FIG Working Week 2016

CHRISTCHURCH, NEW ZEALAND 2–6 MAY 2016

Recovery
from disaster

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Multidimensional Cadastral System in Germany

Jens Riecken (DVW Vicepresident),
Ulrich Gruber, Markus Seifert (DVW WG Geoinformation)

TS08C - GIS, 3D Data and Cadastre
Multidimensional Cadastral System in Germany

Content

- About my home place
- Efforts on 2D level
- Efforts on 3D level
- Efforts on 4D level
- Conclusions

Germany

82 Mio. inhabitants

0.35 Mio. km²

64 Mio. cadastral parcels
[5 trillion (10 ^{12}) EUR]

40 Mio. buildings

Bavaria

70 550 km² (=20% of Germany)

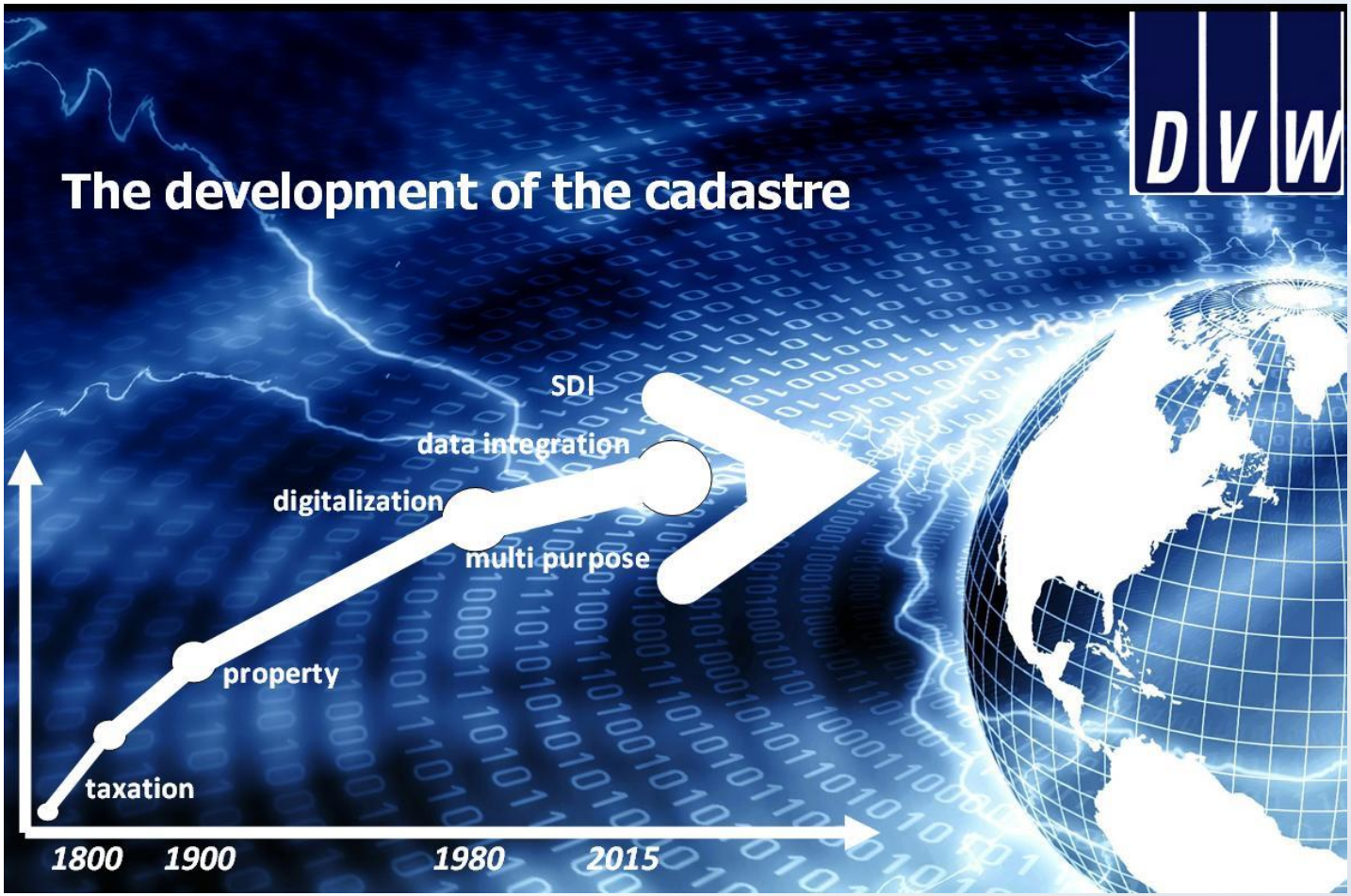
12 Mio. inhabitants

Official Cadastre in Germany

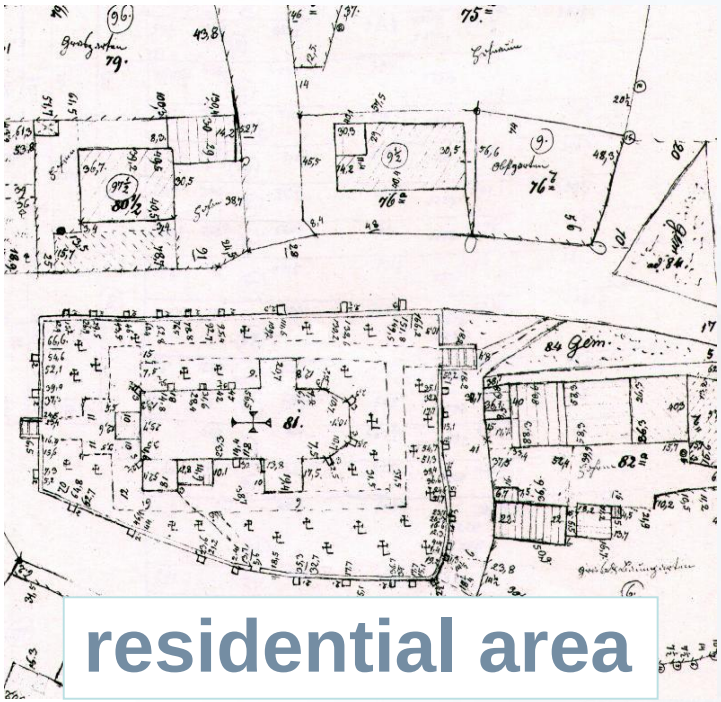
Responsibility: 16 German States (Länder)
– independent in cadastre issues –

Structure		16 Surveying, Mapping and Cadastral Authorities
	plus	255 Regional Authorities
	plus	1523 Licenced Surveyors (in all German states except Bavaria)
Cadastral Specialists in total		33 000 (Germany)
		2 900 (Bavaria)

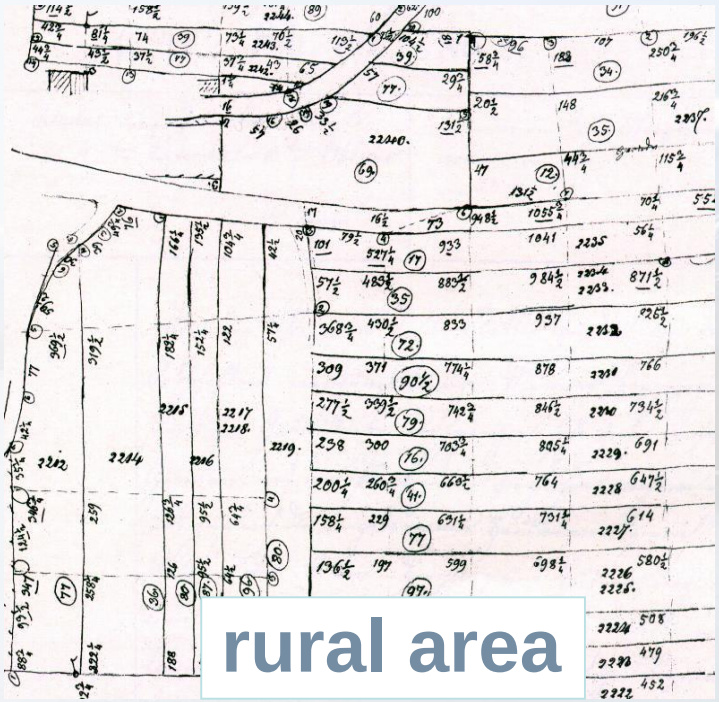
The Development of the cadastre, the global context



