

# ALKIS<sup>®</sup> - GERMANY'S WAY INTO A CADASTRE FOR THE 21<sup>ST</sup> CENTURY

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## ABSTRACT

Germany's tradition in cadastre is more than 150 years old. During the last three decades of the 20<sup>th</sup> century the analogue maps and records were digitised. Both digital cadastral maps and digital records are stored in separate systems. The digital cadastral data bases in Germany are the Automated Cadastral Map (ALK) and the Automated Property Register (ALB). They became a basic Land Information System for an increasing number of users in the public and private sector. The roots of ALB and ALK developments date back to the 70s and 80s of the last century.

In addition to these developments the Official Topographic and Cartographic Information System ATKIS<sup>®</sup> was established throughout the whole republic. ALK, ALB and ATKIS<sup>®</sup> do not have the same object structures which makes a straight data exchange almost impossible even if some features in ATKIS<sup>®</sup> could be derived out of ALK or ALB. Further development of these software systems seems not to offer future oriented solutions.

Considering these facts and trends the Working Group of the Surveying Authorities of the States of the Federal Republic of Germany (AdV) decided in 1995 not to invest in these software solutions in future, only to guarantee sustainability of the systems until 2005, but to invest in the development of a new integrated data base model for cadastre and topography. AdV decided that a further development of ATKIS<sup>®</sup> could only be seen in context with a redesign of the cadastral information systems. The result of a first rough study of the situation brought out that 75 % of all information to a parcel stored in ALK and ALB are redundant. An object oriented data base model of the entire cadastre seems to be meaningful and as a result of a market observation of current GIS software as well feasible.

Since 1997 several expert groups established by AdV have been developing a model of an Integrated Official Cadastral Information System called ALKIS<sup>®</sup>.

ALKIS<sup>®</sup> is designed to

- run all necessary data for a parcel based map and a register of land owners and land use as unified basic data for any GIS in the entire country,
- control the use and maintenance of the system and to
- enable the access to the entire geographical data of the surveying authorities for all users via a meta data system including quality information for all data and a standardised data interface for ALKIS<sup>®</sup> and ATKIS<sup>®</sup>. Of course links from the custom-

ers' own specific data to ALK, ALB or ATKIS<sup>®</sup> which are already established still have to be possible in the new systems without reasonable new investments on the users' side. They can trust in the sustainability of their investment in data.

The object catalogues and data of ALKIS<sup>®</sup> and ATKIS<sup>®</sup> shall be harmonised in order to allow a vertical data flow avoiding data redundancy and double work in data acquisition and data processing. AdV followed the idea only to design and to describe a data base model. The GIS industry shall carry out the software solutions. The new ALKIS<sup>®</sup> standard therefor has to guarantee sustainability as well for the GIS industry in order to protect their long-term investment in the ALKIS<sup>®</sup> software development. Essential for this approach is the use of a standardised data base description language with graphical and lexical features (AdV 1999). Of course one major claim is the option for a complete automated migration of the ALB, ALK and ATKIS<sup>®</sup> data into the new target systems.

ALKIS<sup>®</sup> is the first information system world-wide described by using ISO standard UML (Unified Modelling Language) and XML (Extensible Markup Language). ISO established a test bed for ALKIS<sup>®</sup> to test the standards for feasibility.

The activities on the side of AdV concerning the processes of modelling ALKIS<sup>®</sup> and ATKIS<sup>®</sup>, the definition of standard output products based on a XML interface and the meta data catalogue based on UML are completed. The Standard Data Exchange Interface NAS will be derived automatically from the UML model. The member states in AdV agreed upon basic contents of ALKIS<sup>®</sup> in order to guarantee a unique standard for the system and data in ALKIS<sup>®</sup> for the entire country.

Some GIS companies introduced already ALKIS<sup>®</sup> prototypes during the INTERGEO<sup>®</sup> 2000 Exhibition in Berlin. These prototypes are developed with OGC simple features under Oracle 8i spatial. The migration process was tested with real ALB and ALK data. The first experiences and results shown confirm that the ALKIS<sup>®</sup> model seems to be feasible.

Some states in Germany are already on the track to establish ALKIS<sup>®</sup>, most states are planning and preparing the migration process. All states committed themselves to start with the implementation of ALKIS<sup>®</sup> not later than 2005.

Both the public sector and the GIS companies successfully designed and developed a future oriented cadastral information system.

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## **BIOGRAPHICAL NOTE**

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