



Český úřad zeměměřický a katastrální

2018

ANNUAL
REPORT

**Annual Report
Of the Czech Office for Surveying, Mapping and Cadastre
For 2018**

Prague, 2019

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INTRODUCTION

State administrative bodies of the real estate cadastre managed by the Czech Office for Surveying, Mapping and Cadastre (ČÚZK) provide state administration of the real estate cadastre in the Czech Republic and ensure performance of surveying activities in the public interest given by the law.

In 2018 cadastral offices performed the records of ownership and other rights to real estate the fifth year according to new legal regulations of the real estate cadastre that occurred as a result of the new Civil Code. Despite the short time since renewal of the principle that a building is a part of a parcel, since introduction of the right of building, increase of the number of registered types of material rights to 20 as well as increase of the number of notice types, can be said that accommodation to new cadastral services succeeded. In the daily practice application problems occur only rarely and they do not concern those most often solved cases. Registrations of rights to real estate were therefore performed without significant problems in 2018. Cadastral offices received in total 931 662 proposals for entry of owners' and other rights to real estate in 2018 which is 5.4 % less than in 2017. Registrations of rights were performed in 23 days from the submission of the application on average similar as in 2017. The time between proposal submission and its realization cannot be reduced more because of the legal rule, containing a 20day period during which the entry cannot be permitted as a measure for improving the security of real estate business.

The number of completed registrations or deletions based on record and notation reached 426 620. The number of delivered requests regarding the verification of the survey sketches reached 161 599. Data provision was realized mainly by the electronic way using the remote access to the real estate cadastre. Nearly 14. 2 million requests for information were performed, representing mild decrease in comparison to 2017. At counters of the cadastral offices the decrease of requests was another 15 % in comparison to 2017. In 99.2 % of all cadastral units are the cadastral maps in digital form. Only 0.8 % of all cadastral units are in the phase of finalization of land consolidation or new cadastral mapping and so the digitization could not be carried out there. The digital map will be the result of these land consolidation projects or new mapping.

State administration of land surveying and real estate cadastre is responsible beside the cadastre for important land surveying products and services which co-create the national geoinformation infrastructure necessary for task fulfilment of the state and local administration. In 2018 the care for classic ground and gravimetric control points has been carried out 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 being provided both to the public administration and commercial use and serving also as a data source for state map series. In 2018 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 2018 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.

ČÚZK governs 14 regional cadastral offices, which have 94 cadastral branch offices in larger towns and executes state administration of the real estate cadastre; it further manages 7 survey and cadastral inspectorates that control cadastral offices and supervise some commercial activities, whose results are applied to the real estate cadastre and state documentation funds, and finally the Land Survey Office (ZÚ), which focuses on other land survey activities that are provided in the public interest. ČÚZK is also the founder of the Research Institute of Geodesy, Topography and Cartography, p.r.i (VÚGTK, v.v.i.).

Administration authorities in the branch of land surveying and cadastre have been set up by the Act No. 359/1992 Coll., on land surveying and cadastral bodies, which also specifies their subject-matter and territorial competence. 14 cadastral offices have the territorial scope as of the single regions. Cadastral offices set out their cadastral branch offices. The number of them has been step by step reduced to 94. Survey and cadastral inspectorates have usually the territory scope of two regions. Land survey office has the national coverage.

2. Administration of the Real Estate Cadastre

Current Czech real estate cadastre was established in 1993 and integrates the function of Land Registry Book (registration of rights) and former Cadastre of Lands (records of real estate) into one tool. On 1.1.2014 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 real estate cadastre - are now regulated in one act.

With force from 1 January 2014 the private law has been recodified and Cadastral Act came into force taking into account many new provisions regarding real estates. The principal change is the brand new definition of the term “real estate” and application of the principle “superficies solo cedit”, according to which the building is a part of the parcel. The new Civil Code also introduced many other material rights not existing yet, which have to be registered into the real estate cadastre from 1.1.2014. As from the same day the implementing rules of the Cadastral Act came into force, i.e. Decree No. 357/2013 Coll., on the Real estate cadastre (Cadastral Decree), the Decree No. 358/2013 Coll., on Information provision from the real estate cadastre and the Decree No. 359/2013 Coll., on Specimen form specification for submission of the proposal for institution of proceeding on entry permission.

Since its adoption, the Cadastral Act has been amended 8 times, but it was only a minor change due to the adoption of other laws. In 2018 no amendments of the Cadastral Act occurred.

In 2018, decree No. 358/2013 Coll., on Data provision from the real estate cadastre, was amended by Decree No.256/2018 Coll. This decree entered into force on 1 January 2019, with the exception of the Article I, points 4 and 5, which are to come into force on 1 July 2020. The amendment occurred because of the necessity to adapt the decree to the concept of personal data protection, resulting from the Regulation No. 2016/679 of the EC and EP on the natural persons' protection with regard to the data processing and free data movement and repealing of the Directive No. 95/46/EC (General data protection regulation – GDPR). The amendment responded also to the progressive electronization of the state administration by more appropriate adjustment of the real estate cadastre data provision that are kept and subsequently provided in electronic form. Continuous good practices from daily work were incorporated.

The legislation on entries in the Land Registry, including the implementing decrees, can be considered as successful and does not require substantial changes in the near future.

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 Registry of territorial identification, addresses and real estate – RÚIAN, which is one of the four basic registries of state administration. Launch of the system of basic registries 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.

In the course of 2018 extensive ISKN adaptations have been implemented as a result of Regulation No. 2016/679 of the EC and EP on the natural persons' protection with regard to the data processing and free data movement (GDPR).

2.1. Main Tasks of Cadastral Offices and Their Statistics

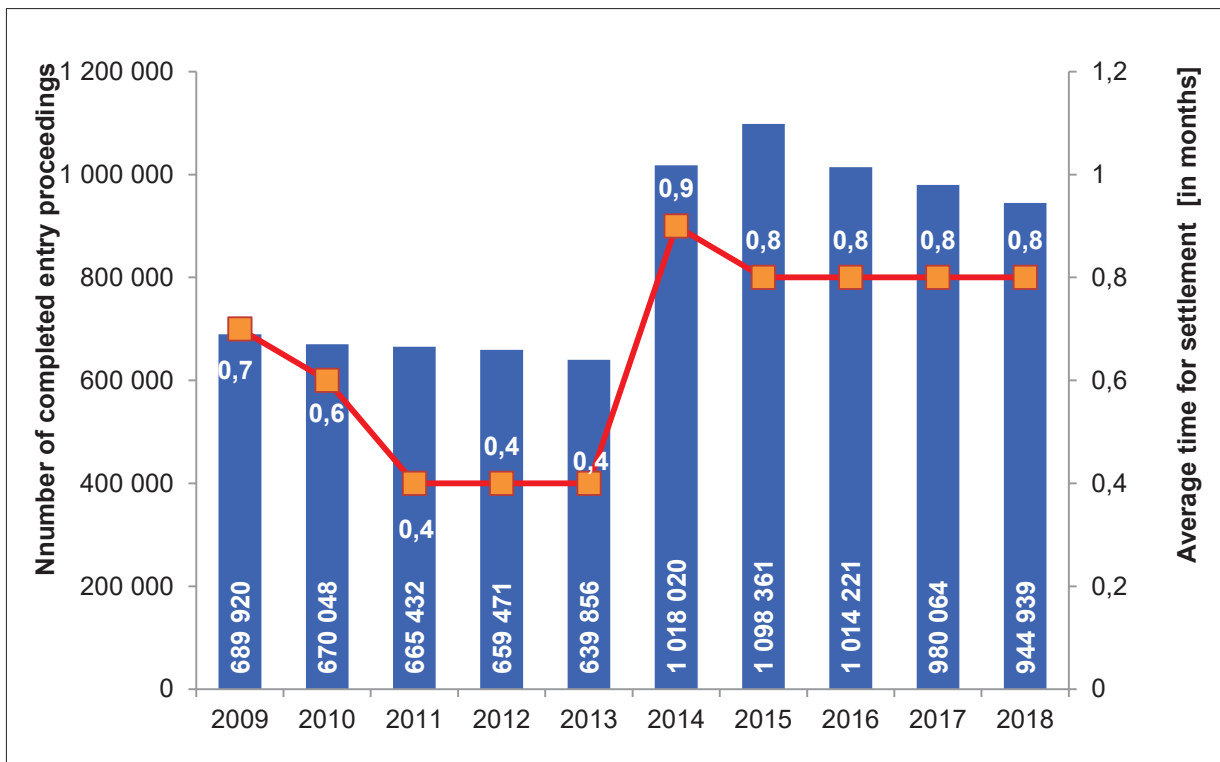
Main task of cadastral offices is recording of proprietary and other rights to real estate and other data.

Entries of Proprietary Rights into the Real Estate Cadastre

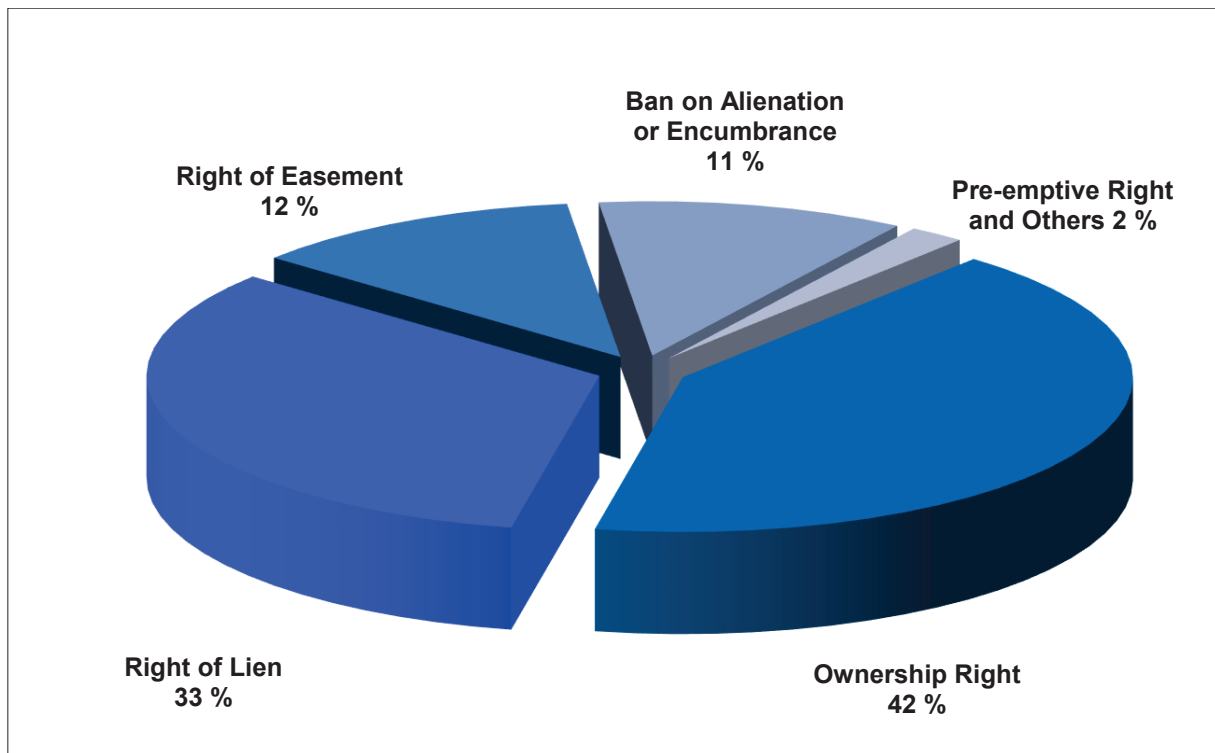
Registration of all material rights, rights agreed as material so as lease and tenure are being performed in the way of entry regardless of its constitution – either based on the contract or other way. It includes at present ownership right, right of building, easement, right of lien, future right of lien, right of sub-mortgage, pre-emptive right, future possibility of using the property after its transfer (type of easement), supplementary co-ownership, administration of trust fund, reservation of ownership right, reservation of the right to purchase back, reservation of the right of back sale, prohibition of alienation or encumbrance, reservation of the right of better purchaser, trial purchase arrangement, lease (based on the request of the owner or leaseholder with the approval of the owner), tenure (based on the request of the owner or the tenant with the approval of the owner) and surrender the right for damage compensation on the estate. Further the distribution of right to real estate into single ownership rights to units is registered by entry.

In 2018 the number of accepted proposals for entries of rights by cadastral offices was 931 662, which means decrease of 5.4 % in comparison to 2017. The share of mortgages on the total number of entries decreased slightly, by 1 %. Number of completed proposals for entry of proprietary right was 944 939 and yearly average time for completing of application for entry has not changed. The 30day time was exceeded only in cases containing some defects.

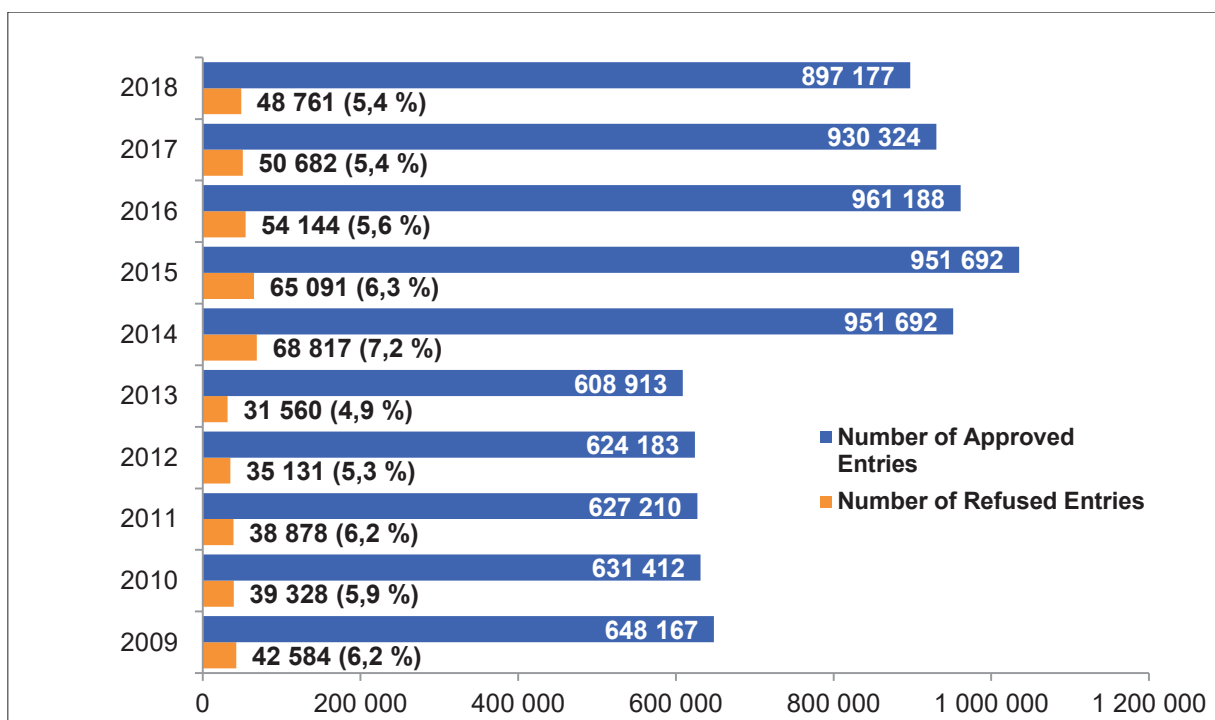
Registration of Rights to the Cadastre (Fig 1)



