



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

**Bundesamt für Landestopografie swisstopo**  
Geodäsie und Eidgenössische Vermessungsdirektion

wissen wohin  
savoir où  
sapere dove  
knowing where

# Land Administration in Switzerland

WPLA/CLRKEN Joint Workshop  
Lausanne, Switzerland, 21 April 2017

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# Content

- **Facts about Switzerland**
- **Legal basis and organisation of Land Administration**
- **Technical elements**
- **Developments**



# Location and Basic Dimensions



## **SWITZERLAND**

**41'290 sq km**

**26 cantons**

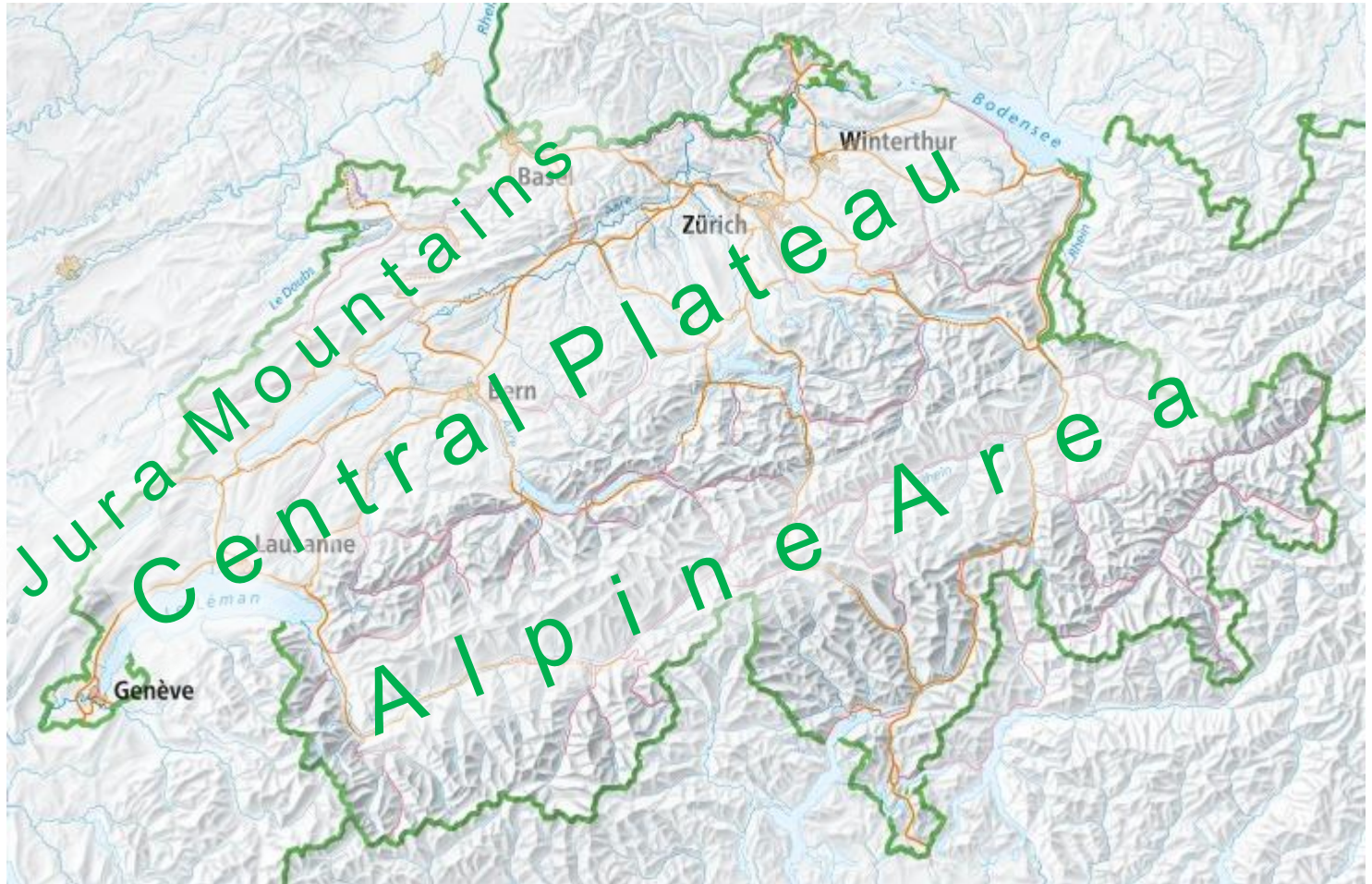
**~2300 municipalities**

**~8.4 million population**

**~4.1 million parcels**

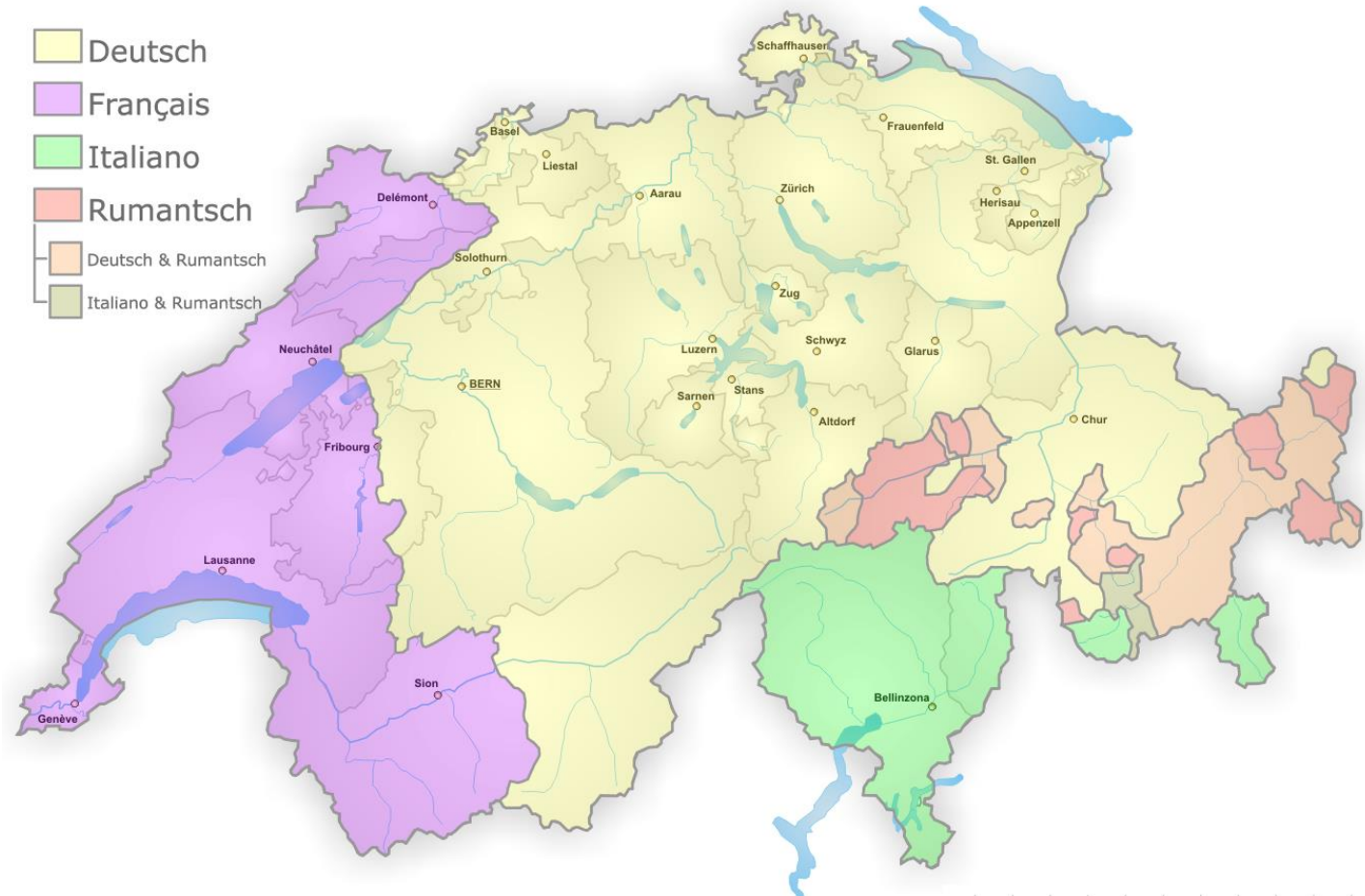


# Topography





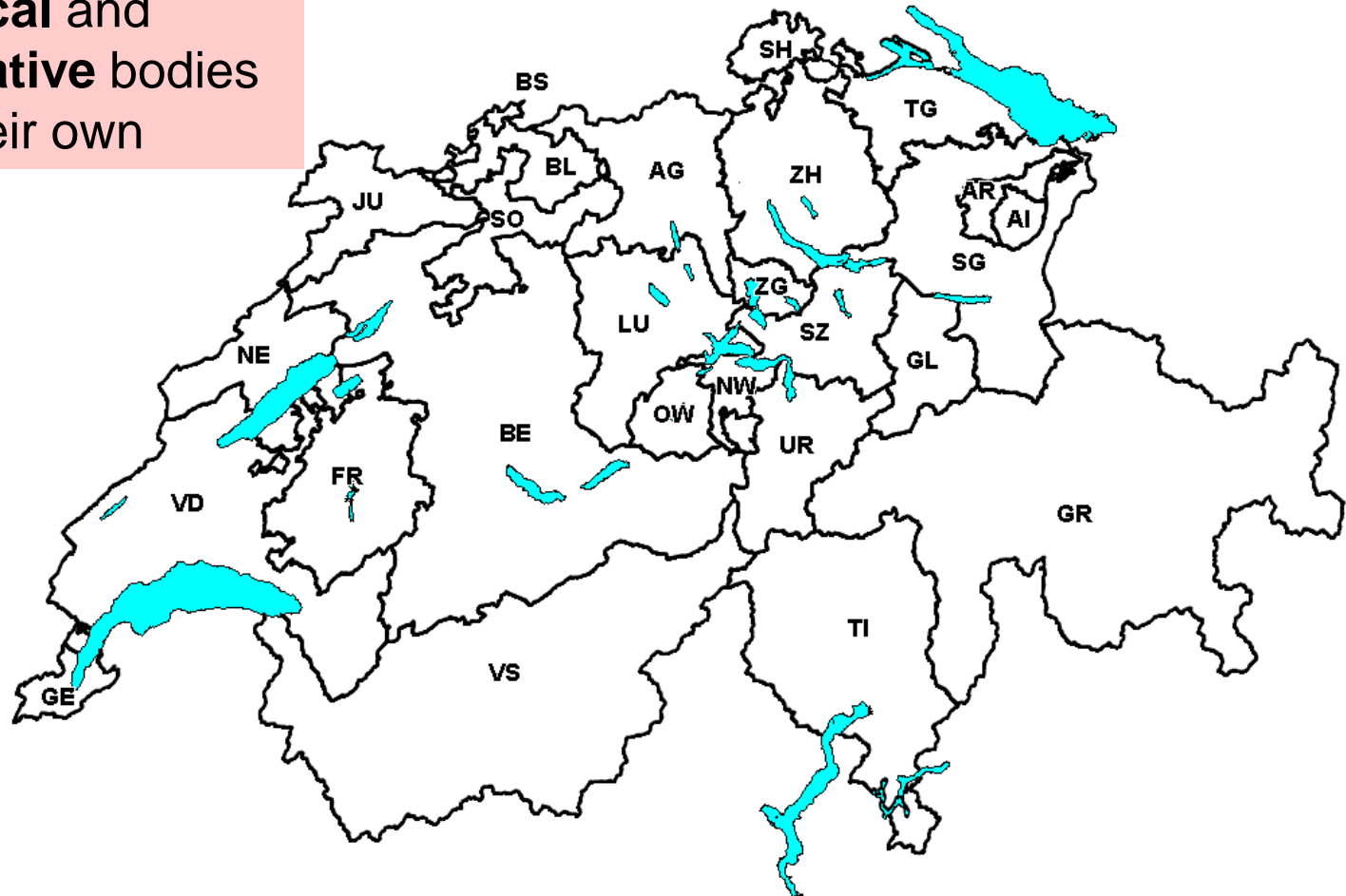
