Official Surveying in Luxembourg

- cadastral databases
- update procedures
- data exchange techniques

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Dipl.-Ing. Paul MOOTZ, géom. officiel
Data inventory

- Parcel ownership and rights database (Publicité foncière (PF))
- Digital cadastral map (Plan cadastral numérisé (PCN))
- Official surveying database (Mensuration officielle (MO))
- National address database
cities involved

National center for information technologies (CTIE)
- Database for parcel ownerships & rights
- National Adress DB
- National Citizen DB

National cadastre and mapping authority (ACT)
- Management of the official GIS Databases
- Official Survey management & control
- Survey jobs

Private Surveyor (Géomètre officiel (GO))
- Survey jobs
Parcel ownership and rights

A separate database (IBM-DB2 mainframe) and software (Publicité foncière) are localized externally (CTIE) and connected with the GIS / cadastral databases through webservices.

- Parcel ownership and rights
- Parcel identification numbers (ID)
- Field names and other reference lists
Nationwide definition of an approximate mutual position of parcels
Partly based on official surveyings
Origin: ancient, analog and not georeferenced cadastral maps (scale 1:2500), updated manually from 1824 to 2000
Digitization and geo-referencing from 1997 to 2001
In 2002, introduction of a CAD-based update concept, used until 2012
Beginning in 2012, cadastral data is stored in a modern SDE-database and managed with ESRI-based software products
(GEONIS, GEOCOM Informatik AG, Switzerland (CH))
Build with point, line and polygon feature layers
Based on a centroid-edges GIS scheme
- 680,000 parcels
- 194,000 buildings
- 6,34 Mio parcel edges
- 1,24 Mio building edges
- Change records through ArcGIS-GeoDB history and additional historical data stored in GIS and ownership databases
Proof of historic parcel and rights mutations possible until origins
Initial data quality (1824) and error propagation during almost two centuries of updates created an inhomogeneous dataset presenting up to 25 meters of dislocation opposite to the national coordinate system (LUREF). Building representation is out of date or rather incomplete on cadastral map due to a lack of survey obligation. Cadastral map is thus quite unsuitable as a planning document, which is however largely required.
Position adjustments on cadastral map
- local adjustments with affine transformations (Delaunay-Algorithm)
- position accuracy is improved up to 80%
- maximum accuracy up to 1-2 meters
- 30% of the parcels located in urban areas have actually been treated

Complete renewal of the building data (LiDAR, orthophotograph,...)

Parallel buildup of the official survey database (MO) containing precisely measured surveying data.
The national address database contains:

- exclusively alphanumeric data (Municipality, locality, street, housenumber, ...)
- interface with:
  - the national population database (RNPP)
  - the parcel owner and rights database (PF)
  - the GIS-system
- connection between address and parcel
  - countrywide georeferenced addresspoints
Private surveyors, established by law in 2002

- National cadastre authority
  - treats unfortunately still 58% of the official survey jobs
  - supervises the cadastral compliance of the activity of the private surveyors
  - archiving, management and update operations on all cadastral data
- separate CAD-Data
- central data archive
- analog update operations on cadastral maps

- separate CAD-Data
- central data archive
- CAD-based update system of cadastral data

- central GIS-Database
- intelligent and automated DB-update system for surveying and cadastral data (MO & PCN)

- introduction of GML-based data exchange format
- fully automated data exchange with private surveyors
data management with ArcGIS versioning technology (reconcile/post)
efficient database lock on all parts concerned by updates

• combined PCN and MO data update procedures
• guaranteed data consistency and identical update status of both databases
Error minimization and efficiency

Redefined processes and automated data entry options (intelligent object management)

Data consistency checks (permitted values only,...)

Topology checks (closed polygons, self-intersections,...)

Highly automated layout operations
cial surveying (MO) – data exchange

data exchange procedures between private surveyors (GO) and national cadastre authority (ACT)

GO2ACT

- standardised GML interface (starting on 15/09/2014)
- XML schema described in INTERLIS-GML 2.3
- online data upload possibility
- rigorous data verifications of all features (geometry, attributive, ...)
  - error reports sent by email
- database integration procedures managed by FME and ArcGIS server

ACT2GO

- fully automated GML data supply (PCN & MO)
- free of charge
Official surveying (MO) – data exchange
Cadastral surveying (MO) – data exchange
national surveying