

Acquisition of Generalization Knowledge using Matching Methods

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 **Goals**

 **Procedure and methods**

 **Test data**

 **Matching program**

 **Implementation**

 **Reliability**

 **Outlook**

I Goal – Construction of a new DLM50.2

Procedure development for the construction of a new DLM50.2 based on the existing DTK50 and Basis-DLM

- Utilization of the existing data
- Automated manufacture / Updating of the TK50

II Procedure and methods

I. Data: Basis-DLM and DTK50

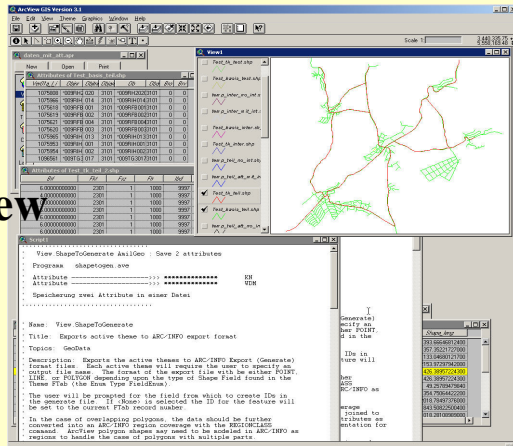
- geometry und
- semantics

II. Matching-process

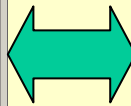
- objects matching
- objects formation
- *attributes transfer*

III. Visualization of the matching results

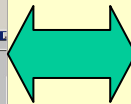
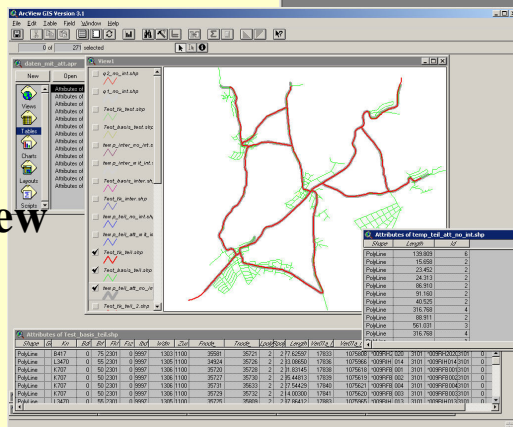
ArcView



Matching



ArcView

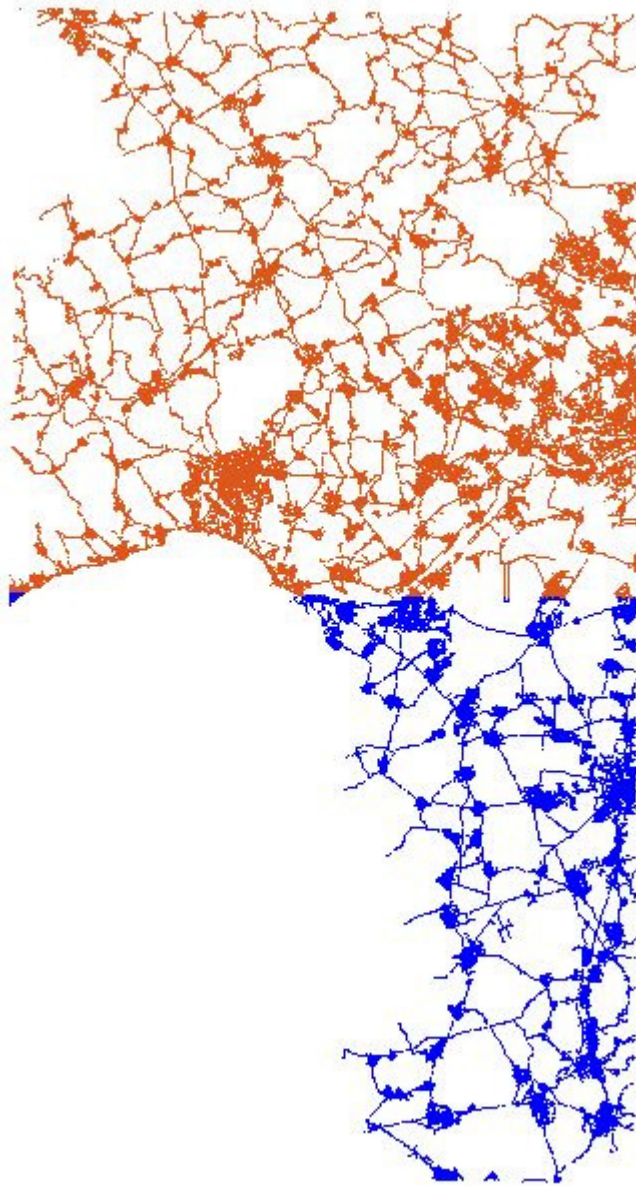


III Test data

- **Traffic objects**
 - **Area:**
Frankfurt-Mainz-Wiesbaden-Darmstadt,
map L5914, L5916, L6114 und L6116
 - **Format:**
GK3-System as Shape-file
- **Basis-DLM-Data:**
 - **Geometry**
 - **Semantics**
23 attributes
- **LOC-Data (DTK50):**
 - **Geometry**
 - **Semantics (L5914)**
16 attributes