Fit for purpose?



residential area

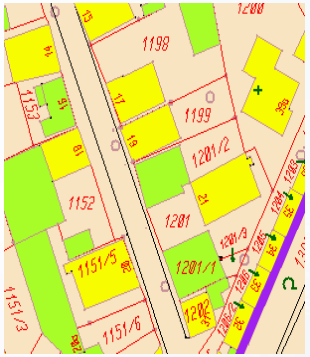


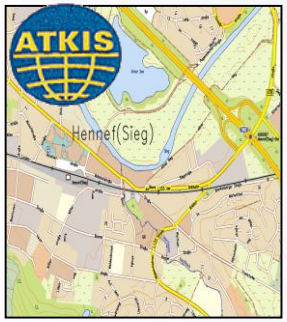
rural area

first cadastral survey of the year 1872

Efforts on 2D Level

ALK
Automated Real Estate Map

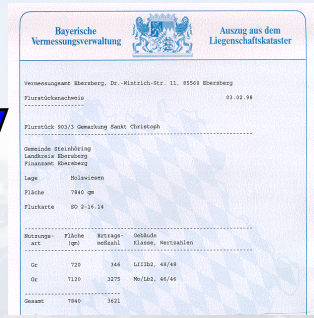


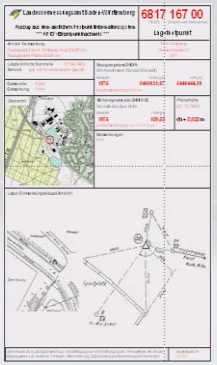


ATKIS
Offical Topographic and Cartographic Information System

+

ALB
Automated Cadastral Register





ALKIS

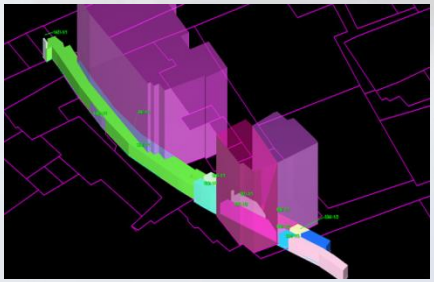
AFIS
ALKIS
ATKIS

Integrated modeling:
triple-A Model

Geodetic Reference Points
AFIS

3D Cadastre in Germany

- Cadastral law: Cadastral information should be improved and developed by taking into account the requirements of the public users and the possibilities of the technology
- There is a need for a nation wide harmonised dataset for the third dimension (building height, DTM)
- A real 3D cadastre is currently not necessary since there are practical solution which are properly working.
- The possibilities (benefits) of capturing rights and restrictions on parcels are currently evaluated



Ongoing Discussion:

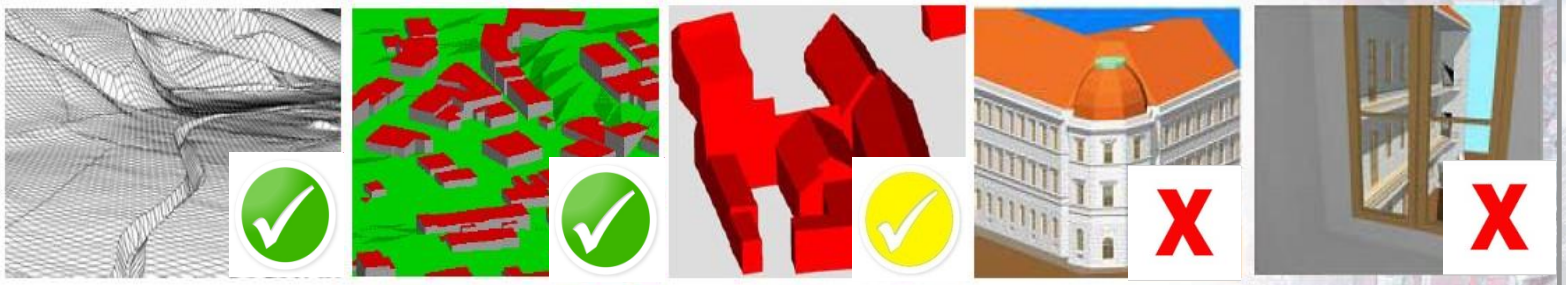
Is a 3D Cadastre really needed?

