



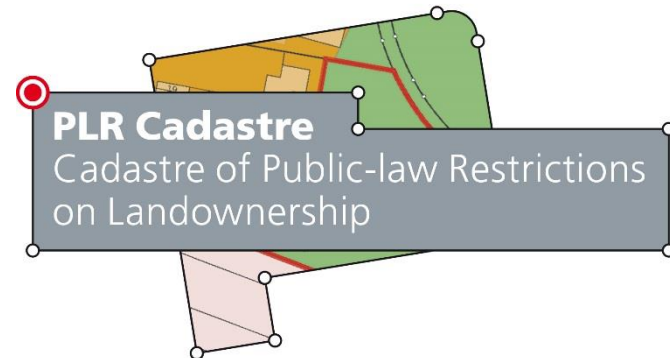
wissen wohin  
savoir où  
sapere dove  
knowing where

# Enhancements of the Cadastral System in Switzerland

swisstopo

«Cadastré of Public-Law Restrictions on Landownership» and «National Utility Cadastre»

Christoph Käser





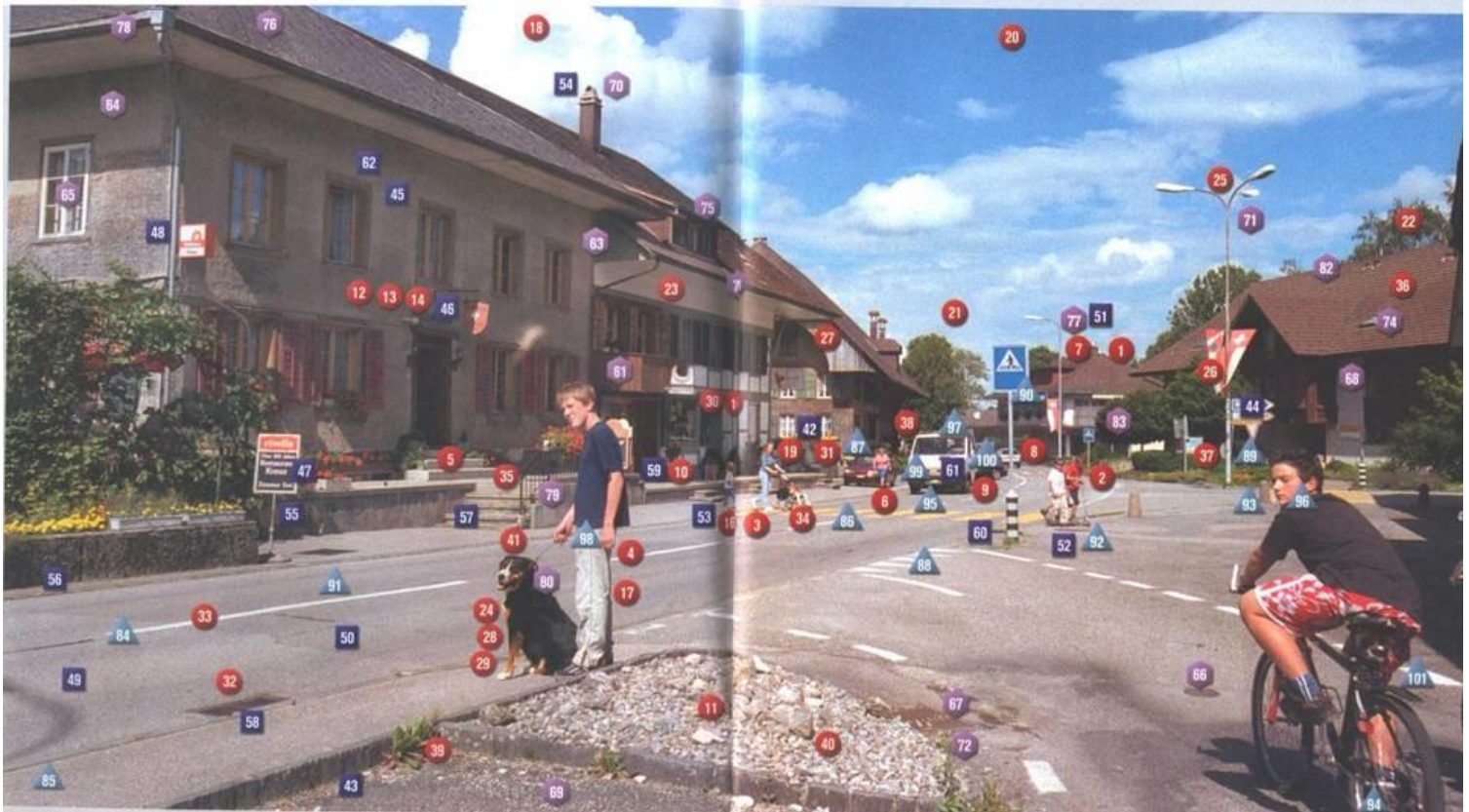
# Content

1. Cadastre of Public-Law Restrictions on Landownership
2. National Utility Cadastre





# We are surrounded by PLR ...



101 laws, ordinances and regulations have to be considered in everyday situations (source: FACTS, 02.09.2004)



# Private-law rights – public-law restrictions



## Private-law rights

are agreed upon between 2 parties.

Example: purchase of real estate

They are recorded in the land register and are already publicly and centrally available today.



## Public-law restrictions

come into existence through a decision by the legislator or the public administration.

Example: definition of noise protection zones.

They are publicly accessible in certain regions of Switzerland and a central information website is available for consultation.

