms published on the RÚIAN website: https://reklamace.cuzk.cz/formular also help to reduce the number of incorrectly kept data in RÚIAN. Currently, mainly financial and cadastral offices or the ČSÚ uses them.

The Content of RÚIAN at December 31, 2022 for chosen Items was following:

Subject	Number 2021	Number 2022
Municipality	6 258	6 258
Part of municipality	15 105	15 106
Cadastral unit	13 076	13 076
Building object	4 152 198	4 179 237
Building object with the orientation/registry number	2 893 886	2 911 101
Address point	2 966 352	2 983 858
Parcel	22 616 437	22 537 389
Street	84 293	84 819

Errors Removal in RÚIAN (Fig 10)



Public Remote Access to RÚIAN Data https://vdp.cuzk.cz/

Application Public remote access to RÚIAN data (VDP) enables to view and acquire data from the basic register RÚIAN via VFR so as some data from editing agenda information systems ISÚI and ISKN.

Access to the VDP application does not need any registration. Provided VDP data are free of charge and serve solely for information. Only data shared via the Information System of Basic registers have a reference character.

In 2022, a new version of the application was published, in which the user interface was improved, functionality was added to simplify the search for territorial elements, and it was adapted for viewing on mobile devices as well.

Application contains following functionalities:

- Search for existing and cancelled elements
- Depiction of detailed infromation about chosen element included its map position
- Export element complexes in PDF, CSV and XML formats and data provision in VFR exchange fromat
- Information provision about chosen element back at a specific date in the past
- Address verification included address search based on incomplete information

Access to RÚIAN Data via IS of Basic Registers of Public Administration of the CR

The number of accesses to reference RÚIAN data is on average higher than 15 million accesses per month according to the statistics of the Basic registers administration. Existing valid data on addresses, territorial division, parcels or/and local names simplifies verification/updating of inputs for hundreds public administration agendas in the CR.

5. Digital Map of Public Administration (DMVS)

https://cuzk.cz/DMVS/O-IS-DMVS.aspx

Based on the Act No 47/2020 Coll., the regions have the obligation to create digital technical maps of regions (DTM) until 30 June 2023. DTM will be important database for number of professional activities in both public administration and private sector. A legislative process is currently underway, the result of which will be an amendment to the Land Surveying Act, which will align the efficiencies associated with the construction and launch of regional DTMs with the Building Act, including the one-year shift of DTM production operations to 1 July 2024. For the period, 1 July 2023 to 30 June 2024 a pilot operation is planned.

ČÚZK is obliged to build information system of digital map of public administration (IS DMVS), ensuring necessary central services for regional DTM and their users.

New DTM of Regions

Regional office is going to be the administrator of the DTM. The content of the DTM is stated in the Decree No 393/2020 Coll., on Digital technical map of a region, published in 2020 by the CUZK.

The key is the division of DTM content into two basic data groups:

1. Objects and equipment of transport and technical infrastructure.
2. Basic spatial situation defined by the law as selected construction and technical objects and equipment and selected natural objects on the earth's surface, below or above it, which characterize the basic spatial arrangement of the territory.

Each of these data groups has different editors and fundamentally different update principles based on the law. In general, however, the editor is always responsible for the accuracy, completeness and timeliness of the data entered. The technology for data transfer between DTM regions and DMVS will be the Unified exchange DTM format (JVF DTM).

Technical Infrastructure and Basic Spatial Situation in Regional DTM

DMVS

CUZK has launched building of the digital map of public administration (DMVS), which consists of orthophotomap, cadastral maps and technical maps of regions. In addition to making DMVS data available, the new information system managed by the CUZK will provide records of owners, administrators and operators of transport and technical infrastructure, records of authorized editors and an interface for sending update data to all information systems of DTM regions.

DMVS project is co-financed by the Integrated Regional Operational Program (IROP), Call No 94 for Digitization of Construction Management.

In 2022, an aerial survey of the eastern half of the Czech Republic was carried out as part of the DMVS project to create an orthophoto with resolution of 12.5 cm pixels. Furthermore, the central infrastructure of CUZK for the operation of IS DMVS was strengthened and intensive building of the information system was ongoing; from preparatory and analytical work, through own implementation of the information system and its testing, to preparations for integration into individual regional solutions and connection of systems of owners, administrators and operators of transport and technical infrastructure. The collection, consolidation and verification of data on the owners, administrators and operators of the transport and technical infrastructure, which will be part of the central component of the IS DMVS, including information on the territory in which they operate, took place. In the frame of the Coordinating Council of DMVS/DTM administrators, which is a working group of the Working Committee for Digitization of Construction Management and Spatial Planning of the Government Council for the Information Society (RVIS), regular coordination of the preparation and implementation of the IS DMVS and regional DTM project took place throughout the year. Every step has been carried out in accordance with the relevant provisions of Act No. 200/1994 Coll. on land surveying as amended and relevant implementing legislation.

6. Land Surveying Activities in the Public Interest

Main task of the state land surveying service is administration of national geodetic control and creating basic standardized geographic datasets and map products particularly for support of activities of the state and local administration of the Czech Republic. Fulfilling this task in the ČÚZK branch is in responsibility of the Land survey office (ZÚ).

6.1. Geodetic Control

Geodetic control is a set of theories, equipment, technologies and services enabling clear spatial and time assignment and documentation of geographical objects and features in binding reference systems with defined accuracy. Basic frame for the geodetic control of the Czech Republic are fundamental geodetic control points (ZBP) being divided into horizontal, vertical and gravity geodetic control. Taking into account the development of technologies of global navigation satellite systems (GNSS) the fundamental geodetic control comprises also the points of the network of permanent stations GNSS CR (CZEPOS) that create the fundamental reference frame for horizontal and time assignment of geodetic surveying by means of satellite geodesy.

By the end of 2022, ZÚ registered in the database following numbers of geodetic control points:

69 191 centres of trigonometric (ZPBP) and densification points,
29 985 associated points,
1 313 levelling lines of the Czech state levelling network (ČSNS) being in total 24 721km long,
125 406 levelling points (82 520 out of them are ČSNS points), and
462 gravity points.

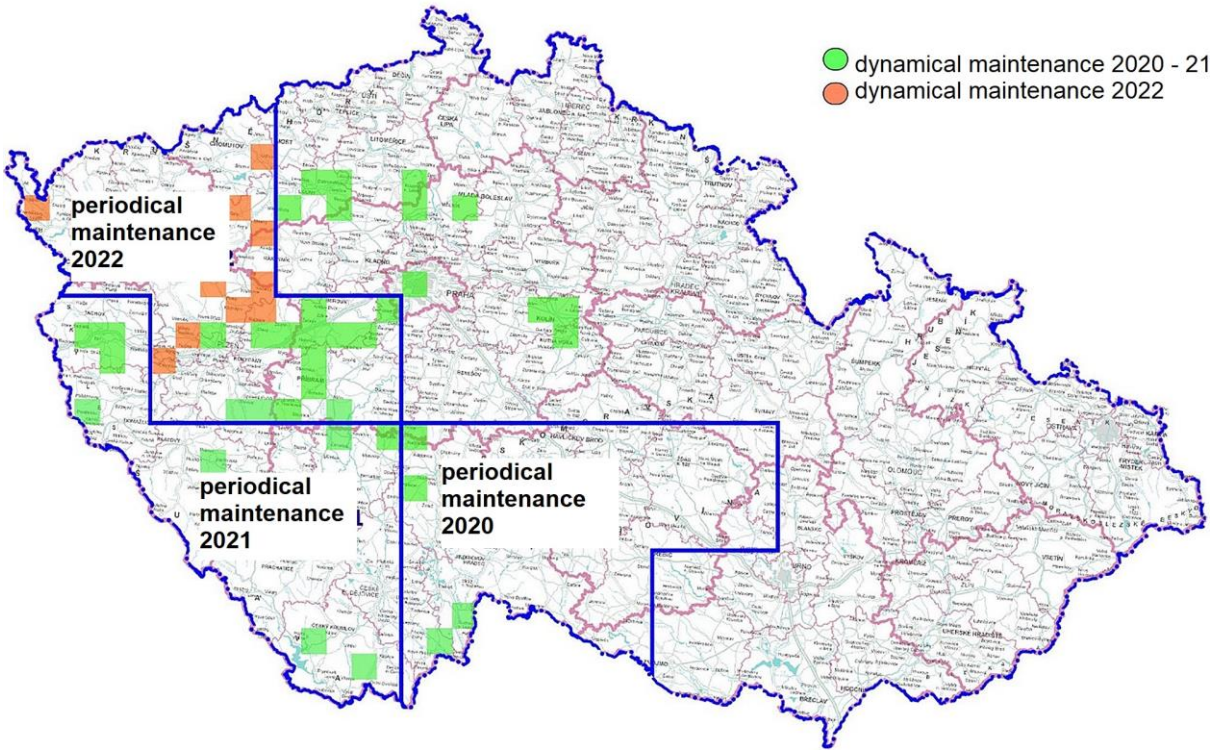
In the area of ZBP administration ZÚ focused in last years, particularly, on so-called dynamic maintenance based on defects reporting on single ZBP points sent to ZÚ by users. In 2022 in total 1 966 cooperating users were registered. Dynamical maintenance relates to 60 points in locations chosen based on the density of reports. In 2022, the maintenance of 556 significant geodetic control points went on after its suspension in 2012 and launching again in 2020.

As part of ensuring the management and development of the fundamental gravity point field (ZTBP), the levelling polygon of the points of the Basic Geodynamic Network (ZGS): 24 Plzeň – 26 Přimda – 4 Cheb – 12 Čertova hora – 18 Medvědí skála was targeted using the very precise leveling method (VPN). The ZGS points were targeted by GNSS, VPN and gravimetric methods 4 Cheb, 24 Pilsen, 12 Čertova hora and 30 Velký Lopeník.

Using new technologies of satellite geodesy enables continuous accuracy improving of reference systems both at the continental and global levels. Parallel activities occurred for integration of national reference systems with the goal of realization of unified reference frames at both the European and global levels. ZÚ as the administrator of geodetic control in the CR ensures both theoretical and practical activities, some supporting documents and data with the goal of positioning points of geodetic control in new reference systems, particularly, in the frame of European projects. Further ZÚ publishes information about realized reference systems and provides the development of transformation services that enable precise transformation of points' coordinates between geodetic reference systems, which are mandatory in the state territory, and reference frames in European Union.

In accordance with the provision "Analysis for stating of uniform reference positional and altimetry coordinate system including the transformation method" (one of the outputs of GeoInfoStrategy in the Czech Republic till 2020), the accurate transformation relations between reference systems were enlarged by the possibility of transformation from/to WGS 84. The accuracy of the transformation from ETRS89 (in the realization ETRF2000) and WGS 84 (in realization G873) is characterized by the mean error in position m_p = 4.0 cm. Before mentioned transformations were implemented into the new version of transformation programme ETJTZU 2019 and its calculation module as part of the transformation services of Geoportal ČÚZK.

Dynamical Maintenance of ZBP Points in Previous Years



In the frame of international relations and cooperation ZÚ participates in projects, dealing both with geodetic control initiated by the sub-commission of International geodetic association for European reference systems (EUREF) and with European network of permanent stations GNSS (EUPOS). For purpose of unified adjustment of coordinates of EUPOS stations, the EUPOS processing centre was regularly provided with bulk data from GNSS surveying (SINEX) from the CR territory based on the CZEPOS monitoring. ZÚ participates significantly in this way on the definition and accuracy improvement of the European geodetic frame.

