REPUBLIKA SLOVENIJA MINISTRSTVO ZA OKOLJE IN PROSTOR

GEODETSKA UPRAVA REPUBLIKE SLOVENIJE




LAND CADASTRE
Transformation and geometric quality improvement

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33nd Conference of Surveying Authorities, 18-20 Mai, 2016

1. **Land cadastre in Slovenia (history overview)**
2. **Land cadastral data (problem of data quality)**
3. **TRANSFORMATION to new coordinate system and HOMOGENIZATION (geometric quality improvement)**
4. **Conclusion/Challenges**

1. Land cadastre in Slovenia (history overview)

1811 – 1813: *Napoleon Cadastre*

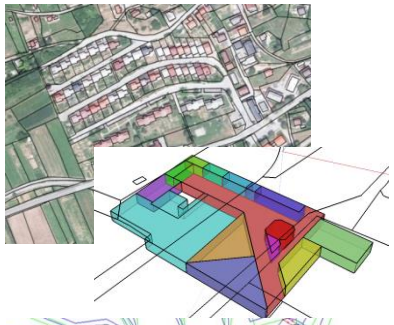
1818 – 1829: Franciscean cadastre - *first cadastral survey (Cadastral plans 1:2880; Land use, land classification and ownership were defined)*

1869 – 1882: Reambulation - *new systematic cadastral survey (only some areas)*

1871: Land register - *dual property registration system*

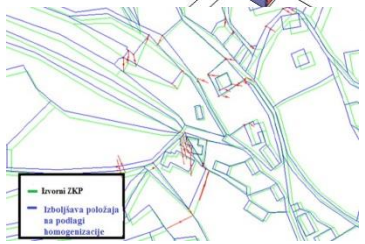
1945 – 1991:

- *new reference coordinate system D48/GK*
- *the maintenance of the land registration system (land cadastre) was not important*
- *new cadastral survey of some small urban areas*
- *land consolidations*



1991 (Slovenia) - :

- *digitalization*
- *land Information system*
- *Building cadastre (2000 -)*
- *New central base of real properties*
- *Geometric quality improvement*



2. Land Cadastral data (problem of data quality)

DATA SETS HAVE BEEN DEVELOPED OVER LONG PERIOD/PROBLEM OF DATA QUALITY!

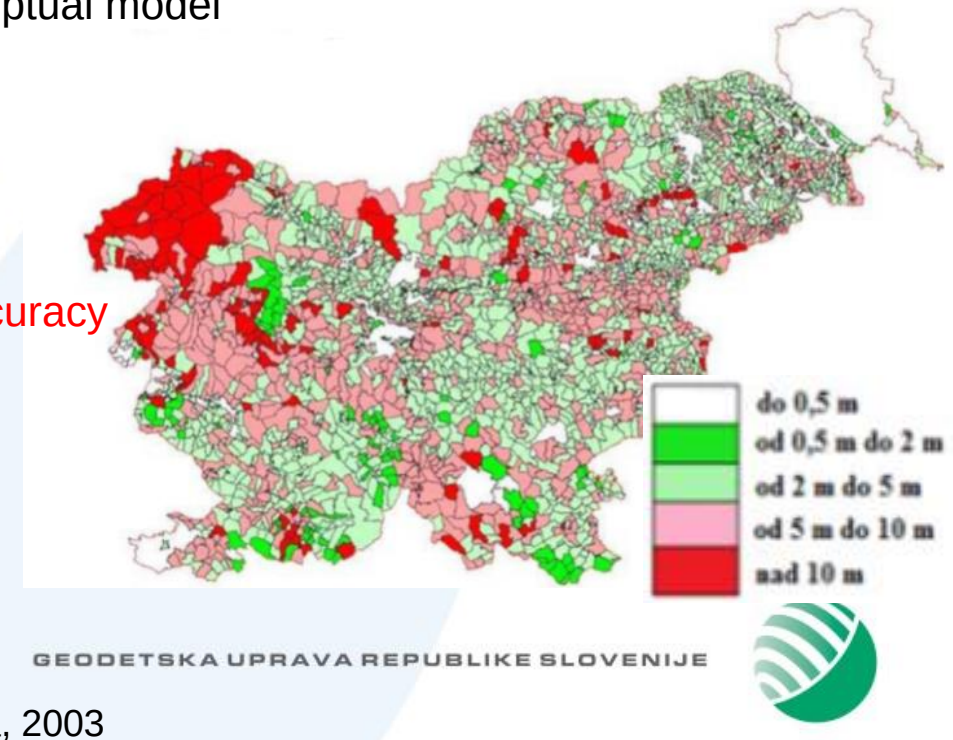
- different methods of data acquisition
- different methods of data maintenance
- a dynamic system ...

