

# How to Use Digital Data and Maps in Juridical Experts' Practice

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**Key words:** digital maps, juridical expertise.

## SUMMARY

Juridical experts for land surveying during their activity have to set against cadastral maps from different sources and the real situation in the nature, and find out their changes or deviations. If you have analogue maps the examination could be subjective. Setting against computer aided digital datasets you have the opportunity of a more reasonable examination. Analogue maps can be digitised into vector datasets. Data measured in the nature can be fitted straight into the dataset.

## SUMMARY (in Hungarian)

Az igazságügyi földmérő szakértői gyakorlatban különböző térképeket és a helyszíni állapotot kell összehasonlítani, és megállapítani az eltéréseket. Analóg térképek esetén az összehasonlítás szubjektív elemeket is tartalmaz. Digitális állományok számítógépes összehasonlítása műszakilag megalapozottabb vizsgálatot tesz lehetővé. Analóg térképeinket digitalizálással vektoros állományokká alakíthatjuk át. A helyszínen végzett méréseket a digitális állományokba közvetlenül beilleszthetjük.

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Thanks to development of surveying and mapping technologies there is a growing demand to use digital data and maps in juridical experts' practise. As the digital maps are spreading as official maps these can be the relevant base for the examination at the same time.

The most important point of view is to know what was the way of creation and what is the actuality of the data used in the database. Digitising analogue maps, by loading of calculated co-ordinates or by new digital surveys can be created digital maps, too. You can create it in any way the accuracy of the new product can be at most the same or less as the original was. Creation of a digital database is not able to increase the accuracy of the original elements. The advantages of implementation of a database are the structural handling, the homogeneous arrangements of the elements and the possibility to co-ordination the spatial information and descriptive attributes.

The so-called layer technology at handling digital maps gives a new clear tool to the experts for set against different databases and reveals of deviations and changes. If they are determined in different reference systems, we can create databases for direct examination by transformation. In any different arrangement we can put them on to each other, and we can make printouts, and we can calculate the relevant differences in distance and area. In addition we can do the investigation at any scale and any size of area.

If the official map is analogue, and no other mapping information, we can create of a digital database by digitising of it. If we scan the map for digitising, the scanned database could be used as a background at demonstration of the results.

After digitising first we have to check the area of the parcels compared to the registered value. Inside the allowed tolerance we can correct the digitised lines to improve the harmony of mapping representation and registered value of area. To consider the digitised data the same accuracy as the numeric defined data is a very serious professional error. If we have original measured data beside the analogue map, we can use them for correction the crude digitised situation. On the other hand by measured data we can improve the rectangular shape of the buildings, too. We can work in a local reference system, but we have to transform it into the reference system of the official map, for comparison to the databases origin from different sources. If the examination of the size of parcel's area shows bigger difference as allowed the expert must propose the correction of the error in an official procedure before further processing.

If a new digital map is available about the related area, but not circulated as an official map for land-registry, we can get very useful information using it for preparation the examination in the nature.

In the nature we have to record the real situation with special regard to the debated issues. For surveying the mapping elements in the nature we can follow two different ways. If a new digital map is available, and we can identify enough elements of it in the nature, we can determine the new, or changed or debated elements compared to the identified parts already mapped. Otherwise you have to do the survey that could be mapped independently. If we work in a local reference system, the transformation into the national reference system must be done.

There are very good experiences with the use of GPS devices. We can use it if in the related area no control points or very far only and there is good condition to observe the satellites. This technology can assure suitable accuracy for the requirements of expert practice.

Processing the measurements we can create another digital database, which can be set against to the relevant one to find out the sameness or the deviations and changes. To set against the database to digitally proceeded aerial photographs and orthophoto maps is also available, and the elements of them can be transferred into the database.

Evaluation of the experiences has to consider the tolerances allowed by the standards and professional regulations. No maps without errors, even created by the most precise technology. Relatively small differences could be spectacular by digital way because of no scale. That is why licensed surveyors and juridical experts have to be consider that the new digital technology in mapping is modern, easy to do, and could be reconstructed without contradiction, but its accuracy depends on the accuracy of the survey of its elements in the future, too.

Now, let us see a short demonstration.

## BIOGRAPHICAL NOTES



### Personal data

Name: Zoltán Forgács dr.  
Date and place of birth: 2. June 1945. – Budapest, hUNGARY  
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### Education

Budapest University of Technology (Phd.) 1979.  
Budapest University of Technology (master of degree) 1977.  
Budapest University of Technology (engineer for land surveying) 1969.

### Professional experience

Institute of Geodesy, Cartography and Remote Sensing  
Quality manager 1998-  
Head of department. on land registration 1989-1997  
Head of department on supervising for geodesy 1979-1996  
Pest County Land Office (surveyor) 1969-1978.  
Juridical expert for surveying and appraisal 1976-  
Licensed surveyor 1990-  
Lecturer at Postgradual Institute of Budapest University of  
Technology (Land Registry and Geodesy) 1993-

### Memberships

Hungarian Society of Surveying, Mapping, and Remote Sensing (section leader)  
Hungarian Chamber of Juridical Experts (section leader)  
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