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

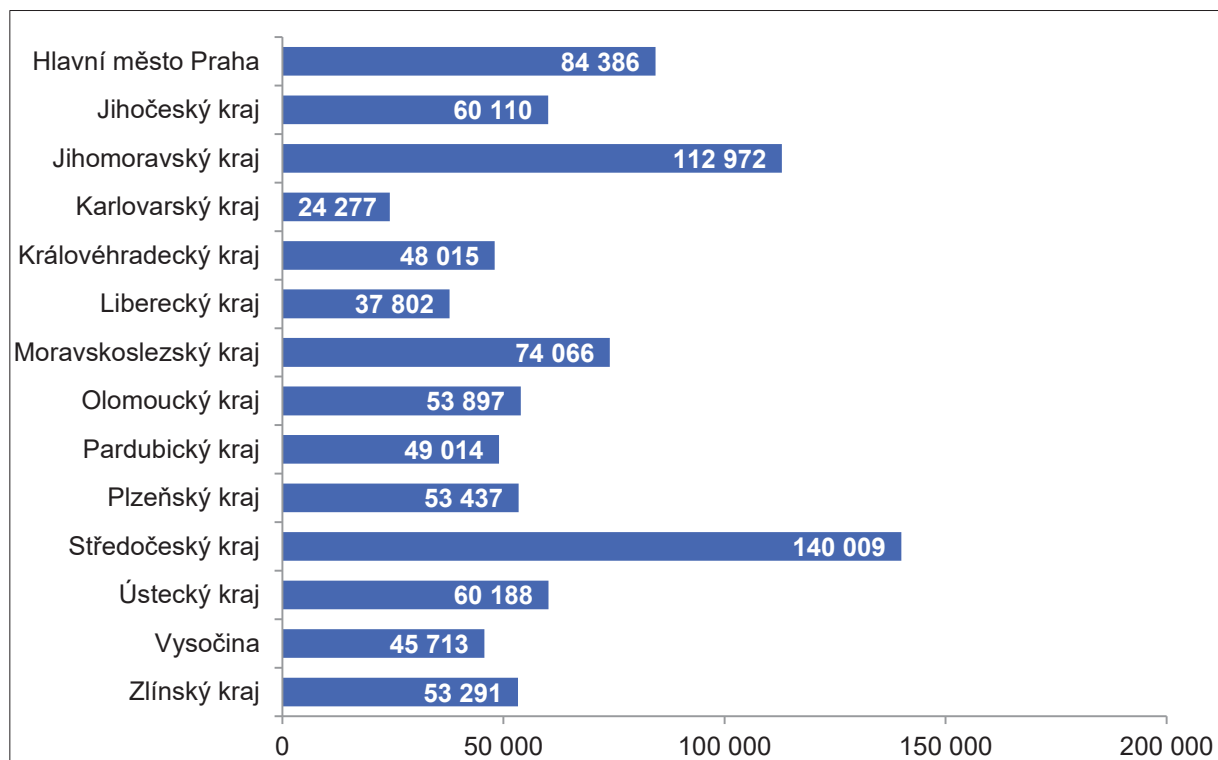


Development in the Number of Approved and Refused Entries (Fig 3)



From the total number of yearly requests for entry in 2018, 95 % entries of rights were approved, the rest of administrative proceedings were refused or interrupted. In 2018 the number of refused entries has not changed, as you can see in Fig 3.

Number of Entries in Single Regions of the Czech Republic in 2018 (Fig 4)



Registration by Record and Note and Others

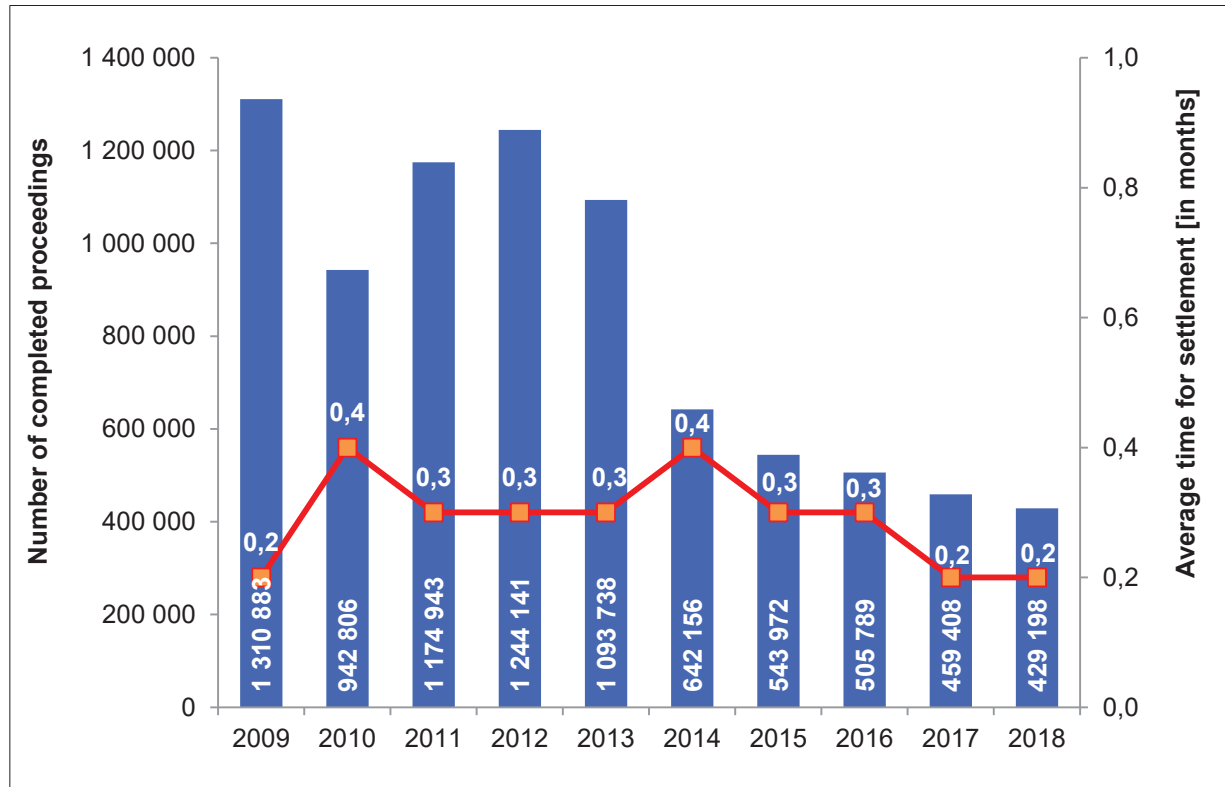
Cadastral offices performed also other registrations into the real estate cadastre. It is primarily the competence of the state and state organizations to manage state property, the right to manage state property, state property management, property of the capital city of Prague and statutory cities entrusted to urban areas or districts, property owned by local self-governing units etc. Other

Návrh na záznam práva do katastru nemovitostí	
Spisová značka	_____ vyplní katastrální úřad
Ohlášení se podává:	
Katastrálnímu úřadu pro	_____
Katastrální pracoviště	_____

types of records are notes serving for record of legally important facts relating to a real estate or person. Following data are recorded into the real estate cadastre regarding e.g. change of land type, real estate protection etc.

In 2018 426 620 submissions for registration by record and by note were delivered to cadastral offices, which means that the number of these records decreased yearly by 7 %. In total 429 198 submissions were completed and the average time has not changed yearly.

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



Data Acceptance from the Basic Registries of the Public Administration

Part of other registrations into the real estate cadastre previously carried out on the basis of 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 2018, 161,733 changes in addresses of permanent residence and registered offices of legal entities and changes in names were taken over from ROB and ROS. Furthermore, in 2018, 234,870 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, 37,564 changes in real estate data were taken over in 2018.

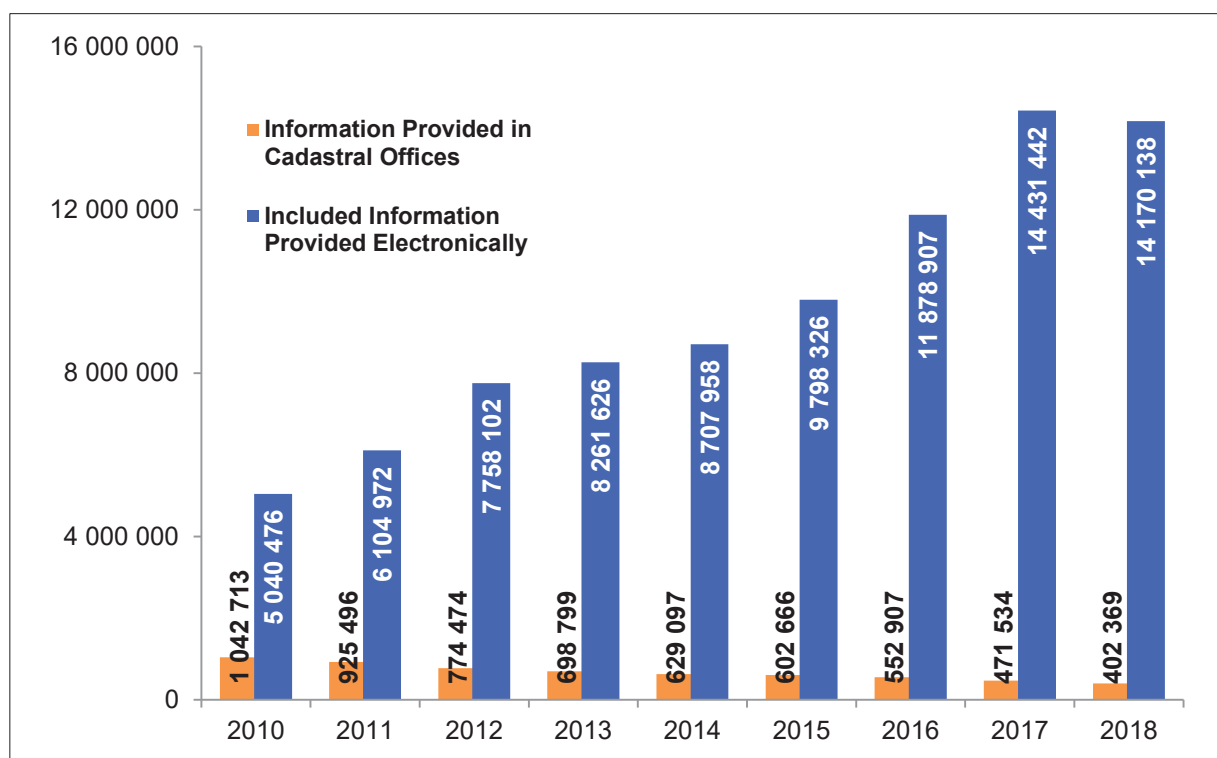
Provision of Information from the Real Estate Cadastre

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 whole state territory. Since 2001 internet services have been made available allowing outputs from the cadastre by remote access, without visiting the cadastral office. 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 decreased yearly on 15 % in 2018 and number of completed requests for information from the real estate cadastre including remote access decreased slightly. The number of applicants for information from the real estate cadastre remained unchanged in 2018 – 97 % 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 234 thousand outputs from the real estate cadastre and 7 thousand of map copies were issued in 2018. Professional users, such as banks and real estate agencies have been more and more oriented towards acquiring information by means of remote access via internet services, and so the trend of continuous decrease of information provided at the desks of cadastral offices goes on. The electronic statements from the real estate cadastre are since 2006 marked with an electronic mark and are considered as public documents.

Information Provision from the Cadastre (Fig 7)



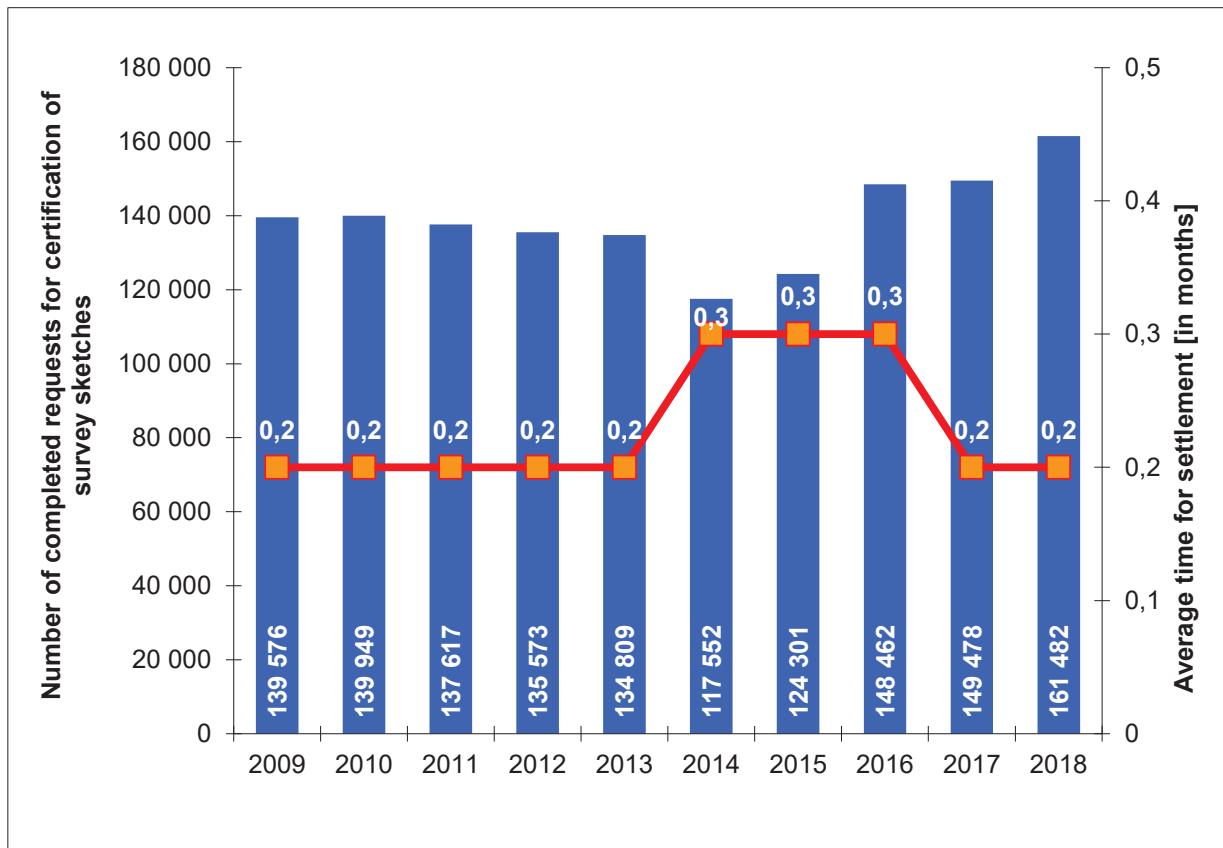
Certification of Survey Sketches

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. They are made solely by private geodetic companies. They create important part of documentation for maintaining of cadastral maps, thus every survey sketch must 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 2018 increase of 8 % in comparison to 2017) and yet the average time for checking and certification of survey sketches by the cadastral offices remained unchanged in 2018. Since 2016 web services are for disposal 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 6)



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.

Digitization of the file of descriptive information of the real estate cadastre was realized in years 1993 – 1998, having created basic conditions for the transition to a higher version of the information system equipped with remote access to data in the central database of the cadastre.

Computerization of all important processes within the administration of the real estate cadastre was carried out gradually. Ongoing is the digitization of further parts of cadastral documentation such as the file of documents or results of land surveying activities.