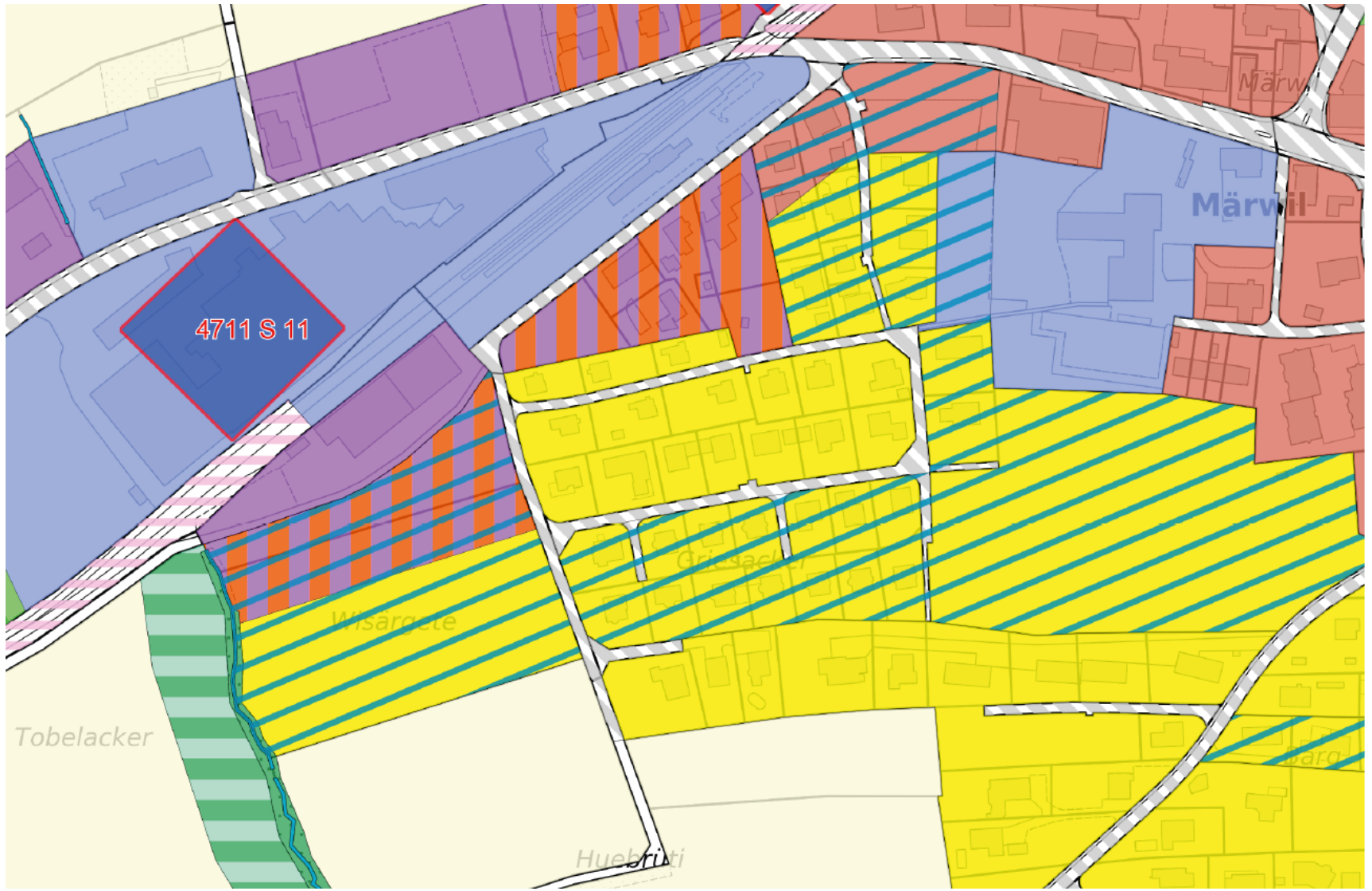


# What are public-law restrictions?

- Official restrictions that apply to landowners.
- Public interests take precedence over private interests.  
For example:
  - A protection zone can be created to secure the public interests associated with the extraction of groundwater.
  - In a land-use zoning map the legislator can specify what kind of land use is permitted.
- In Switzerland there are more than 150 different public-law restrictions.



# Land-use planning





# The PLR-Cadastre offers numerous benefits

The total value of mortgages covering landownership in Switzerland is currently more than 9 billion Swiss francs (status: 2015). In view of this, it is important to ensure that legally binding information about plots of land is provided without delay.

## Benefits

- Easy access to reliable information
- Greater legal certainty thanks to official information
- Simplified decision-making process for the public administration