# Four official languages





## Federal Structure – 26 cantons...

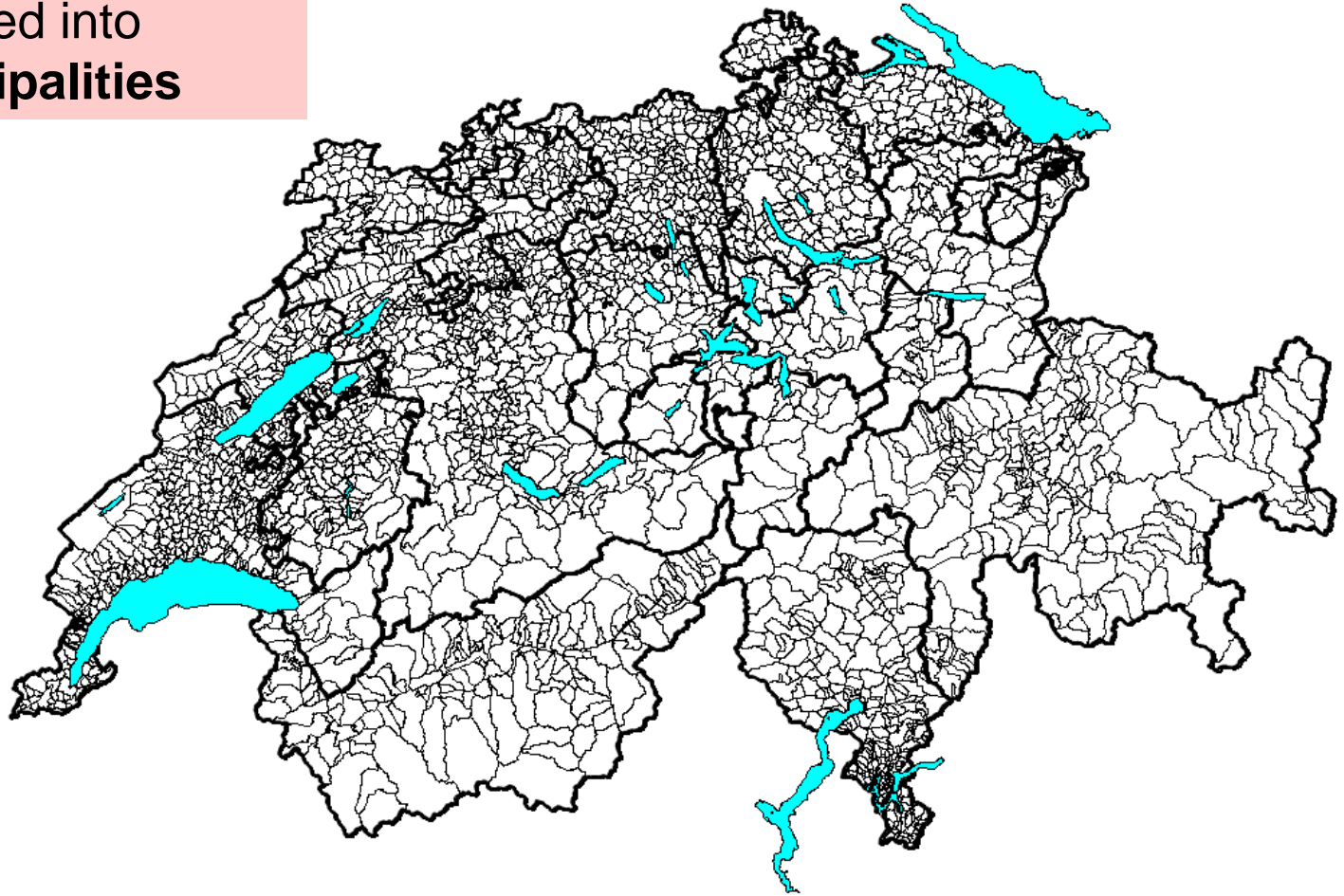
Cantons maintain  
**political** and  
**administrative** bodies  
on their own





## ... and some 2300 municipalities

Cantons are further  
divided into  
**municipalities**





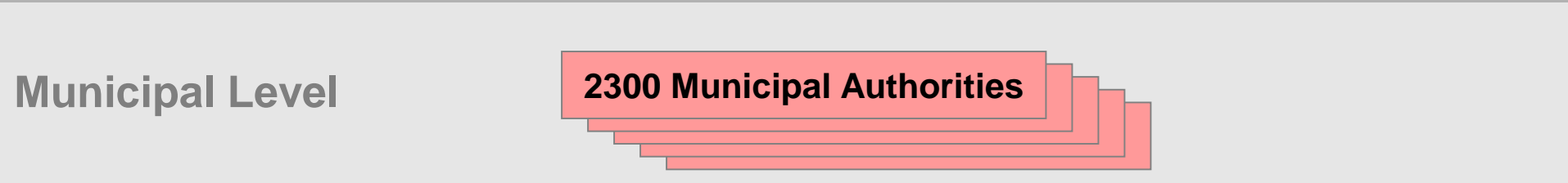
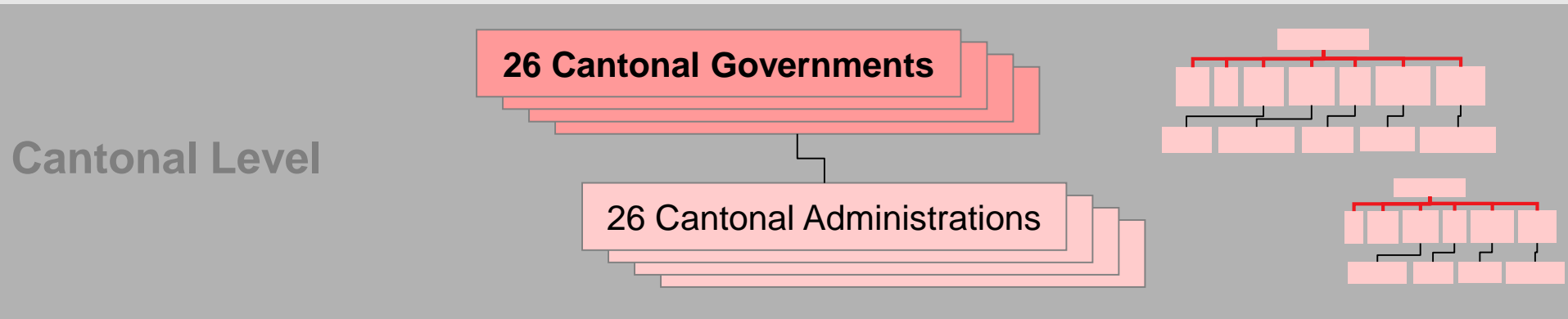
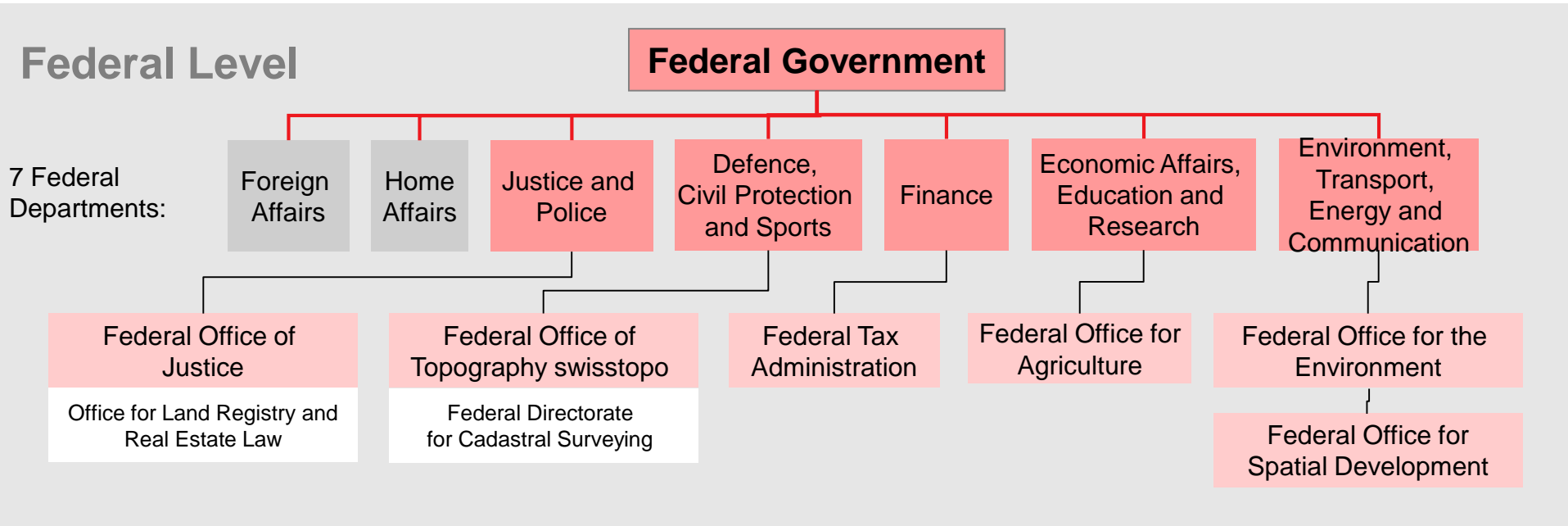
# Land Administration – joint effort in a federated context