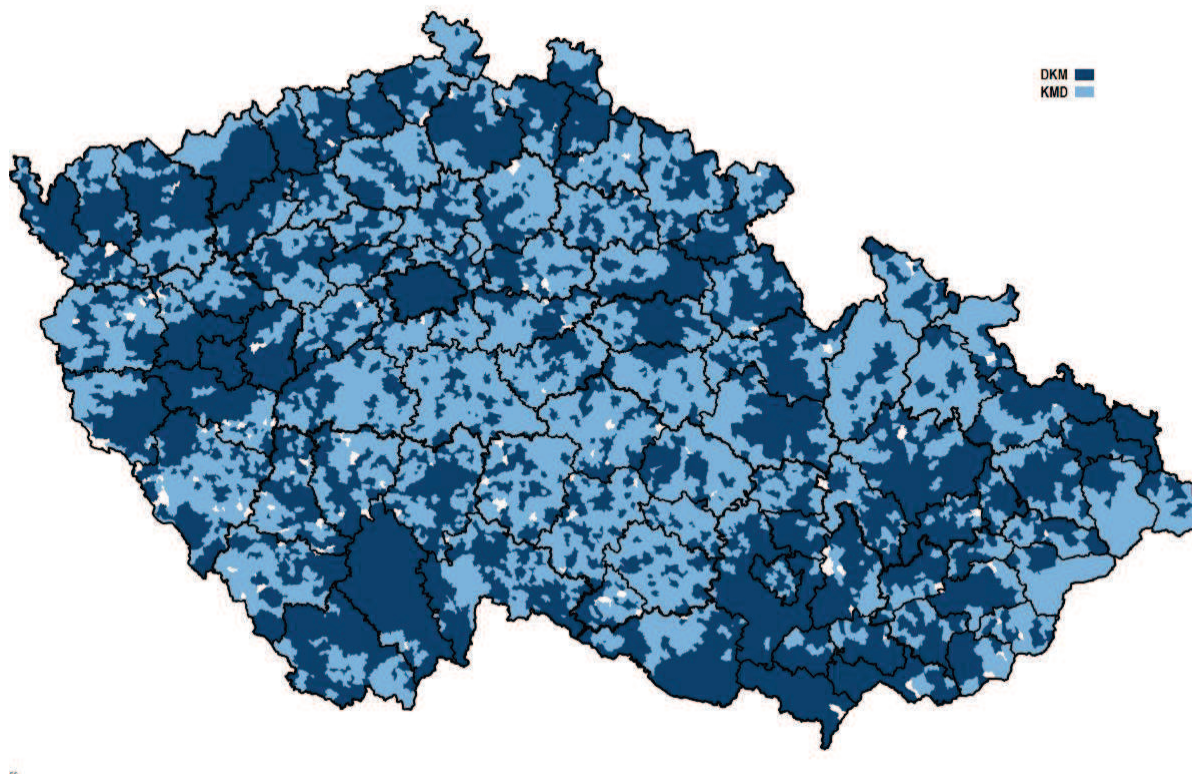
Digitization of cadastral maps ran very intensively in years 2009 – 2017. At present only finalizing works are carried out on complex land consolidation and new mapping.

Development of Digitization of Cadastral Maps between 2003-2018

Year	Till 2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Digitization Completed	4 663	313	763	1 106	1 094	1 127	1 074	910	877	622	349	25
Total in Digital Form	4 663	4 976	5 739	6 845	7 939	9 064	10 166	11 121	11 990	12 612	12 954	12 972
Yearly Growth from the Total of 13 077 c.u.(%)		2,4	5,9	8,5	8,5	8,7	8,4	7,0	6,7	4,7	2,7	0,2
% from the Total Number	36	38	44	52,5	61	69,6	77,9	84,9	91,6	96,3	99	99

Accurate digital cadastral maps (DKM) surveyed after 1927 in national coordinate system JTSK cover 49 % of cadastral units by 31.12. 2017, cadastral maps digitized (KMD) from graphic maps based on the Stabile cadastre in the first half of 19th century cover 50 % of cadastral units.

By 31.12.2018 only in 105 cadastral units the digital form of cadastral map was not for disposal, which is 0.8 % from their total number of 13 077. Since 2018, the cadastral maps have been digitized as a rule only for sites where renewal of cadastral documentation by means of new mapping or land consolidation is ongoing and will be completed in a very short time and replace the existing cadastral map. It is impossible to carry out the digitization in these cadastral units because the map would be replaced in a short time by a new map. Such a procedure could not be considered economical.



State of Digitization of Cadastral Maps on 31. 12. 2018

2.3. New Cadastral Mapping and Cadastre Revision

State administration of the real estate cadastre of the Czech Republic was carrying out long-term development concept since its establishment in 1993. Its goal was to fulfil the basic mission of the modern land registration based on ensuring reliable information on real estates and legal relations to them. High level of cadastral data reliability is necessary for rights protection, development of real estate market and mortgages, territorial development and support of decision-making processes in the public administration.

In the registration of rights to real estate and data connected with these rights the conceptual changes have been realized on 1.1.2014 in accordance with acceptance of the new Civil Code and Cadastral Law. New legislation proves its quality and fulfils all the requirements of a modern registration of legal relations to real estates. Digitization of the real estate cadastre has solved easy accessibility of cadastral information as well as dealing with electronic submissions for registration of rights and other data.

In the area of the technical data of the cadastre it is necessary to build 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. Obsolescence 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.

Before mentioned insufficiencies can be solved by the tools embedded in the existing Cadastral Law, 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. In the frame of the cadastre revision the content of the cadastral map will be updated based on the investigated discrepancies after negotiation with the owners and based on their documentation; moreover renewal of the cadastral documentation based on the new mapping includes investigation of updated parcel boundaries in the field and their precise surveying.

New Mapping and Use of Land Consolidation Results till 2023

In 2018 the digital form of cadastral map was for disposal at 99.2 % of cadastral units or at major part of them. Only in 105 cadastral units (from the total number of 13 077) 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 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 will follow the progress in land consolidation and the excluded part will be renewed by new mapping. It will prevent ineffective repeated renewal of the cadastral documentation in built-up area and real estate owners in these areas will not be burdened by similar administration acts (connected usually with submission of new real estate tax return) in a short time interval.

In further 465 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 by the end of 2023.

Cadastral Office for	Total number of c. u.	Without digital map		Digital map only at a part of c. u.		In process by 31. 12. 2018	
Prague-City	112	0	0,0 %	0	0,0 %	0	0,0 %
South Bohemia region	1 623	16	1,0 %	79	4,9 %	95	5,9 %
South Moravia region	892	3	0,3 %	55	6,2 %	58	6,5 %
Karlovy Vary region	568	7	1,2 %	5	0,9 %	12	2,1 %
Hradec Králové region	961	3	0,3 %	23	2,4 %	26	2,7 %
Liberec region	508	7	1,4 %	18	3,5 %	25	4,9 %
Moravia-Silesia region	616	0	0,0 %	8	1,3 %	8	1,3 %
Olomouc region	770	6	0,8 %	16	2,1 %	22	2,9 %
Pardubice region	790	2	0,3 %	34	4,3 %	36	4,6 %
Plzeň region	1 396	29	2,1 %	74	5,3 %	103	7,4 %
Central Bohemia region	2 075	14	0,7 %	82	4,0 %	96	4,6 %
Ústí region	1 060	4	0,4 %	23	2,2 %	27	2,5 %
Vysočina region	1 263	14	1,1 %	38	3,0 %	52	4,1 %
Zlín region	443	0	0,0 %	10	2,3 %	10	2,3 %
Total	13 077	105	0,8 %	465	3,6 %	570	4,4 %

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

Digitization of cadastral maps enables wide accessibility of maps ensures full conformity with descriptive data on real estates and 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 1st 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 will be 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 $m_{xy} = 14 \text{ cm}$.

Long-term plan will be realized 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, water courses regulation, water constructions or small constructions registered in the cadastre). In the frame of new mapping updating of nature and mode of land use will be realized and so the cadastral map can better serve for many decision-making processes of the public administration regarding the territorial administration.

Removing Discrepancies between the Cadastral Data and the Existing State of Real Estate

Real estate cadastre is based on the principle of data registration according to the submitted documents. For registration of legal rights moreover the constitutional principle applies (the right arises only after registration) and 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.

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 are based on documents from the public administration organs 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 75 % 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 realized with help of the basic Registry 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

Some eServices have been launched in the area of the real estate cadastre, which enable to get a wide range of information from the cadastre to our customers. There are both free of charge services enabling to get some chosen data without any restrictions, as well as paid services providing verified documents serving as public documents, that is from the whole territory of the Czech Republic. Except for this, some other applications are for disposal facilitating the access to cadastral data and communication of inhabitants with cadastral offices.

Entry Proposals

From 2013 there is a legal obligation to submit the entry proposal on the given form. The objective of this measure is to reduce errors that still occurred in the proposals for entry of right and get structured data for further use within record of changes into the database. In order to facilitate completing the form to the applicants an internet application is in operation enabling creation of the entry proposal, which is interconnected to the cadastral database and leads the user through the entire process. The application is very intensively used; in 2018 more than 605 thousands entry proposals were created via it. In 2018 use of these web services of this application went on, mostly by the bank and other institutions as well as by the subjects of state administration, who incorporated the application entry for right of lien into their information systems.

Service for Monitoring of Changes

The Service for monitoring of changes in data about real estates is provided by the Czech office for surveying, mapping and cadastre according to § 55, art.6 of the Act No. 256/2013 Coll., about the Real estate cadastre (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 34 784 in 2018. The service is used not only by some natural persons but also by legal ones 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/>

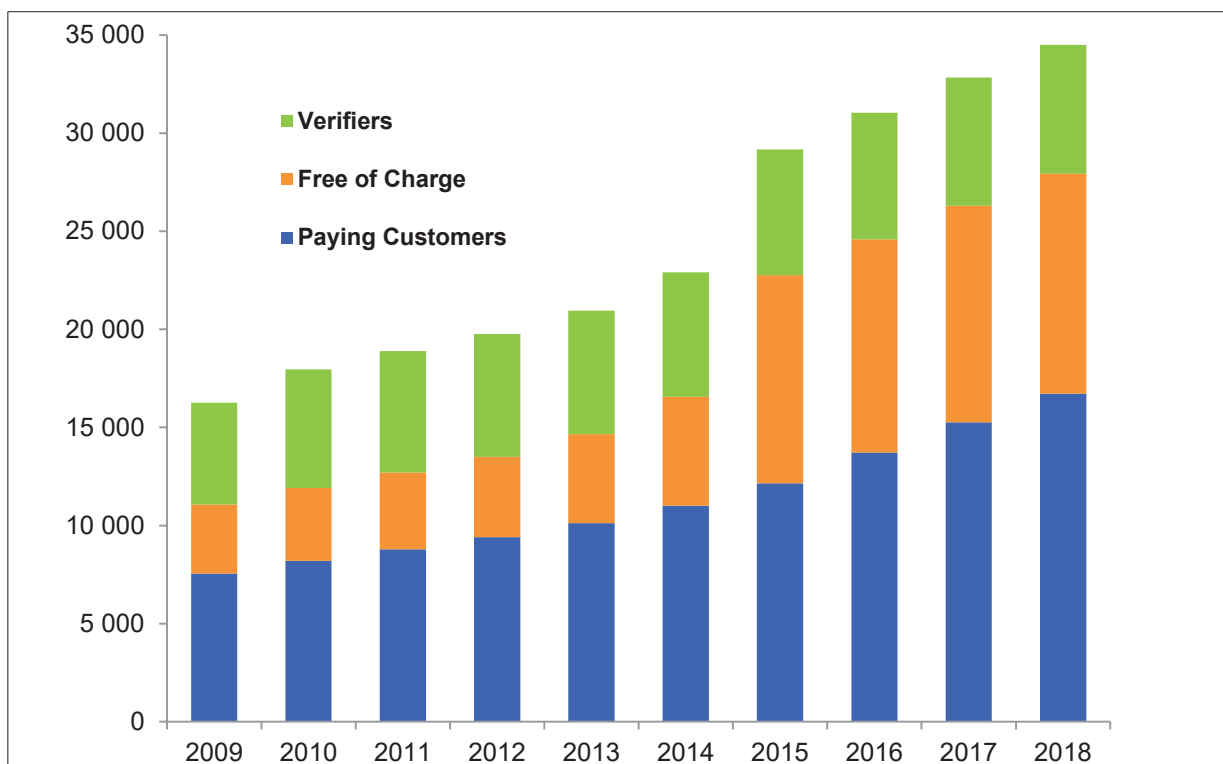
Remote access (DP) enables to get the data from the real estate cadastre from the whole territory of the Czech Republic via internet. Outputs from the real estate cadastre, such as extract from the real estate cadastre and other compositions provided in this way, are formally and materially identical 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, so as 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. DP has been in operation since 2001 and since that the number of customers actively using it has been constantly growing. The yearly increase of users was 5 %. The number of accounts for users was 34 501 by 31.12.2018, 11 218 out of which were free of charge and 6 572 accounts were for verifiers, particularly in the frame of CzechPOINT project.

From 1.1. 2016 it is possible to provide the documents from the file of documents via DP. In 2018 more than 661 000 documents were downloaded via this application, in total from its launch more than 1.58 million documents. Digital part of the file of documents contains more than 13.6 million documents for disposal (completely available are documents from years 2014 - 2018). In case the document has not been scanned yet, it is possible to ask for it via inquiry form. More than 76 thousands of such requests were solved in 2018. This process enables to deliver the document in digital form to the applicant within 2 working days.

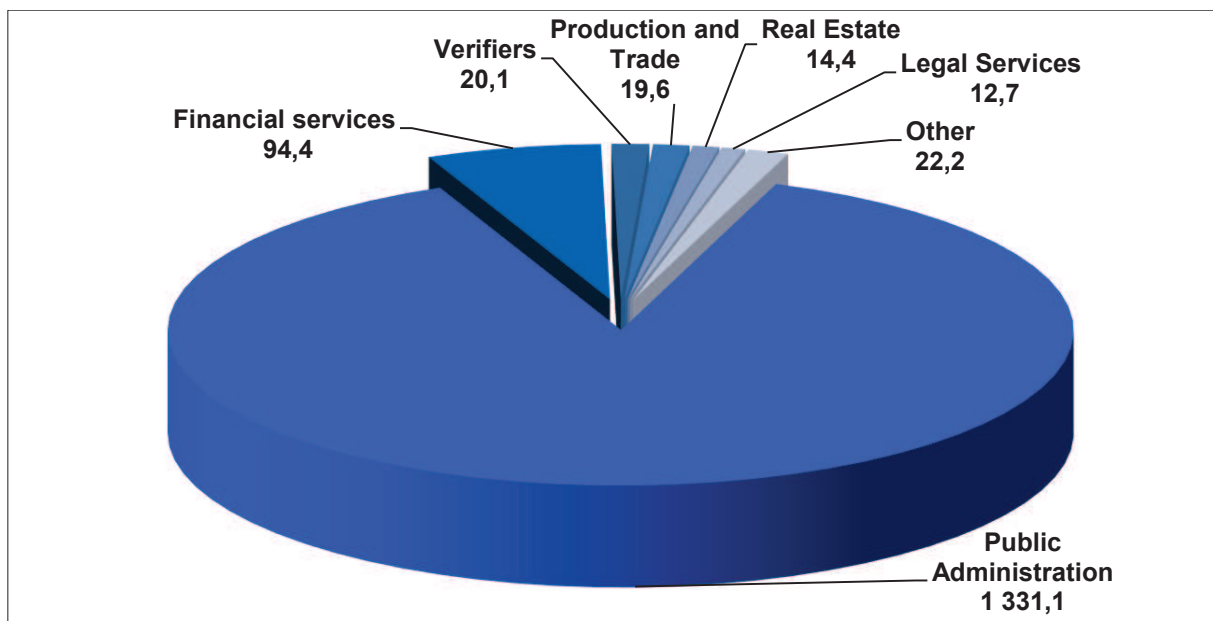
Development of the Number of DP Users as for the Type of Account (Fig 8)



The verified extract from the real estate cadastre can be acquired at the contact points of state administration – CzechPOINTS. In 2018 it was more than 250 thousand outputs. Another 53 thousand outputs were provided via service CzechPOINT@office. At present it is possible to issue the extract from the real estate cadastre, overview of rights registered per an individual person and the cadastral map copy at CzechPOINTS.