he_c5914

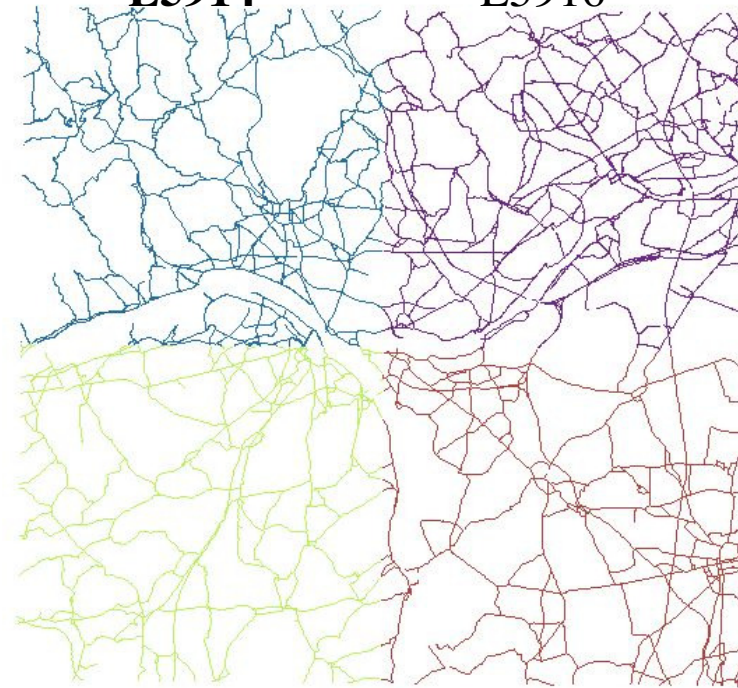
he_c6314



Basis-DLM (1:25000)

L5914

L5916

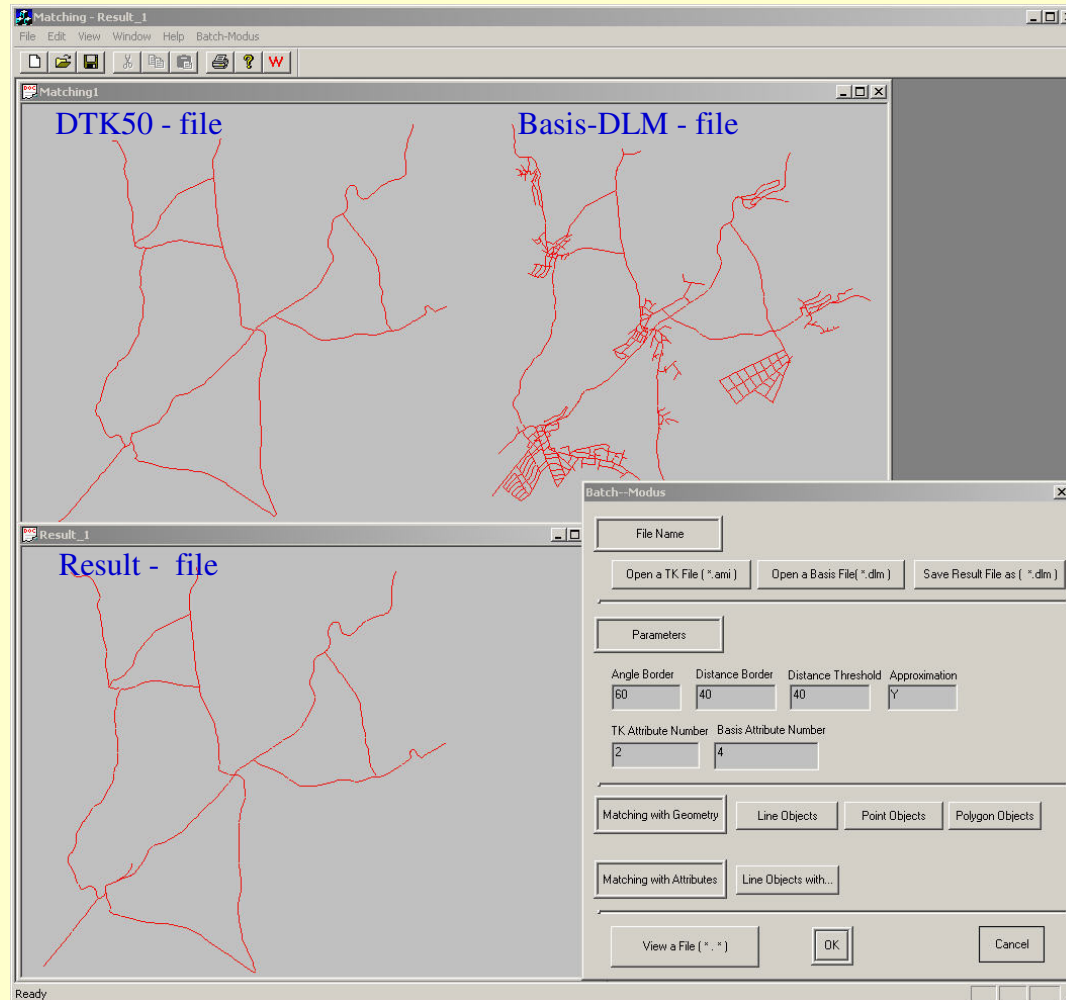


L6114

L6116

DTK50-data (1:50000)

IV Matching - program



A: I/O File

1. DTK50 - file
2. Basis-DLM - file
3. Result - file

B: Parameter

1. Angle border
2. Distance border
3. Distance threshold
4. Approximation
5. DTK – attribute number
6. DLM – attribute number