Czech Positioning Network GNSS – CZEPOS http://czepos.cuzk.cz/

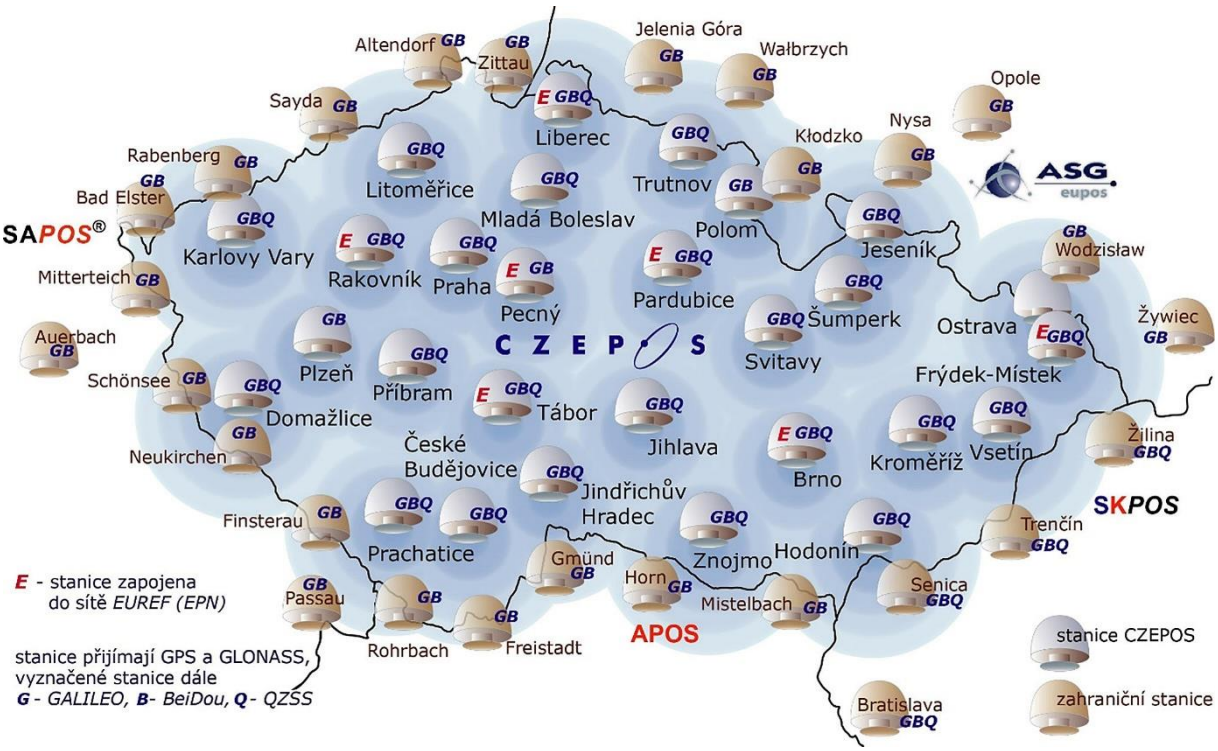
CZEPOS is the network of GNSS permanent stations spread on the whole territory of the Czech Republic. CZEPOS stations are located on roofs of cadastral offices, and record the data from GNSS signals 24 hours a day. Users can get them in the form of corrections enabling to specify GNSS measurements. CZEPOS services are in continuous operation since 2005.

There were no changes in the number and position of the stations in 2022. The network solution uses data from together 55 stations, 28 of them located on the territory of the Czech Republic (23 located on roofs of cadastral offices and 5 external) and 27 in the cross-border areas of neighbouring countries. After the modernization of CZEPOS receivers, completed in 2019, the corrections are provided for all currently available GNSS frequencies, namely American NAVSTAR GPS, Russian GLONASS, European Galileo, Chinese BeiDou, and for regional Japanese QZSS.

In the frame of international cooperation the data exchange between border GNSS CZEPOS stations and state GNSS networks of surrounding countries (Austrian APOS, Polish ASG-EUPOS, German SAPOS® and Slovak SKPOS®) has been carried.

The users can verify availability and quality of the provided CZEPOS services and products on the internet website in on-line regime. There were 2 375 registered CZEPOS network users by December 31, 2022, it means grow of 134 users in comparison to the end of 2021.

Overview CZEPOS Map



Access to the Database of Geodetic Control Points http://bodovapole.cuzk.cz/

Database of geodetic control points (DBP) contains geodetic data on points of fundamental horizontal, vertical and gravimetric control, data on densification and minor vertical control points. Database serves as the basic tool either for CR geodetic control administration or for the geodetic public providing them with basic reference data for follow-up geodetic surveys and setting-out in the territory of the CR. Information about the geodetic points can be found on the ČÚZK Geoportal via application Geoviewer or via viewing services WMS Geodetic control or download service WFS Geodetic control; access to data is public and free.

Users can also inform about the defected points of horizontal and vertical control via implemented application so as view the Statistics of provided geodetic data according to the categories of respective points in another application. There exist also the application Geodetic control statement, which enables finding out to users or owners of real estate, whether and which geodetic points are located in the territory touched by building activity.

6.2. Maintenance and Documentation of the State Border

Land survey activities for maintenance and verification of state borders are based on agreement with the state border documentation administrator, which is the Ministry of Interior. The actual performance of surveying activities, their scope and focus is different for state borders with individual neighbouring states. They are completely subject to tasks arising from international agreements on state borders and their documentation, which is administered based on the agreement between both partners. The international border commission coordinates processing of documentation for maintenance of state border markers, verifying state borders and updating border documentation. All state borders have just been under regular examination.

In 2022, updating of coordinates of state border monuments and unmarked break points of state border in uniform reference system ETRS89 for the EuroGeographics project SBE (State

boundary of Europe) and other cross-border projects went on. The ETRS89 coordinates of 17 break points of state border with Slovakia were updated based on surveying carried out in 2021. Similar work has been under preparation on the state border with Bavaria and Austria.

6.3. Fundamental Base of Geographic Data (ZABAGED®)

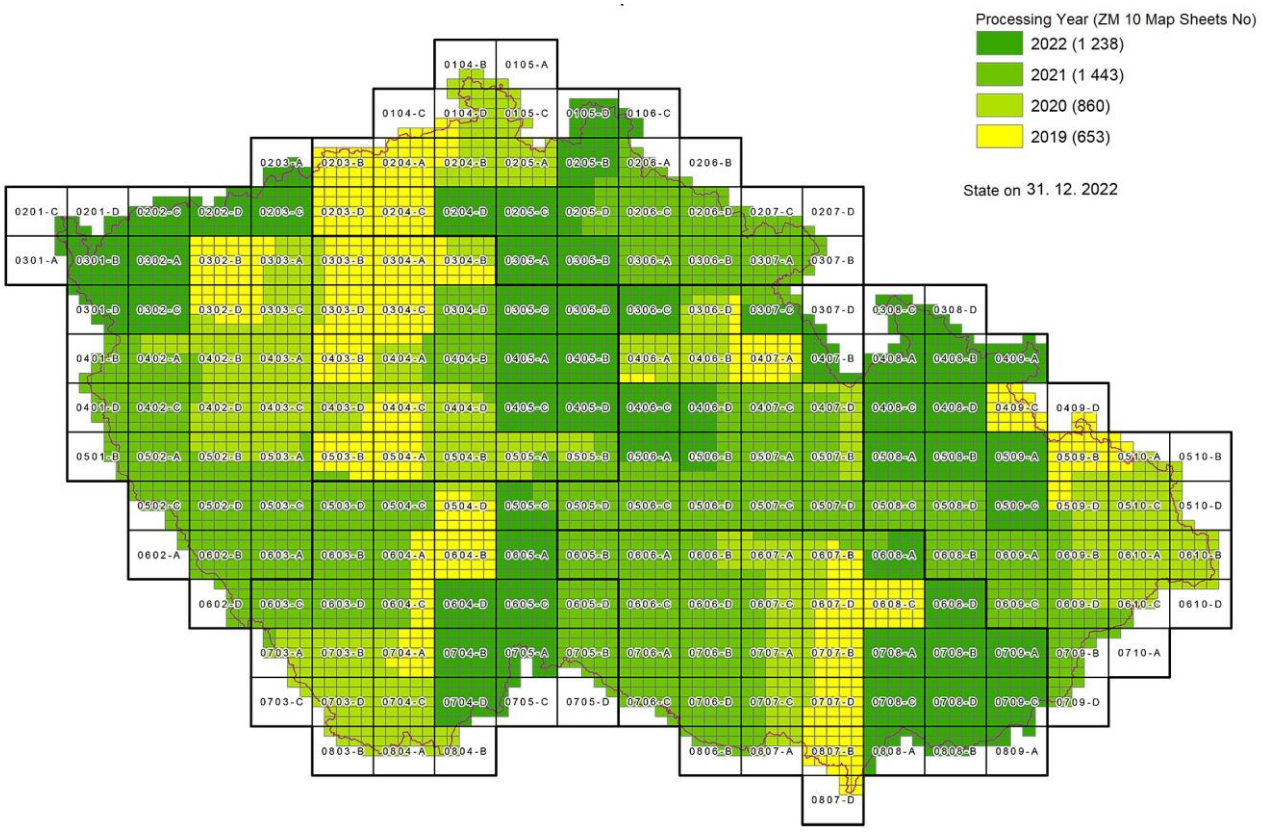
ZABAGED® is a digital geographic model of the territory of the Czech Republic. In 2022, ZABAGED® contained 134 types of geographical features (included 3 types of ZABAGED® elevation part) represented by vector graphic and descriptive part with more than 400 types of descriptive and qualitative attributes. Selected types of features (hydrography, communications) contain in its descriptive part the identifiers (integration keys) for the connection to the databases of their expert administrators.

Permanent attention is given to updating in the area of ZABAGED® administration. Regular updating of ZABAGED® at the whole territory of the state using Orthophoto ČR and aerial photos went on together with investigation of selected information at the public administration bodies and field investigation.

The updating cycle of ZABAGED® is maximum six years; in 2022, the sixth cycle was completed, based on the principle of so called areal update. It means that the territory with quicker dynamics of change is updated at shorter interval than the standard one. In 2022 together 1 238 map sheets of the Base topographic map CR in the scale of 1 : 10 000 (ZTM 10) were updated in this way.

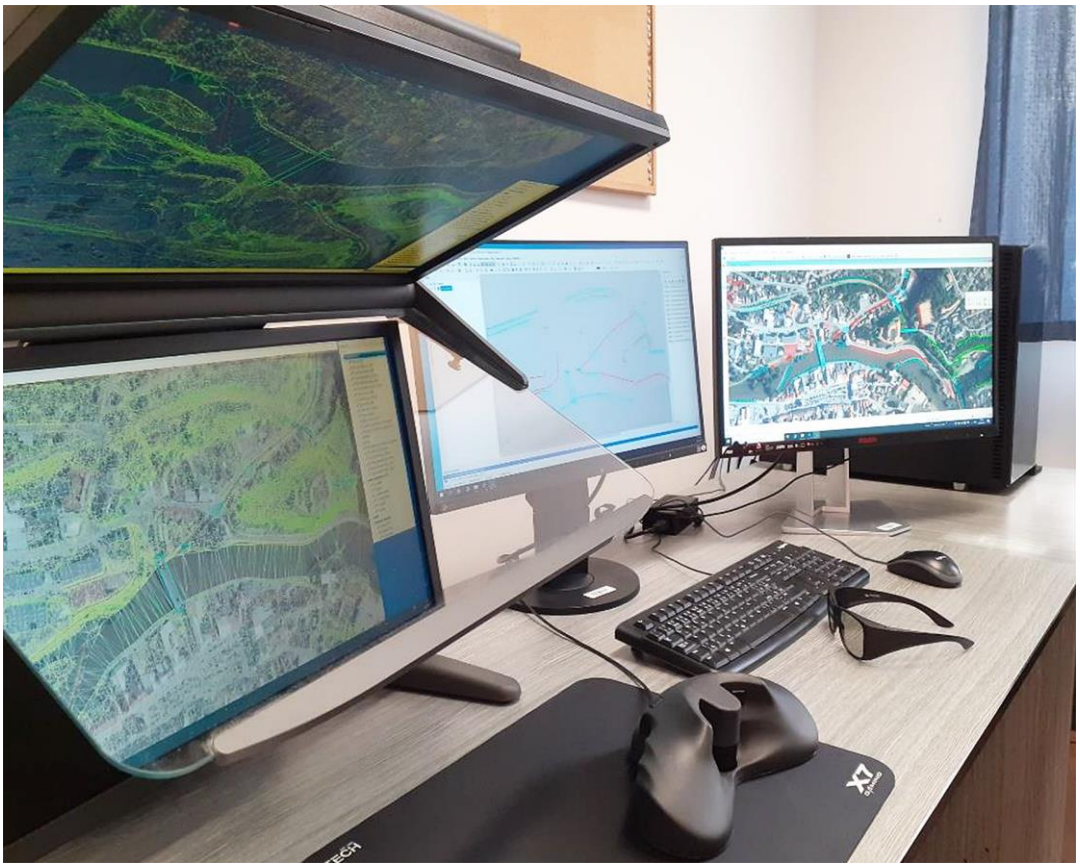
Similarly as in previous years, the continuous updating went on. The significant types of features have been updating in the area of the whole Czech Republic at least once a year, some of them even four times a year. Information about changes are collected from their cooperating administrators. More detailed information about the condition of the continuous areal updating are regularly published on the ČÚZK Geoportal in the section ZABAGED® - planimetry.

