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Cadastral Feedback on Spatial Planning

Gerhard Navratil

Paolo Fogliaroni

Vienna University of Technology

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Introduction

Spatial planning shall optimize land use

Implementation of planned changes takes time

Too frequent changes in the planning may prevent progress

→ Checking success of planning is necessary

Land Management/Land Administration

Limited resource land → Utilization must be organized

- **Land Administration:** Describe what is there
e.g., cadastre, land register
- **Land Management:** Define goals and means to reach these goals
e.g., spatial planning

Land Administration

Tasks are (Creuzer 2002, 2007)

- Registration of real estate
- Maintenance of base information
- Provision of secure land markets and property transaction

Security requires documentation with a time stamp → temporal order of changes

Elements of a Cadastre (1)

- Cadastral map – graphical representation
e.g., Theresian cadastre
 - topology
 - extent
 - shape
 - identifier
 - land use
 - owner (indirect)



(Brovelli et al. 2012)

Elements of a Cadastre (2)



Elements of a Cadastre (3)

- Cadastral data constantly adapted to real situation
- Documentation necessary for security
- ➔ Possible to trace geometry back

Problems

- Undocumented changes
- Involuntary changes (handling errors, redrawing, digitizing)

Land Use from Shape of Parcel (1)

- Changes in cadastral data are interrelated with spatial planning
e.g., areas for agricultural use have a different size than areas for residential use
- Land owners will react promptly to change in spatial planning, if in their advantage
→ Visible in cadastral map

Land Use from Shape of Parcel (2)



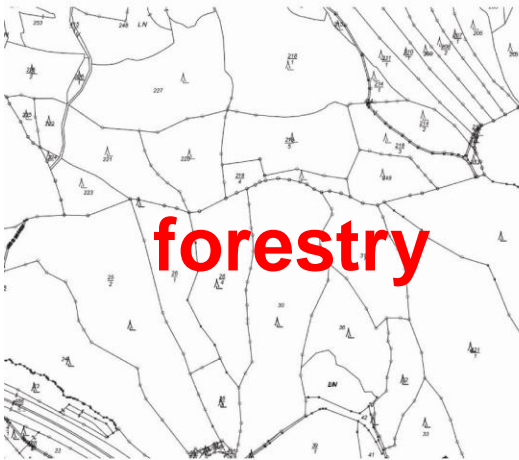
residential

(a)



agricultural

(b)



forestry

(c)



traffic

(d)

(Examples from DORIS)

Land Use from Shape of Parcel (3)

Feedback on spatial planning by

comparing the change in planning with the shape change in the cadastre

- Fast response necessary change
- Slow response change was not adopted

Database Issues

Database must hold

- One or more cadastral map(s)
- Change documentation

What is a suitable data model and DBMS?

Necessary

- Document storage
- Temporal support

➔ relational databases not well-suited!

Alternative: document-oriented DB (non-relational)

e.g., CouchDB, MongoDB

Conclusions

- Cadastre contains data useful as feedback for spatial planning
- Automation seems possible
- Requires modern database approaches