C: Matching

1. Matching without attributes
2. Matching with attributes

V Implementation

- **Matching without semantics**
 - spatial analysis of the data geometry,
 - similarity analysis,
- **Matching with combination of semantics and geometry**
 - combination of the geometry and attributes,
 - neighborhood analysis according to geometry and attributes,
 - recognition and identify.
- **Objects formation**
- *Attributes transfer of identified objects*

- **Geometry**

coordinate of Basis-DLM-data and DTK50-data

- **Attribute**

Basis-DLM-data and the new digitized DTK50-data

KN :

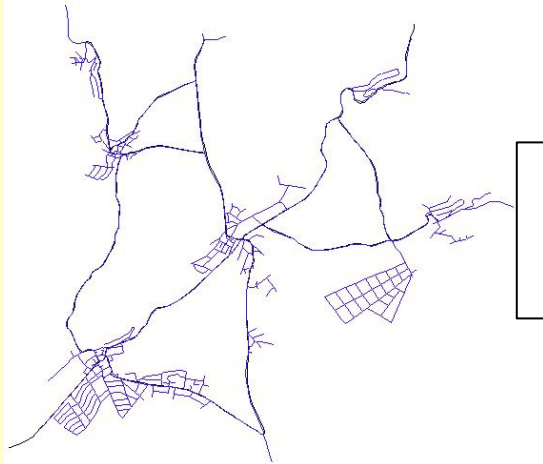
number of the classification / number of the Europe street (for example K7, L789, B9, A5, E4)

WDM :

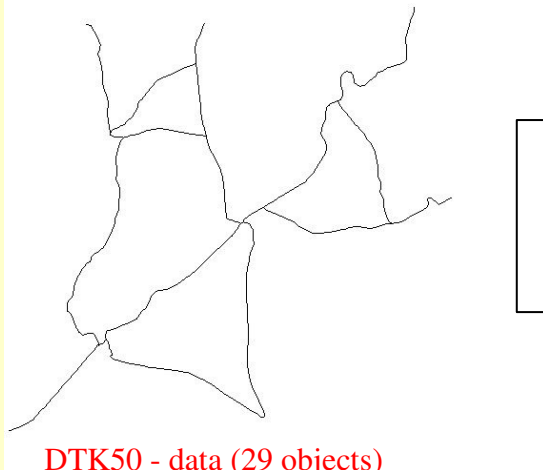
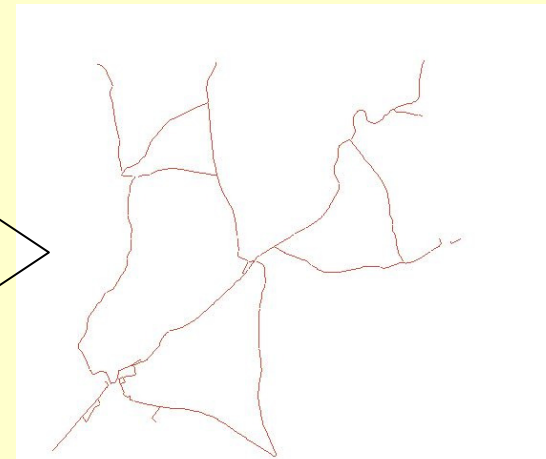
1301	expressway,
1303	highway,
1305	land street,
1306	...
1307	...
9997	no attribute,
9999	other

V.1 Matching-results ---- test area I

Basis-DLM-data (756 objects)



matched objects
with geometry



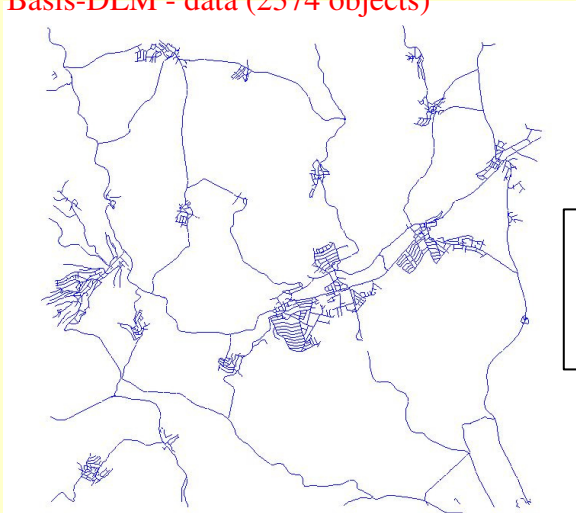
matched objects with
geometry and attributes



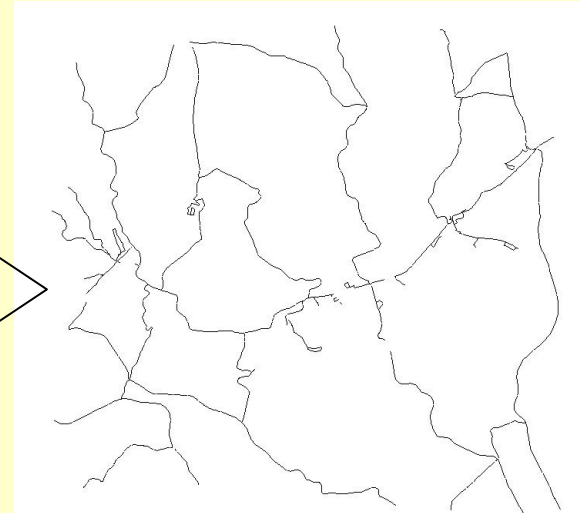
DTK50 - data (29 objects)