State of Areal Updating of ZABAGED® by the End of 2022



Refinement of ZABAGED® also continued in areas where the digitization of the cadastral drawing is still being completed, in 2022 it was in the scope of 85 cadastral territories. In 2022, there was a qualitative change in the combined update of 2D and 3D object types using stereo photogrammetry.

ZABAGED® Stereo-photogrammetric Update Workstation



6.4. Altimetry

ZABAGED® also includes altimetry data. Currently, an altimetry is being published, the primary source of which is data from airborne laser scanning (LLS), which took place between 2009 and 2013, and these data are updated locally according to any changes in the area. The altimetry is available in several forms:

- Digital terrain model of the 4th generation (DMR 4G) – regular square network of elevation points (GRID) 5mx5m,
- Digital terrain model of the 5th generation (DMR 5G) – irregular triangular network (TIN) of elevation nodal points, and
- Digital surface model of the 1st generation (DMP 1G) – earth surface included objects above it (buildings, vegetation etc.).

In 2021, significant task in the area of altimetry data administration was fulfilled. Based on DMR 5G data creation of a new comprehensive dataset of contour lines was completed with the contour lines interval of 1m and in 2022 it was published. It is the vector representation of the digital terrain model with the attributes of highlighted contour lines. This dataset is suitable for altimetry visualisation in the large-scale maps and suitably complements the Orthophoto CR.

DMR and DMP are updated from data obtained by LLS or special aerial measurement imaging (LMS), within the framework of cooperation with the Ministry of Defence of the Czech Republic.

The L410FG-Turbolet military aircraft is alternately installed with ZÚ-owned sensors, either a Leica ALS80 laser scanner or a Leica ADS100 digital three-line photogrammetric camera.

6.5. State Map Series

Apart from cadastral maps, state map series represent sets of basic and medium scale thematic map series. The fundamental state map series (SMD) is a cartographic work with a widely usable content, coherently showing the territory according to unified principles, created and issued by the state administration body in the public interest. The sources of topographic content of the fundamental state map series are particularly ZABAGED® and Geonames. Modern technology of database cartography and digital print ensures processing of the quality of map outputs together with gradual reduction of their updating cycle.

In accordance with the conceptual plans for the development of state map works, the creation of a new Basic Topographic Map on a scale of 1:5 000 (ZTM 5) and a new series of medium-scale maps continued in 2022.

The initial creation of ZTM 5 was completed before the end of 2022, and for the first time in the history of mapping, the entire territory of the Czech Republic was covered with a topographic map on a scale of 1:5 000. The publication of ZTM 5 will be launched together with a new series of medium-scale maps from July 1, 2023. Since that date, users have had a complete map work as up-to-date as possible; work is underway to update the already created map sheets produced in 2019 and 2020.

For the third year, data was created in the S-JTSK coordinate system for scales 1:10 000 to 1:100 000, cartographic data was processed for 4 153 map sheets of ZTM 10, 648 m.s. of ZTM 25, 193 m.s. of ZTM 50 and 53 m.s. of ZTM 100. During the year, data for all 12 m.s. of ZTM 250 were also processed, and the preparation of frame and non-frame data for maps of all scales continued. The preparation of ZTM 10 to ZTM 250 data in the ETRS89-TMzn coordinate system was also started.

Due to the preparation of a new edition of the basic SMD, the general update of medium-scale basic maps was completed as of 2019 as part of the regular edition plans, the production of the existing ZM CR in printed form was terminated, and no SMD map sheets were issued in 2022 according to the edition plan. However, the data for the publication of the map work in the form of file data and through the viewing services of the ČÚZK Geoportal was being updated.

During the update, attention was given to significant changes in the topography throughout the Czech Republic - newly commissioned roads and large buildings were added, the boundaries of administrative units were adjusted and the names of the displayed streets were maintained.

In the first quarter of the year, the vector geographical models of Data50 and Data200 were regularly updated and published in unchanged form. The mentioned products have been provided as open data since 2019.

The last time data was produced for the State Map 1 : 5 000 (SM 5) in 2022. This map is mainly used in spatial planning and projecting. SM 5 is designed as an automatic visualization of selected types of objects from the data of ISKN, ZABAGED®, Geonames and the Database of geodetic control. In 2022, 16,271 m.s. were published with the status as of 1.1. 2022. In the future, the above-mentioned ZTM 5 will replace this map.

6.6. Orthophotographic Representation of the Czech Republic

Orthophoto CR created by the orthogonalization of aerial photographs has been widely used in various information systems. The private subjects based on the frame agreement are carrying out aerial photography. Orthophoto processing is ensured by the ZÚ in cooperation with the Military Geographic and Hydro-meteorological Office (VGHMÚř). At present, the aerial photographs are taken solely by digital cameras, which enables simplification of data processing and improvement of their photo interpreting quality. Since 2012 the aerial photographing of the

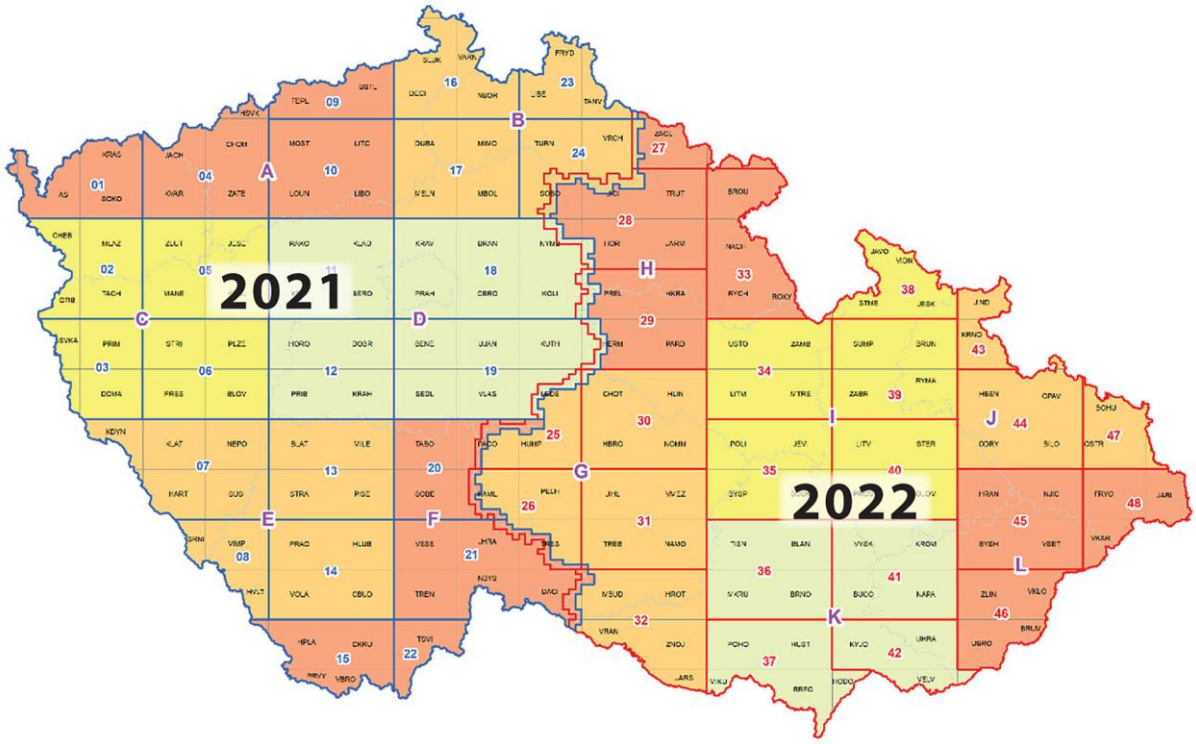
CR territory has been realized in two-year cycle, in 2021 the western half of the CR was completed, following photographing of the eastern part. Unlike the previous years, the boundary between East and West bands was changed. Division between East and West bands takes into account the administrative boundaries of the region, which will better fit for purpose of the project of Digital technical maps of regions (DTM), resp. Digital map of public administration.

In 2022 photography was launched in May 8, last pictures have been taken in July 21, thanks both to favourable weather conditions and minimum technical problems at providers it was completed 7 days earlier than in 2021. Together 41 110 pictures were handed over by the provider. In total 44 300 photos were taken, which means nearly twice more than in the past (in 2020 it was only 24 259 photos) due to the changed pixel size in 2021 from 20 cm to 12.5 cm.

Airborne photography taken from the eastern part of the republic served as a basis for updating of the Orthophoto ČR on 7 958 map sheets of SM 5. Orthophoto ČR is provided in datasets, further via viewing services and based on individual orders in the printed form. Data are in raster format JPEG and are georeferenced in the coordinate system S-JTSK or WGS 84.

Orthophoto of the Czech Republic is used as a geographical orientation basis for processing various projects, in map portals, for the revision of the real estate cadastre, for updating ZABAGED®, for DTM creation etc. The Orthophoto ČR with pixel size 12.5 cm reaches on well identified points the positional accuracy of 0.25 m on the terrain level.

Aerial Survey Photography of the Czech Republic in 2021 – 2022



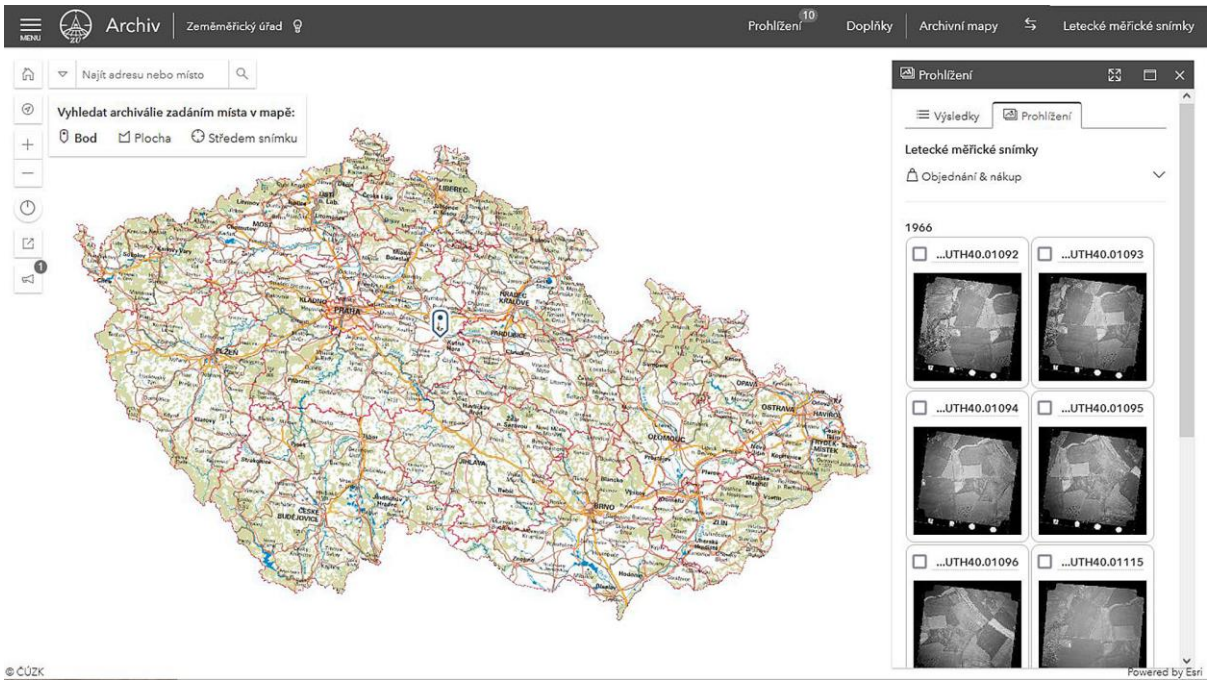
Beside the up-to-date orthophoto also file data of the archival black-and-white orthophotos from years 1998 – 2001 and colour orthophotos from 2003 are provided. Archival orthophotos are published via WMS viewing service as well. The users can identify very dynamical changes of the territory from relatively long time photo series.