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

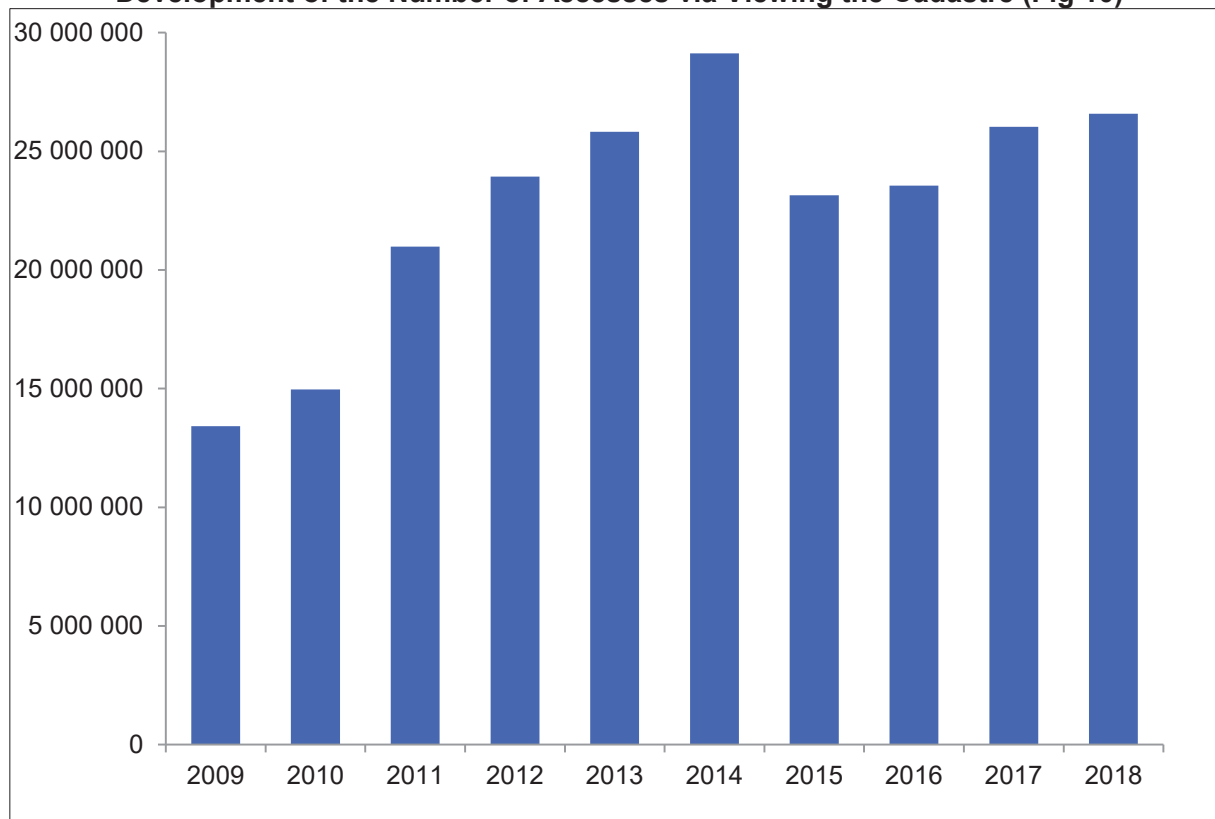


The number of DP users has been growing constantly, so as the income for data provision via DP service. Income of the state budget from charged customers reached in total 183.7 million CZK. The biggest charged user of DP service is the bank sector, which uses it for acquiring of necessary documentation for mortgage provision. However, 88 % of data are provided to the public administration. Free of charge DP is for 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 in the amount of 863.7 million CZK. This range of service use by the executors is obviously disproportionate to the agenda they provide, but unfortunately no effective measures have not yet been taken to reduce it.

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

Probably the best-known eGovernment service, operated in the ČÚZK branch, is “Viewing the cadastre”. This internet service allows provision of selected technical data and data concerning ownership of parcels, buildings and flats. By means of Viewing it is possible to find information on the state of particular proceeding. The viewing application is very intensively used by a wide range of users and has contributed in a significant way to increasing the transparency of the course of individual administrative proceedings. For real estate valuation purposes the application enables easily find out which real estates in the selected area have price recorded since 2014. Since 2018 the application serves also for data provision to registered users – creators and verifiers of survey sketches – enabling them access to previous surveying results (ZPMZ) which should be taken into account during creation of the survey sketch in the given area. Approximately 45.5 million ZPMZ are made available at present, in 2018 more than 412 thousand were downloaded. Since the beginning of provision of these documents more than 702 thousand of them were provided. It is possible to ask for historical document with help of the request form and their provision does not usually take more than two days.

Development of the Number of Accesses via Viewing the Cadastre (Fig 10)



Viewing the cadastre is one of the most visited websites of the Czech state administration. Since 2014 the application has been achieving a constant growth in the number of users with a mild decrease in 2015, which was caused by implementing strict rules against prohibited automated data harvesting. In 2018 the number of accesses increased mildly in comparison to 2017 to nearly 27 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. The volume of provided data decreased yearly by 4 %.

Web Services for Survey Sketches (WSGP)

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. Web service for data delivery (measurement documentation, VF data export) was launched in August 2015, and web service for data reception (application and GP authorization) was launched in October 2016. 1227 customers' accounts for these free of charge services were created by 31. 12. 2018.

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

<http://www.ruian.cz>

ČÚZK is the administrator of the registry of territorial identification, addresses and real estate (RÚIAN), which is one of the four basic registries of the public administration. The content of basic registries is defined in the Act Nr.111/2009 Coll., on Basic Registries, stating also rights and obligations connected with creation, use and operation of basic registries. RÚIAN is edited by ČÚZK in cooperation with municipalities, building offices, Czech statistical office and cadastral offices.

In 2018 two RÚIAN updates were carried out. The first one - RÚIAN 2.4 - completed the crucial technological change, namely upgrade of the Oracle 12c database system. Second update - RÚIAN 2.5 - focused on changes of Information system of territorial identification (ISÚI) to simplify the work of RÚIAN editors (windscreen ISÚI update, functionality enlargement etc.), which is used mainly by the editors from municipalities and building offices. At the same time extensive preparatory work for the technological development of the project started regarding ISÚI graphical user's interface. Accessibility of the ISÚI editing via web services from the applications of building offices was completed. Further RÚIAN development will be primarily focused on introduction of new thematic elements into the registry.

The Content of RÚIAN at 31.12.2017 for Chosen Items was following:

Subject	Number 2017	Number 2018
Municipality	6 258	6 258
Part of municipality	15 094	15 099
Cadastral unit	13 084	13 077
Building object	4 064 906	4 078 662
Building object with the orientation/registry number	2 836 082	2 847 296
Address point	2 907 529	2 919 490
Parcel	22 783 994	22 780 276
Street	82 757	83 035

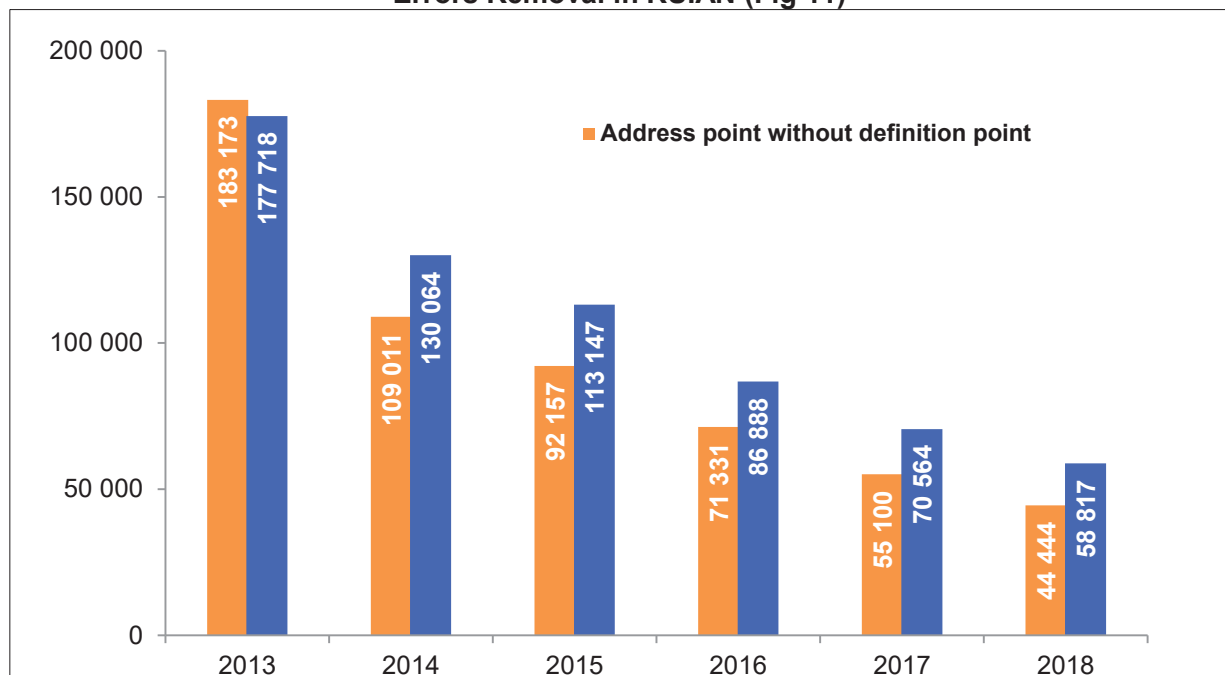
In 2018 intensive training of RÚIAN editors' via many workshops and practical trainings went on. Practical trainings were in 2018 focused also on employees of regional offices who perform the inspection of RÚIAN data recording in municipalities and building offices. More than 650 editors participated in trainings and webinars. At the same time, a pilot project for support and consultation

at building offices was launched, because of greatest problems identified there within editing, complaints processing and correcting of identified errors. Methodological support is highlighted, since unification of procedures eliminates occurrence of errors in the RÚIAN database.

Detailed information about RÚIAN project including detailed methodical instructions for editors are published and continuously updated on the project website www.ruian.cz.

ČÚZK went on in 2018 in checking of the RÚIAN data quality. Their results are published at the <https://ruian.cuzk.cz> via application for RÚIAN data inspection. The number of errors has yearly decreased; f.i. the number of address points without definition points decreased by 19 %, number of buildings with duplicated definition points decreased by 22 % and the number of buildings without identification parcel decreased by 17 %.

Errors Removal in RÚIAN (Fig 11)



Cooperation with external users helps to decrease the number of incorrectly entered data in RÚIAN. Such a company is “Seznam” who takes RÚIAN data to its maps and draws attention to found discrepancies.

5. 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).

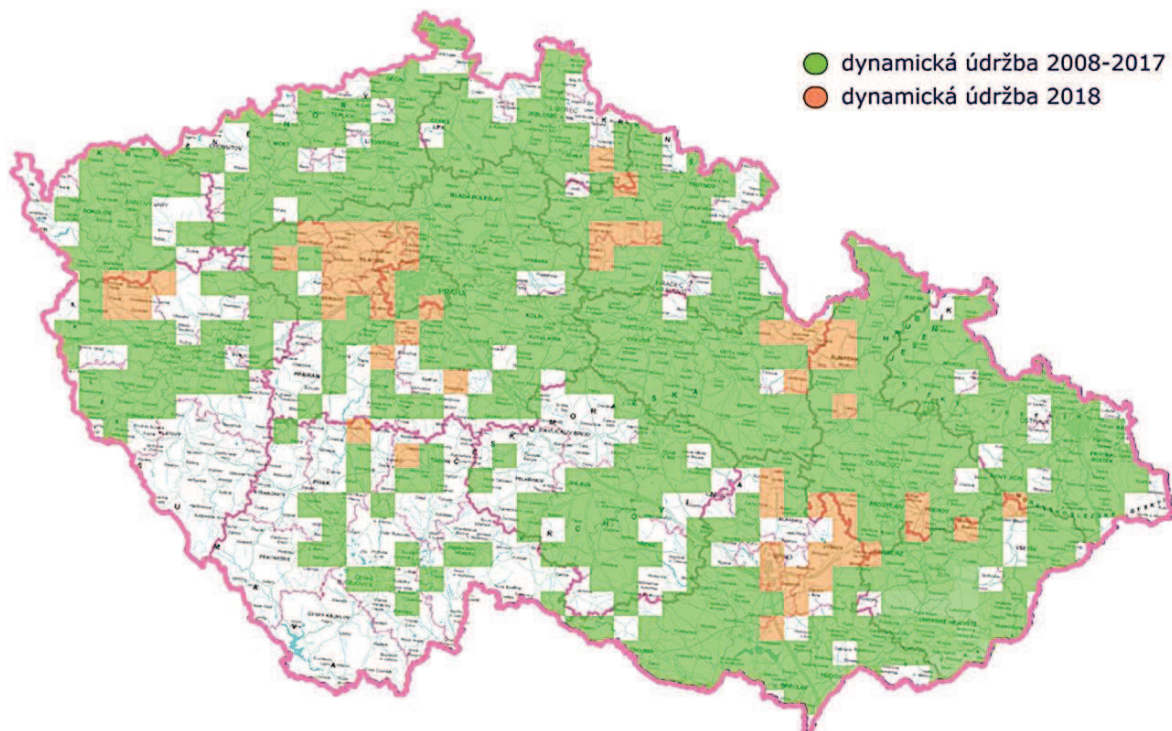
5.1. Geodetic Control

Geodetic control is a set of theories, equipment, technologies and services enabling 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 2018 the database of geodetic control points included 75 132 centres of trigonometric and densification points and 35 314 associated points, further 1 313 levelling lines of the Czech state levelling network being in total 24 754 km long, 119 555 levelling points (82 847 out of them are fundamental vertical control points and 463 gravimetric points).

In the area of ZBP administration ZÚ focuses at present particularly on so called dynamic maintenance based on defects reporting on single ZBP points sent to ZÚ by users. In 2018 in total 2 515 cooperating users were registered. Dynamical maintenance was carried out in range of 280 points.

Dynamical Maintenance of ZBP Points in Past Years



In the frame of special vertical control administration (ZNS), resp. levelling networks, the reconnaissance of the internal parts of ZNS Kladno and Sokolov was realized in total length of 300 km.

Administration and development of the fundamental gravity geodetic control points (ZTBP) was ensured by completing the Uniform gravimetric network with the results of relative gravimetric surveying from 2017; the maintenance of 71 gravimetric points was realized. For purpose of densification and inspection of gravimetric mapping relative gravimetric measurements were carried out on 815 points.

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 both at 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, 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 2018 independent verification of transformation tables' accuracy was carried out enabling more accurate global transformation between coordinate systems ETRS89 and S-JTSK. The test result confirmed the positional accuracy of mean error $m_p = 3.6$ cm determined in 2017 within calculation of new transformation tables on all 112 tested trigonometric points.