Efforts on 3D Level

3D-Models of Buildings

…as geographic core data in Germany

NEW!



LoD0	LoD1	LoD2	LoD3	LoD4
2.5D Geländemodell	Klötzchenmodell	Standarddachformen	Reale Dachform	Modell von Innen- und Außenraum

finished

some states (e.g. Bavaria): finished

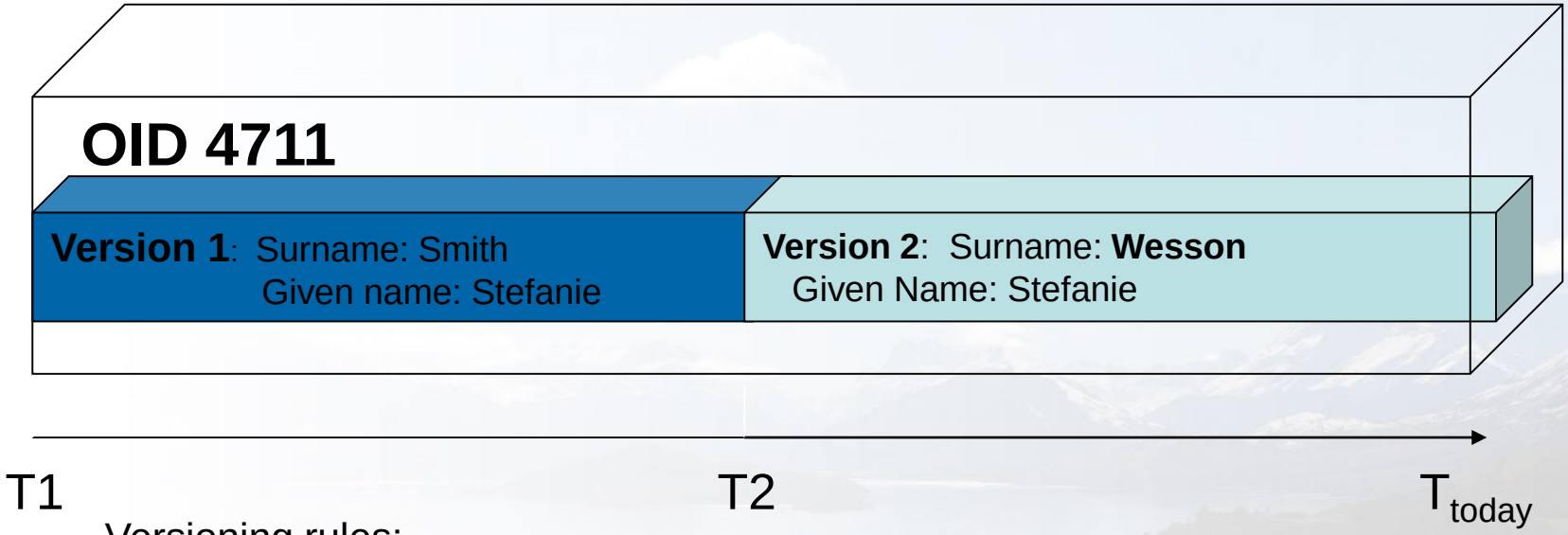
others: until 2016

work in progress

to be done by private surveyors

New in Germany: 3D buildings
(exported to GoogleEarth)