Since 2011 ZÚ cooperates with VGHMÚř in the area of scanning old aerial photographs besides provision of updated aerial photos and Orthophoto ČR. Scanned photographs together with newer photos taken already by the digital cameras can be viewed in the application Archives https://ags.cuzk.cz/archiv/ and can be distributed as the raster datasets. By the end of 2022

aerial photographs from years 1936-1938, 1940, 1942, 1946-1969, 1971, 1975 and 1997-2022 were available to users.

Control Measurement for Orthophoto ČR Verification

Application Archive – Browsing Environment for Archival Aerial Photographs



6.7. Standardization of Geographical Names

Land surveying activities in the public interest include, according to § 4 letter a) of Act No. 200/1994 Coll. "standardization of the names of non-residential geographical objects from the territory of the Czech Republic and the names of residential and non-residential geographical objects from the territory outside the Czech Republic". The results of standardization activities in the area of geographical names are kept in the database of geographical names of the Czech Republic Geonames, managed by the Secretariat of the Nomenclature Commission (SNK) of the ČÚZK under the jurisdiction of the ZÚ, and in the World Names database.

The Geonames database provides a complete set of information on standardized geographical names and names of territorial units (in total 165 types of designated objects) and names of settlement units. The Geonames database facilitates the access to terminological data, allows their analysis for the needs of onomastic and historical research. It is more often used in map portals, web applications and search services. Alongside with the ZABAGED® data it provides users with an integrated view of the territory of the Czech Republic. It is a source for publishing state map series in different scales.

In 2022, updating of the Geonames database was going on, harmonized with updating of ZABAGED® together with digitization of cadastral maps. After completing the data integration in both mentioned applications, geographical names have been connected directly to the objects, and set into the database only once without regard to the number of their occurrence in the map. In accordance with ZABAGED®, updating geographic names were updated on 1 142 ZM 10 map sheets and on 60 ZM 50 map sheets in 2022. In cooperation with cadastral branch offices, the updating of geographical names was carried out in the range of 554 cadastral units.

6.8. Archival maps

http://archivnimapy.cuzk.cz

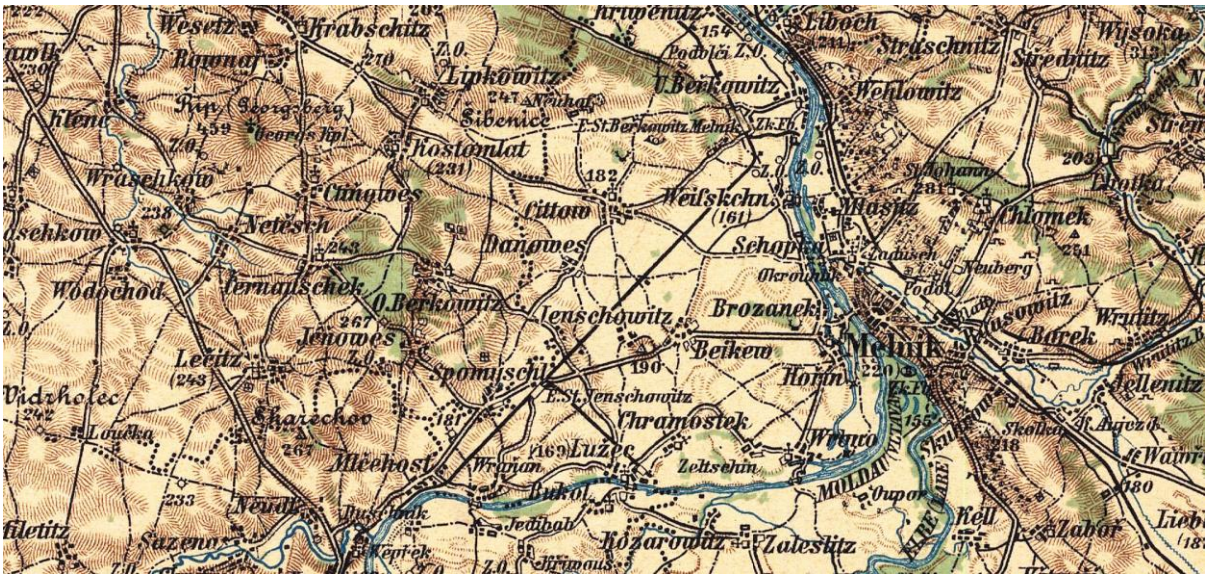
Central archives of land surveying and cadastre (ÚAZK) is a public specialized archive, the main activity of which is taking over and registration of branch archival documents, their proceeding and systematic digitization which enables making them public in the largest range both to the professional and non-professional public. ÚAZK is under responsibility of Land Survey Office; its seat is in the building of cadastral and land surveying offices in Kobylisy. Archival materials are stored in specially equipped rooms; a public research room, enabling to study directly the originals, is also located there. For storage of large archival funds serves also a depository located in Pardubice.

Funds and collections of the ÚAZK were enriched by many valuable pieces not only from the current ZÚ production (mandatory copies) but also from the discarding procedures or as gifts from institutions and private persons in 2022. Further 31 411 raster maps were scanned together with 3 130 copies of non-map material. Data about registered archival materials are concentrated in the database, chosen parts of which are published in the application Vademecum https://uazk.cuzk.cz/vademecum/.

The archival documents can be viewed via application Archive https://ags.cuzk.cz/archiv/; maps ÚAZK and archival documents are available in the data file as well. The most used archival documents are still Imperial mandatory prints of the Stable cadastre from 1824 to 1843 in scale of 1: 2880, included the comparison records of areas between 1845 and 1948 as well as documentation of follow-up cadastral works. Available are also maps created based on the military mapping from the end of 19th century, post-war topographic maps in the system S-1952 as well as collection of maps and plans from the second half of the 16th century until 1850. Even so called indication sketches are published there, which are physically stored in other archives.

General maps of the 3rd military mapping 1:200,000 in various editions between 1891 and 1955 were newly published in 2022 from the archive funds of the ÚAZK.

General Map of the 3rd Military Mapping published in the Application Archive



In the Archive application, it is possible to browse - the all-over layers of significant map works: f.i. combined Land Cadastre, the combined imperial obligatory prints in the South Bohemian Region, nationwide coverage of the supplemented first edition of the State Map derived 1: 5 000, S-JTSK georeferenced Müller maps of Bohemia and Moravia from the beginning of the 18th century. All digitized maps can be ordered in eShop of the ČÚZK Geoportal in the form of digital sets in printing quality.

In addition to remote access to the archives, researchers are also allowed to view the archives in the archive's research room. After a number of restrictions in recent years because of the government's emergency measures caused by the COVID-19 epidemic, the frequency of visits has slowly begun to return to pre-epidemic levels. However, the total number of 129 research visits for 2022 was so far roughly half of the annual numbers before 2020.

7. Provision of Data, Services and OpenData

ČÚZK provides data, which are collected based on legal obligations in various formats and coordinate systems. It also provides data according to open format standards for open data and through viewing and downloading services.

All published datasets are updated continuously. Updates of data and services for publication are performed continuously for data sets of the real estate cadastre and RÚIAN, quarterly for ZABAGED® data and medium-scale map works, and annually for other data sets. The data is provided based on a license, in most cases according to the standardized license CC-BY 4.0. The license associated with a given data file is always part of the metadata.

All data files, services, applications and map compositions provided by ČÚZK are equipped with metadata, information about data or services, according to which it is possible to search, compare and subsequently decide on the appropriate use of data or services. Metadata are available on the ČÚZK Geoportal, from where they are harvested on the National Geoportal, which further mediates their distribution on the INSPIRE Geoportal. If the data is provided as open data, i.e. in a machine-readable format, without restrictions on use (except information about the source), the metadata is also published in the National Open Data Catalogue in accordance with the Act on Free Access to Information.

Data sets are provided through standardized services. Data viewing via viewing services (WMS) and optimized pre-prepared tiles for faster responses in WMST format. Downloading vector data is possible online via WFS (Web Feature Services) services, for raster data via WCS (Web

Coverage Services). For online access to data, it allows machine downloading of data in the form of pre-prepared files - ATOM. Services are available at https://services.cuzk.cz/ , https://geoportal.cuzk.cz/ and https://atom.cuzk.cz/ .

7.1. INSPIRE

ČÚZK branch is a key provider of basic datasets for the Infrastructure for spatial information in the EU INSPIRE (see Directive 2007/2 / EC). According to the Act No. 123/1998 Coll., and § 4 of the Act No. 200/1994 Coll., ČÚZK provides basic data sets, which are harmonized in accordance with the INSPIRE data specification in GML format. Above these datasets network services have been created, which enable searching, viewing, downloading or transformation of data and their provision via Geoportal ČÚZK. Data are provided in the coordinate systems S-JTSK and ETRS89.

The theme Parcels (CP) is published from ISKN, the themes Buildings (BU), Addresses (AD) and Administrative units (AU) are published from RÚIAN. From ZABAGED® it is the Transport network (TN), Hydrology (HY) and Land use (LU) themes, from Geonames it is the Geographical names (GN), from DMR 4G and DMR 5G the theme Elevation (EL) for GRID and TIN data model and Orthoimagery (OI) is from the Orthophoto CR database. The Geographical grid systems (GGS) are being prepared from the data of geodetic control. All datasets are continuously updated. Based on the approved INSPIRE implementation strategy ČÚZK is the gestor of approximately one third of National INSPIRE datasets.

In the extended data model corresponding to the scope of data provision at the national level, the CPX data set is provided for the theme Parcels.

INSPIRE services are implemented to the same extent as national services, i.e. WMS, WFS, ATOM, WCS.

Data download services are implemented in the form of WFS and WCS services, which allow direct access to data, and from ATOM services, which are used to download pre-prepared data available as open data. In 2022, the compatibility of INSPIRE download services was supported to meet validation tests on the European portal, to increase the quality of services, which is regularly monitored by the European Commission.