Land admin. sectors	Mandates	Federal level	Cantonal level	Municipal level
Land ownership	land registration	Office for land registry and Real Estate Law (~8 persons)	26 cantonal land registries + ~250 regional agencies	notaries
	cadastral surveying	Federal Directorate for Cadastral Surveying (15 persons)	20 cantonal surveying offices (~300 persons)	private sector (~2700 persons)
Land value	taxation	Fed. Tax Administration	Cantonal tax offices	---
	land evaluation	---	Cantonal agencies	mandated agents
Land use	land-use planning	Fed. Office for Spatial Development	Cantonal offices	private sector
	agriculture	Fed. Office for Agriculture	Cantonal offices	private sector
	forestry, environment	Fed. Office for the Environment	Cantonal offices	private sector
Geoinformation	SDI, NGDI	Fed. Office of Topography swisstopo (~300 persons)	Cantonal office for geoinformation	municipal administration





# Offices involved in Land Administration



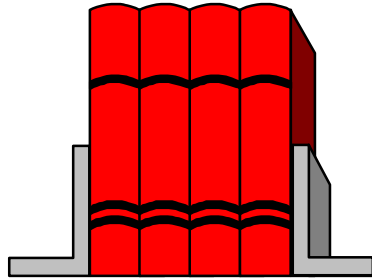


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# Legal basis and objectives for Cadastre and Land Registration



## Swiss Civil Code, 1912



### Objectives of the legislator:

- **Security of ownership**, efficient land market, and mortgaging of real estates



## Basic principles for documenting landownership (as defined in civil code)

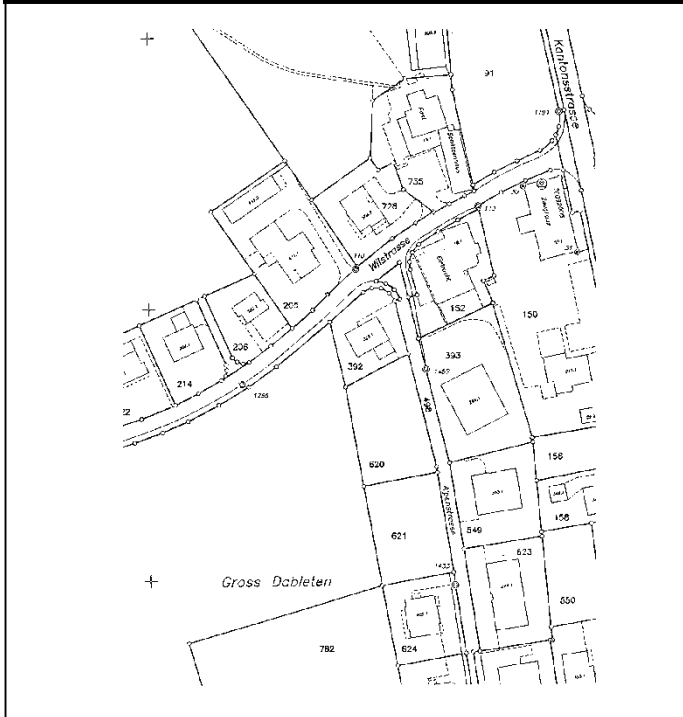
- **No landownership without registration** (art. 656)
- **No registration without surveying** (art. 950)
- **No surveying without boundary definition** (art. 669)