PROBLEMS (graphical subsystem):

- (in)completeness of the conceptual model
- (in)completeness of attributes
- logical (in)consistency
- positional (in)accuracy
- temporal (in)accuracy
- thematic and attributes (in)accuracy

Maintenance:

- 86% the paper method
- 11% the coordinate method
- 3% the combination



Source: Geodetic Institute of Slovenia, 2003

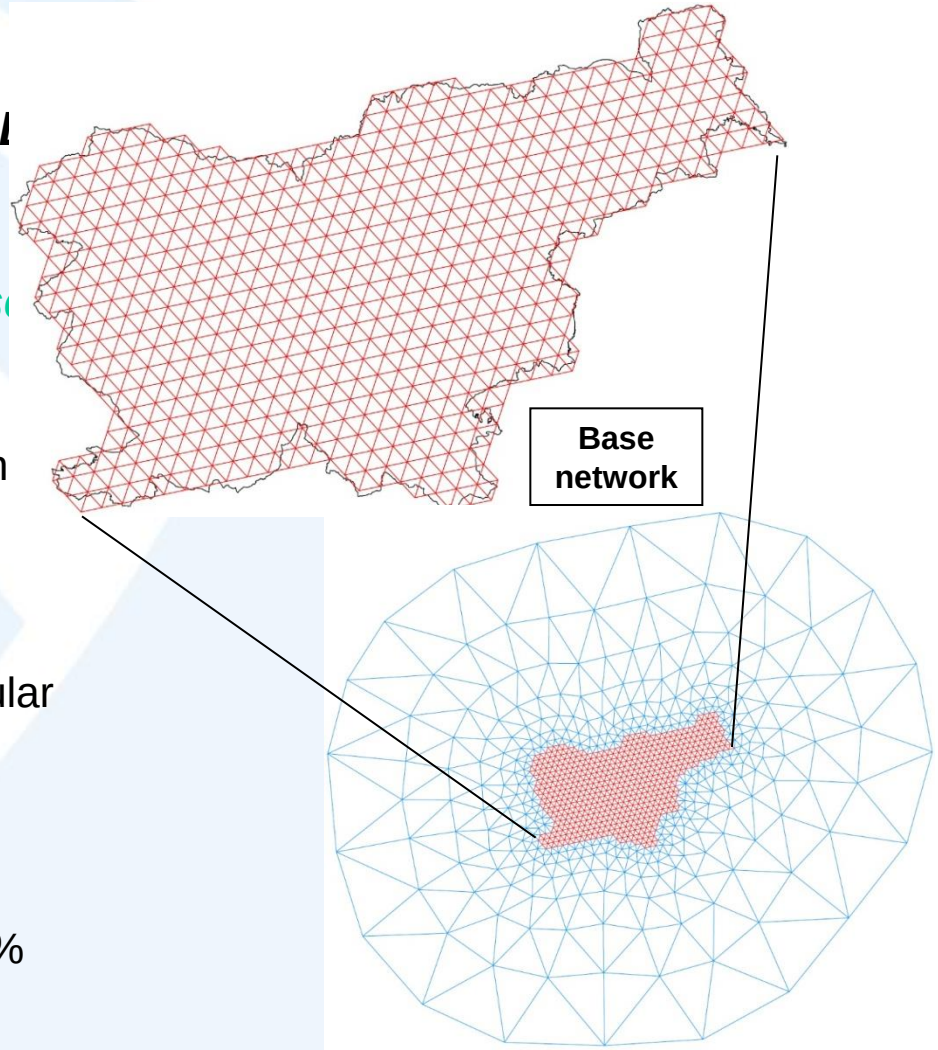
3. TRANSFORMATION and HOMOGENIZATION

FIRST STEP

TRANSFORMATION MODE

Triangle-based piecewise affine transformation

- The basis for transformation a set of about 2000 actually measured points
- Virtuale tie points are used, which form a regular triangular network