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/>

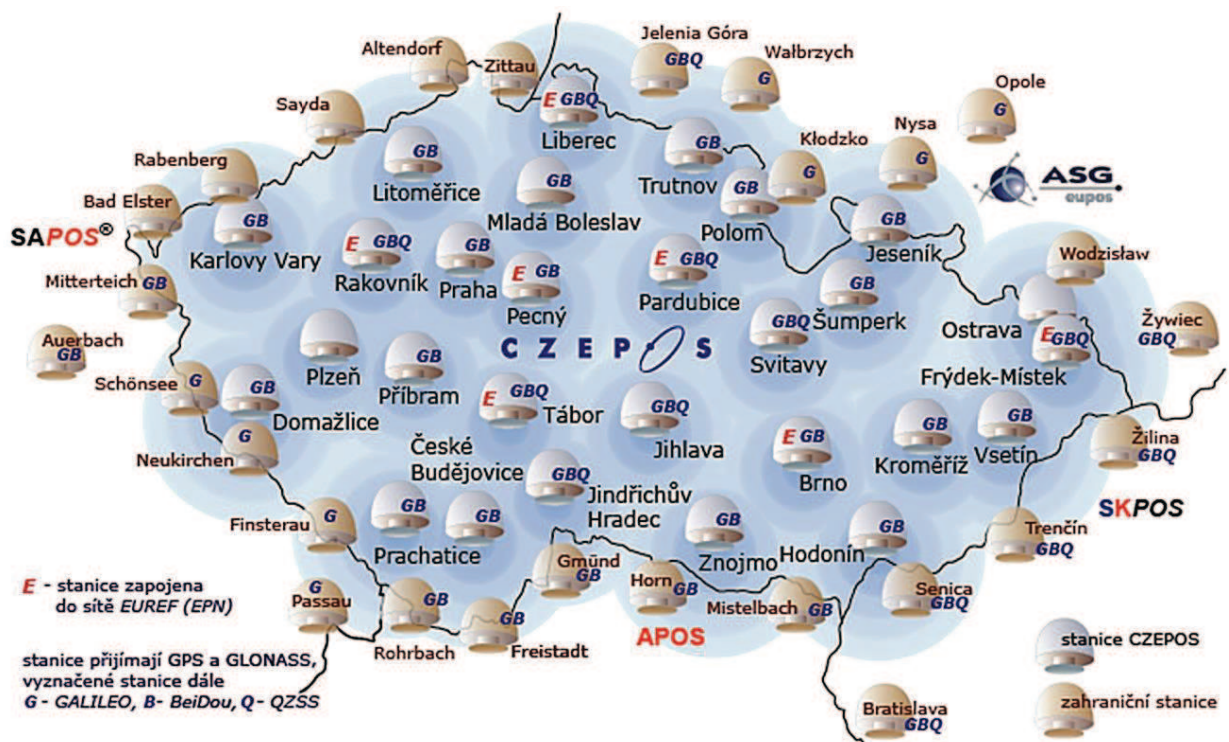
CZEPOS is the network of GNSS permanent stations spread on the whole territory of the Czech Republic. CZEPOS stations are installed on roofs of buildings in which cadastral offices are located and record the data from GNSS signals in the interval of 1s for 24 hours a day. Users are provided with them in the form of corrections enabling to specify GNSS measurements. CZEPOS services are provided in continuous operation since 2005. The network solution uses data from together 55 stations, 28 of them located on the territory of the Czech Republic and 27 in the cross-border areas of neighbouring countries.

CZEPOS services are at present compatible with all accessible satellite systems, i.e. American navigation satellite system NAVSTAR GPS, Russian global navigation satellite system GLONASS, European navigation satellite system Galileo so as with Chinese BeiDou system.

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.

Availability and quality of the provided CZEPOS services and products can be verified on the internet website in on-line regime by the users. There were 1 697 registered CZEPOS network users by 31. 12. 2018, it means grow of 139 users in comparison to the end of 2017.

Overview CZEPOS Map

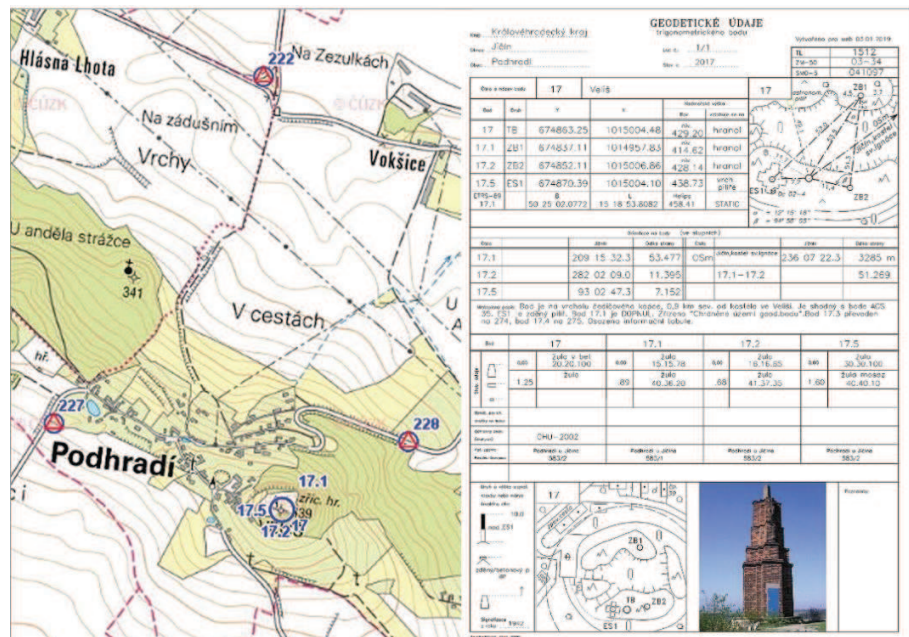


Database of Geodetic Control Points

<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 either as the basic tool 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.

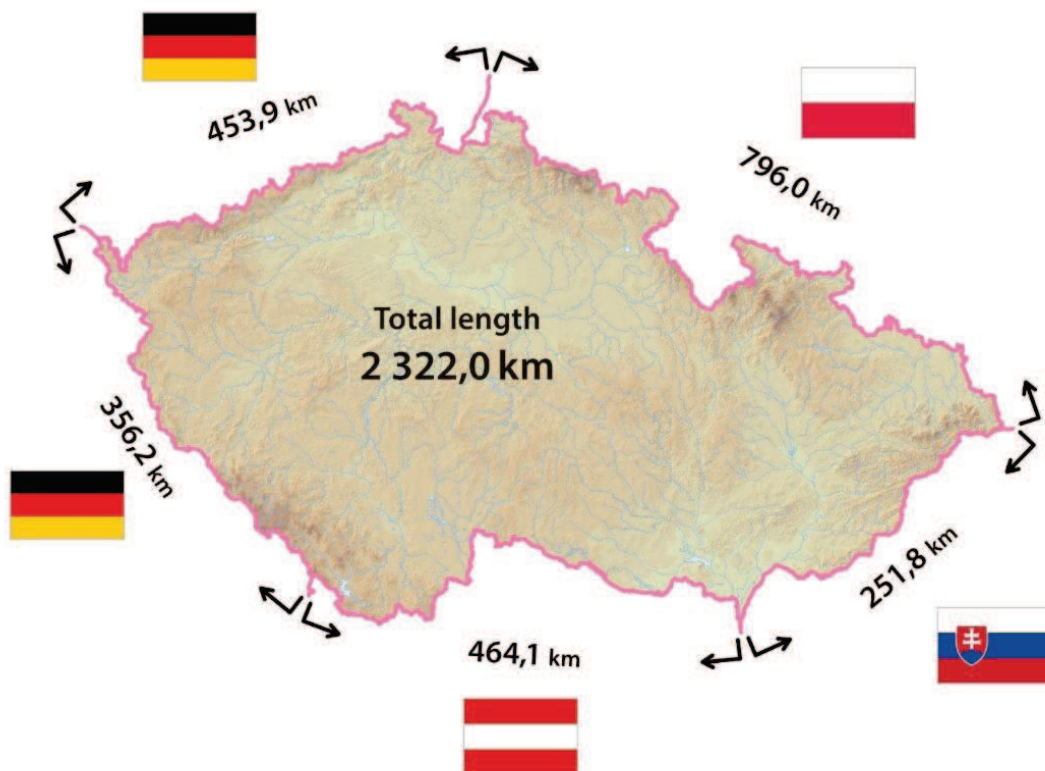


The database is published on the internet; access to data is public and free. Users can also inform about the defected points of horizontal and vertical control via implemented application so as view the Statistic of provided geodetic data according to the categories of respective points in another application.

40 historically significant ZTBP points were marked in 2018 by the information table that should make these points popular by link to newly created website <http://bodovapole.cuzk.cz/vyznamneTB.aspx>.

5.2. Maintenance and Documentation of the State Border

Land survey activities for maintenance and verification of state borders are carried out based on agreement with the state border documentation administrator, which is the Ministry of Interior. The actual performance of surveying activities, their scope and specific material content 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 in agreement between both partners. The international border commission coordinates processing of documentation for maintenance, signalling and verifying state borders and updating border documentation. All state borders have just been under regular examination. Besides regular examination of the stability of state borders according to international agreements precise geodetic surveying with the goal of interconnection of geodetic data on state borders into a uniform geodetic reference system ETRS89 is in the process. In the frame of the project State Boundaries of Europe (SBE) led by EuroGeographics association are the state boundaries data handed over in the reference system ETRS89 to the SBE centre.



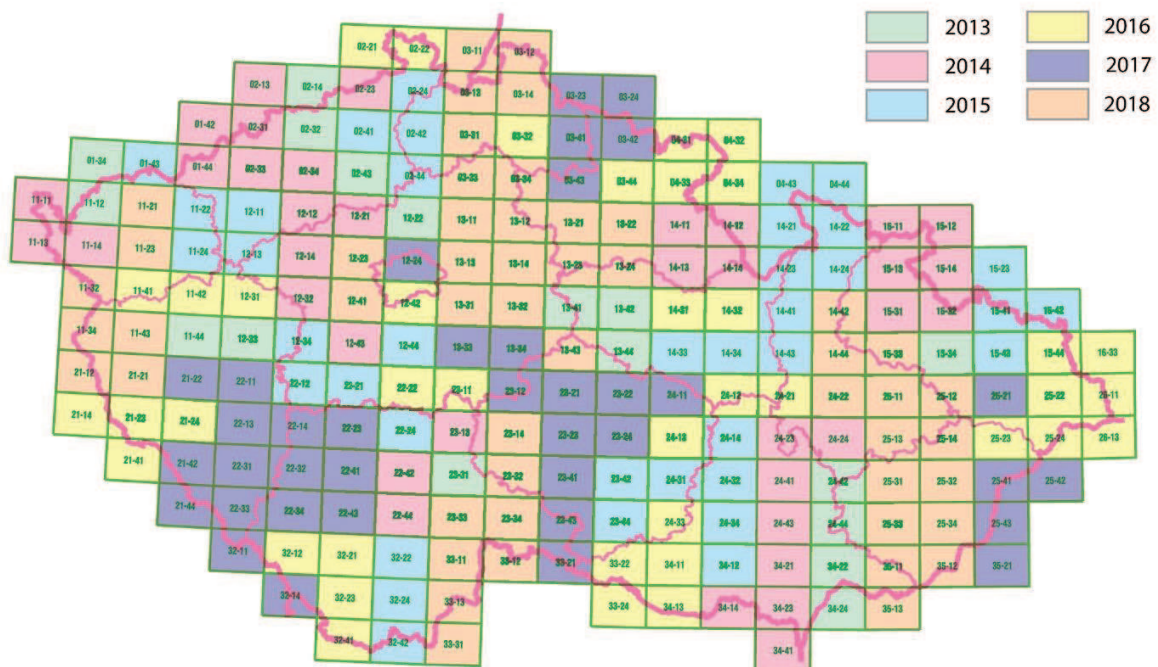
Cooperation on the EuroGeographics project SBE (State boundary of Europe) went on in the form of participation in the coordination committee of the SBE working group. Finishing work were ongoing on the new data model of the SBE database (version 5). This database is to be distributed in two versions: full version completed from legally binding data and simplified (technical) version enabling edge matching of OpenELS data at the state border.

5.3. Fundamental Base of Geographic Data (ZABAGED®)

ZABAGED® is a digital geographic model of the territory of the Czech Republic. ZABAGED® content represents at present 128 types of features (included altimetry ZABAGED® 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.

Regular updating of ZABAGED® at the whole territory of the state using orthophotos and aerial photos went on together with investigation of selected information at the public administration bodies. In 2018 together 1222 map sheets of the Base map CR in the scale of 1 : 10 000 (ZM 10) were updated in this way. The updating cycle of ZABAGED® is less than six years, in 2018 already 5th cycle started on the principle of so called areal update. It means that the territory with quicker dynamics of change is updated at shorter interval.

State of Areal Updating of ZABAGED® by the End of 2018



The ZABAGED® content was also being improved by continuous updating of more significant types of features at least once a year, some of them even four times a year. Information about changes are collected from their cooperating administrators. In 2018 systematic accuracy improvement of the position of roads, highways, railroads, watercourses and further ZABAGED® elements based on the data of a new altimetry model of the Czech Republic went on. Roads were improved on 550 map sheets of ZM 10, watercourses on 800 map sheets and chosen points and lines of the terrain on 847 map sheets of ZM 10. Improvement of the building and construction objects accuracy was carried out on the territory of 2207 cadastral units based mainly on ISKN data, orthophoto and airborne laser scanning data.

In the frame of ZABAGED® content improvement, a new type of feature Forest land with trees – classified was published using ÚHÚL (Forest Management Institute) data. The forest land has been segmented according to the height and predominant forest type. In cooperation with SŽDC (Railway Administration Office) work on digitization and implementation of a new geographical element “rail” into ZABAGED® went on; the rails were processed on 197 map sheets of ZM 50.

The project co-financed by EU “ZABAGED® 2014+ development” for years 2018-2020 fully started and in its frame some HW was bought and tender for complex SW provider was successfully carried out.

5.4. Altimetry

At present the newest and most accurate altimetry data at the whole Czech Republic territory are result of the multiannual common project of Ministry of Agriculture and Ministry of Defence that was realized in years 2009 – 2013. Based on the airborne laser scanning data three altimetry models were created, Digital terrain model of the 4th generation (DMR 4G), Digital terrain model of the 5th generation (DMR 5G) and Digital surface model of the 1st generation (DMP 1G). DMR 4G is a raster digital terrain model represented by the network of altimetry points with space resolution of 5 x 5 m and is used preferably for orthophotos production. DMR 5G is the digital terrain model in the form of knot points in the irregular triangular network (TIN), which is used f.i. for creation of contour lines in state map series, for improving of ZABAGED® topography or for creation of flood maps. DMP 1G represents the Earth surface including the objects above it and is used mostly for visibility analyses and further military applications.

Altimetry data are published - in the form of text files suitable for further elaboration - via web application Altimetry analyses, which enables expressing of the terrain in different way, as for instance slope steepness, orientation towards cardinals or different kinds of shaded terrain. The possibility of reading the point height in the map and dynamic function of altimetry profile of chosen route or visibility between two points is also for disposal.