- **Title registration system**
- **Title guaranteed by the government**



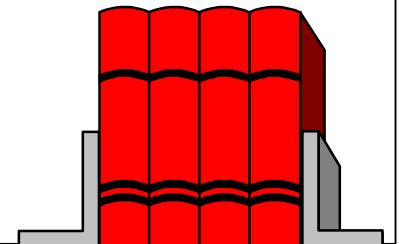
# Swiss cadastral system

## Cadastral Surveying



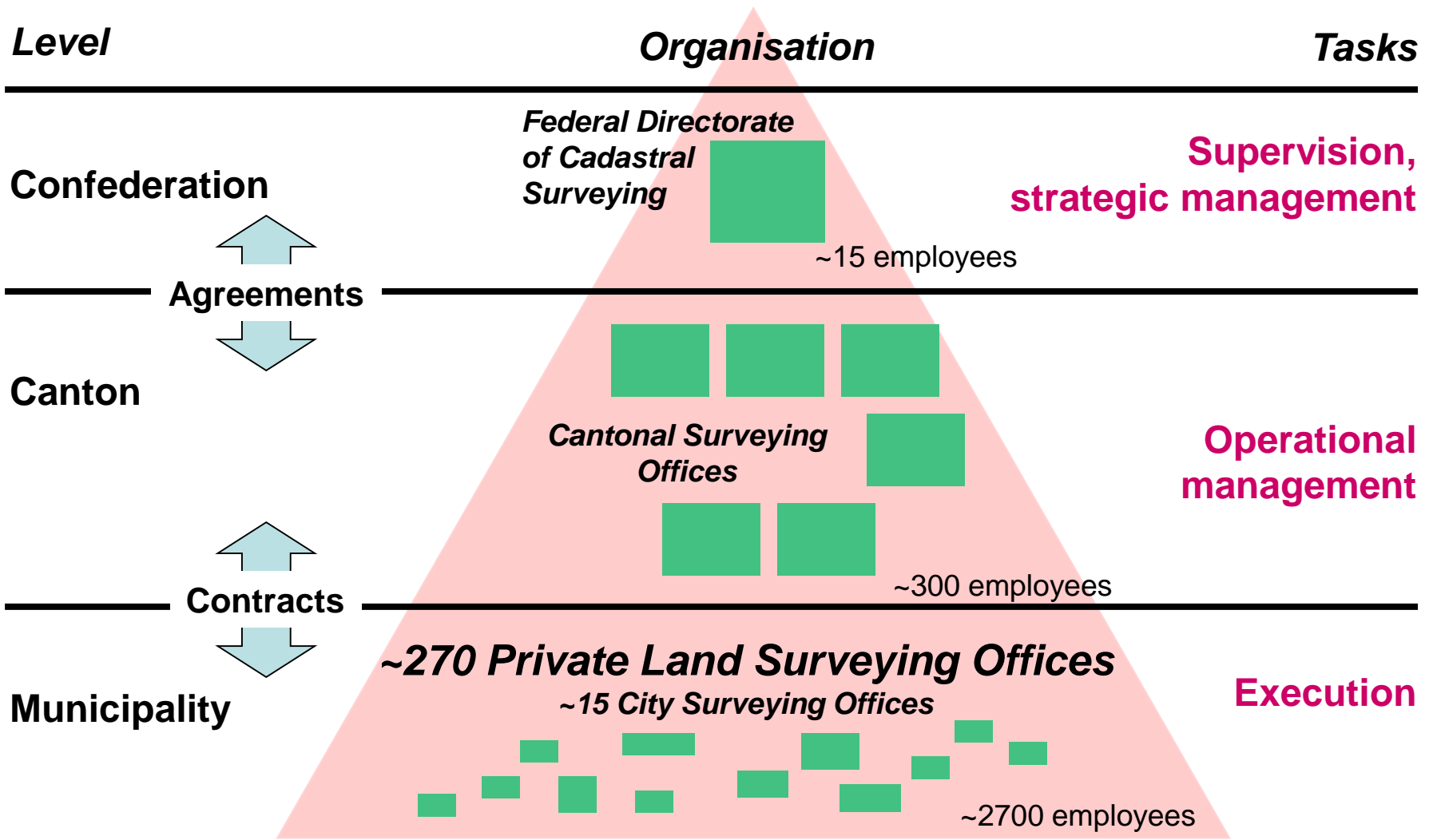
## Land Register

- main book
- auxiliary registers (in particular the list of property owners)
- deeds (records and evidences)
- description of properties
- day book





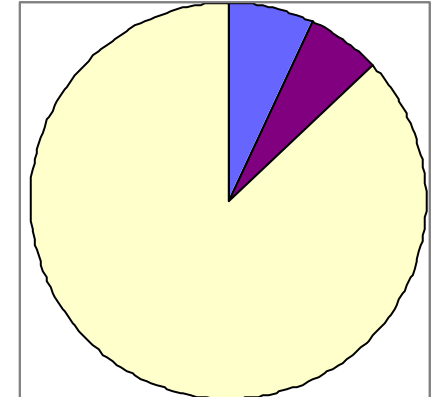
# Organisation of cadastral surveying





# Public-Private Partnership

- No. of staff active in cadastral surveying: 3'050
- federal and cantonal administration: 6.9%
  - other public sector offices: 6.0%
  - private sector offices: 87.1%



## Public Sector

- legislation (Federal and cantonal level)
- financing structure
- setting standards
- supervision
- co-ordination
- verification



## Private Sector

- production
- maintenance
- service to clients
- **innovation**

**Two Partners !!!**



# Financing of cadastral surveying

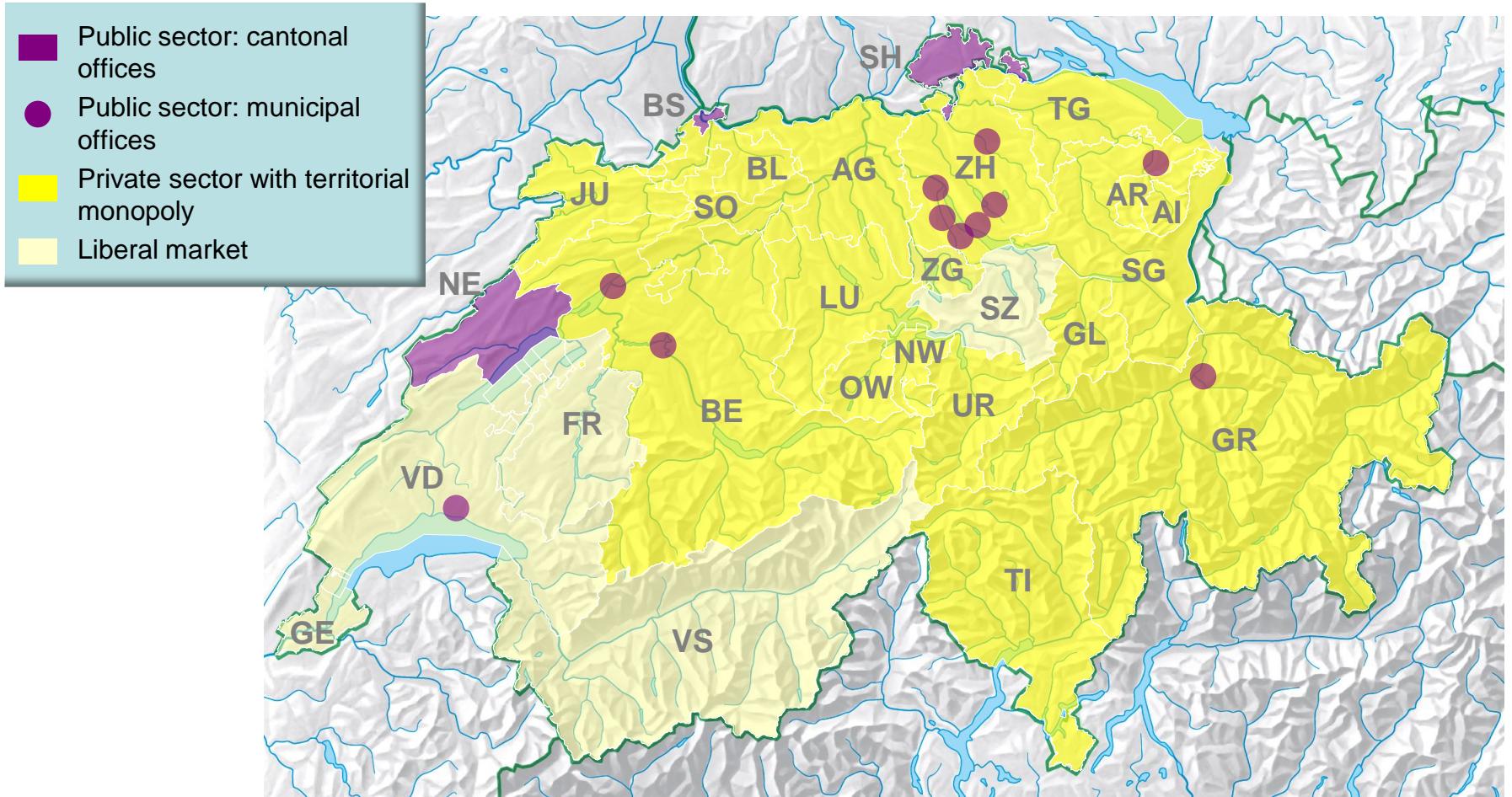
- **Projects** (according to the Ordinance on the financing of cadastral surveying, FVAV, from 6. Oct. 2006) are strongly subsidized by the Federal level:
  - first surveys (BZ1-3: 15%, 30%, 45%)
  - renewal (BZ1-3: 15%, 20%, 35%, GZ: 25%)
  - monumentation in BZ3: 25%
  - special amendments of exceptionally high national interest: 60%
  - periodic updating: 60%
  - remaining costs are borne by the canton, which can decide to include further partners in the financing (municipalities, landowners)
- **continuous updating**: to be paid by the party causing the change





# Continuous updating of cadastral system: different organizational set-ups

In Anlehnung an Bericht des Preisüberwachers zu den Gebühren für die Nachführung der amtlichen Vermessung (April 2016).