max lenght deviation: 0.0065%
max surface deviation: 0.0085%

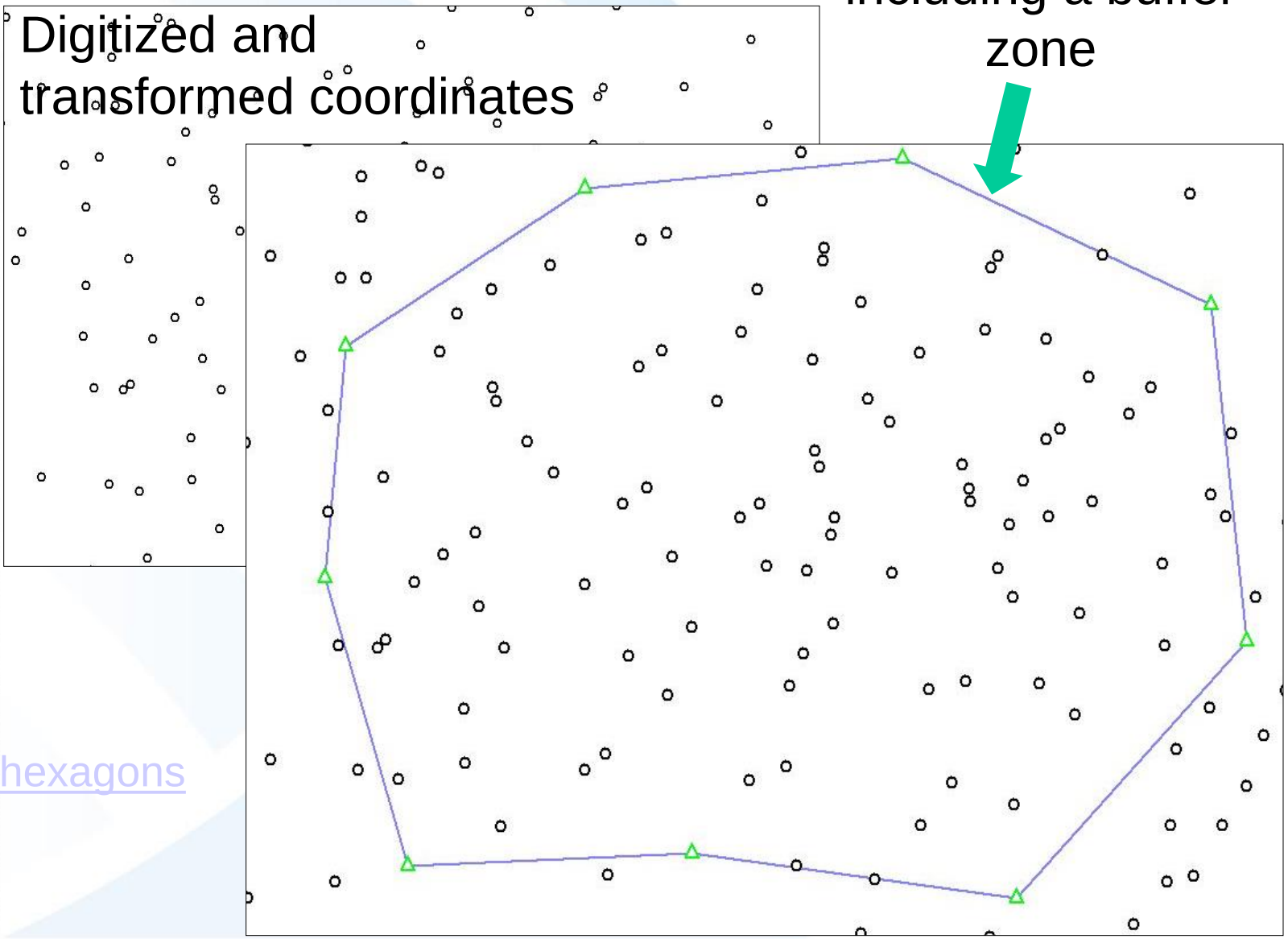
Source: Geodetic Institute of Slovenia

3. TRANSFORMATION and HOMOGENIZATION

SECOND STEP

Definition of a frame including a buffer zone