## Users

- Landowners
- Players on the mortgage market
- Public administrations





# The 17 most important PLR



## Spatial planning

- Land-use planning (cantonal/municipal)



## Motorways

- Project planning zones for motorways
- Building lines for motorways



## Railways

- Project planning zones for railways
- Building lines for railways



## Airports

- Project planning zones for airports
- Building lines for airports
- Security zone plan for airports



## Contaminated sites

- Cadastre of contaminated sites
- ... military sites
- ... civil airfields sites
- ... public transport sites



## Groundwater protection

- Groundwater protection zones
- Groundwater protection area



## Noise

- Noise sensitivity levels (in land-use zones)



## Forests

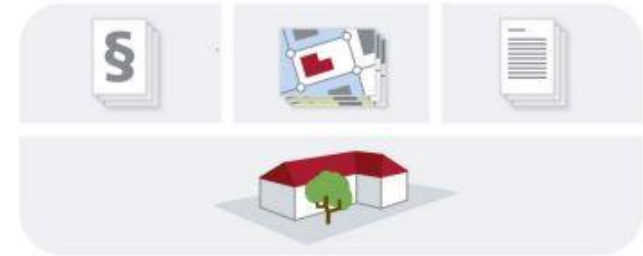
- Forest perimeters (in build-up areas)
- Forest distance lines





# Comprehensive information in the form of a map and texts

A PLR on landownership comprises:

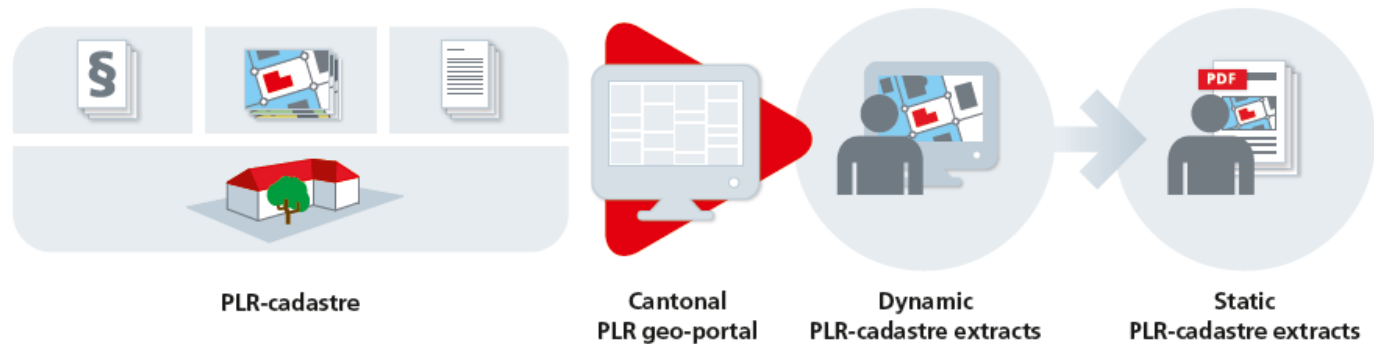


- **The relevant legal provisions**  
Rulings on which the restriction and its effects are based.
  - **A map**  
Depicting the region in which the public-law restriction is applicable.
- 
- **Legal bases**  
General regulations on which the rulings are based.
  - **Additional information**  
For example, name and address of the authority to contact for further information.



# Easy Access to information about PLR on landownership

- Search engine that greatly simplifies the search for information
- Complete, reliable, comprehensible and wide-ranging information available via a central source



[www.cadastre.ch/ch](http://www.cadastre.ch/ch)

Access to information about PLR on landownership



# Dynamic PLR-Cadastre extract



## Dynamic extract: web-based visualization

Individual public law restrictions can be displayed in a variety of ways for all users via the corresponding cantonal geoportal.

- Multiple public law restrictions can be viewed simultaneously, i.e. overlapping one another.
- It is possible to view individual plots of land as well as entire regions.
- This makes dynamic extracts valuable aids for dealing with questions and discussing spatial issues.



# Static Extract of PLR-Cadastre

## Static extract: decision-making basis

- Detailed information about a specific plot of land
- PDF-A1a
- Several pages
- Official document
- *Upon request: notarisation by the authority responsible for the cadastre*



Overview of public-law restrictions on landownership  
The overview shows all available public-law restrictions on landownership and those restrictions that apply to the plot of land.

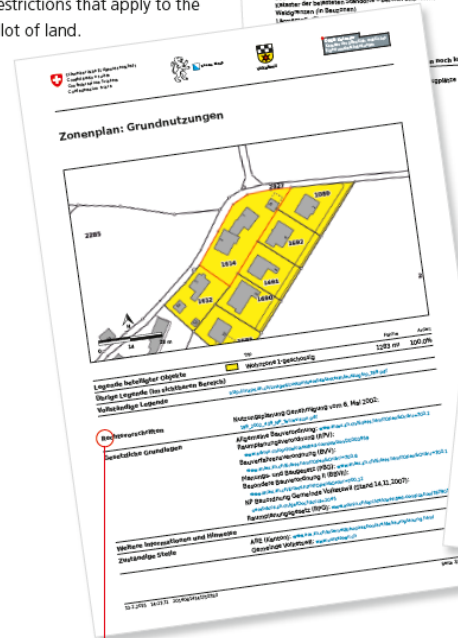
**Übersicht ÖREB-Themen**

Eigentumsbeschränkungen, welche den Grundstück 3854 in Volkstanz betreffen	
Nr.	Bezeichnung
3	Zonenplan Grundnutzungen
4	Grundwasserschutzzone
5	Mess- und Messpunkte
6	Bauweise Standorte (20)
A1	Kantonaler Verordnung Nr. 1, Anlage Originalplan
A2	Originalplan „Bauweise Standorte der Gemeinde Volkstanz“