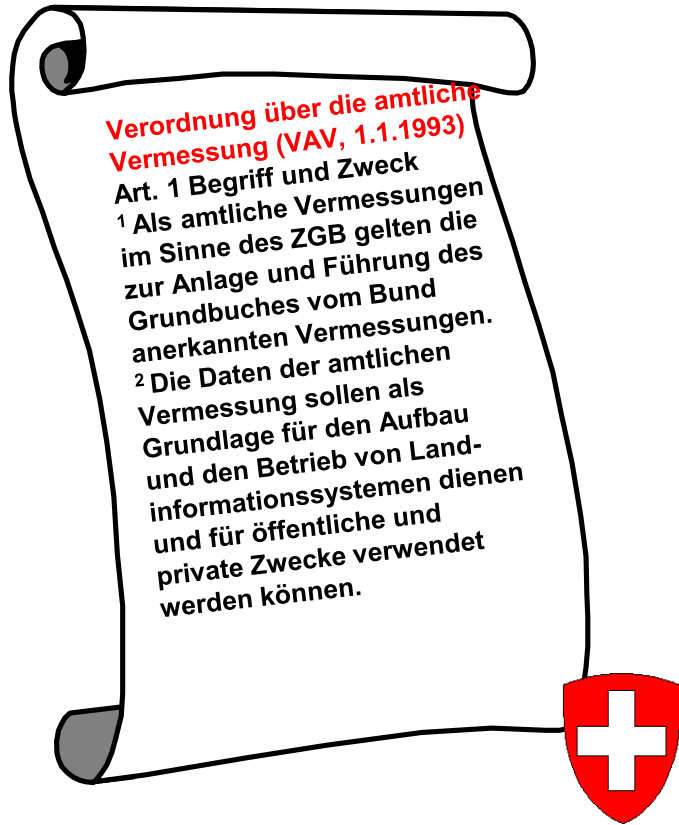


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# Legal act 1993, adding a new and extended purpose



## Ordinance on cadastral surveying (1.1.1993)

### Art. 1: Definition and Objective

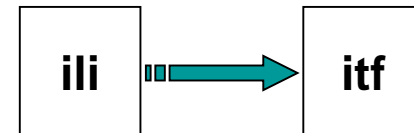
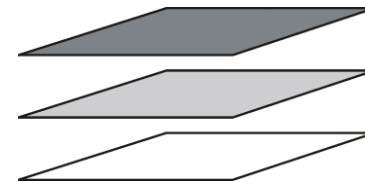
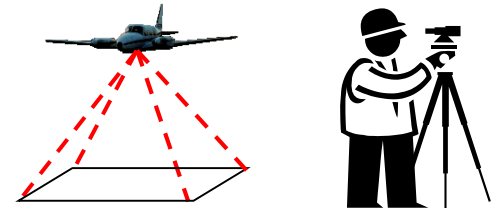
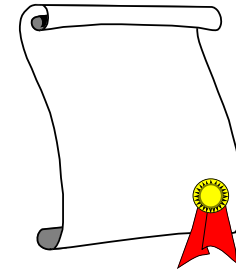
<sup>1</sup> In terms of the Civil Law, cadastral surveying is considered to be surveying – approved by the Confederation – for the **purpose of operating the land registry**.

<sup>2</sup> The data of cadastral surveying shall serve as basis for **the establishment and the operation of land information systems** and shall be suited for public and private purposes.



# Conceptual elements of AV93

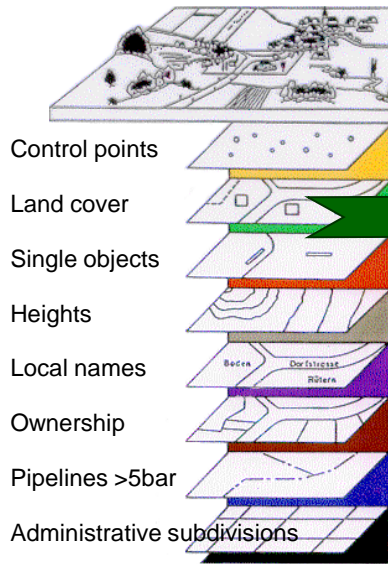
- Clear definition of the product
- Freedom of methods and systems (as basis for tendering)
- Independent information layers (link between layers only through geographic location)
- Standardized way of data description and data transfer (INTERLIS)



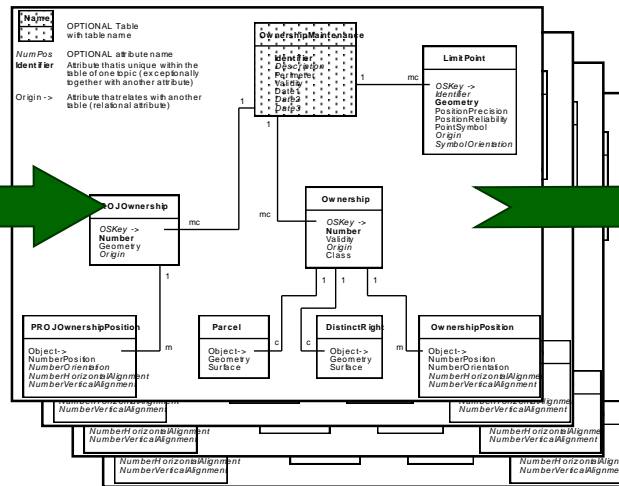


# Technical elements

Standardized description of digital data (introduced in 1993)



8 information layers  
(Possibility to realise the layers separately)



Data model (UML)  
(Entity-Relationship-Diagram)

```
TRANSFER Data_Catalogue;
MODEL Basic_Data_Set
DOMAIN
  LKoord = COORD2 480000.000 70000.000
                840000.000 300000.000;
  HKoord = COORD3 480000.000 70000.000 0.000
                840000.000 300000.000 5000.000;
  Height = DIM1 0.000 5000.000;
  Precision = [0 .. 300];
  Reliability = (yes, no);
  LetterOrientation = GRADS 0.0 400.0;
  Status = (planned, valid);

TOPIC Control_Points =
.....
END Control_Points;

TOPIC Land_Cover =
.....
END Land_Cover;

Ownership =
MAIN
  Monumentation = (border_stone, plastic_peg, cross,
                    not_monumented);
  OwnershipType = (parcel, distinct_right,
                  construction_right, water_source_
                    right);

TABLE LimitPoint =
  OSKey: OPTIONAL -> OwnershipMaintenance;
  Identifier: OPTIONAL TEXT*12;
  Geometry: LKoord;
  PositionPrecision: Precision;
  PositionReliability: Reliability;
  Origin: OPTIONAL TEXT*30;
  !! Default: 0.0
  IDENT
  Geometry;
END LimitPoint;
END Ownership.
END Basic_Data_Set.
```

Data description language  
**INTERLIS**  
(system independent)



With the use of data modelling, the acquisition, use and exchange of digital data is independent from the brand of the GIS or software system.