7.2. Open Data

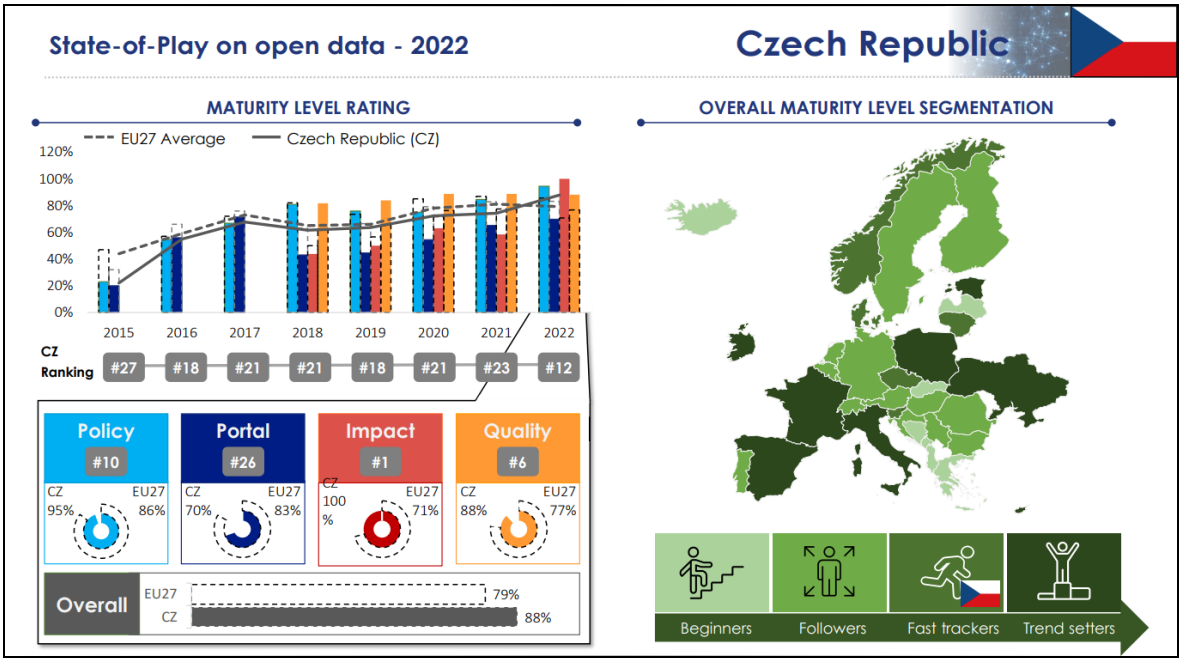
Data sets are also provided in accordance with the requirements of the Act No 106/1999 Coll., on Free access to information, in machine-readable format without significant restrictions on use, i.e. as open data. Thus, 36 series of data sets and more than 137 thousand data files are provided. Metadata exists for each file.

ČÚZK open data is provided in accordance with open formal standards. The local open data catalog, which provides metadata about open data, is harvested daily to the National Open Data Catalogue (NKOD).

The data provided for the INSPIRE infrastructure are harmonized according to the requirements of the European Commission and are provided to the same extent as in the entire European Union. Land and building datasets are added beyond the requirements of INSPIRE in the extended data model. The data is provided in two coordinate systems in open XML format through WMS browsing services. Data download is possible via WFS services or via ATOM services for pre-prepared data sets.

In 2022, we continuously updated more than 137 000 open data sets of ČÚZK, which we have registered at NKOD. For the data sets managed by us, we have introduced the principle of data series, which improves the search and viewing of data sets on NKOD. We are now publishing information from the resort's official boards.

Development of Open Data in the CR



We have also prepared an amendment to our local ČÚZK catalogue (LKOD), which fulfills the NKOD. The main modification consists in replacing approx. 137 000 data sets with approx. 30 data series linked to the services (ATOM, WFS and WCS) providing the data sets. With the amendment, we are trying to respond to the upcoming increase in the number and volume of provided open data of the ČÚZK, which is foreseen by the amendment to the Land Surveying Act (Parliamentary Press 163, https://www.psp.cz/sqw/text/historie.sqw?o=9&T=163) with proposed effect from 01/07/2023.

7.3. ČÚZK Geoportal

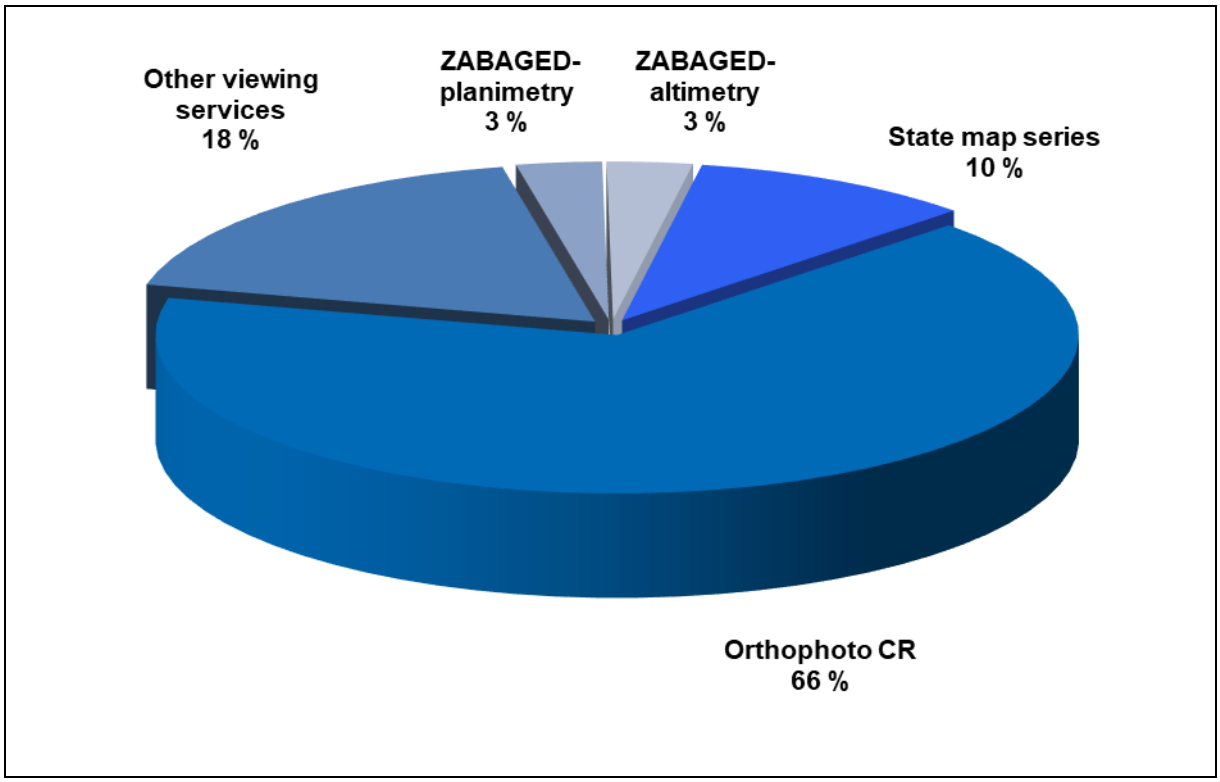
https://geoportal.cuzk.cz/

The ČÚZK Geoportal enables centralized access to map products and services of the branch. It is possible to find information (metadata) on spatial data, services and applications in responsibility of the branch in one place, it enables viewing and ordering electronic or printed data and services. Network services are used also in geographic information systems, map portals and web applications of other providers. Via ČÚZK Geoportal the results of the obligations resulting from the INSPIRE Directive are provided to the National INSPIRE Geoportal and information is being harvested from there to the European INSPIRE Geoportal.

By means of the internet shop (eShop application) it is possible to order data not only in existing vector and raster formats, but also, for example, in GML format (ZABAGED®, Geonames and INSPIRE themes data). The client has the possibility to select required data according to the sheet line system or according to square units for direct files. The most often provided datasets are ZABAGED®, Orthophoto CR and raster form of the Base map of the Czech Republic 1 : 10 000. Viewing services are most popular with Orthophoto CR. To simplify the processing of orders or their payment there is a payment portal for users. The biggest data amount is provided to users from the public administration.

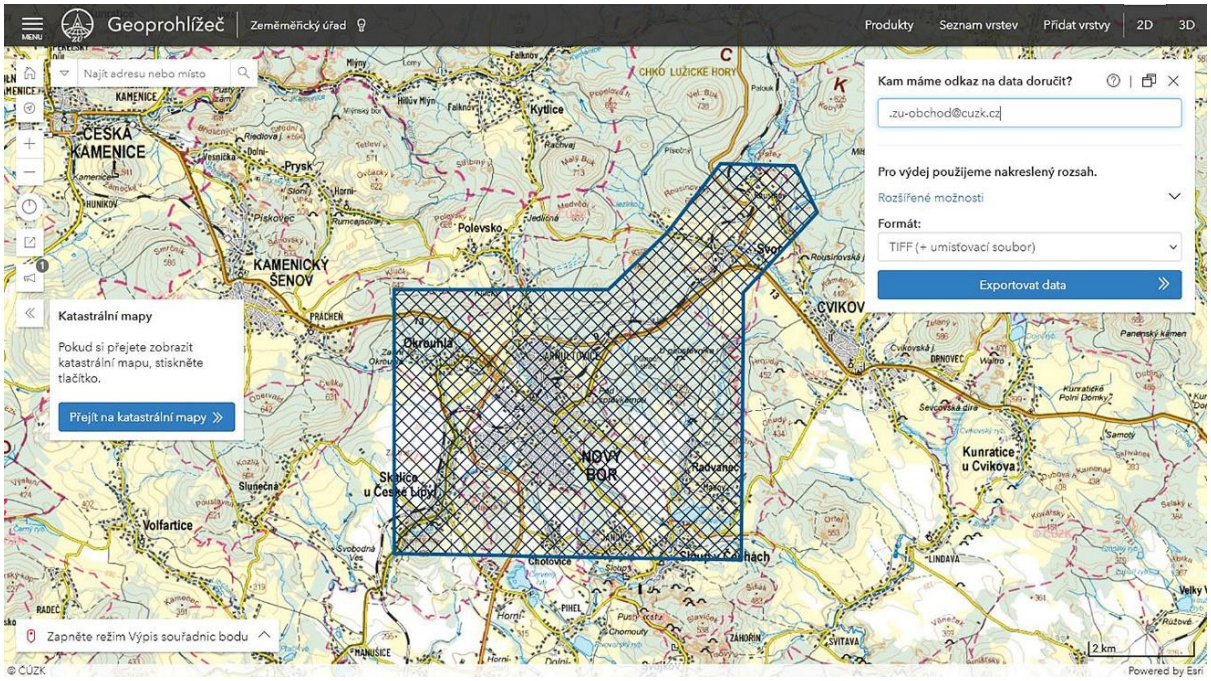
Use of data via network services and applications has been growing during last years. Available data are provided with maximum up-to-date content and defined service quality (SLA).

Access to Viewing Services of ČÚZK Geoportal (Fig 12)



For viewing and data analyzing, users of the ČÚZK Geoportal have at their disposal web applications created on the unified programming platform ArcGIS API for JavaScript 4.x. The applications have a uniform appearance and control, full functionality is ensured even on mobile devices (tablets, smartphones, etc.), and thus the use of map applications in the field is supported. Individual applications can be launched separately from the ČÚZK Geoportal environment or from the central map application Geoviewer.

Geoviewer with the Possibility of Testing Functions for Downloading of Raster Data



The most recently innovated application Names of the World has been added to the Archive applications (together with access to the Archive Maps and the Aerial Survey Archive) and the Altitude Analysis application. Through the modern way of using gadgets (widgets), the functions Error reporting, Comment on the existence of point field points and Coordinate transformation are available.

In 2022, preparations continued for the technical security of the wider provision of open data. For the time being, it is possible to download the Data50 and Data200 sets from cartographic products as open data directly in the Geoviewer environment. In this way, users can obtain small-scale seamless data defined by the viewport of the current map window. Geoviewer is also ready for wider use as an ATOM client of the ČÚZK service, which is a service for obtaining a list of links to download pre-prepared data files in the area of interest. Users are offered the opportunity to test the mentioned function on a sample of data from an area of approximately 4500 km^2; it is possible to download data from the new series of Basic topographic maps.

8. Economics and Human Resources

8.1. Employees and Education

By December 31, 2022 together 4 908 persons were employed in the ČÚZK branch, 4 547 out of them were civil servants and 361 ordinary employees. Neither educational and age structure nor the share of women in the branch has significantly changed in the long-term perspective. Traditionally prevailing share in educational structure have employees, who reached the secondary school education (54.7 %), second place belongs to the employees with University degree (40.9 %).The most numerous age group was created by the employees aged 41-50 (35.0 % from all) and further by employees aged 51-60 (34.8 % from all).