V.2 Matching-results ---- test area II

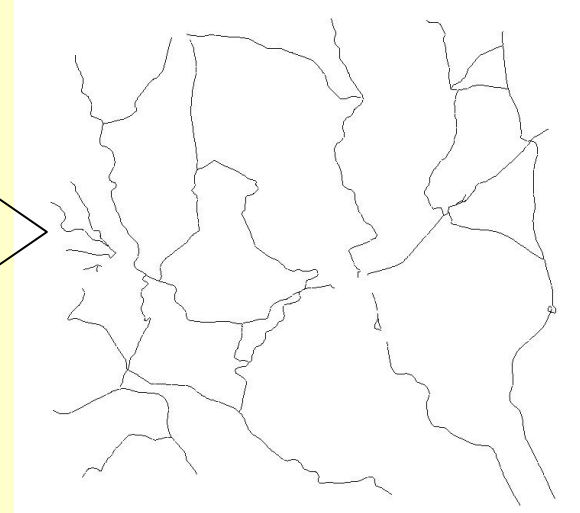
Basis-DLM - data (2374 objects)



matched objects
with geometry

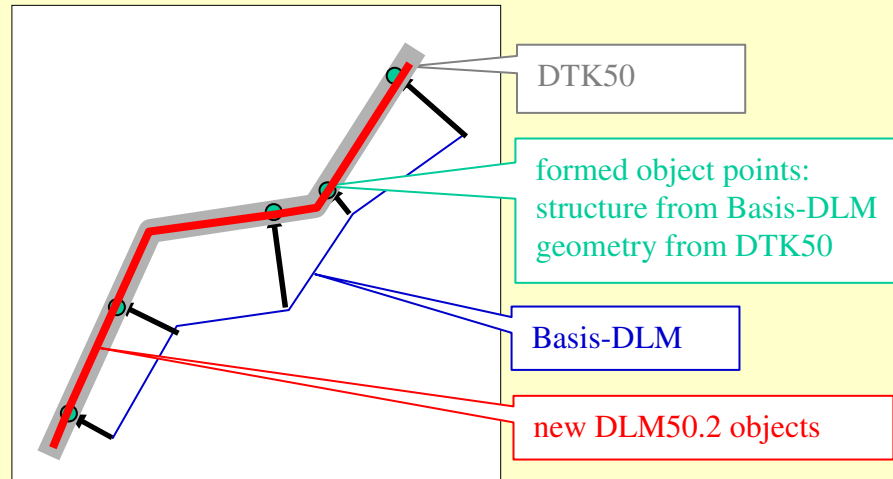


matched objects with
geometry and attributes



DTK50 - data (83 objects)