# Legal Foundation: Art. 75a of Federal Constitution

## Federal Constitution of the Swiss Confederation

of 18 April 1999 (Status as of 1 January 2008)

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### Preamble

In the name of Almighty God!

*The Swiss People and the Cantons,*

mindful of their responsibility towards creation,  
resolved to renew their alliance so as to strengthen liberty  
and peace in a spirit of solidarity and openness toward  
determined to live together with mutual consideration  
conscious of their common achievements and their  
generations,

and in the knowledge that only those who use their freedom  
strength of a people is measured by the well-being of its  
members,

*adopt the following Constitution*<sup>1</sup>:

### *Art. 75a Surveying*

- <sup>1</sup> **National surveying** is a matter of the Confederation.
- <sup>2</sup> The Confederation shall legislate on **cadastral surveying**.
- <sup>3</sup> It can legislate on the **harmonization of official land information**.



## Legal basis



### Swiss Civil Code, 1912

- **Security of ownership**, efficient land market, and mortgaging of real estates

### Act on Geoinformation, 2008

- A **uniform legal basis for all land information** based on the various federal decrees (incl. cadastral surveying)
- A legal basis for the introduction of a **cadastre for public legal restrictions on landownership rights (PLR-Cadastre)**



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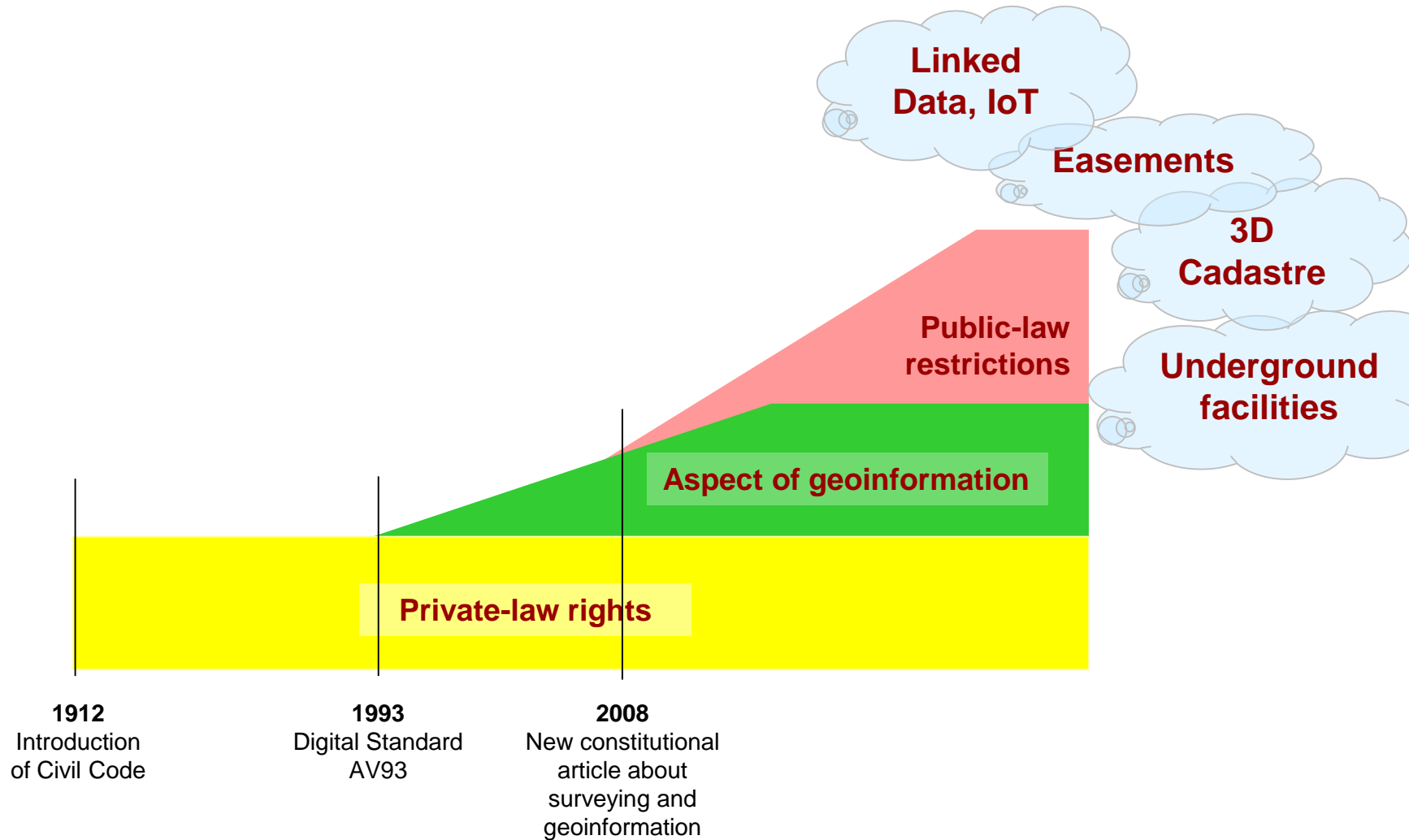
# Landownership: the macro-economic dimension



The Swiss cadastral system helps to secure real estate values in the order of EUR 2,000 billion, of which approx. EUR 850 billion of mortgages are given out (or more than EUR 100,000 per population).