Physical State of Employees by 31.12.2022

ČÚZK Branch	Age Structure						Women	Graduated
	to 30	31-40	41-50	51-60	61 and more	In total		
Civil Servants	244	685	1619	1553	446	4547	76.2 %	42.7 %
Employees	10	26	101	155	69	361	72.0 %	15.2 %
Total	**254**	**711**	**1 720**	**1 708**	**515**	**4 908**	**75.9 %**	**40.9 %**

One of key tasks in the management of human resources was carrying out tenders for civil service vacancies. In 2022, in total 672 tenders were prepared in the ČÚZK for vacant service positions (at some positions repeatedly); based on their results 387 successful candidates for civil service were chosen either for civil service position or appointed to the civil service position head; 34 tenders were due to be completed in the beginning of 2023. Together 57.6 % of all tenders for service position carried out in 2021 were successful and the applicant was chosen. Some civil servant positions were successfully occupied based on ordinary employee transfer without tender in accordance with the Act on Civil service, and the final successful number is then 59.0 %. The number of carried out tenders was significantly higher than in 2021 (by 53) and the success rate increased by 5.7 %. Civil service positions can be temporarily occupied by the ordinary employees according to the § 178 of the Act on Civil service. Together 101 such tenders were carried out in 2022, 40.6 % of which were successful. Regarding occupation of 35 positions of ordinary employees, the total success was 28.6 %. It was significant yearly decrease in 2022.

During 2022 in total 328 civil servants and 94 ordinary employees terminated their employment. The rate of fluctuation was 8.6 % in 2022 that is 0.6 % higher than in 2021 and in opposite to 2021 the tendency rate was persistent.

Fluctuation Rate in Previous Years

Year	Terminated Employment	Rate of Fluctuation
2022	422	8,6 %
2021	398	8.0 %
2020	299	6.0 %
2019	417	8.3 %
2018	374	7.4 %

By December 31, 2022 the number of women in managerial positions was 352 (57.9 %) in the ČÚZK branch from the total number of 608.

Share of Women in Leading Positions by 31.12.2022

Management Type	Civil Servants			Employees		
	Number of Heads	Women out of Them	Women Share	Number of Heads	Women out of Them	Women Share
Head of the Staff Office	23	5	21.7 %	0	0	
Section Director	14	9	64.3 %	0	0	
Department Director	135	62	45.9 %	2	1	50 %
Division Director	417	264	63.3 %	17	11	64.7 %
Total	**589**	**340**	**57.7 %**	**19**	**12**	**63.2 %**

In the first quarter of 2022, a regular service evaluation of civil servants was carried out for the period from January 1, 2020 to December 31, 2021. 4 212 civil servants were evaluated in the service offices of the ČÚZK department, of which 570 were superiors. 15.8 % of them were evaluated with excellent results, 40.1 % with very good results, 40.5 % with good results, and 3.6 % of the total number of civil servants were evaluated with satisfactory results. Only two civil servants were evaluated with unsatisfactory results. The next regular service evaluation will take place in the first quarter of 2024, the period from January 1, 2022 to December 31, 2023 will be evaluated.

Service Evaluation of Civil Servants between 1.1. 2020 and 31.12. 2021

Civil Servants	Number of Assessed	Assessment Results				
		Excellent	Very Good	Good	Satisfactory	Unsatisfactory
Superiors	570	384	177	9	-	-
Other Civil Servants	3 642	280	1 514	1 695	151	2
Total	**4 212**	**664**	**1 691**	**1 704**	**151**	**2**

Another main priority in the area of the human resources was education of employees. It was carried out in 2022 based on the approved Plan of education in the Czech Office for Surveying, Mapping and Cadastre in accordance with stated individual goals for personal development of civil servants. Personnel departments of individual administrative offices prepared many educational activities for their employees focused on the problems of real estate cadastre, human resources management, legislation and law, economics and accounting, IT and other areas of professional education. Moreover, the ČÚZK personnel department prepared or participated in preparation of 21 specialized team workshops for chosen workers from all branch offices as well as for the internal lecturers, many of them repeatedly, mostly with help of external lecturers, in total in 24 terms. Based on the good practices from previous years of pandemic situation caused by COVID-19 most workshops were carried out in a hybrid environment, both in person and on-line.

In the period from January 1 to December 31, 2022, in total 167 tests from general part of civil service tests were carried out in the ČÚZK. In the same period, 182 tests were carried out from the professional part of civil service tests namely branch No 55, land surveying and real estate cadastre that falls within the scope of ČÚZK. Of the total number, 19 cases involved employees or civil servants who did not have a prescribed requirement for an official examination in the given service branch. Seven applicants were not successful in the general part of the test and four in the professional part. Six applicants have repeated the test in 2022, five of them successfully. In comparison to 2021, the number of carried out general tests was 28 more in general and 36 in professional part. Further 20 branch employees passed the professional tests from other branches of civil service in other offices, namely service branches No 1, 3, 22, 27, 28, 37 and most often 63.

8.2. Granting Official Authorization for Verification of Results of Land Surveying Activities

Within granting official authorization for certification of the results of surveying activities professional competence exams for authorization were held in five terms in 2022 in accordance with section 14 of the Act on Surveying and mapping (February, May, October and November).

The total number of completed applications was 47 and the official authorization was newly granted to 28 applicants and 8 applicants enhanced their existing authorization. One authorization was granted based on the recognition of the professional qualification. The other cases were solved as follows: 1 applicant did not pass the exam repeatedly and his application was refused and 2 applicants took the application back. Six participants did not succeed; nevertheless, they are going to repeat the exam in 2023. Two applicants were not able to participate in the exam because of illness and so they will be invited to the exam in the beginning of 2023. Another 5 participants submitted their requests in the end of 2022 and so they will be invited to the exam in the beginning of 2023. In 2022, no official authorization was deleted from the registry.

8.3. Economics

The Chamber of Deputies of the Parliament did not approve the Act on the State Budget of the Czech Republic for the year 2022 before the first day of the budget year 2022, and in the period from January 1 to March 18, 2022, the state administration operated with the provisional budget. The Act No. 57/2022 Coll., on the state budget for 2022 came into force on 19 March 2022 and for the ČÚZK chapter contained an expenditure budget of CZK 3 616 million and a revenue budget of CZK 1 485 million. During the year, the Act on the State Budget for 2022 was amended, which for the ČÚZK chapter included a corresponding increase in operating expenses and non-tax income by CZK 60 million. After the change, the total expenses of the chapter's budget amounted to CZK 3 676 million and total income to CZK 1 545 million.

The department's expenditure budget was modified in 2022 by fourteen budgetary measures under the competence of the Ministry of Finance. Over the course of the year, there was a total

increase in the budget of expenses by CZK 65.2 million, mainly for salaries and related expenses from the chapter General cash management for CZK 65 million. CZK 0.5 million was provided from the budget of the European Union (EU) for the project Insulation of the KÚ building for the Zlín Region, and CZK 0.4 million from the New Green Savings Program of the Ministry of the Environment. On the other hand, expenses were transferred both to the budget of the Ministry of the Interior for the payment of services for the management of basic registers (for 0.7 million CZK), and to the budget of the Authority for representing the state in property matters (ÚZSVM) (0.2 million CZK). The second one covered the operating expenses of the central archive in České Budějovice, which was handed over to the ÚZSVM. Furthermore, the Ministry of Finance approved several budget measures, which made the required changes to the state administration systematization by moving funds between salaries of employees, salaries of civil servants, other payments for work performed, program expenses and other in-kind expenses. In addition to these budgetary measures approved by the Ministry of Finance, the offices carried out ten budgetary measures within the competence of the department, which they used mainly to shift expenses from investments to operating expenses to cover the increased prices of energy and services. As part of the permitted exceeding of binding indicators, entitlements from unconsumed expenses were used for CZK 87.3 million, of which the amount of CZK 59.7 million was used for program expenses, including EU projects.

The tax revenue budget was set at CZK 1 200 million, and its fulfilment reached the volume of CZK 1 152.8 million, i.e. 96.1 %. Compared to 2021, the collection of administrative fees decreased by CZK 338.4 million. This decrease was mainly caused by decrease in the number of proposals for the deposit of lien rights due to a lower number of mortgages. Non-tax revenues in 2022 were set at CZK 280 million, and due to real estate cadastre data provided mainly by remote access, they were fulfilled for CZK 292.9 million, i.e. at 104.6 %. Revenues from the EU budget were achieved in the amount of CZK 44.94 million, including the project within the framework of the IROP- Information System of Digital Public Administration Maps (CZK 44.87 million) - and the heating of the KÚ for the South Bohemian Region (CZK 0.06 million) within the operational plan for environment.

The total utilization of the 2022 expenditure budget was CZK 3 685.6 million. The largest part was made up of funds for salaries of civil servants, salaries of employees, agreements on the performance of work and severance pay, including mandatory insurance premiums and Fund of cultural needs (FKSP) in a total volume of CZK 2 837.8 million. These expenditures accounted for 77 % of the chapter's total expenditures. The average monthly income in the resort reached CZK 36 085 in 2022, i.e. a year-on-year increase of almost 3 %.

The second largest part of the expenses of chapter 346 of the ČÚZK was expenses of an operational nature for CZK 661.3 million, mainly for data processing and services related to information and communication technologies for CZK 181 million, and postal services for CZK 155.6 million. Other operating expenses were used for renting buildings and computer equipment (CZK 34.6 million) and expenses for the purchase of materials (CZK 32.5 million). Compared to 2021, the largest increase was recorded in operating expenses for the purchase of water, fuel and energy, which amounted to a total of CZK 100.1 million (CZK 51.2 million was spent on electricity-CZK 25.7 million in 2021), where there was an almost two-fold increase, and also the purchase of gas CZK 15.7 million (6.6 million CZK in 2021). Wage compensation during illness was drawn for CZK 37.5 million, which is increase more than by one third compared to last year (CZK 27.6 million). The remaining part covered expenses for employee meals, travel expenses and training and education services. Further, it was used for property repairs and maintenance, data and voice telecommunications services, and a membership fee to the international organization EuroGeographics.

A significant part of the expenses (CZK 172.6 million) was investment expenses for the financing of programs managed in the EDS/SMVS program financing information system, i.e. for the acquisition and restoration of tangible and intangible assets of the department. The share of these expenses in the expenses of the chapter was for 5.1 %. A substantial part of investment expenditure was represented by expenditure on ICT, primarily software equipment (CZK 102.2

million) and the purchase of computer technology (CZK 35.9 million), as well as expenditure on machinery and equipment (CZK 16. 7 million) mainly for measuring equipment, building reconstruction (CZK 15.0 million) and at least for the renewal of transport equipment (CZK 2.8 million).

Revenues and Expenditures of the State Budget - Chapter 346 ČÚZK

Index/ Year	2018	2019	2020	2021	2022
Revenues of the chapter (in CZK thousands)	849 376	880 856	1 452 676	1 854 299	1 490 690
Out of it: revenues for administration fees	618 146	620 995	1 170 170	1 491 282	1 152 849
Income from EU budget	0	9 418	16 547	22 763	44 938
Total expenditure of chapter	3 327 114	3 540 266	3 606 067	3 668 161	3 685 598
Out of it: projects co-financed from EU budget	11 697	20 473	26 165	68 434	61 308
Current expenses without non-investment	3 079 634	3 302 312	3 399 240	3 392 578	3 499 054
Including: wage resources	1 832 443	1 992 878	2 058 158	2 044 192	2 091 690
Insurance and FKSP	659 433	715 280	735 934	730 050	746 105
Other material expenditure	587 758	594 154	571 055	618 336	661 259
Program expenditure	247 480	237 954	240 920	275 583	186 544
Including: non-investment	33 537	42 781	34 093	52 651	13 949
Investment	213 943	195 173	206 827	222 932	172 595
Number of employees in Sector	4 957	4 956	4 849	4 847	4 823
ČÚZK	136	135	137	141	141
Cadastral Offices	4 361	4 358	4 261	4 259	4 232
Land Survey Office	376	379	370	366	368
Survey and Cadastral Inspectorates	84	84	81	81	82

9. Inspection and Supervisory Activity

9.1. Professional Inspection and Supervision

Inspection of state administration of the real estate cadastre, supervision over the certification of results of land survey activities used for the real estate cadastre and state map series, and decision-making on appeals against first instance decisions of cadastral offices are delegated by law to the 7 surveying and cadastral inspectorates (ZKI).