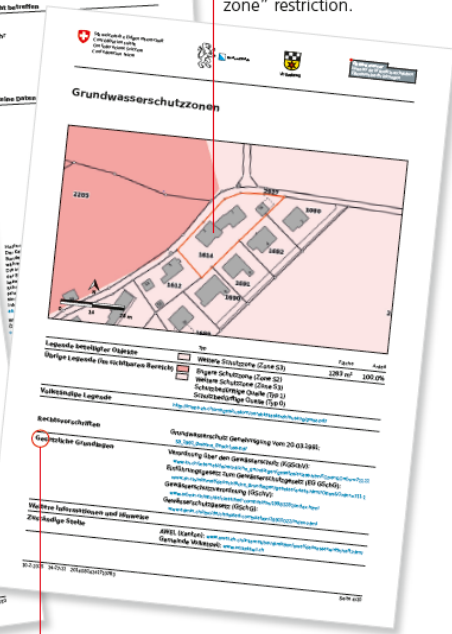
**Eigentumsbeschränkungen, welche das Grundstück nicht betreffen**

Nr.	Bezeichnung
1	Grundbesitz
2	Grundbesitz
7	Grundbesitz
8	Grundbesitz
9	Grundbesitz
10	Grundbesitz
11	Grundbesitz
12	Grundbesitz
13	Grundbesitz
14	Grundbesitz
15	Grundbesitz
16	Grundbesitz
17	Grundbesitz
18	Grundbesitz
19	Grundbesitz
21	Grundbesitz
22	Grundbesitz
23	Grundbesitz
24	Grundbesitz
25	Grundbesitz
26	Grundbesitz
27	Grundbesitz
28	Grundbesitz
29	Grundbesitz
30	Grundbesitz
31	Grundbesitz
32	Grundbesitz
33	Grundbesitz
34	Grundbesitz
35	Grundbesitz
36	Grundbesitz
37	Grundbesitz
38	Grundbesitz
39	Grundbesitz
40	Grundbesitz
41	Grundbesitz
42	Grundbesitz
43	Grundbesitz
44	Grundbesitz
45	Grundbesitz
46	Grundbesitz
47	Grundbesitz
48	Grundbesitz
49	Grundbesitz
50	Grundbesitz
51	Grundbesitz
52	Grundbesitz
53	Grundbesitz
54	Grundbesitz
55	Grundbesitz
56	Grundbesitz
57	Grundbesitz
58	Grundbesitz
59	Grundbesitz
60	Grundbesitz
61	Grundbesitz
62	Grundbesitz
63	Grundbesitz
64	Grundbesitz
65	Grundbesitz
66	Grundbesitz
67	Grundbesitz
68	Grundbesitz
69	Grundbesitz
70	Grundbesitz
71	Grundbesitz
72	Grundbesitz
73	Grundbesitz
74	Grundbesitz
75	Grundbesitz
76	Grundbesitz
77	Grundbesitz
78	Grundbesitz
79	Grundbesitz
80	Grundbesitz
81	Grundbesitz
82	Grundbesitz
83	Grundbesitz
84	Grundbesitz
85	Grundbesitz
86	Grundbesitz
87	Grundbesitz
88	Grundbesitz
89	Grundbesitz
90	Grundbesitz
91	Grundbesitz
92	Grundbesitz
93	Grundbesitz
94	Grundbesitz
95	Grundbesitz
96	Grundbesitz
97	Grundbesitz
98	Grundbesitz
99	Grundbesitz
100	Grundbesitz

Content of plan with explanatory key  
The plan contains a definition of the area in which a given public-law restriction applies – here, a plan relating to a “groundwater protection zone” restriction.



**Legal provisions**  
The legal provisions indicate the rulings on which the restriction is based and which describe the nature of the restriction and its effects. This may, for example, take the form of the acceptance of a municipality's land use plan.