V.3 Matching-results ---- objects formation

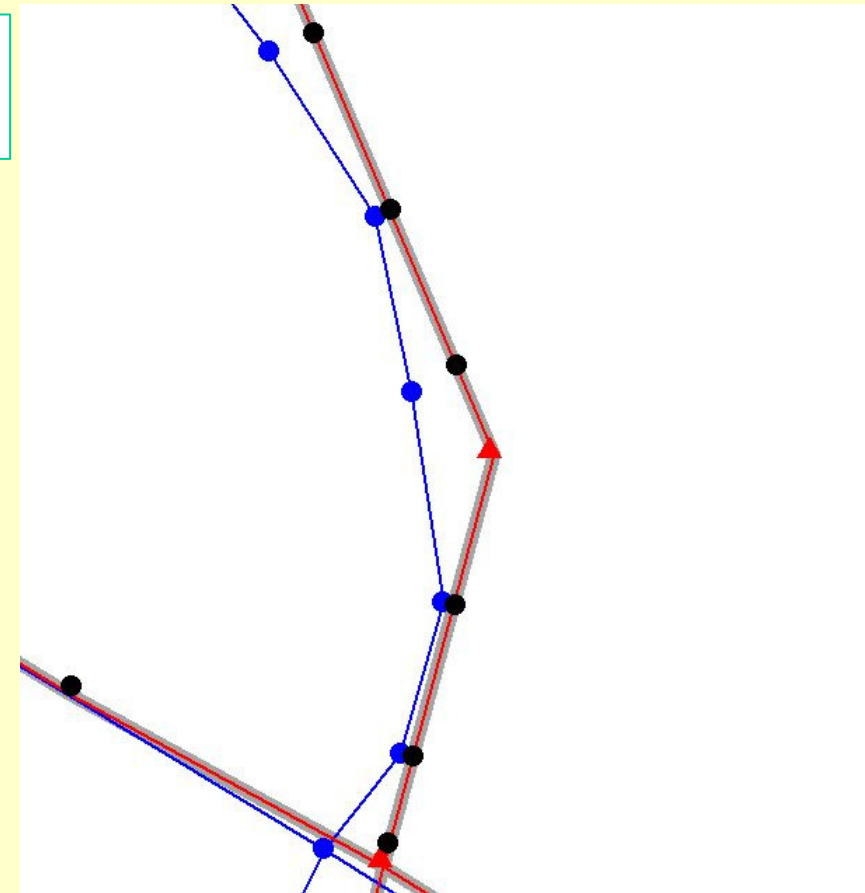


red: DTK50

blue: Basis-DLM

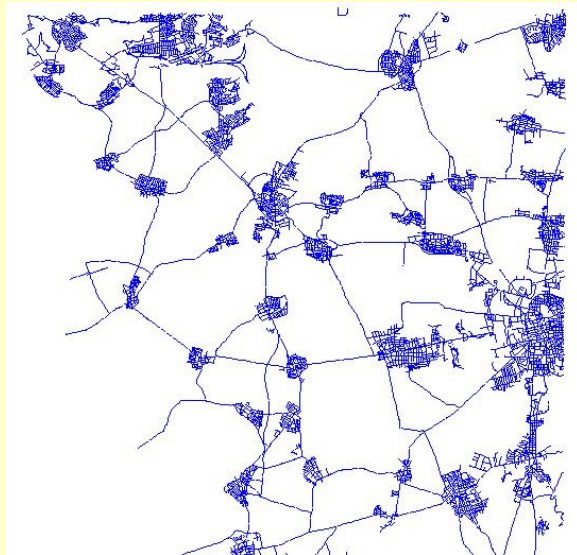
gray: matched and
formed objects
-- new DLM50.2

Black points:
formed points

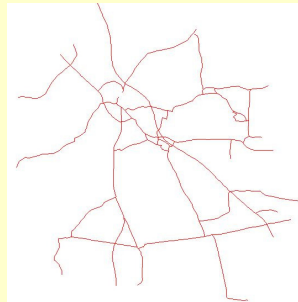


VI Reliability

VI.1 without attributes



Basis-DLM - data (13969 objects)

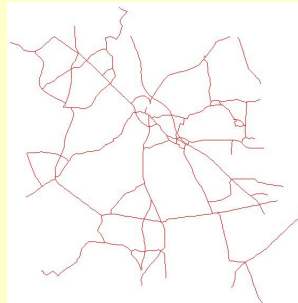


section I (73 objects)

matched objects : **71.2%**

not completely matched objects : **23.3%**

false matched objects : **5.5%**



section II (113 Objects)

matched objects : **70.8%**

not completely matched objects : **18.6%**

false matched objects : **8%**



section III (298 Objects)

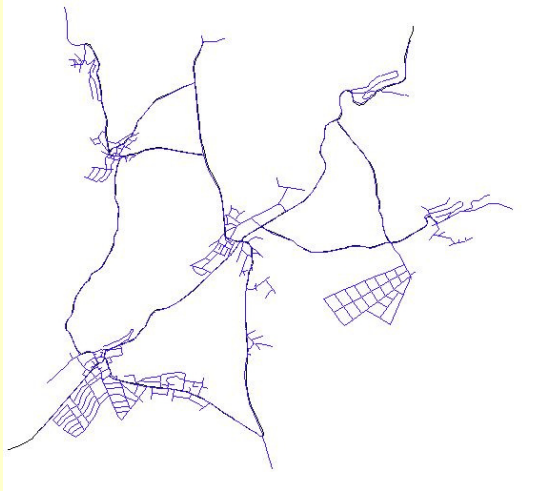
matched objects : **70.4%**

not completely matched objects : **14.8%**

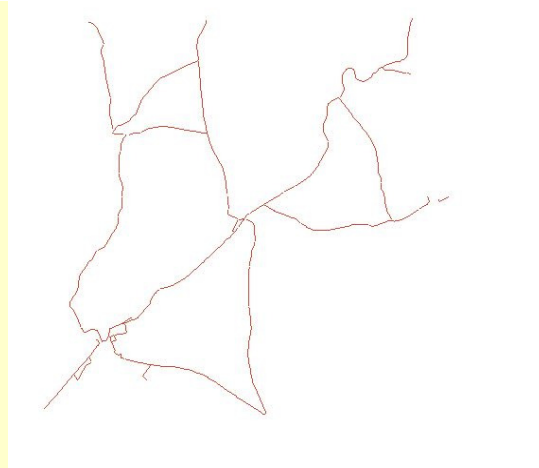
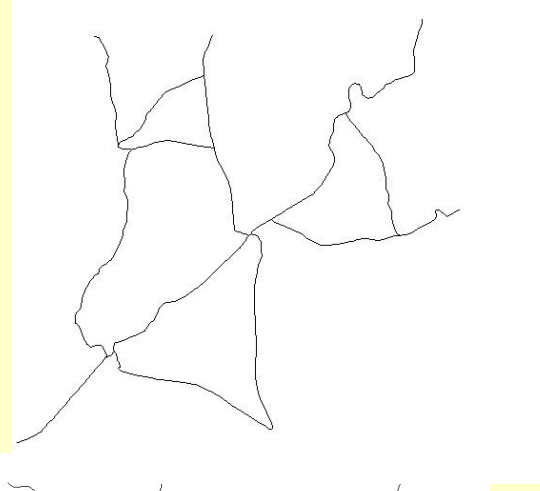
false matched objects : **9.1%**