Only some data from the complete ZKI activities statistics for the year 2022 are published here. ZKI received in total 35 complaints and 392 other submissions. The extent of decision-making agenda on appeals against decisions of KÚ decreased mildly in comparison to 2021 (268 appeals delivered in 2022 as opposed to 320 appeals delivered in 2021). The quality of decision-making activities of cadastral offices as first step authorities improved slightly in 2022 (40.3 % KÚ decision were proved illegal as opposite to 41.2 % in 2021). The number of appeals in matters regarding correction in cadastral documentation decreased by 18.9 % in comparison to 2021 (154 appeals delivered in 2022 as opposed to 190 delivered in 2021). The number of appeals in matters regarding objections against the content of renewed cadastral documentation decreased by 21.2 % last year (41 in 2022 as opposed to 52 in 2021). Finally the number of delivered appeals against procedural decisions of KÚ decreased by 8.8 % in 2022 in comparison to 2021 (52 in 2022 as opposed to 57 in 2021).

ZKI performed in total 1 309 documented inspection actions (the increase of 12.2 % occurred in comparison to 2021, when 1 167 inspections were performed). In the framework of supervisory activity regarding certification of the results of land survey activities ZKI performed in total 249 documented supervisory actions in 2022 (increase by 6.9 % in comparison to 2021, when 233 actions were performed). In 18 from 21 cases (14 in 2021) in the subsequently conducted administrative proceedings ZKI decided that the verifier of the result of land surveying activities had committed an administrative offence of infringement of order in the sphere of surveying and imposed fines at a total of CZK 368.0 thousand (CZK 251.5 thousand in 2021). ZKI also received 9 applications for measures against inaction and following requests:

4 requests for renewal of proceedings,
4 requests for review proceedings,
9 requests for information pursuant to Act No. 106/1999 Coll., on Free access to information,
49 requests for extradition of the authorization to verify the results of surveying activities, and
41 applications for the issue of a service card for entry to real estate.

Particular cases of discovered insufficiencies were specified and commented in ZKI half year analyses, which are systematically organized according to unified concept and regularly handed over to other ČÚZK departments for further utilization. Internal branch publicity has been ensured via branch intranet.

Systematic inspection activity of ZKI in 2022 focused mainly on:

• entry proceedings with documents in electronic form and review of the procedures of the KÚ in entry proceedings, where the proposal for the proceeding was submitted electronically (by data box, via eMail, or in person or by post on a data carrier) with an attached entry document in electronic form,

• checking the implementation of cadastre revisions together with methodological assistance provision to KÚ,

• checking the implementation of cadastral documentation renewal by new mapping together with methodological assistance provision to KÚ.

Complaints

Inspectorates	Not resolved at 1.1.	Received after 1.1.	In total	Forwarded	Legitimate	Not legitimate	Still being resolved
in Brno	-	4	4	2	-	2	-
in Č. Budějovice	-	2	2	-	-	1	1
in Liberec	-	4	4	3	1	-	-
in Opava	-	7	7	4	-	3	-
in Pardubice	1	5	6	4	-	2	-
in Plzeň	-	4	4	2	-	2	-
in Praha	-	9	9	7	2	-	-
Total	**1**	**35**	**36**	**22**	**3**	**10**	**1**

Other Submissions according to the Part IV of the Inspection Rule

ZKI	Not resolved at 1. 1.	Received after 1. 1.	In total	Referral for no jurisdiction	Resolved	Still being resolved
in Brno	5	92	97	9	85	3
in Č. Budějovice	8	91	99	9	85	5
in Liberec	1	15	16	-	16	-
in Opava	-	38	38	4	34	-
in Pardubice	-	50	50	6	43	1
in Plzeň	-	24	24	2	22	-
in Prague	1	82	83	12	70	1
Total	**15**	**392**	**407**	**42**	**355**	**15**

ZKI Decisions on Appeals against KÚ Decisions

Matters	Not resolved at 1.1.	Received after 1.1.	In total	Appeal rejected	KÚ decision changed	KÚ decision repealed and proceeding terminated	KÚ decision repealed and returned to KÚ	Decision annulled	Still being resolved	Faulty and Forwarded proceedings
Correction of errors in the cadastre	21	154	175	87	21	1	37	7	15	7
Objections to revised cadastral documentation	11	41	52	27	3	1	12	1	7	1
Infringements of order in the sphere of the cadastre	-	2	2	-	2	-	-	-	-	-
Procedural	4	52	56	23	4	-	17	7	4	1
Changes in the boundaries of cadastral districts	-	1	1	-	1	-	-	-	-	-
Administrative fees	-	3	3	2	1	-	-	-	-	-
Rejection of applications for submission of information	1	11	12	10	1	-	1	-	-	-
Other	-	4	4	2	-	-	-	2	-	-
Total	**37**	**268**	**305**	**151**	**33**	**2**	**67**	**17**	**26**	**9**

ČÚZK (as relevant central administrative office) performed in 2022 inspection of delegated powers conferred on the regional institutions and Prague-city in the area of RÚIAN. In 2022, together 6 inspections were carried out in regional offices (South Bohemia, Plzeň, Zlín, Moravia-Silesia, Ústí nad Labem and Liberec). General information for the year 2022 about their results is published on the ČÚZK website in accordance with the § 26 of the Inspection Rules.

9.2. Financial Inspection

ČÚZK ensures public inspections in the subordinated bodies according to the Act No. 255/2012 Coll., on Inspection (Inspection order), Act No. 320/2001 Coll., on Financial inspection in public administration (further only Financial Act), and to its implementing Decree No. 416/2004 Coll. Public inspection is integral part of the financial inspection system.

According to the approved plan of public administration inspections for 2022, the inspection group of ČÚZK carried out public administration inspections at following 6 inspected bodies:

KÚ for the Region South Moravia, KÚ for the Region Pardubice, KÚ for Prague-city, land Surveying Office and ZKI in Pardubice and Brno.

During public administration inspections, partial deficiencies were detected in the inspected entities (with the exception of the ZKI in Pardubice), which were to be rectified, or to prevent repetition, the inspected persons submitted proposals for corrective measures to the president of the ČÚZK. The adopted measures related in particular to improving the performance of financial control during the awarding of public contracts, procedures for verifying the identity of applicants for the provision of data from the real estate cadastre, and conducting documentary inventories of assets and liabilities in the sense of generally binding and internal regulations. When providing travel reimbursements, it will be necessary to focus attention on consistent compliance with financial control procedures in accordance with implementing Decree No. 416/2004 Coll., to the Financial Act. In 2022, by carrying out public administration controls at selected administration bodies, no deficiencies were detected that would have a negative effect on the management of the accounting units, or they met the parameters of a control finding or based the suspicion of corrupt practices. Unauthorized use of public funds was not detected, nor was there a violation of the conditions under which public funds were provided.

9.3. Internal Audit

Internal audit is a part of the internal inspection system in the ČÚZK branch based on the Financial Act No. 320/2001 Coll. It includes organizationally separate and functionally independent review and evaluation of the adequacy and effectiveness of management control, while the functional independence of the internal audit within the ČÚZK conditions as well as in the subordinated bodies is ensured through the relevant organizational rules. The internal audit function in all ZKIs is, in accordance with the Financial Act, replaced by an annual public-administration inspection.

In 2022, there were performed together 87 audits. In accordance with the relevant methodology of the Ministry of the Interior of the Czech Republic, internal audit plans included the implementation of internal reviews of setting criteria for improving the quality management system in service offices.

Out of the total number of performed internal audits were

• 18 financial audits, focused mainly on the audit of management and accurate presentation of assets in financial, accounting and other statements,

• 41 system´s audits, which examined the management of public funds and the financing of activities of subordinated offices,

• 14 performance audits that dealt with the operation of the internal control system, and

• 14 other, otherwise focused audits.

The internal audits carried out were mainly aimed at verifying the effectiveness of the internal control system, the legality of procedures and operations when spending public funds, compliance with budgetary discipline and ensuring the principles of expediency, economy and efficiency in the performance of public administration. Not one of the audits carried out in 2022 revealed deficiencies with a significant risk for the management of public funds. The internal control system in the department's organizational components is sufficiently effective, adequate and efficient and fulfils an important information function in providing timely and reliable operational, financial and other information to all levels of the management.

10. International Cooperation

ČÚZK actively participates in the work of international organizations being active in the field of the real estate cadastre, land registration and land surveying administration. Besides, it also actively cooperates with all neighbouring countries in the area of mutual data and information exchange based on bilateral agreements. It systematically ensures the interoperability of spatial data and related services according to European rules to enable their wide use in cross-border and European projects and solutions (f. i. in EUROSTAT). ČÚZK also prepares professional programs and excursions for foreign students or branch experts.

In 2022, even non-virtual conferences, workshops and other meetings began to take place again, and as part of the activities connected with the presidency of the Czech Republic in the Council of the EU, a plenary session of the Permanent Committee on Cadastre, organized by ČÚZK, was held.

ČÚZK is an active member of the organization EuroGeographics (EG), which associates mapping agencies and cadastral offices of European countries. EG enables experience exchange and mutual cooperation; it systematically develops the cooperation with the European Union bodies on building of the united infrastructure for spatial data in Europe. EG contributes to it by creating of pan-European products with harmonized parameters for all European countries, f. i. EuroRegionalMap, EuroBoundaryMap, EuroGeoNames, EuroSpec and Core Reference Data (CRD). EG negotiates experts´ involvement from member organizations into modifications of harmonization provisions included implementing rules of the INSPIRE Directive and helps to implement them on the particular member states level. The EuroGeographics General Assembly, the meeting of the heads of European mapping and cadastral agencies, was held in Sarajevo (Bosnia and Herzegovina) with more than 100 participants from 50 organizations in 40 European countries. EG organized a series of weekly workshops focusing on various areas of interest from the activities of its members. The same form of the on-line workshops have the KEN (Knowledge Exchange Network) meetings, followed in some cases by the webinar for wider audience (Quality KEN).

ČÚZK continued its active participation in the European section of UN-GGIM (United Nations Commission for Global Management of Geospatial Information established in 2011). The Plenary meeting was held in Geneva (Switzerland) with an active representation of ČÚZK. The meeting topic were not only the themes connected with the European section jurisdiction, but also with the global themes of the UN-GGIM Commission.

In 2022, the implementation of the INSPIRE Directive continued and ČÚZK representatives took part in both online webinars and the MIG (Maintenance and Implementation Group) technical workshop, which took place face-to-face in Brussels (Belgium) in November 2022. In addition, at Štrbské pleso (Slovakia) was also held an international conference "Inspire Us 2022" in December with the participation of two representatives of ČÚZK.

ČÚZK regularly monitors the activities of the Working Party on Land Administration (WPLA), working under the auspices of UNECE, which is engaged in land and real estate information and related thematic. In 2022, the representatives from the ČÚZK monitored the WPLA activities still only virtually.

The first meeting of the Permanent Committee for Cadastre in EU (PCC) was in 2022 held as a hybrid meeting in Paris (France) with participation of two representatives from ČÚZK, who took over the symbolic flag of the upcoming Czech EU Council presidency. The second meeting of the PCC in 2022 was organized by ČÚZK as a Joint Conference of EuroGeographics LR&Cadastre KEN and PCC in Prague, in the building of the Land Surveying and Cadastral Offices as a hybrid meeting. More than 30 delegates in person and another 30 ones virtually attended the conference. The conference focused on the role of the cadastre in supporting the development of the infrastructure necessary to achieve energy independence and support environmental goals.