**Legal bases**  
As legal bases, the general regulations on which the rulings are based are cited, for example a cantonal water protection ordinance.





# PLR-Cadastre - a national product : Convenient central access

Swiss cadastral system

Jobs

Information for media

Contact details

Search

DE FR IT

Cadastral  
Surveying

PLR-cadastre

Land  
register

About  
cadastre.ch

Services &  
publications

News

Manuals for  
professionals

## cadastre.ch

Homepage > PLR-cadastre > Initial developments

← PLR-cadastre

Initial developments

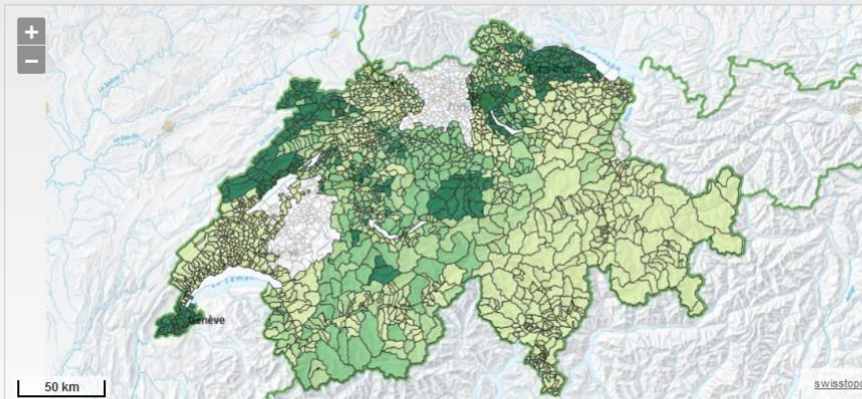
Static PLR-cadastre extract

Dynamic PLR-cadastre extracts

## Initial developments

The first cantons went online with their PLR geo-portals in 2014. This means that users in these cantons can now obtain an overview of the most important public law restrictions on landownership, and download them.

Search address, ZIP, coordinates ...



### Search examples

ZIP: For «3007 in Bern» type 3007

Addresses: For «Rue de l'Évêché in Gené» type évêché

Swiss coordinates: For «600000/200000» type 600000 200000

Parcel: For «Parzelle 3125 in Bern» type Bern 3125





# Content

1. Cadastre of Public-Law Restrictions on Landownership
2. National Utility Cadastre





# Initial situation for a utility cadastre

In 2016 a survey was carried out over all of Switzerland in order to find out the need for a national utility cadastre. Infrastructure companies (utility owners), public data integrators and users participated on a broad scale.

The legal basis for an utility cadastre exists in only 14 cantons.

Basic question: If – and if yes, how – a utility cadastre has to be established on a national level, and for what purposes should it be built?