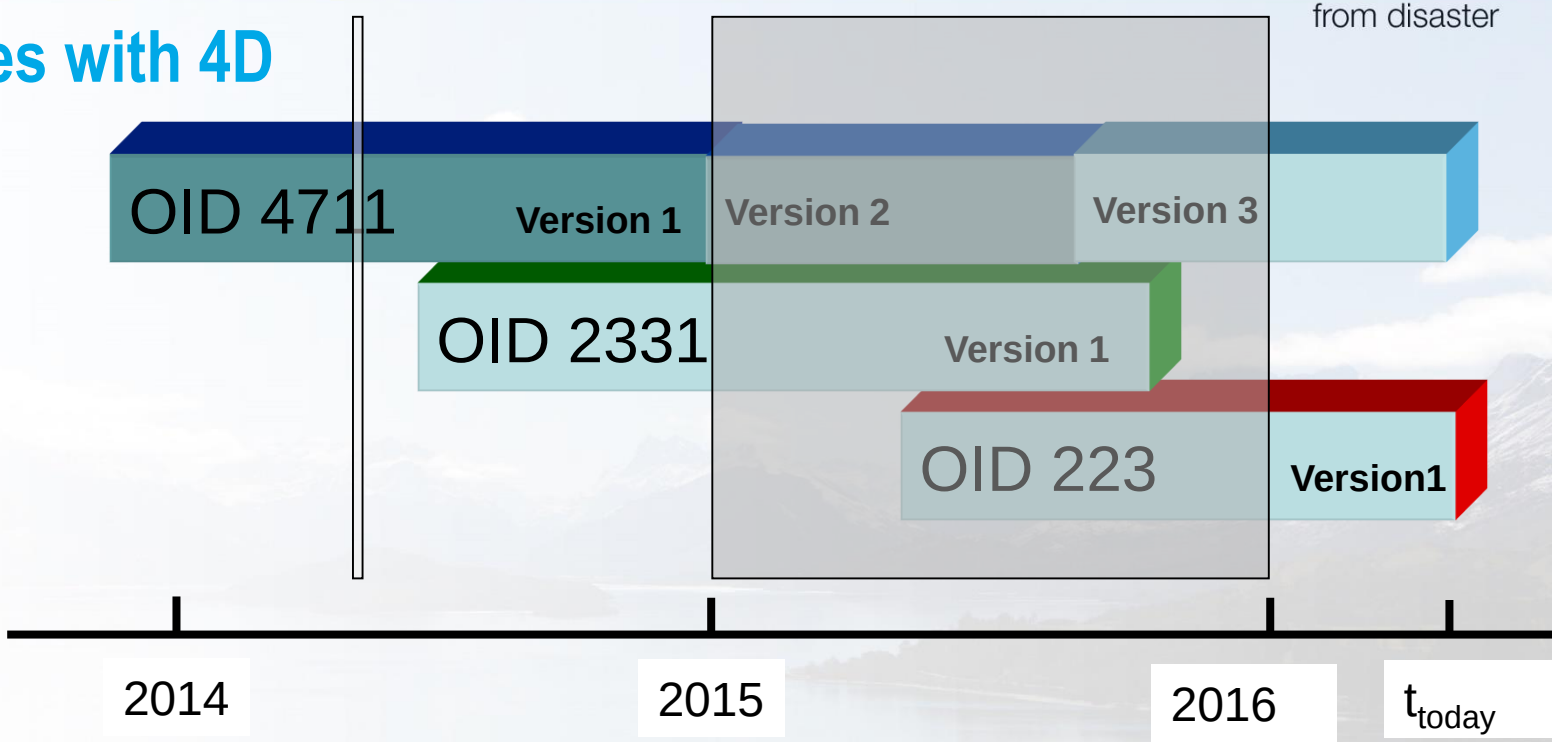
Efforts on 4D Level



Versioning rules:

- major changes of attributes cause the „deletion“ of the object; the deleted object remains in the data base
- minor changes of attributes cause a new version
- no structural differences between current and historical data
- conceptually:
  - object „container“ holding all versions, one ID for one object
  - each version carries ID and life cycle information

Possibilities with 4D



- Incremental update information directly out of the data base
- Information extraction for ANY **time stamp** or **time frame** possible (the current date is only a specific case)
- serves data delivery and allows the management of historical information

Benefits of the time component in cadastral information systems

- Enquiries about the development of a parcel in case of disputes
- Monitoring the development of cities and villages over time
- Statistic of changes of land use and land cover
- Planning purposes
- Historical archiving
- Monitoring of cultural heritage.

Conclusions

- Big efforts have been done to evolve the cadastre in Germany be part of a SDI as a multi-purpose cadastre
- Modern GIS technology is up and running in cadastral offices
- There ist a great demand for 3D data but not yet for 3D cadastre information
- The fourth dimension is already implemented for differential updating of user systems; the technology can be also used for storing and providing historical information
- Short:
  - 2D ✓
  - 3D ✓
  - 4D ✓
  - 5D ???

For more information see
www.adv-online.de

Thank you for your attention!

Contact:

Dr. Markus Seifert

Geschäftsstelle Geodateninfrastruktur Bayern
(Secretariat for SDI in Bavaria)

Munich, Germany

Markus.seifert@ldbv.bayern.de