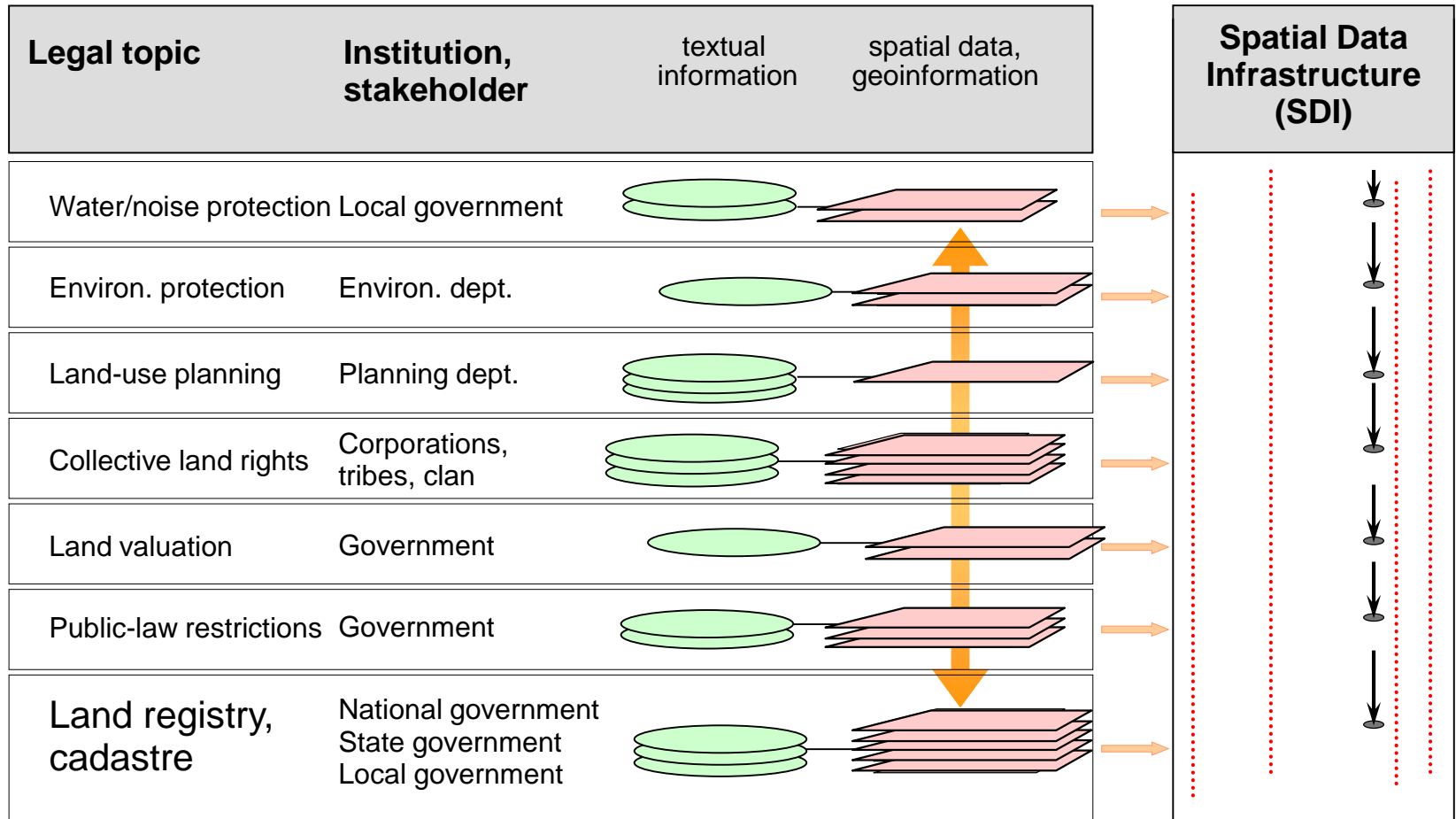


# Trend of increasing purpose and content of cadastral system



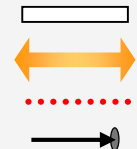


# Common Data Integration Concept



**Four basic principles for a common data integration concept:**

- 1) to respect the legal / institutional independence of stakeholders*
- 2) to use a standardized data modelling concept*
- 3) to use a common geodetic reference framework*
- 4) no logic relations between objects in different topic except through geographic location*

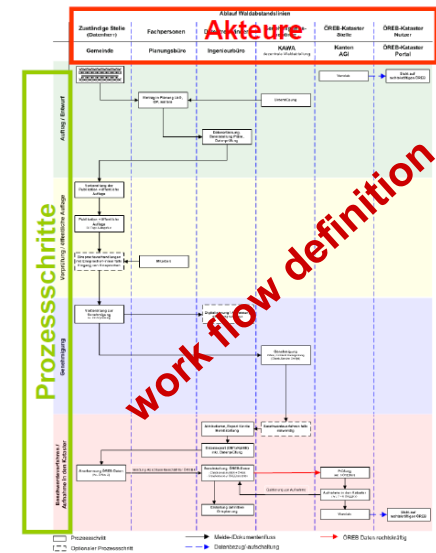
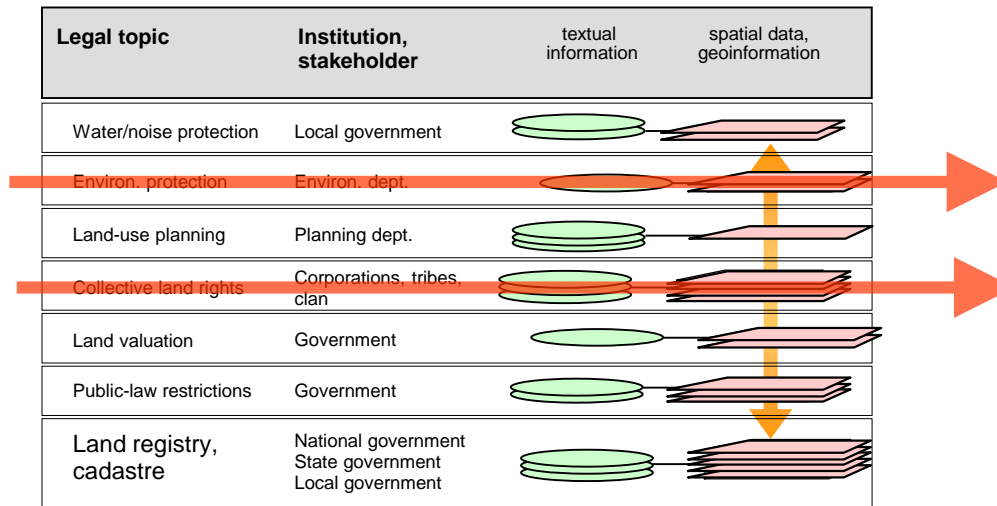




# Independent information layers

## Advantages:

- stakeholders can look after their own data sets, they only have to respect the defined basic principles
- the fear of stakeholders – losing control over their data – can be overcome
- work flow and data flow can be clearly defined and managed for each stakeholder independent from the others





## The Swiss way of thinking ... summed-up

- data and information need to be shared among partners (horizontal, vertical, across sectors), therefore **data exchange** is essential;
- clearly defined **data models** are crucial and basic; we do not talk of maps and plans, we are talking and thinking of data sets;
- data models need to be under the control of the **public sector** (not software companies or private sector organizations);
- the **four principles of the "Common Data Integration Concept"** need to be followed by all partners; only then a modular and flexible SDI can be established and operated.