# Definition of terms by the national utility standard SIA405

## Information about the utility network (UN)

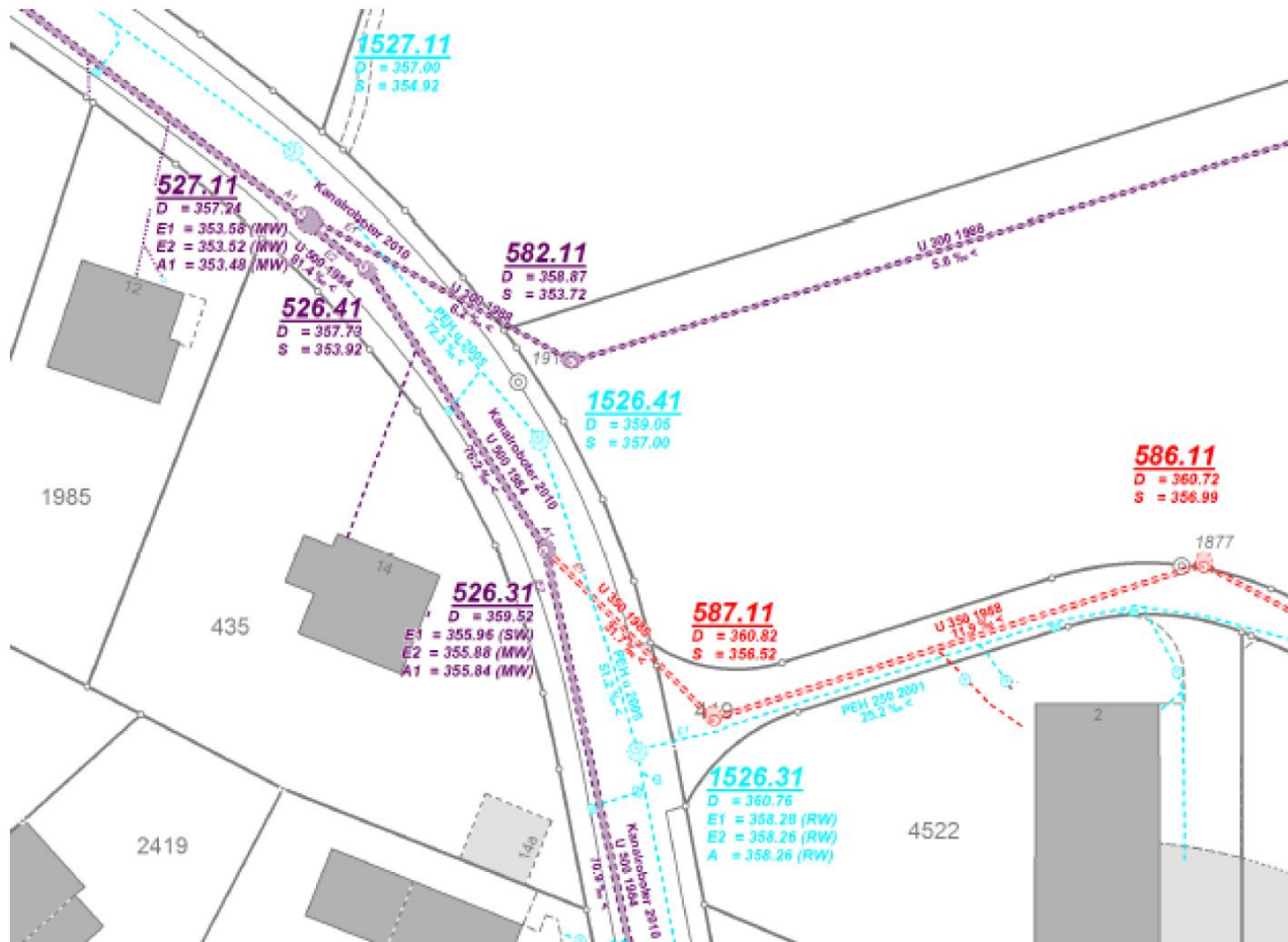
- Represents all data of one specific media within the perimeter of an infrastructure company (utility owner) for operating and maintaining its network.
- Includes position data and a multitude of thematic data.
- Serves the infrastructure company for the planning of its infrastructure (new construction, replacement, upgrading, maintenance), network simulations, or financial calculations.





# Graphical example UN media waste

Ausschnitt Werkinformation (hier: Medium Abwasser)





# Definition of terms by the national utility standard SIA405

## Utility cadastre (UC)

- Is the sum over all media of a certain amount of utility network data. This data allows to describe the space, which is occupied by conducts of different media. It mainly consists of the planimetric network, the visible objects and few thematic data.
- Is an important coordination instrument for information and planning tasks in the public space.



# Graphical example UC

In der Informationszeile unten sind die wichtigsten Informationen zur angewählten Kommunikationsleitung (grüne Ellipse) bei Haus Nr. 27 angegeben.