Illustrations from the Application Altimetry Analyses



5.5. State Map Series

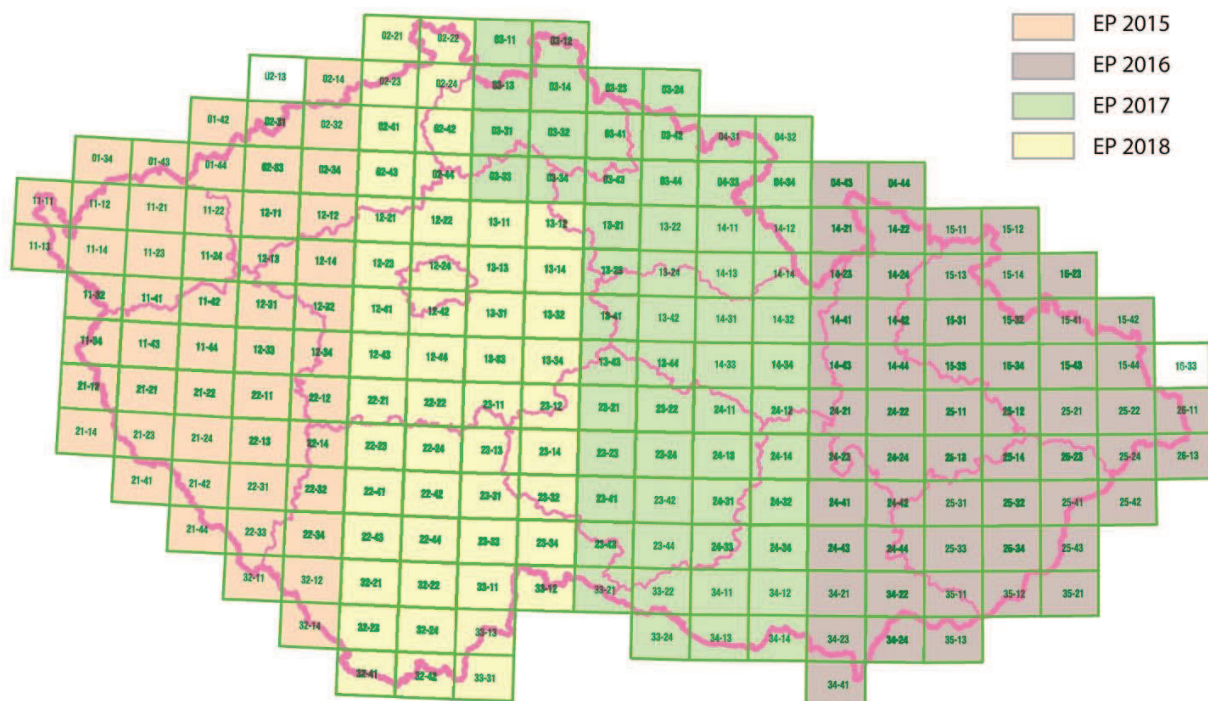
Apart from cadastral maps state map series represent sets of basic and medium scale thematic map series. The base state map series is a cartographic work with a widely usable content, coherently showing the territory according to unified principles, created and issued by the state administration body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

Base maps of the Czech Republic (ZM) at scales 1 : 10 000 to 1 : 100 000 have been created since 2010 from two digital databases, Data 10 and Data 50, which are part of the modern information system of state map series. In 2018 following map sheets were created in the frame of the ČÚZK publishing plan (EP): 1 158 map sheets of ZM 10, 191 map sheets of ZM 25, 58 map sheets of ZM 50 and 17 map sheets of ZM 100.

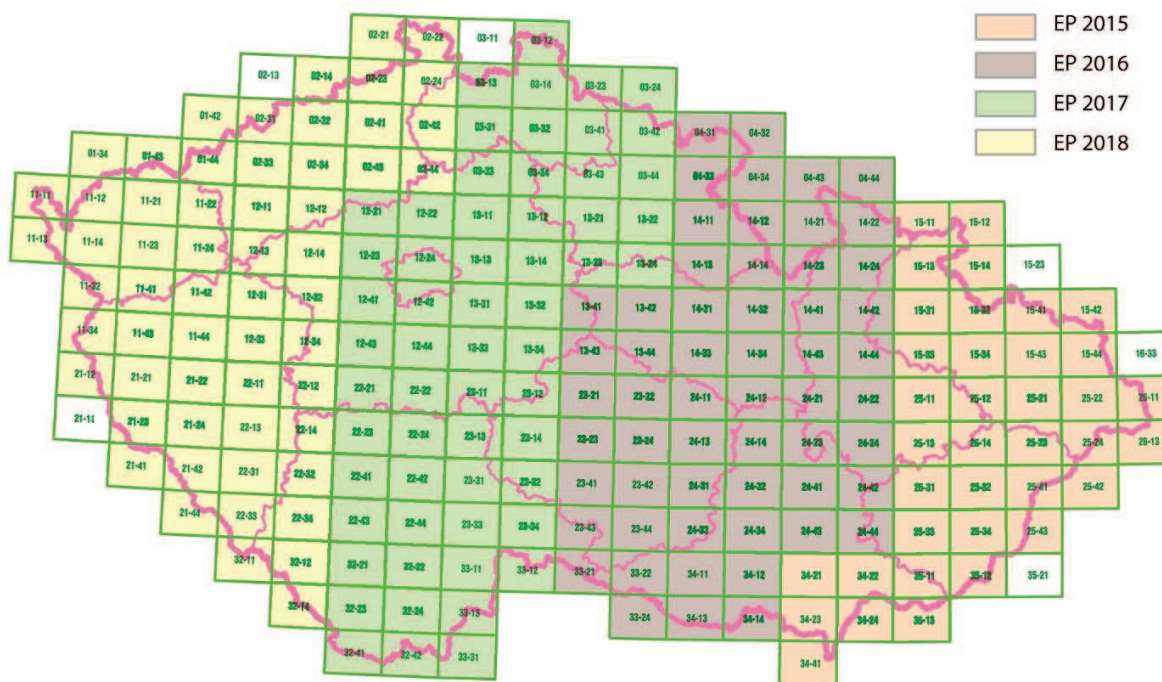
In accordance with the EP further following map sheets were updated: 24 map sheets of Overview of trigonometric and densification points, 24 map sheets of Overview of the levelling points, 10 map sheets of the Road map of the CR all in the scale of 1 : 50 000 and finally 55 map sheets of the Map of municipalities with enlarged administrative competencies in scale of 1 : 50 000. Following the processing of the seamless topographic database of Europe in the detail corresponding to scale of 1 : 250 000 and the derived Data200 database, the renewal of 18 map sheets of ZM 200 was carried out.

In 2018 production of the new edition of the State map 1: 5 000 (SM 5) was going on with the intention of serving especially for the purposes of urban planning. The conception of the new SM 5 is an automate visualisation of chosen object types based on the data from the real estate cadastre, ZABAGED® and Geonames. In 2018 in total 16 255 map sheets were published with the validity of 1.1. 2018.

Overview of Raster ZM 10 and Raster ZM 25 Publishing



Overview of Raster ZM 50



The preparation of the new map series – Basic topographic map in the scale of 1: 5 000 (ZTM 5) and new medium scale map series – went on based on the Development concept of land surveying in 2015 – 2020. Preparation of new technology for ZTM 5 creation was completed enabling launch of pilot testing in the range of 50 map sheets in 2019.

5.6. Orthophotographic Representation of the Czech Republic

Orthophoto CR created by the orthogonalization of aerial photographs has been widely used in various information systems. Aerial photography is being carried out by the private subjects based on the frame agreement. Orthophoto processing is ensured by the ZÚ in cooperation with the Military Geographic and Hydro-meteorological Office (VGHMÚř). At present the aerial photographs have been taken solely by means of digital scanning, 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 2018 the east half of the CR was completed.

Orthophoto CR is provided in datasets on map sheets of the State map 1: 5 000 (5 sq. km) via viewing services and in the print form. Data are in raster format JPEG or TIFF since 2016 with the resolution of 0.20 m on the ground and are georeferenced in the coordinate system S-JTSK. The data sets for coordinate system WGS 84 are also provided. 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.

Since 2011 ZÚ cooperates with VGHMÚř in the area of scanning of old aerial photographs besides provision of updated aerial photos and Orthophoto CR. Scanned photographs can be viewed in

the application Archives of aerial photographs and are for disposal also as the raster datasets. By the end of 2018 aerial photographs from years 1936 - 1938, 1940, 1942, 1946 - 1949, 1954 - 1955, 1962 - 1963 so as from 2003 to 2017 were for disposal to users.

Orthophoto CR – Comparison 2008 and 2018



5.7. Geonames 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 increasingly 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 2018 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 and not in the number of their occurrence in the map. In accordance with ZABAGED® updating were geographic names updated on 958 map sheets ZM 10 in 2018.

5.8. 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.

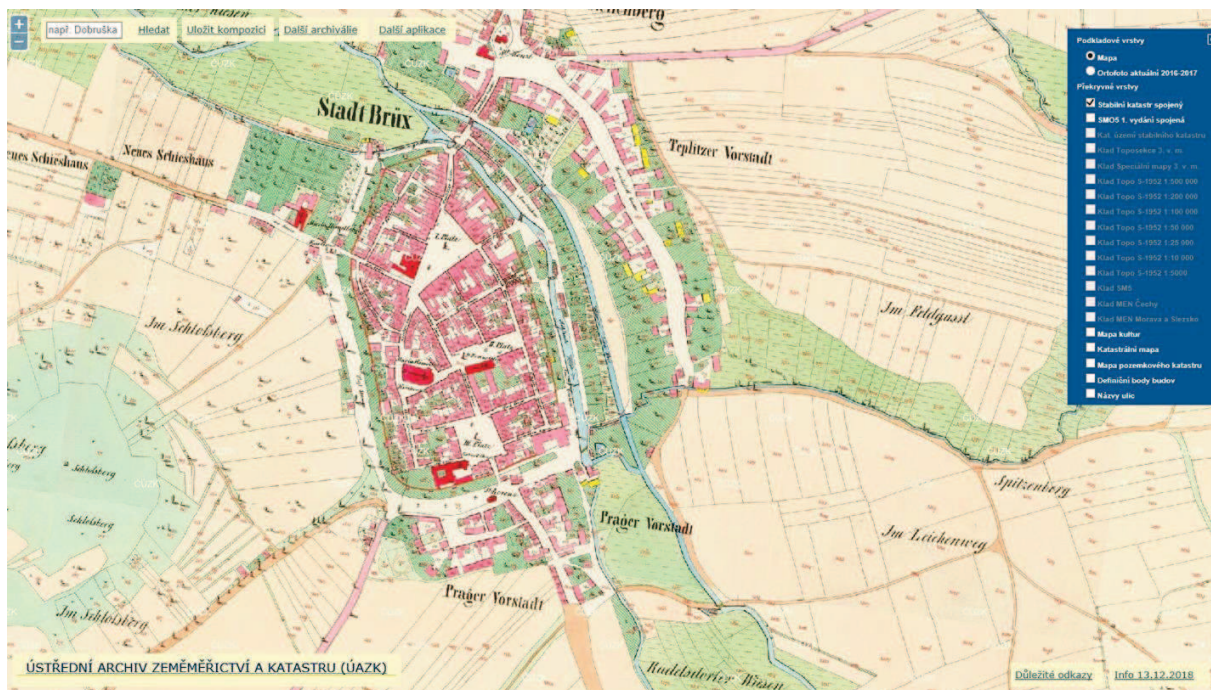
Funds and collections of the ÚAZK were enriched by many valuable pieces not only from the current ZÚ production (mandatory copies) but also from the discarding procedures or as gifts from institutions and private persons. In 2018 in total 31 862 maps were scanned, 10 125 out of them being original Stable cadastre maps. Data about registered archival are concentrated in the database, chosen parts of which are published in the application Vademecum <http://uazk.cuzk.cz/vademecum/>.

The archival documents can be viewed via application Archival 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, prints of topographical sections of the third military mapping between 1872 and 1853 in scale of 1 : 25 000, collection of maps and plans from the second half of the 16th century until 1850. Even so called indication sketches are available there, which are physically stored in other archives. Via Geoportal of the ČÚZK it is possible to order copies of archival documents or digital sets in printing quality.

Part of the ÚAZK creates also a public research room enabling to study the archival directly from the originals. In 2018 there were 117 visitors in the research room visiting the archive for 266 times. In the frame of their visits 648 archival copies in total were created for them at place and further 61 copies were sent to the customers based on their written request.

The ÚAZK depository is placed in Pardubice. In 2018 was the depository granted the accreditation by the Ministry of Interior CR, which means that these premises can be used for permanent storage of paper archives and for chosen parts of the analogue archive.

Illustration from the Archival Application – Imperial Imprints Mosaic- Stable Cadastre



5.9. INSPIRE

ČÚZK branch is a key provider of basic datasets for 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 enabling searching, viewing, downloading or transformation and provided via Geoportal ČÚZK. Downloading services are based on the WFS standard; for Opendata and for pre-prepared data based on ATOM standard. Datasets and services are described in metadata which are shared both on National and European INSPIRE geoportal. In 2018 big effort was given to quality improvement of harmonized data and interoperable services by newly available tools from the European geoportal.

From the ISKN database the theme parcels is published, from RÚIAN database buildings, addresses and units of territorial administration, from the ZABAGED® transport network and hydrology datasets, from Geonames the geographic names, from DMR 4G the theme altimetry and orthophotos from the Orthophoto CR database. The themes reference systems and coordinate networks are being prepared from the data of geodetic control. All datasets are continuously updated. Based on the approved INSPIRE implementation strategy ČÚZK is gestor of approximately one third of National INSPIRE datasets.

Network services are provided in accordance with the requirements for performance, availability and capacity. INSPIRE data and services were the first step in building the European Location Framework (ELF).

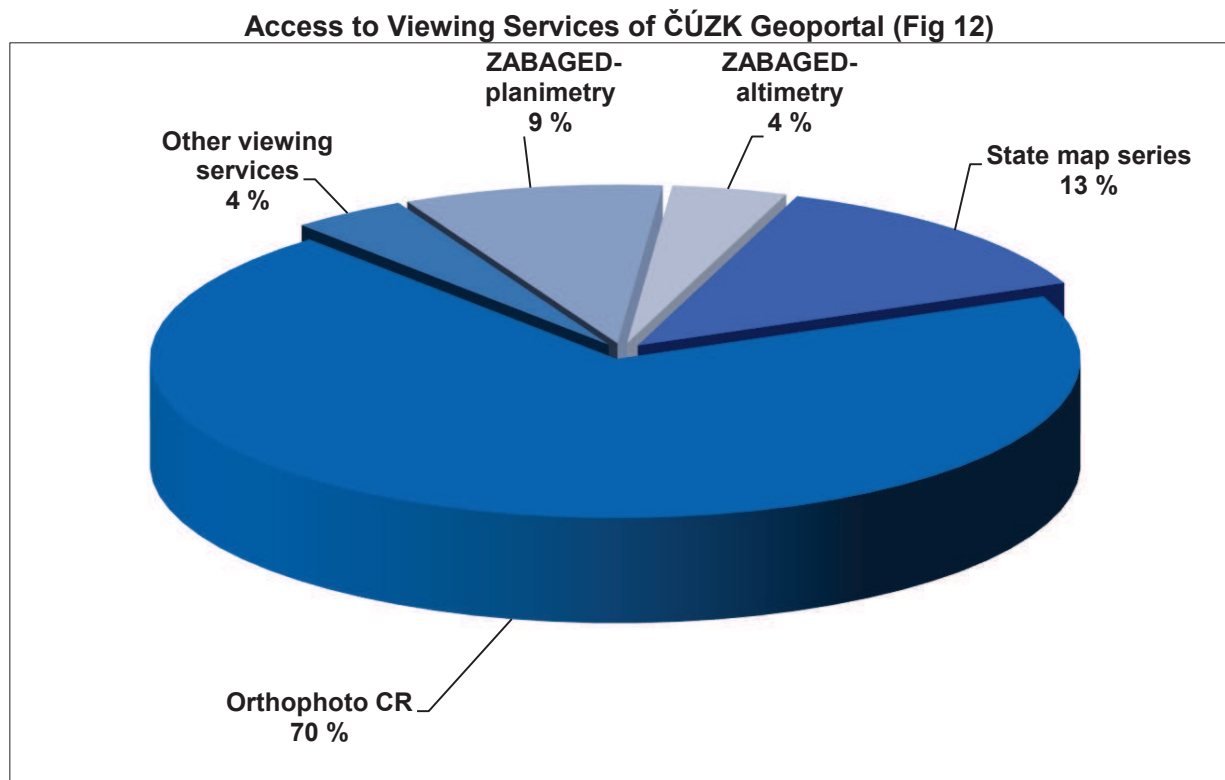
ČÚZK has enlarged the INSPIRE data content for chosen specifications based on his participation in the ELF project. This data were further provided in 2018 based on the agreement conditions.

