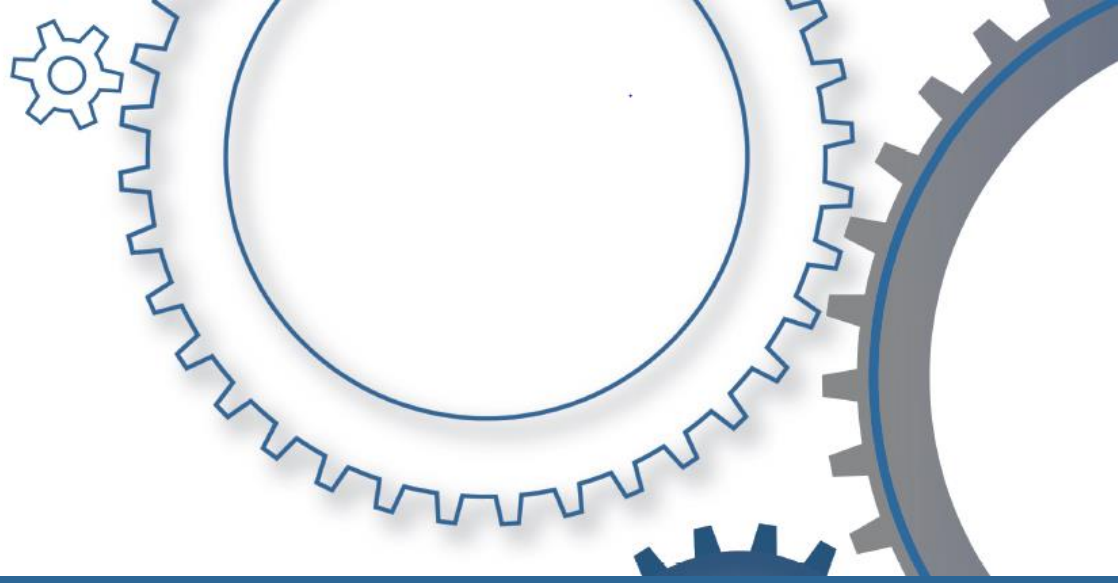

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# The improvement of production of the GDR50LT in Lithuania

Kęstutis PAPŠYS, Lina PAPŠIENĖ, Julius D. BUDREVIČIUS, Marius MARMA,
Evaldas ROŽANSKAS, Mindaugas PAŽEMYS / GIS-Centras
Jurgita ŠPŪRAITĖ / National Land Service

# The company - The National Center of Remote Sensing and Geoinformatics „GIS-Centras“ (SE „GIS-Centras“)

BUREAU VERITAS
Certification

Sertifikatas
Išduotas

VĮ Distancinių tyrimų ir geoinformatikos centrui
“GIS-Centras”
Sėlių g. 66, LT-08109 Vilnius

GIS-Centras

Šiuo sertifikatu Bureau Veritas patvirtina, kad įvertino nurodytos organizacijos vadybos sistemą ir nustatė, jog ji atitinka toliau nurodyto vadybos sistemos standarto reikalavimus

STANDARTAS

ISO 9001:2008 / LST EN ISO 9001:2008

SERTIFIKAVIMO SRITIS

Geografinės informacijos sistemų (GIS) ir erdvinių duomenų kūrimas ir tvarkymas

Sertifikavimo ciklo pradžios data 2014 m. kovo 14 d.

Organizacijos vadybos sistemai nuolat atitinkant nurodyto standarto reikalavimus, šis sertifikatas baigia galioti 2017 m. kovo 13 d.

Pradinio patvirtinimo data 2014 m. kovo 14 d.

Nuotiduoti papildomai pasiteirauti apie šio sertifikato galiojimą, prašome skambinti tel. (5) 233 79 75. Nuotiduoti gauti daugiau informacijos apie šio sertifikato veikimo sritį ir vadybos sistemos reikalavimų taikymą, prašome kreiptis į organizaciją, kuriai išduotas sertifikatas.

Sertifikato Nr.: LT0764Q

Išdavimo data: 2014 m. kovo 14 d.

Įgaliotas darbuotojas

UKAS

- Since 1992
- Supervised by the National Land Service
- Headquarters in Vilnius, branch in Kaunas
- Leader in distribution of geographic data and maps
- Official manager of State Information Systems:
  - Portal of the National Spatial Data Infrastructure (www.geoportal.lt)
  - (Geo)reference data cadaster (GRPK)
  - (Geo)reference spatial data set at the scale 1:10.000 (GDR10LT)
  - National GNSS permanent network (LitPOS)

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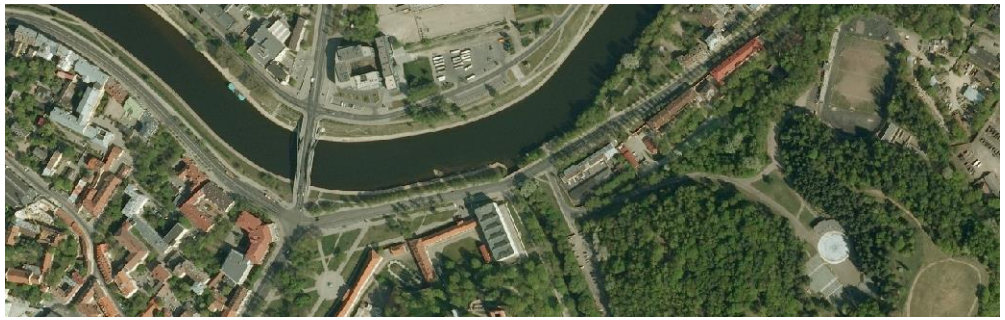
# Reference data

**(Geo)reference spatial data** represent:

- natural (the land cover, water bodies, etc.) and
- anthropogenic (buildings, roads, etc.) objects of the landscape.