VI.2 with attributes

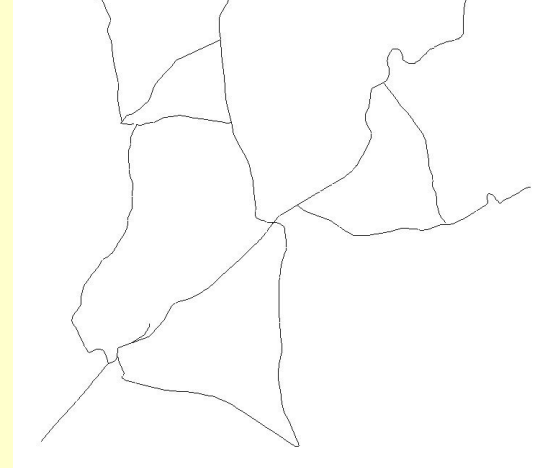
Basis-DLM - data



DTK50 - data



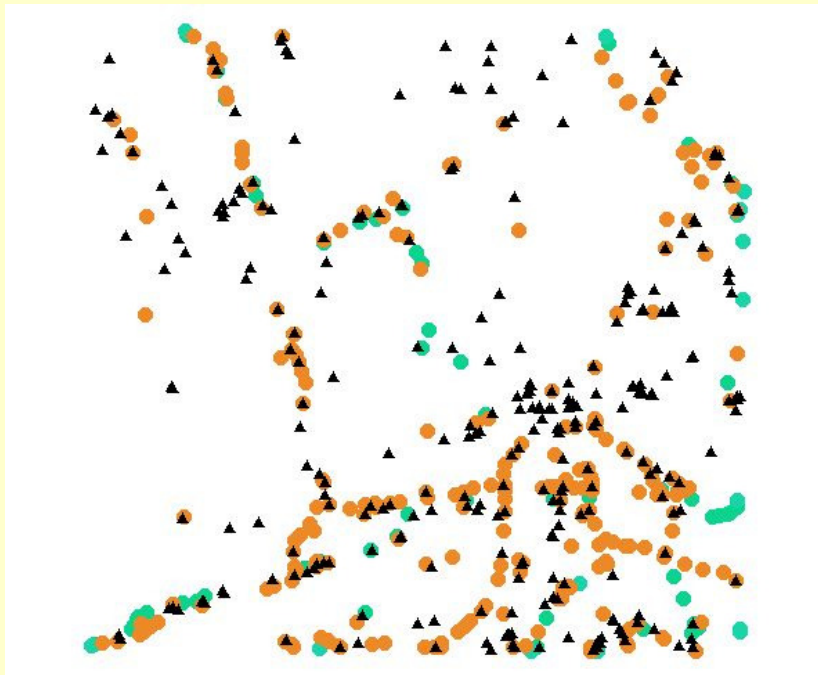
without attributes



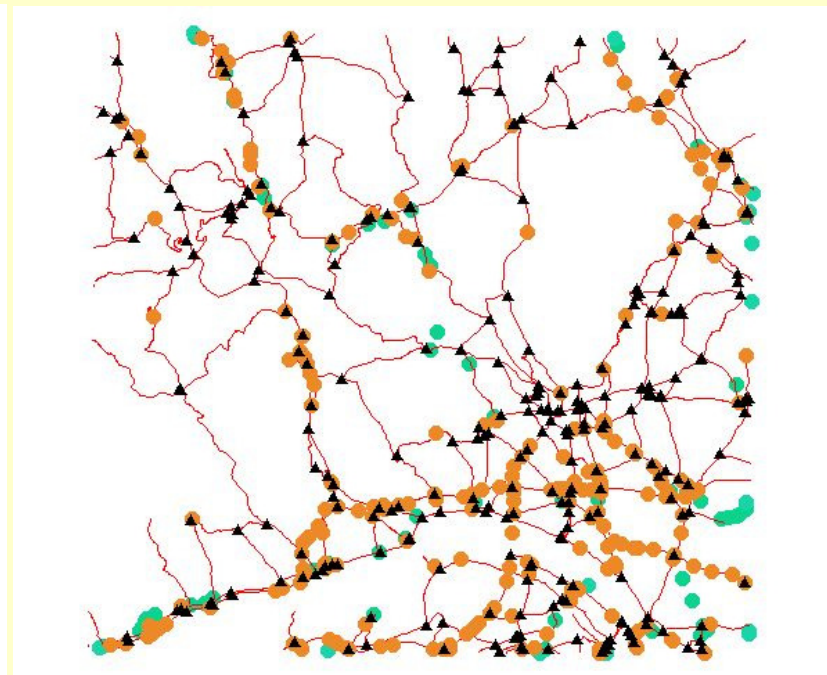
with attributes (KN and WDM)