Opendata of the branch are provided via OpenELS project, the follower of the ELF, based on the agreement with the project administrator EuroGeographics.

5.10. ČÚZK Geoportal

<http://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, 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 demanded data sets 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. The biggest data amount is provided to users from the public administration.

To simplify the processing of orders or their payment the payment portal is for disposal to users. 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).

In 2018 further upgrade of existing applications was carried out. The most important improvement was launch of simplified version of the Geoviewer, accommodated for small mobile devices screens. Another innovated application was reporting of data errors, enabling refinement of possible discrepancies in the product in comparison to the terrain and directly draw the right state into the map. Popular application Altimetry analyses was enlarged with further functionalities as the tool for volume calculation (f.i. construction excavation or causeways) or for search of given relief characteristics (f.i. between two given height points of the relief).

6. Economics and Human Resources

6.1. Employees and Education

By 31.12.2018 together 5 058 persons were employed in the ČÚZK branch, 4 674 out of them were civil servants and 384 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 (57.4 %), second place belongs to the employees with University degree (38.1 %). The most numerous age group was created by the employees aged 41-50 (36.8 % from the total number) and further by employees aged 51-60 (32.1 % from the total number).

Physical State of Employees by 31.12.2018

ČÚZK Branch	Age Structure						Women	Graduated
	do 30	31-40	41-50	51-60	61 and more	In total		
Civil Servants	379	745	1 751	1 473	326	4 674	75.7 %	39.9 %
Employees	17	41	111	150	65	384	73.7 %	15.1 %
Total	396	786	1 862	1 623	391	5 058	75.5 %	38.1 %

In 2018 in total 651 tenders were announced in the ČÚZK for vacant service positions (at some positions repeatedly); based on their results 393 successful candidates for civil service were chosen either for civil service position or appointed to the civil service position head; 55 tenders were due to be completed in the beginning of 2019. Together 60.4 % of all carried out tenders for service position announced in 2018 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 65.0 %. A small improvement occurred in comparison to 2017. Civil service positions can be temporarily occupied by the ordinary employees. Together 99 such tenders were carried out in 2018, 80.8 %

of which were successful. Much worse situation occurred with occupation of ordinary employees (54.1 %) despite the fact, that this tender is not so complex.

During 2018 275 civil servants and 99 ordinary employees terminated their employment. The rate of fluctuation was 7.4 % in 2018 that is 1.3 % less than in 2017.

Fluctuation Rate in Previous Years

Year	Terminated Employment	Rate of Fluctuation
2017	374	7.4 %
2016	441	8.7 %
2015	377	7.4 %

By 31.12 2018 the number of women in managerial positions was 353 (57.4 %) in the ČÚZK branch from the total number of 615.

Share of Women in Leading Positions by 31.12.2018

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	4	17.4 %	0	0	0.0 %
Section Director	15	9	60.0 %	0	0	0.0 %
Department Director	135	64	47.4 %	2	2	100.0 %
Division Director	424	263	62.0 %	16	11	68.8 %
Total	597	340	57.0 %	18	13	72.2 %

In accordance with § 155 and § 156 of the Act the first official assessment of civil servants for the calendar year 2017 was carried out in the first quarter of 2018. In the ČÚZK service offices 4 324 civil servants were evaluated, who performed the civil service in 2017 for more than six months. 18.3 % of them were assessed, with excellent evaluation results, 69.4 % with good results and 12.3 % of the total number of evaluated public servants with sufficient results. No civil servants were evaluated with unsatisfactory results

Official Assessment of Civil Servants for the Year 2017

Civil Servants	Number of Assessed	Assessment Results			
		Excellent	Good	Satisfactory	Unsatisfactory
Superiors	582	442	137	3	0
Other Civil Servants	3 742	350	2 863	529	0
In total	4 324	792	3 000	532	0

Another main priority in the area of the human resources was education of employees. It was carried out in 2018 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. Personal departments of individual administrative offices prepared a lot of 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 personal department prepared or participated in preparation of 33 specialized team workshops for chosen workers from all branch offices as well as for the lecturers, many of them repeatedly, in total 44 terms. The crucial part of educational activities in 2018 was performed with help of internal lecturers from the ČÚZK staff who are familiar with the trained branch issues.

In the period from January 1 to December 31, 2018 in total 204 tests from general part of civil service tests were carried out in the ČÚZK, 12 of them were employees from other administrative offices or persons meeting the requirements of the civil service. In the same period, namely in 2018, 201 tests in total were carried out from the professional part of civil service tests namely branch No. 70, land surveying and real estate cadastre which falls within the scope of ČÚZK; 7 applicants were not successful and 5 had to repeat the test. In comparison to 2017, the number of passed general tests increased by 18.6 % and the number of professional tests by 28.3 %. Further 21 branch employees passed the professional tests from other branches of civil service in other offices. Currently 185 employees in the branch have not passed the civil servants test yet, 18 civil servants have to pass the general part of the test and 12 civil servants have to pass the professional part.

6.2. 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 2018 in accordance with section 14 of the Act on surveying and mapping (February, April, June, September, and December).

In the year 2018 the total number of completed applications was 75 (21 of them from 2017). Based on the professional competence exams official authorization was newly granted to 40 applicants and 10 applicants enhanced their existing authorization. The other cases were solved as follows: 4 applicants did not meet the legal requirements for granting official authorization, 3 applicants did

not pass the exam repeatedly, 8 applicants took the application back. 5 participants did not succeed but are going to repeat the exam in 2019. Five applicants submitted the application in the end of 2018 and will be invited to the exam in the beginning of 2019. In 2018 two official authorizations were deleted from the registry.

2 540 persons have been registered on the updated list of officially authorized land surveying engineers administered by the ČÚZK by the end of 2018.

6.3. Economics

Approved state budget of the Czech Republic for 2018 specified revenue of CZK 700 million and expenditure of CZK 3 283.6 million for the chapter 346 ČÚZK.

Revenue collection, coming to the budget from the administrative fees, was prescribed in the amount of CZK 550 million; its fulfilment reached CZK 618.1 million which is 112.4 %. Non-tax revenues were in 2018 approved in the amount of CZK 150 million and were fulfilled by the amount of CZK 231.2 million, meaning 154.2 % fulfilment. The EU revenues were modified by the budgetary measure to CZK 13.4 million for a new project „Development ZABAGED 2014+“ co-financed by the EU in the frame of the Integrated regional operational programme. This project is carried out by the Land Survey Office. Real revenues from the EU budget were in 2018 null.

The budget for expenditure was modified in 2018 by eleven budgetary measures of the Ministry of Finance (MF). The budget was increased by CZK 16.6 million in total. The increase dealt in particular with the EU financing of the before mentioned project in the amount of CZK 13.4 million. Further it was CZK 6.7 million moved from the Ministry of Agriculture and Ministry of Defence for ensuring aerial survey photographing and CZK 0.2 million from the Czech Statistical Office enabling the reconstruction of a building in Zlín. On the other hand CZK 0.7 million were moved from the ČÚZK budget to the budget of Ministry of Interior and CZK 3 million to the budget of the Ministry of Education, Youth and Training for regional education. Beside the measures in competence of MF in total ten budgetary measures were carried out in the branch competence used mainly for shifting expenditures between programmed actions. The unused means in the total amount of CZK 56.3 million were used in 2018 in accordance with the regulations for reconstruction of recreational facility in administration of the branch.

Total expenditure in 2018 was CZK 3 327.1 million. The biggest part was used for the salaries of employees including the insurance and FKSP (Fund for cultural and social needs) in the total amount of CZK 2 491.9 million. These expenditures created 74.9 % of the total expenditure. The average monthly income achieved in 2018 reached CZK 31 173 per civil servant and CZK 25 771 per ordinary employee.

The second biggest expenditure group of the chapter 346 ČÚZK were other material expenditure in the amount of CZK 587.8 million; postal services were received in the amount of CZK 138.2 million. Except for postal services mainly further services were purchased in 2018 included particularly data processing services and services related to information and communication technologies (CZK 126.7 million), on building and computer equipment lease (CZK 30 million) and data and voice telecommunication services (CZK 20 million). Further expenditure were given to energy purchases, heating, gas, fuel and water in the amount of CZK 61.4 million, to property repair and maintenance in the amount of CZK 36.3 million, and for purchase of material (CZK 56.5 million). The rest of the expenditure was given to catering allowance of all employees, travel costs, compensations during illness, education and workshops, bank services, court proceedings, and EuroGeographics (see chapter 8) membership fee.

Significant part of the expenditure (CZK 247.4 million) were those used on financing of programmes administered in the information system of programmed financing, it means the expenditure allotted for procuring and modernisation of sector tangible and non-tangible property. The share of these expenditures has been yearly mildly increasing, in 2017 it was 6.5 % while in 2018 it was 7.4 %. Part of the program expenditure was the expenditure for the implementation of a project co-financed from the EU budget "Development ZABAGED 2014+". In November 2018, with the agreement of the Ministry of Finance, the program expenditure budget was increased by CZK 2 million by transfer from other material expenses. A substantial part of the program investment expenses consisted of expenditure on acquisition and technical improvement of intangible fixed assets, in total CZK 101.0 million. Other items were the programme investments for building reconstructions (CZK 36.3 million) and renewal of the transport (CZK 22.5 million) and calculating and surveying means (CZK 34.2 million).

Index/ Year	2014	2015	2016	2017	2018
Income of the chapter (in CZK thousands)	1 160 637	950 029	929 130	889 519	849 376
Out of it: revenues for administration fees	542 068	632 582	657 597	651 805	618 146
Income from EU budget	420 624	82 287	38 730	194	0
Total expenditure of chapter	2 826 373	2 882 336	2 981 920	3 108 288	3 327 114
Out of it: projects co-financed from EU budget	87 717	55 621	912	0	11 697
Current expenses without non-investment	2 558 418	2 624 142	2 770 128	2 905 947	3 079 634
Including: wage resources ¹⁾	1 462 339	1 532 404	1 613 019	1 705 674	1 832 443
Insurance and FKSP	511 031	535 852	572 228	613 732	659 433
Other material expenditure	587 207	555 886	584 881	586 541	587 758
Program expenditure	267 955	258 233	211 793	202 341	247 480
Including: non-investment	49 280	57 167	40 079	40 297	33 537
Investment	218 675	201 066	171 714	162 044	213 943
Number of employees in Sector²⁾	5 096	5 062	4 995	4 963	4 957
ČÚZK	146	138	137	136	136
Cadastral Offices	4 486	4 459	4 398	4 371	4 361
Land Survey Office	378	380	375	372	376
Survey and Cadastral Inspectorates	86	85	85	84	84

7. Inspection Activity

7.1. 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 (KÚ) are delegated by law to the 7 surveying and cadastral inspectorates (ZKI).

Only some data from the complete ZKI activities statistics for the year 2018 are published here. ZKI received in total 34 complaints and 360 other submissions. The extent of decision-making agenda on appeals against decisions of KÚ decreased in comparison to 2017 (450 appeals delivered in 2018 as opposed to 507 appeals delivered in 2017). The quality of decision making activities of cadastral offices as first step authorities worsened slightly in 2018 (44.7 % KÚ decision were proved illegal as opposite to 37.3 % in 2017). The number of appeals in matters regarding correction in cadastral documentation decreased on 15.3 % in comparison to 2017 (233 appeals delivered in 2018 as opposed to 275 delivered in 2017), the number of appeals in matters regarding objections against the content of renewed cadastral documentation decreased on 23.7 % (106 in 2018 as opposed to 139 in 2017) and the number of delivered appeals against procedural decisions of KÚ increased by 12.9 % in 2018 in comparison to 2017 (96 in 2018 as opposed to 85 in 2017).

ZKI performed in total 1 315 documented inspection actions (the decrease of 6.3 % occurred in comparison to 2017, when 1 403 inspections were performed). In the framework of supervisory activity regarding certification of the results of land survey activities ZKI performed in total 278 documented supervisory actions in 2018 (increase by 4.1 % in comparison to 2017, when 267 actions were performed). In 14 cases from 15 (11 in 2017) 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 248 thousand (CZK 155 thousand in 2017). ZKI also received 16 applications for measures against inaction, 4 requests for renewal of proceedings, 6 requests for review proceedings, 18 requests for information pursuant to Act No. 106/1999 Coll., On free access to information, 49 requests for extradition authorization to verify the results of surveying activities, 41 applications for the issue of an official entry permit and 8 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 2018 focused mainly on:

- checking of record of notes into the real estate cadastre based on the prosecution,
- review of the reason for the interruption of the proceedings (in particular the entry proceedings) due to the ongoing preliminary ruling procedure,

- 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.

ČÚZK (as relevant central administrative office) performed in 2018 2 inspections in ZKIs focusing on procedures within inspection of execution of state administration of the real estate cadastre with focus on meeting legal time in which the entry cannot be allowed. The inspection was performed in ZKI Pardubice and Prague.

Complaints

Inspectorates	Not resolved at 1.1.	Received after 1.1.	In total	Forwarded	Legitimate	Not legitimate	Still being resolved
in Brno	1	4	5	2	-	3	-
in Č. Budějovice	-	-	-	-	-	-	-
in Liberec	1	5	6	-	1	5	-
in Opava	-	11	11	7	-	3	1
in Pardubice	1	2	3	2	-	1	-
in Plzeň	-	4	4	-	-	4	-
in Praha	-	8	8	3	-	5	-
In total	3	34	37	14	1	21	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	3	95	98	16	79	3
in Č. Budějovice	12	104	116	5	105	6
in Liberec	-	22	22	-	21	1
in Opava	2	34	36	1	34	1
in Pardubice	1	35	36	-	36	-
in Plzeň	-	14	14	1	12	1
in Prague	-	56	56	3	53	-
In total	18	360	378	26	340	12

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	38	233	271	133	22	4	75	8	21	8
Objections to revised cadastral	11	106	117	57	6	1	37	3	13	-
Infringements of order in the sphere of the	-	-	-	-	-	-	-	-	-	-
Procedural	5	96	101	33	5	1	37	7	6	12
Changes in the boundaries	-	-	-	-	-	-	-	-	-	-
Administrative fees	-	1	1	-	-	-	-	-	-	1
Rejection of applications	-	7	7	5	-	-	-	-	-	2
Other	1	7	8	5	-	-	-	1	1	1
In total	55	450	505	233	33	6	149	19	41	24

ČÚZK (as relevant central administrative office) performed in 2018 inspection of delegated powers conferred on the regional institutions and Prague-city in the area of RÚIAN. In 2018 together 5 inspections were carried out in 4 regional offices (Olomouc, Pardubice, South Moravia and Hradec Králové) and in the Prague City Hall. General information on their results are published on the ČÚZK website in accordance with the § 26 of the Inspection Rules.

7.2. Financial Inspection

ČÚZK carried out public inspections in the subordinated bodies according to the Act No. 320/2001 Coll. on financial inspection in public administration (further only Act), and to its implementing Decree No. 416/2004 Coll., in 2018. Public inspection is integral part of the financial inspection system.

According to the approved plan of public administration inspections for the year 2018 the inspection group of ČÚZK carried out public administration inspections at following 12 inspected bodies:

KÚ for the Region Pardubice, KÚ for the Region Prague-city, KÚ for the Region South-Moravia, KÚ for the Region Central Bohemia, KÚ for the Region Moravia-Silesia, and all seven ZKI, in which performing of internal audit is substituted by performing of public administration inspection in compliance with the section 29, art. 5 of the Act. Inspection authorization and order was issued by the president of the ČÚZK.