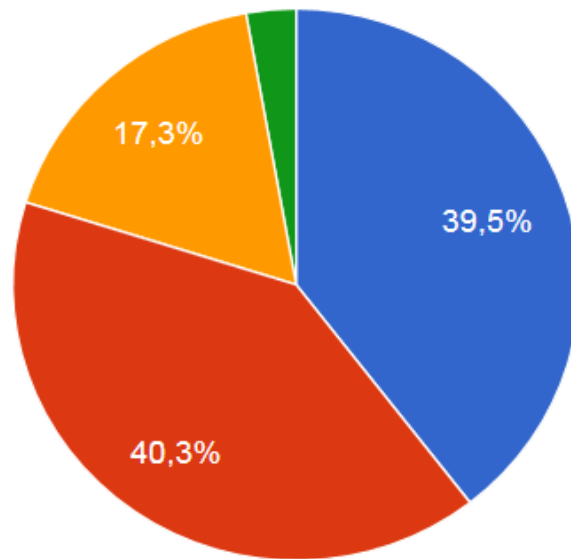
The screenshot shows a GIS application interface. On the left, there is a 'Themen' (Themes) panel with 'Leitungskataster' (Utility Register) selected. The main map area displays an orthophoto and a colored base map. A green ellipse highlights a specific communication line object near house number 27. Below the map, there is a scale bar (10 m) and a coordinate display (2'628'324, 1'256'887). At the bottom, there is a table with the following data:

BFS-Nr.	Medium	Objektart	Werkzeugentümer	Status	Lagebestimmung	Profiltyp	Breite	Datenlieferant	Letzte Änderung
2861	Kommunikation	Kommunikation.Trasse.unterirdisch	Swisscom (Schweiz) AG	unbekannt	genau		250	Swisscom (Schweiz) AG	20151217



# Participants of the survey

**354 received answers**, enclosing 22 associations  
-> 344 «true» participants



- 141 ● Owner (exploitant) of a utility network
- 142 ● Integrator – responsible for utility cadastre – authority
- 62 ● User of utility cadastre data (today or in future)
- 10 ● I am not affected by the topic resp. not interested in the survey

languages: 8 Italian + 71 French + 275 German



# Opinion of utility network owners

- About 10% have their utilities fully or about 75% partly described in the land register as a servitude.
- The network data exists mostly in digital form and with a huge amount of thematic data, mostly in 2D or 2.5D. The third dimension doesn't exist at all.



# Opinion of integrators

- Approx. 80% of the integrators transfer data to third parties or make the data available to them.
- On average, 10 data requests from other parties are counted per week and integrator. Integrators, who offer a data presentation service, report a much higher number of requests.



# Opinion of users (incl. owners and integrators)

- The main users of utility data are the private sector and municipality administrations with both 40%.
- The respective purpose of use is very different, dispersed and broad:
  - tool for planning, projecting, and maintenance;
  - information systems;
  - overview, complete view and localization of conducts.
- The level of data access authorisation B (data partly accessible to public) is broadly accepted.
- The data of the utility cadastre is accessed several times per week; queries are done not only for the main network, but also for utilities connecting the buildings. The minimal periodicity of data deliveries by the utility owners is expected on a monthly to 3 monthly basis.



# Opinion of users (incl. owners + integrators)

- About 45% of users are satisfied with the level of detail according to SIA405 (LKMap). The 30% not satisfied ask for a separation of waste water in mixed, dirty and clean water, followed by the material and age of the utilities.
- Only 25% are satisfied by the existing 2D data model, 45% wish 2.5D, and 30% expect the data to be in 3D in the future.
- About 65% of the users would see a great or very great benefit in a homogeneous, nationwide utility cadastre for Switzerland.





# Conclusions

A national utility cadastre is not only considered doable, but there is a clearly expressed need for it. This is even articulated by cantons, which do not have regulations about a utility cadastre up to now.

The role of the confederation should be the coordination; the operational responsibility should be with the cantons.

No new utility cadastre should be created, but rules for gathering a homogeneous nationwide utility cadastre should be established.



# Conclusions

Points to be clarified are:

- what aim and purpose should a homogeneous utility cadastre serve?
- what quality standards are required?

Only after these points have been clarified, a serious calculation, a costs/benefits analysis, and decisions for further steps are possible.



# Thank you for your attention!