VII Outlook

VII.1 Feasibility of the point objects

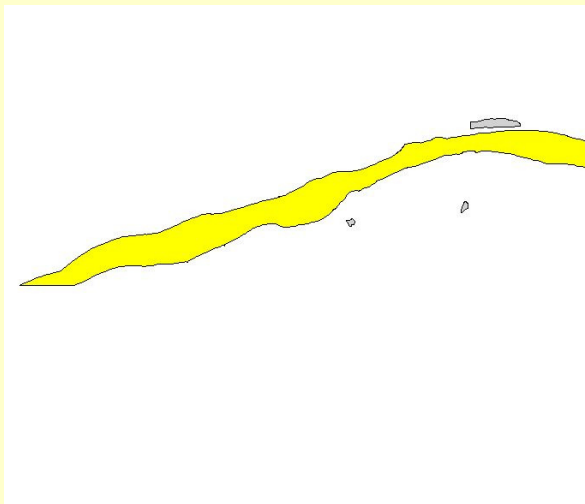


● Objects of DTK50 - data



▲ Objects of Basis-DLM - data

vii.2 Feasibility of the polygon objects



objects of DTK50 - data

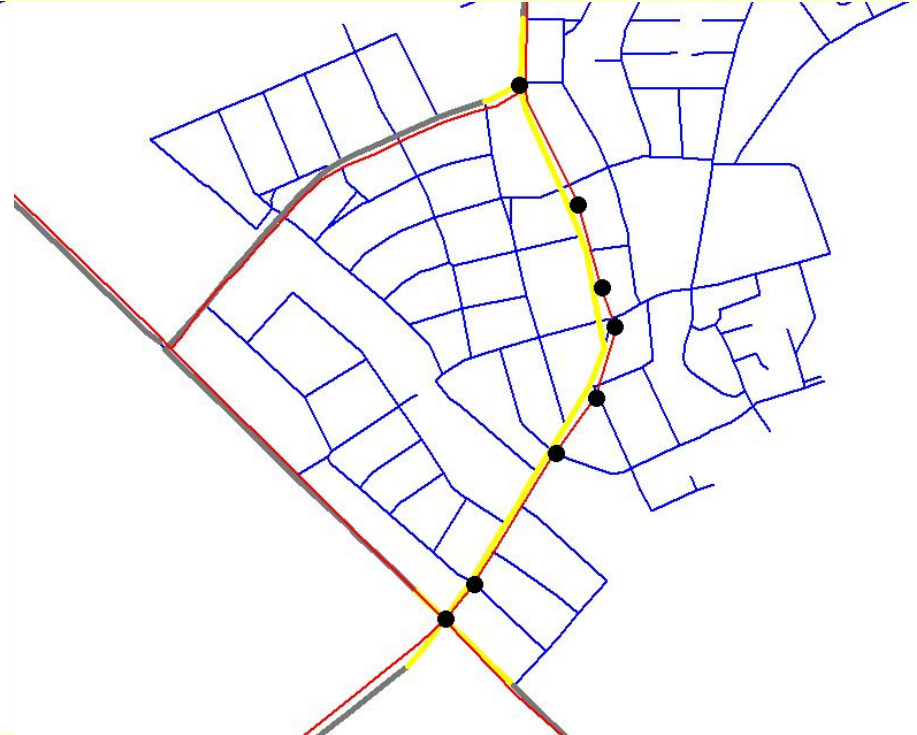


objects of Basis-DLM - data

Matching-method



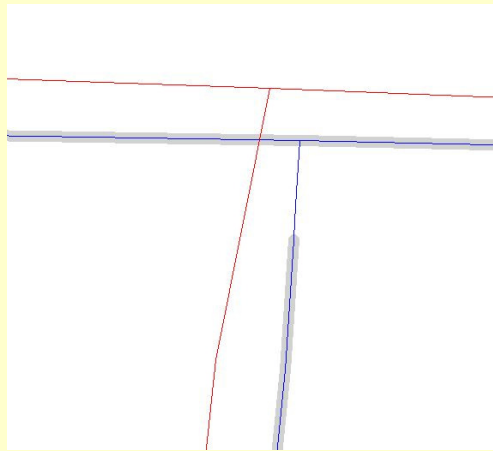
Matching-process



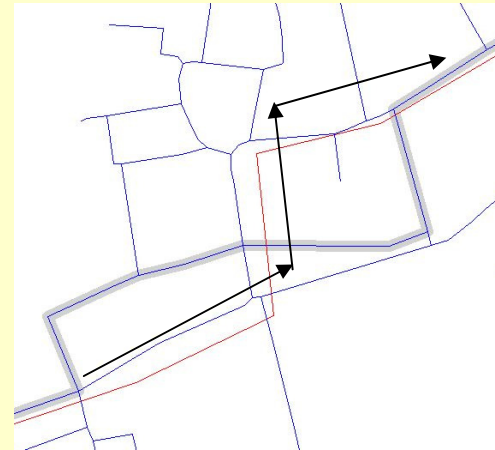
Matching - result

SCC : Search – Compare – Connect – objects formation

Remark



a) not completely Matching