Digitized and transformed coordinates

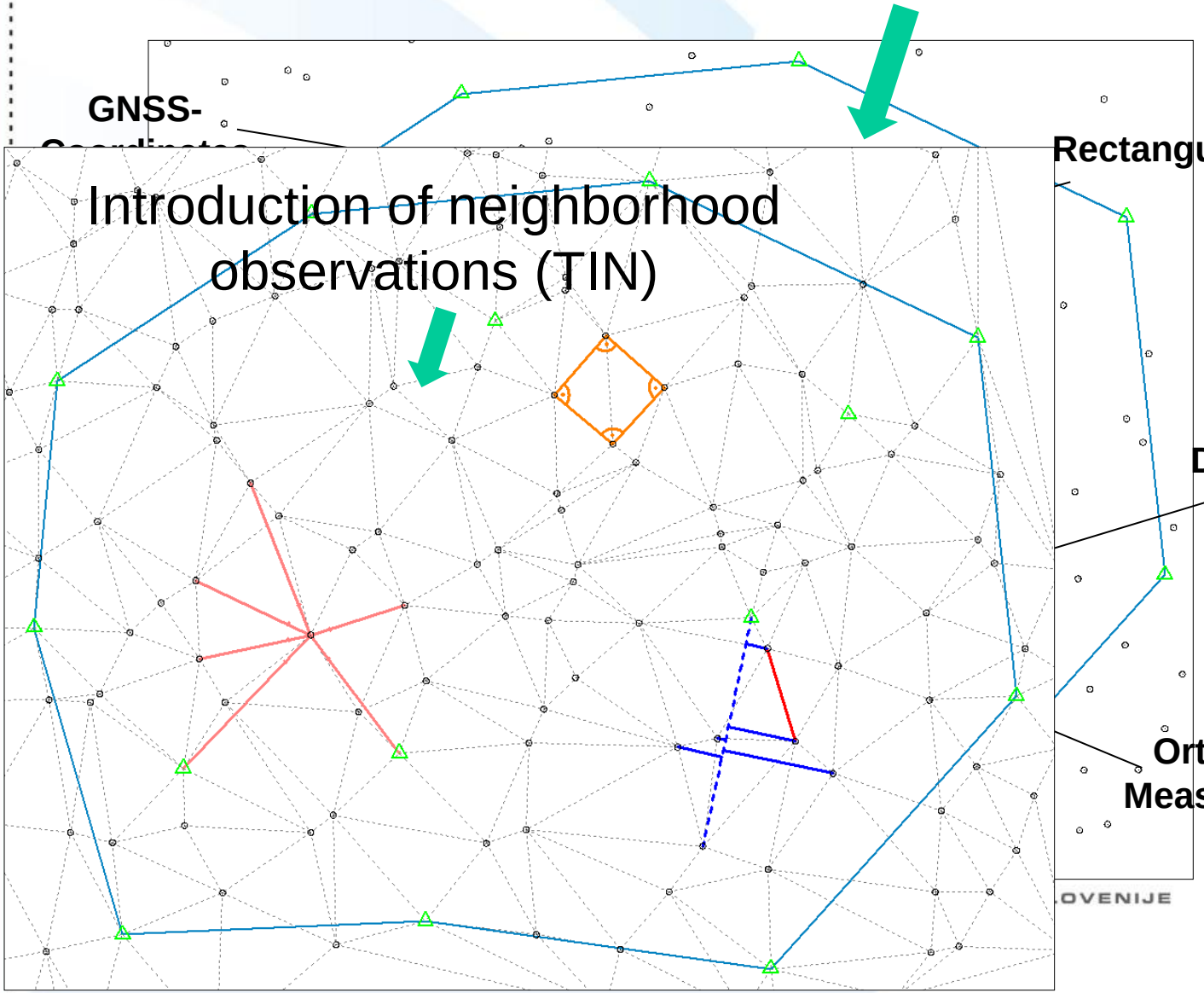


hexagons

3. TRANSFORMATION and HOMOGENIZATION

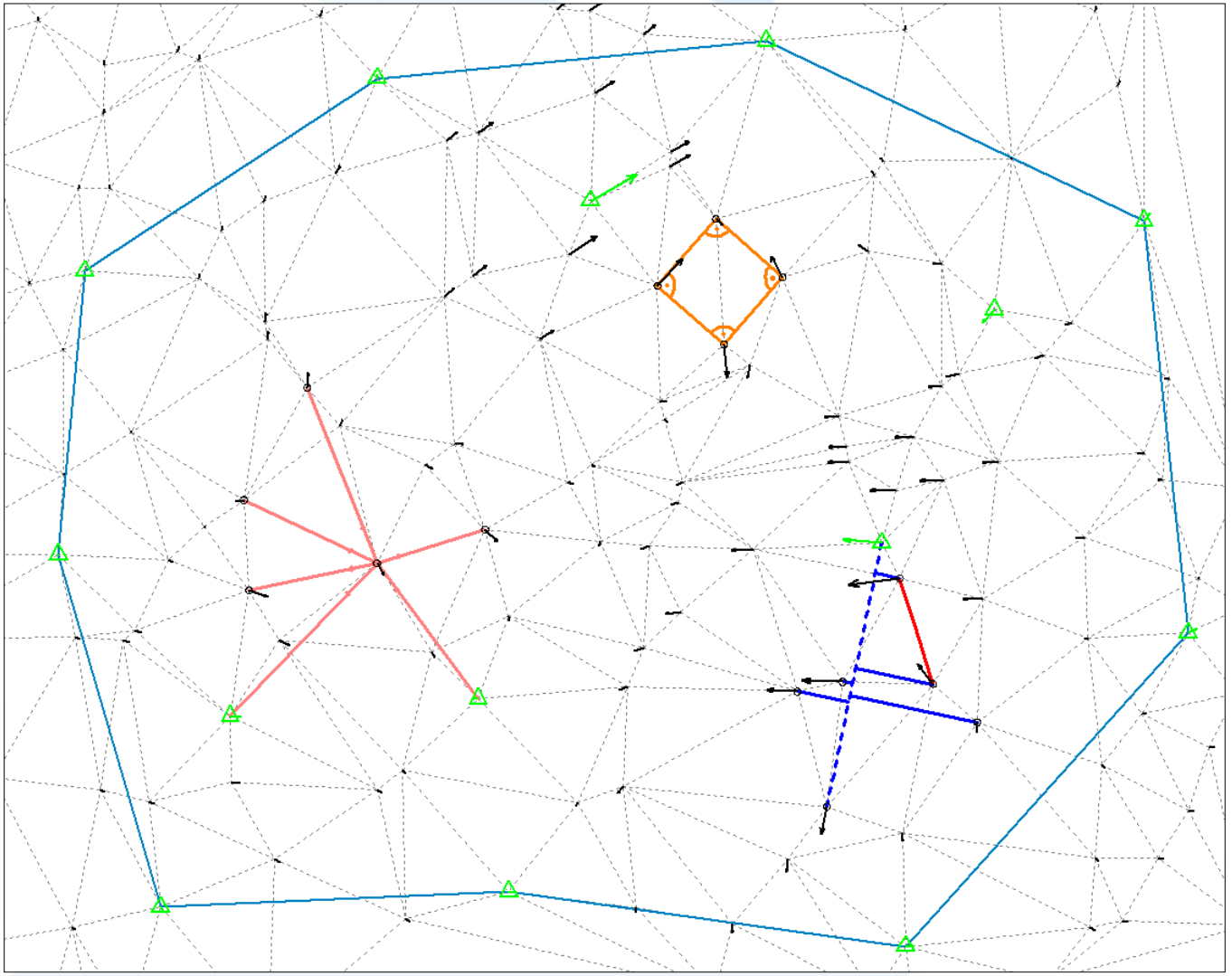
THIRD STEP

Introduction of GNSS - and field book observations