The main goal of performed inspections was to verify the observance of generally binding legislation, economic and internal rules of the inspected persons, spending budgetary means for ensuring the assigned tasks within the given deadlines and in a good quality, functioning of internal

managing systems and creation of the conditions for economical and efficient performance of the public administration. The inspection included also checking of the call for public tenders and their realization, the correct amount of administration fees, payments and prices for provision of data from the real estate cadastre and results of land surveying activities. Further the control of compliance with selected provisions of the Act. No. 234/2014 Coll., on Civil Service, was carried out. Particular attention was also paid to the way of compensation for damages caused by incorrect decision or incorrect official procedure within the meaning of Act. No. 82/1998 Coll., on Liability for Damage Caused by the Execution of Public Power by a Decision or Incorrect Official Proceeding, as amended, and the performance of the tasks of the Anti-Corruption Program of ČÚZK.

The auditing of accounting documents verified their formal aspects and the method of performing the preliminary, continuous and follow-up inspection. The results of the inspection and evaluation of before mentioned operations including the measures taken to eliminate, mitigate or prevent risks were the basis for verification of the adequacy and effectiveness of the financial control systems.

Public administration inspections of some inspected persons in 2018 found less serious formal and objective shortcomings emerging from the inconsistent compliance with some provisions of ČÚZK economic rules, some partial shortcomings in records of assets and in provision of information from the real estate cadastre as well as in some procedures from the civil law. Written reports from realized inspections were together with proposed measures submitted to the president of the ČÚZK and he then imposed measures to inspected persons to eliminate existing insufficiencies and prevent them from repetition. Measures taken mainly concerned the management inspection, accounting correctness, budgetary adjustments, property management and inventory, compliance with the terms of the tender documentation, reimbursement of travel expenses for business trips of employees and data provision from the real estate cadastre.

After information about measures taken by the inspected persons were the public administration inspections terminated properly by the ČÚZK president.

No serious shortcomings were discovered that would unfavourably affect the activities of inspected persons in 2018. Final report about results of financial inspections in the ČÚZK branch for the year 2018 was submitted in March 2019 to the Ministry of Finance via information system of the financial inspection in the public administration.

7.3. Internal Audit

Internal audit is a part of the internal inspection system in the ČÚZK branch based on the Act No. 320/2001 Coll., on financial inspection in public administration. It includes, in particular, 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 and in the subordinate bodies (KÚ and ZÚ) is ensured through the relevant organizational rules. The internal audit function in all ZKIs is, in accordance with the Act on financial inspection, replaced by an annual public-administration inspection.

Internal audit is carried out by authorized employees - internal auditors. Systemized job positions are established in ČÚZK, Land Survey Office and in all 14 cadastral offices. Organizational rules ensure full independence of the auditors and their separation from managerial and executive structures. The main task of performed internal audits is independent inspection and evaluation of appropriateness and efficiency of the managerial inspection, including verification of accuracy of

chosen operations. The activity of internal auditors results from the medium-term and yearly plans. Planning of audits is based on the risk evaluation and is focused on priority processes in activities of particular offices. The parts of the plans of internal audits are also further tasks in compliance with Standards for the professional practice of internal auditors. In particularly justified cases, when there are suspicions of unanticipated risks that could adversely affect the operation of the subordinated bodies, in the immediate detection of such risks, the implementation of a specific audit beyond the approved annual plan may be included in the internal audit.

In accordance with approved plans for 2018 internal auditors performed together 80 internal audits, 79 planned and 1 special audit beyond the approved plan.

From this total number of internal audits 14 were financial ones focused on the proof of the economy of particular offices, 35 were audits of systems proving the administration of public resources and property, 13 were audits of operation dealing mainly with the functioning of the internal inspection system and 18 were other audits.

Performed audits inspected the functionality and efficiency of the internal inspection system, existing state of the fulfilment of suggested recommendations stemming from completed audits and inspections in previous year. Further the audits evaluated whether the standards and internal regulations have been issued and continuously updated. Special attention was given to the Risk catalogue administration based on the updated internal anticorruption program ČÚZK, evaluation of the risk system management, updating of the risk map and adjusting the optimal parameters for their management.

Performed audits were completed in the written reports with recommendations, most of which were accepted and carried out in given deadlines.

In 2018 performed audits proved that internal inspection system is effective, identifies possible risks and diminishes probability of their occurrence in ČÚZK activities.

8. 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. Beside that it also actively cooperates with all neighbouring countries in the area of mutual data and information exchange based on bilateral agreements and prepares professional programs and excursions for foreign students or branch experts.

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, ESDIN, and EuroSpec and Core Reference Data (CRD). EG negotiates experts involvement from member organizations into modifications of harmonization provisions included implementing rules of the Directive of the European Parliament and the Council for establishing of the Infrastructure of Spatial Information (INSPIRE) and helps to implement them on the particular member states level.

Since March 2013 the project European Location framework (ELF) was in operation. Its goal was to prepare the unified frame for provision of European reference geoinformation data and services.

ČÚZK actively participated on activities of some working groups as a project partner, provided sample data for pilot testing. The project was successfully completed in October 2016 and parallel Programme Board for transition to the European Location Service (ELS) was launched with ČÚZK representative incorporated. ČÚZK participates as the observer of the OpenELS project and contributes to it with open data INSPIRE/ELF for themes addresses, administration units, parcels and buildings. ČÚZK was co-organizer, host, of the EG General Assembly with participation of more than 140 representatives from the majority of European national mapping and cadastre agencies.

The activity of European section of UN-GGIM went on in 2018 with the plenary meeting held in June in Brussels and the global session in August in New York. ČÚZK sent a representative to both these meetings.

In 2017 implementation of the INSPIRE Directive went on and ČÚZK participated in many webinars and some international workshops as well as specialized groups dealing with updating of implementing and harmonization rules and existing experience from current implementation. The main event was 12th INSPIRE international conference that was held in Antwerp and that summarizes the implementation activities for the whole year. ČÚZK representatives actively participated in its programme.

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 2018 the representatives from the ČÚZK did not participate in any of the meetings because of technical reasons.

ČÚZK representative in the ISA2 Geospatial Solutions Group, set up by the European Commission under the ISA2 programme, aims at strengthening the interoperability of public administrations and services in the EU since 2014. Two meetings were held in Brussels in April and November; the European conference on semantic interoperability took place in Sofia in June.

The meetings of the Permanent Committee for Cadastre in EU (PCC) in 2018 were held in Bulgaria and Austria. The ČÚZK was represented in both meetings.

35th 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 Croatian Koprivnica in May 2018. The main theme of this meeting was Real estate cadastre development in the digital era.



In the area of geographical names ČÚZK was represented in the 21st session of working group for exonyms that was held in Latvian Riga and in the 5th meeting of geographical names authorities from Poland, Slovakia and Czechia, held in Polish Warsaw. The aim of these sessions is to raise awareness about standardization of geographical names, to support collection and authorization of geographical names and contribute to the international and regional cooperation in this area.

In 2018 the ČÚZK president invited the president of the Geodesy, cartography and cadastre authority of Slovak Republic (ÚGKK SR) for a friendly working visit, following up previous successful collaboration with her predecessors.

In addition, ČÚZK prepared several specialized workshops and excursions for foreign delegations, namely for students of surveying and cadastre from Turkey, for specialists from the Estonian land board, local administration officers from the China province Hennan and Korean colleagues from the state administration and from land surveying office.

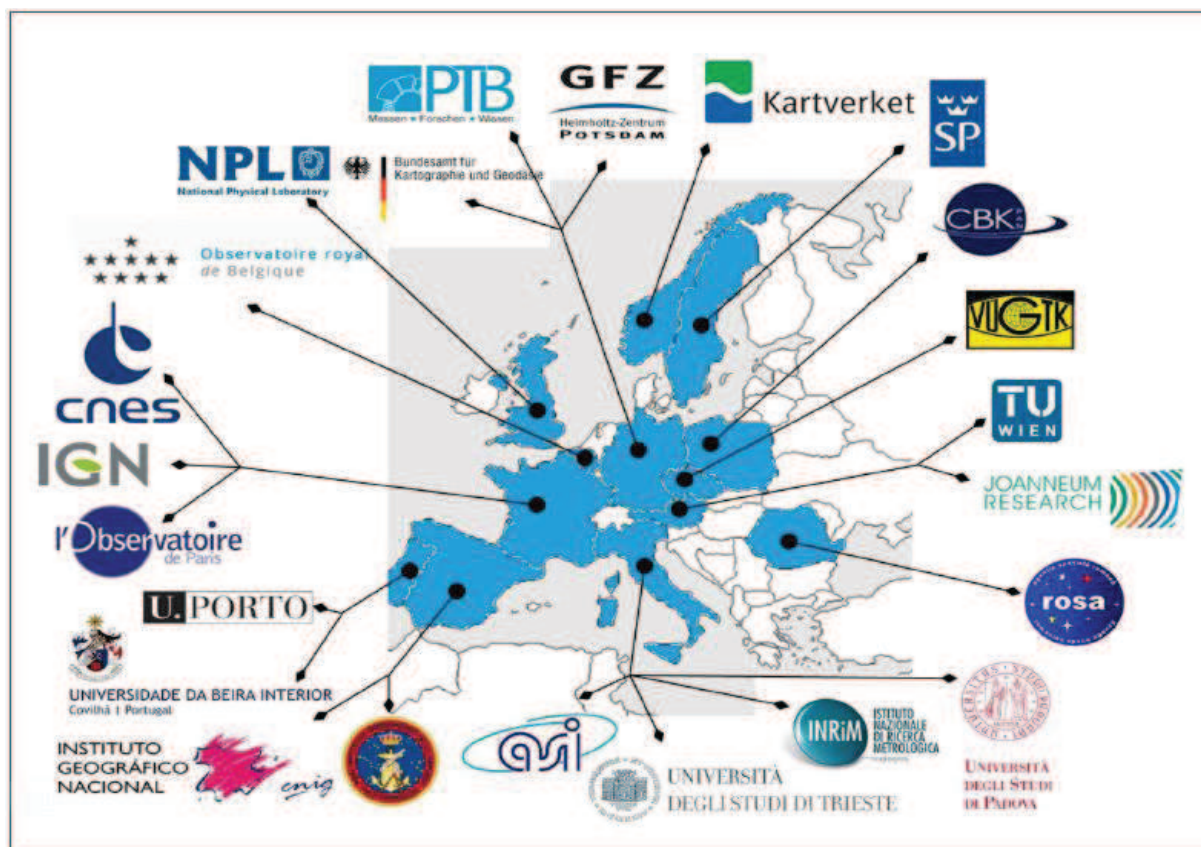
Further international activities dealt with participation on professional seminars, scientific-technical conferences, information technologies conferences and preparation of the scientific professional magazine Geodetic and Cartographic Review (GaKO).



9. Research and Development

ČÚZK performs the function of the founder of the Research Institute of Geodesy, Topography and Cartography (VÚGTK), v.v.i. The main activity of the VÚGTK is 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®.

During 2018 VÚGTK participated on solution of 20 projects from 7 providers within the main scope of its activities. One of the most important projects is the project H2020 „EPOS – Implementation Phase EPOS iP“ and project GSA “Galileo Reference Centre - Member State“. Three more projects BETA 2TA CR are also of big importance, because in their frame the research needs of the ČÚZK and of the Ministry of Interior in the field of geoinfostrategy are ensured.



In 2018 the GIS and real estate cadastre research department participated in the implementation of MapOO's results into the practice of the ČÚZK branch. The research "Use of digital technologies for processing of archival aerial photos for the actual surveying of drainage systems

in the S-JTSK system" in the area of photogrammetry and remote sensing of the Earth (DPZ) was completed in 2018. Follow up project "Procedures for geodata and specific data complementation by contactless surveying methods using consistent application of conceptual land consolidation tools" started. Both these projects have been processed with support of the TA CR in the EPSILON programme. Following two projects were processed in the BETA2 TA CR in 2018: "Optimization of the SW platform for graphical part of the MicroGeos Nautil and DIKAT applications" and "Catalogue of users' needs for development of the National infrastructure for spatial information".

Land survey 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 professional and general public.

The ODIS research unit and the Land survey library[®] dealt in 2018 with the NAKI II project of the Ministry of Culture of the Czech Republic "Fields and pheasantry - ignored value of the cultural heritage" and in cooperation with the Písek Technology centre project TRIO MPO "Data integration from the internet of things sensor platforms within smart GIS systems city eServices".

Basic and applied research in geodesy and geodynamics is provided for a long time by the research department of geodesy and geodynamics at the Pecný Geodetic Observatory in Ondřejov. In 2018, the gravimetric laboratory with its superconducting and two absolute gravimeters was involved in international projects in the areas of gravimetry, geodynamics and metrology. An important event was participation in the international comparison of absolute gravimeters and in the workshop on absolute gravimetry at the National Institute of Metrology near Beijing. In 2018, operational, data and analytical centres were added to the services of the International Association of Geodesy and World Meteorological Services. The basic research was carried out in the framework of one project of the GA CR focusing on the advanced processing of absolute gravity measurements. In 2018, the project "DORIS as integral part of the realization of reference systems and GGOS" in the frame of Inter-Excellence Ministry of education, youth and sports (MŠMT) was launched, focusing on research of systematic influences of devices and improvement of DORIS data analysis. Applied research focused on the development of software tools for the processing of GNSS data in precision positioning mode, the development of metrological bases for gravity and GNSS measurements and monitoring of the stability of the GNSS reference network in the Czech Republic.

Experimental work of the department was supported by the project "Distributed system of observatory and field measurements of geophysical fields" within MŠMT OP Research, development and education. In 2018 another project "Development of precise tropospheric model for refining of GNSS measurements and software for generating of virtual GNSS data in CZEPOS network" was launched in the frame of the BETA2 TA CR program, which aims at refining the GNSS positioning.

The Metrology and Engineering Geodesy Research Department solved the project "Methodology and Technology for Creating Thesauri and Dictionaries for the Development of National Infrastructure for Spatial Information" in 2018, within the BETA2 TA CR program. It is a joint project of the Ministry of the Interior and ČÚZK, which was prepared as the first in the Czech Republic in the form of an innovation partnership. Other projects were solved within the EPSILON TA ČR program and the NAKI II program of the Ministry of Culture.

In the form of contractual research, the Institute for Nuclear Safety deals with the "Preservation of State Standard (SE) of Large Lengths, the so-called metrological continuity of SE". In addition to the research activities, the department was involved in determining the lengths of road sections

with a controlled speed of vehicle movement within the Czech Republic and in the calibration of geodetic devices and tools. From 1 January to 21 November 2018, in total 648 orders for 1 677 calibration of measuring devices and tools were carried out. An important activity was the participation of the calibration laboratory in the international inter-laboratory comparative measurements regarding the length parameter organized by the EURAMET (European Association of National Metrology Institutes).

In connection with the activity of the calibration laboratory VÚGTK, v.v.i., the laboratory was subject to an audit of the Czech Accreditation Institute and the Czech Metrology Institute in October and November 2018 according to the new international standard ČSN EN ISO / IEC 17025. Based on the positive assessment, the laboratory has been certified according to a new international standard and its results are acknowledged even within the EU.

Other activities of the department dealt with the “development and production of a new mobile HYNi hydrostatic system kit”. Verification measurements and registration work for the industrial design are underway.

Continuous provision of service activities for measuring systems at Temelín Nuclear Power Plant was ensured.

Under the contract with the Czech Office for Surveying, Mapping and Cadastre, services in the field of metrology were provided via participating in the Technical Committee for Gauges and in the Metrology Council at ÚNMZ.



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