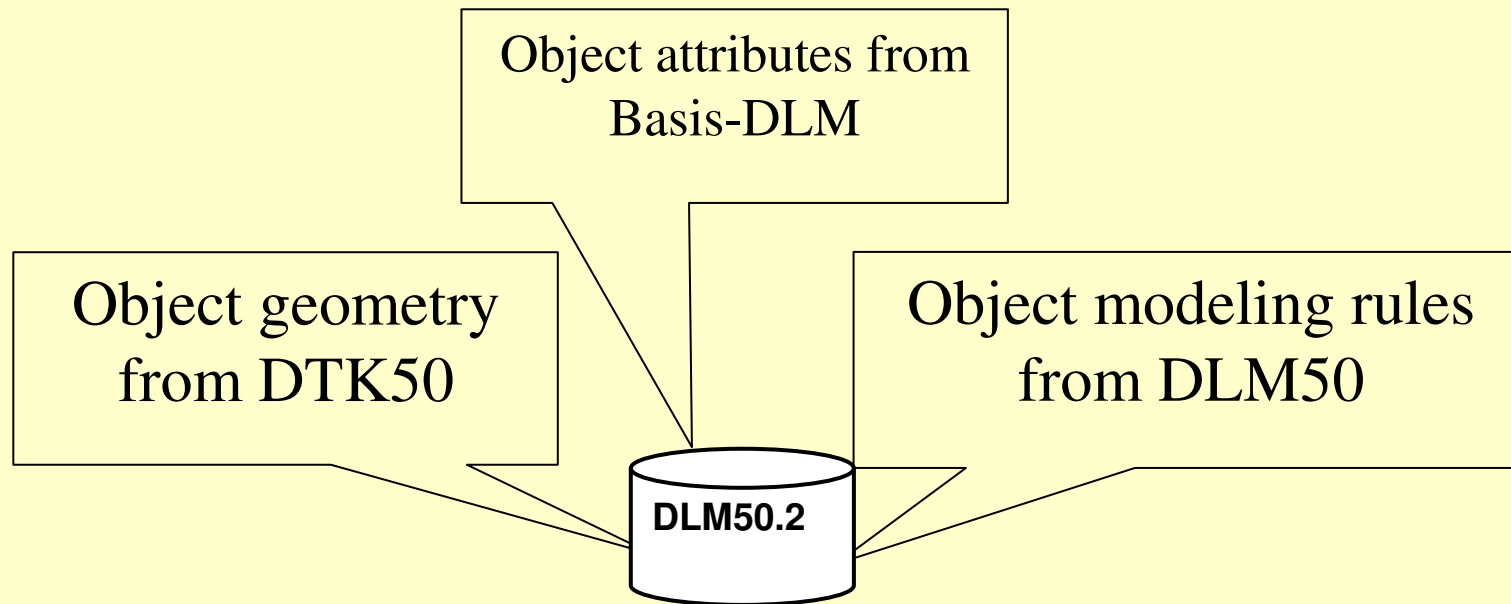
b) false results

a) „ **not completely matched objects** “ means that the matching - process of an object from DTK50 is not finished with 100% correctness. The gray lines are matched objects.

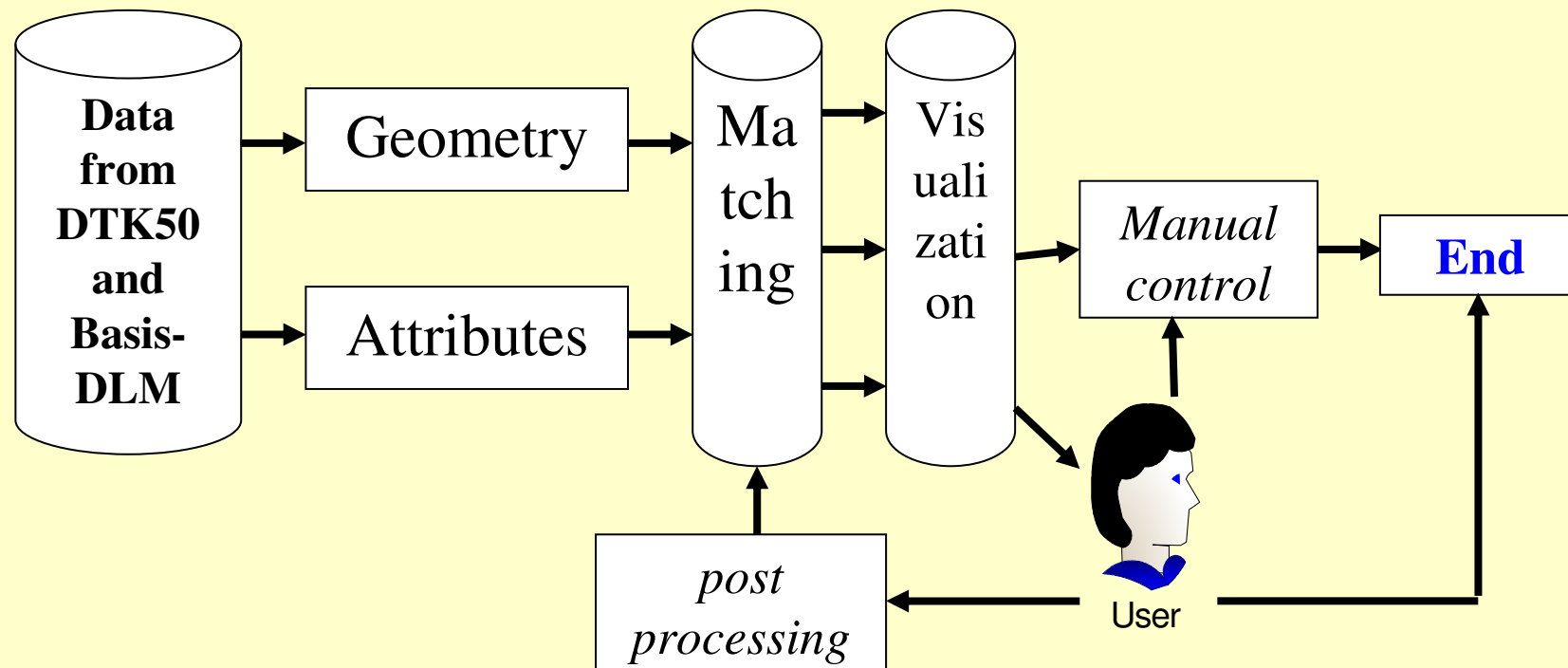
b) „**False matched objects**“ shows in Fig.b. They are false or partially false matched.

Reliability increase

- Introduction of the attributes
- Optimization of the procedure
- Manual post processing of the identified objects
-



Components of the DLM50.2



Flowchart of a matching process