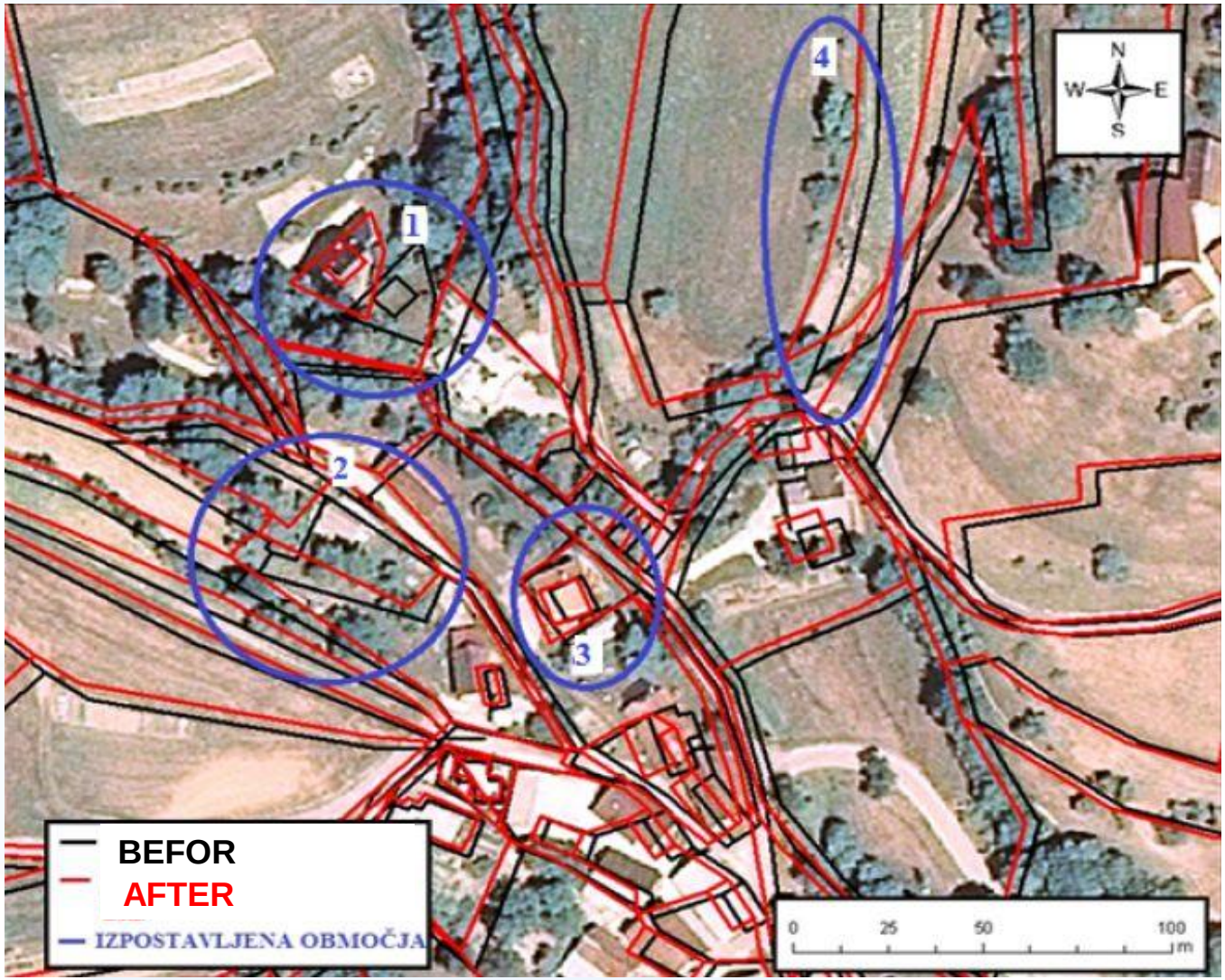
3. TRANSFORMATION and HOMOGENIZATION

FOURTH STEP → **Adjustment** (Homogenization with observations and constraints)



3. TRANSFORMATION and HOMOGENIZATION

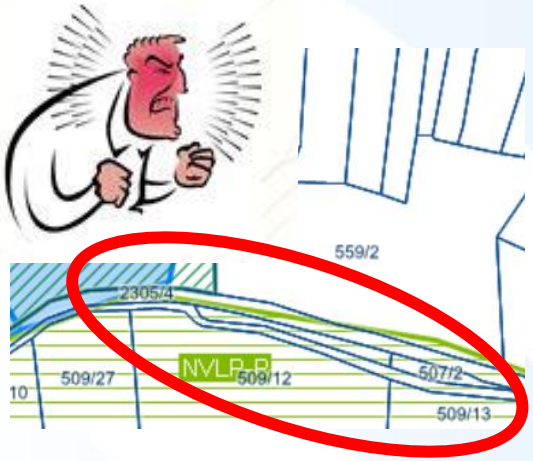
THE RESULTS



Avg deviation = **1.44m**

4. Conclusion/Challenges

The positional (in)accuracy → **Geometric quality improvement**



- **Cadastral points → included in the adjustment or not**
- **Maintenance of graphic part of cadastre**

THANK YOU FOR YOUR ATTENTION!