37th meeting of cadastral service providers of succession state of the former Austro-Hungarian Empire, namely Croatia, the South Tyrol, Austria, Slovakia, Trentino, Hungary and the Czech Republic was held in Trieste in Italy after two years gap. Two participants from the ČÚZK actively participated in both topics, namely "Integration of cadastral data into the historical GIS" and "Cadastral data before and after pandemic".

In the field of geographical names, the ČÚZK sent its representative to the 1st Meeting of the Working Group on Geographical Names held in the United States (New York) in 2022, and to the 22nd Meeting of the Division for Central and South-Eastern Europe (ECSEED) held in Slovakia (Bratislava). In May 2022, ČÚZK - the secretariat for geographic names - hosted the 26th meeting of the ECSEED geographical names expert group. The one-day meeting took place in a hybrid format.

The preparation of the professional magazine Geodetic and Cartographic Review (GaKO) returned to the standard mode, when both (Czech and Slovak) editors met regularly to prepare each issue.

Some other international activities continued to be implemented either entirely virtually or as hybrid meetings.

11. Research and Development

ČÚZK performs the function of the founder of the Research Institute of Geodesy, Topography and Cartography, v.v.i. The main activities of the VÚGTK are:

- following applied and basic research in geodesy, land surveying and cadastre branch,
- development and testing of new methods, procedures and programs, and specialized consultations in the area of creation and management of the ISKN, photogrammetry and remote sensing of the Earth,
- geodesy, geodynamics, engineering, metrology and standardization, state map series creation and maintenance, development of special tools, equipment and measuring systems.

In the frame of metrological requests for the ČÚZK branch and activities connected with its membership in international association EURAMET, accredited calibrating laboratory is in operation in VÚGTK together with the authorized metrological centre. The Institute is also the accredited educational body and operator of the Land Surveying Library®.

In the course of 2022, VÚGTK participated in the solution of 10 projects from four domestic providers (TA CR, Ministry of Education, Culture, Sports, Science and Technology of the Czech Republic, MK CR, MPO CR), three vochers from the Central Bohemian Region and 4 international projects (2x GSA, 1x H2020 and 1x ESA/EUSPA). The most important projects included the "Galileo Reference Center - Member States" project supported by the EUSPA agency and the "Galileo Improved Services for Cadastral Augmentation Development On-Field Validation" project of the H2020 framework program. This project was initiated by the Council of European Surveyors (CLGE), with 14 institutions from a number of European countries participating in it. The content of the project is research, development and verification in practice of a new measurement technology based on PPP GNSS, preferably for the needs of the real estate cadastre. This technology is expected to replace networked N-RTK based technologies in surveying practice in the near future. Projects of the Beta 2 TA CR program were also significant, within the framework of which the research needs of the ČÚZK department were secured, or projects aimed at solving BIM issues in the CR (MPO CR).

In 2022, the GIS and Real Estate Cadastre research department also participated in the administration and maintenance of the MapOO v. 1.06 application in the ČÚZK department. In April 2022, MicroGEOS Nautil 4.16 and DIKAT 4.10 were released containing a modification to work with VFK 6.0 with UTF-8 encoding. In July 2022, in connection with the replacement of servers in the branch, it was necessary to modify the network security of the Groma application so that it responded to the IP address changes made. Subsequently, new installations of the MicroGEOS Nautil 4.16 and DIKAT 4.10 applications were created, which contain the modified Groma module.

In 2022, ODIS research department and the Land Surveying Library® tackled the NAKI II MK CR project "Garden-architectural creation in the period of totalitarian regimes in the years 1939–1989 in the territory of the Czech Republic" and, in cooperation with EuroGV, two projects in the field of BIM within the framework of the call of the MPO- Application. At the same time, in the mobility field, the institute managed a project of the Ministry of Education, Culture and Science, within the framework of which two foreign experts were guests at VÚGTK.

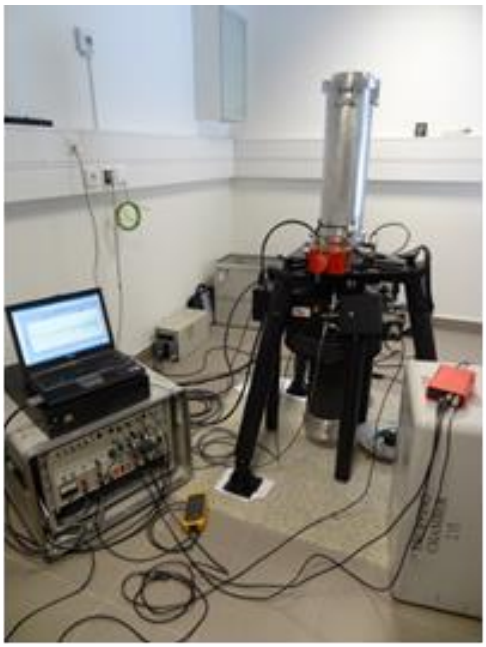
Land Surveying Library® has a unique and exclusive status not only in the Czech Republic but also in the international scale as for its documentation fund and specialization in the branches of geodesy, geography, geodynamics, metrology and real estate cadastre. It is connected to many activities of interlibrary cooperation and provides scientific information resources from the area of its competence. The library provides the background for scientific activities not only for all employees of the institute but also to professionals and to public.

Basic and applied research in the fields of geodesy and geodynamics has long been provided by research unit 24 geodesy and geodynamics located at the Pecný Geodetic Observatory in Ondřejov. In 2022, the department's research needs were met through the solution of an applied research and innovation project for the needs of the state administration within the BETA2 TA CR program "Refining the determination of changes in gravitational acceleration in the Basic Geodynamic Network and at absolute gravity points in the Czech Republic using absolute gravity measurements". As part of international scientific cooperation, the multi-year international projects "EGNOS Service Performance Monitoring" and "Galileo Reference Centre - Member States" for independent monitoring of the EGNOS and Galileo navigation systems, supported by the European Union Agency for Space, were successfully completed.

In 2022, successful cooperation with Italian partners continued as part of the European Space Agency (ESA) project to verify and refine the global model of tidal phenomena of the solid Earth with the aim of predicting risks using GNSS observations such as volcanic activity or earthquakes. International cooperation in the field of applied research also continued within the consortium of the international project GISCAD-OV (H2020) focused on research into the application of modern and effective methods for processing GNSS data in the field of real estate cadastre.

In 2022, the long-term cooperation of department 24 with the Czech Metrological Institute continued as part of the project solution of the Ministry of Education and Culture. The research was aimed at refining the measurement of absolute gravitational acceleration values using new measurement systems and at determining the uncertainty estimate of gravitational acceleration measurements using experiments and theoretical analyses. Gravitational acceleration values, determined with help of two absolute gravimeters and their time changes determined from superconducting gravimeter data at the Pecný gravimetric station, were sent to the international data centres of the International Geodetic Association (IAG). Another project of the Ministry of Education and Culture supported the activities of department 24 in the field of data processing of the DORIS satellite system.

Reference GNSS Station and State Standard for Gravity Acceleration at GO Pecný



As part of IAG's scientific services, the unit operated data and analytical centres for the processing of satellite navigation data (GNSS and DORIS) and gravimetric data, in 2022. In the

frame of this activity, the department also focused on the creation and dissemination of products obtained through data analysis. This activity contributed significantly to the implementation and maintenance of global geodetic reference systems for position and gravitational acceleration. In this way, the Institute also provided a national contribution to the fulfilment of the UN resolution "Global Geodetic Reference Frame for Sustainable Development" in 2022, to which the Czech Republic is also a signatory. The applied research of department 24 was focused on the development and use of precise processing of GNSS and DORIS data for accurate determination of spatial position and other parameters (troposphere, systematic errors of navigation data, etc.), on the development of metrological bases for gravity and GNSS measurements, and on monitoring position stability reference GNSS stations in the Czech Republic.

The Research Department of Metrology and Engineering Geodesy solved the project "Preservation of the state standard (SE) with a length of 25 m to 1450 m", so-called ensuring the metrological continuity of the SE, as part of the contract research for ÚNMZ. In addition to research activities, the department focused on the length of measured road sections on land roads. In 2022, 656 orders were implemented, during which 1663 calibrations were performed.

The VÚGTK calibration laboratory has successfully completed two audits checking the operation and compliance with established standards and regulations. The Czech Institute for Accreditation and the Czech Metrological Institute carried out the audits.

The department also dealt with a project co-financed by the European Union. At VÚGTK, a hydrostatic levelling system with HYNIV2 sensors designed for their use on hollow bridge decks was developed, manufactured and verified. In 2022, the staff of the Metrology and Engineering Geodesy department successfully installed an online measuring hydrostatic system on the new bridge in Hradec Králové.

Day and Night View of the Bridge in Hradec Králové and the Developed Hydrostatic Levelling Sensor

Extensive international cooperation of VÚGTK is of considerable importance for scientific and research activities. The employees of the institute took part in a number of international meetings taking place in the form that was possible in view of the ongoing pandemic. A number of scientific and scientific-research problems were discussed, including the joint preparation of international

projects. These activities of VÚGTK certainly contribute significantly to basic research and keep involved scientific and research workers in the field of geodetic theory at the forefront of European and, in some cases, world research. From the extensive international cooperation, we will mention a little more specifically the very numerous participation in the regular meetings of the European Geoscience Union in Vienna, as well as in the meetings of the International Geodetic and Geophysical Union. At these meetings, representatives of the institute contribute very significantly to the current development of geodetic theory in a number of areas, such as reference frames, the study of the gravitational field, the dynamics and rotation of the Earth, positioning and many others. These activities greatly contribute to basic research in fundamental geodesy, and the contributions and participation of researchers from VÚGTK are evaluated very positively.

In addition to a very good work of the research departments, it is necessary to mention that 2022 was also the last year for the Institute to implement the Long-term Development Concept for the years 2018-2022. This was elaborated on the instructions of the Ministry of Education and Culture of the Czech Republic, according to the M17+ Methodology. In the evaluation period 2018-2022, according to the M 17+ Methodology, two interim evaluations took place at the level of the Ministry of Education, Culture and Science, for the period 2018-2019 and for the period 2020-2021. In the consensus protocols for both Interim Evaluations, it was stated that the summary evaluation taking into account the results in all five modules was very good. In addition, it was stated in the Consensus Protocols that in terms of quality, originality, significance and practical impact, the results of the research work are comparable to the results of similar European research institutions, and that the results achieved are better than in the previous evaluation. The final evaluation covering the year 2022 was submitted to the Ministry of Education, Culture and Sports at the beginning of January 2023. It is clear from the presented evaluation that unexpected events (unfavourable pandemic situation, increase in energy prices, unbearably high inflation and, last but not least, very late payments from providers), the institute coped very well with the fulfilment of R&D tasks in the first four years of the evaluated period, and continued its maximum efforts in 2022 so as to continue with a very good evaluation.

In addition to finalizing the implementation of the Long-Term Concept for the years 2018-2022, it was already necessary to prepare a new Long-Term Concept for the years 2023-2027 during 2022. Even this very demanding and serious task was managed by the institute in such a way that at the end of October 2022 the new Long-Term Concept was submitted to the Ministry of Education and Culture of the Czech Republic. From the final protocol of the Ministry of Education, Culture and Science of the Czech Republic on the presented concept, in addition to a very good evaluation, it is possible to quote with satisfaction: "*VÚGTK is a unique research organization with a transnational impact. As an organization, it effectively manages the funds obtained and creates results with a broad social impact. The obtained research projects are above average considering the breadth of the staffing of the institute. The reserves are in co-participations in large international projects enabling the employment of top foreign researchers and the purchase of investment-intensive research infrastructure equipment. VÚGTK has a well-defined vision and profiles itself as a research institution of European importance. The institute has considerable innovation potential and the ability to achieve results that correspond to the purpose of its establishment and stand up to national comparisons.*"

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Český úřad zeměměřický a katastrální

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