

# Automated parcel boundary Design Systems in Land Consolidation

Two implementations



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## Summary (1)

- Automated parcel boundary design can be used as the final step in land reallocation design
- Goals:
  - Improve quality by consist use of rules
  - Improve quality by iterating design
  - Reduce cost by faster design





## Summary (2)

2 implementations for automated parcel boundary design:

1. TRANSFER, for Dutch Cadastre
  - Status: currently being tested
  - Projects in autumn 2012
  - Proprietary software, Dutch
2. R-APP, general **Reallocation Application**
  - Due out for release July 2012 (v1.0)
  - Automated parcel boundary in v2.0
  - Will be available through [www.r-app.eu](http://www.r-app.eu)



## Land consolidation

- Land reallocation is just one part of LC

Focus on information system:

- *Project based* Land Information System
- Functionality for creating a reallocation
  - Algorithm for calculating reallocation
    - Result: Value allocation plan
  - Geometric editing for creating parcel boundaries
    - Result: Reallocation plan

## Types of project areas

### General

- Project area is first-time land reallocation
- Farms buildings are not in reallocation area
- Improvement of size and shape

### Projects in NL

- Land reallocation has been carried out in the past
- Improvement by enlarging home parcel
- Improvement by concentrating field parcels



## Parcel boundary design

- Is it possible to automate the design of parcel boundaries
- Research: PhD thesis by Buis (1998)
- 2011: let's implement this idea
- Two types of automated design
  1. Guided automated land division
  2. Stepwise combination in existing topography




## Starting point


- Parcel boundaries existing situation
- Blockparts
  - parcel grouping by infrastructure
- Owner preferences (interview)
- Value allocation plan
  - List of allocated values/areas in blockparts
- Map of boundaries to be protected



## Design of parcel boundaries

- Make a list of blockparts in order of processing
- For each blockpart: allocate any fixed allocations
- Make a list of allocation tasks to perform:
  - Fixed parcels to be enlarged
  - Field parcels to be created
  - Calculate priority of tasks
- After processing of tasks: adapt value allocation plan if needed







## R-app

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- Supports all needed data and activities to do reallocation
  - Importing, checking, editing
  - Support for interviews
  - Value allocation plan (v1.0)
  - Parcel boundary design (v2.0)
- In english; translatable





## R-app

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- Example: interview support

Interview

Party	Principal Name	Family name	Extra identificati...
42	AYSE		
43	CEMAL		
44	DURSUN		
45	HAMIDE		
46	...		

Party

Principal name: DURSUN

First name: DURSUN

Family name:

Extra identification:

ID Card number:

Section:

Parcelnumber	Old	New 1	New 2	New 3	New 4
1552	115	108	106	112	109
1553	115	108	106	112	109
680	108	108	106	112	109

Parcel 1552

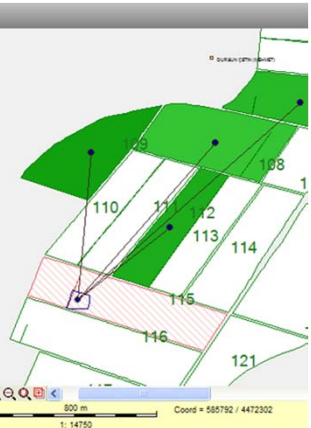
Total area 7.468

Total value 4.331

Share fraction 1/1

Claim area 7.468

Claim value 4.097



# R-app

## Principle of design support

- Primary design axis
- Distance to village
- Design order
- Access to road

# TRANSFER

## Stepwise combination

**Log of task execution**

Vol...	Start	Status	Score	Niveau
Veldkavel n...	Start	42214.39	4	4
Veldkavel n...	Start	42610.48	4	4
Veldkavel n...	Start	38334.25	4	4
Veldkavel n...	Start	670.49	4	4
Veldkavel n...	Start	353476.53	5	5
Veldkavel n...	Start	354985.58	5	5
Veldkavel n...	Start	348071.32	5	5
Veldkavel n...	Start	399197.87	5	5
Veldkavel n...	Start	344819.72	5	5
Veldkavel n...	Start	728111.51	5	5
Veldkavel n...	Start	498.66	6	6
Veldkavel v...	Start	1036.66	8	8
Veldkavel v...	Start	962.00	8	8
Veldkavel v...	Start	1007.05	8	8
Veldkavel v...	Start	850.15	6	6
Veldkavel n...	Start	395197.39	5	5
Veldkavel n...	Start	354853.48	5	5
Veldkavel n...	Start	390577.25	5	5
Veldkavel n...	Start	395453.12	5	5
Veldkavel n...	Start	28210.12	4	4
Huiskavel v...	Start	57.94	2	2

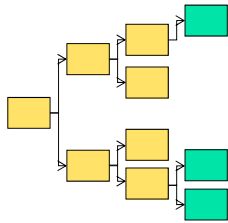
**Designed parcels**

**Information on selected object (task or map object)**

Bedrijfsnr	Uitslag	Log toepassing
Bedrijf	1003487	
Bedrijfsdeel	3	
Benodigde oppervlakte	35.65.98	
Huidge oppervlakte	37.66.54	
rest	1.99.44	
Toegevoegd aan		



## Main conclusions



- It is possible to automate the process (but much more refinement is necessary)
- Linear decision chain was not enough, a tree structure has been implemented to explore alternative solutions
- Some user interaction needed for better solutions