**Scales:** 1:10 000, 1:50 000, 1:250 000



from 2013-07-01

GDR10LT + GRPK

GDR50LT

GDR250LT

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# Reference data

**GRPK**

road and street centerlines
railroads centerlines
river and stream centerlines
canal and ditch centerlines
rivers, pounds, lakes,
see shorelines
buildings
geodetic points
elevation points
boundaries of land coverage

**GDR10LT**

built-up territories
swamps
power lines
gas pipelines
oil pipelines
air navigation obstacles
geographic names
etc.

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# Sources for updating

- Other official data providers
- Geodetic Points IS
- National Roads IS
- Cadaster of rivers, lakes and pounds
- Register of Address
- Land IS
- Surveyors
- Municipalities

Data providers, registres, etc.

*Owner: National Land Service*

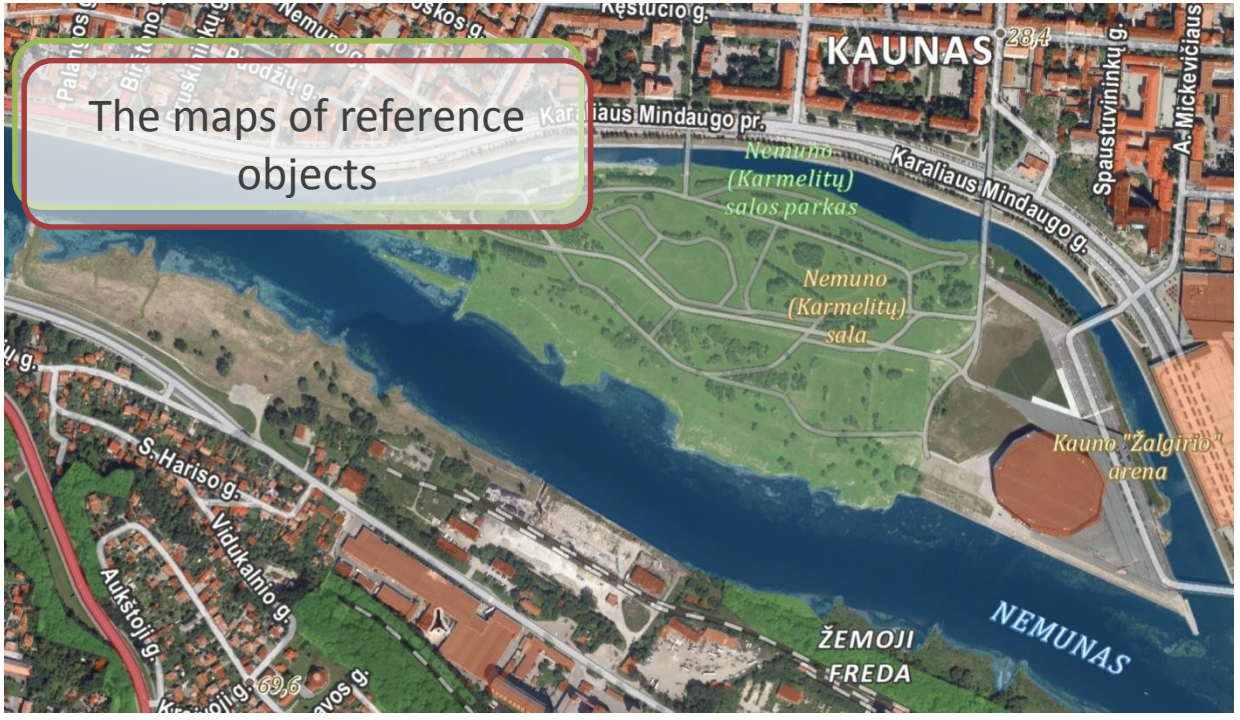
GRPK

GDR10LT

*Manager: GIS-Centras*

GDR50LT

GDR250LT

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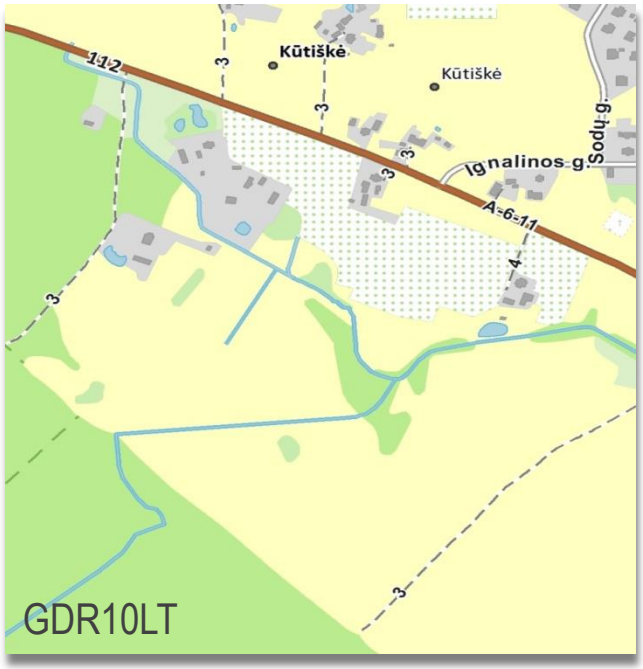
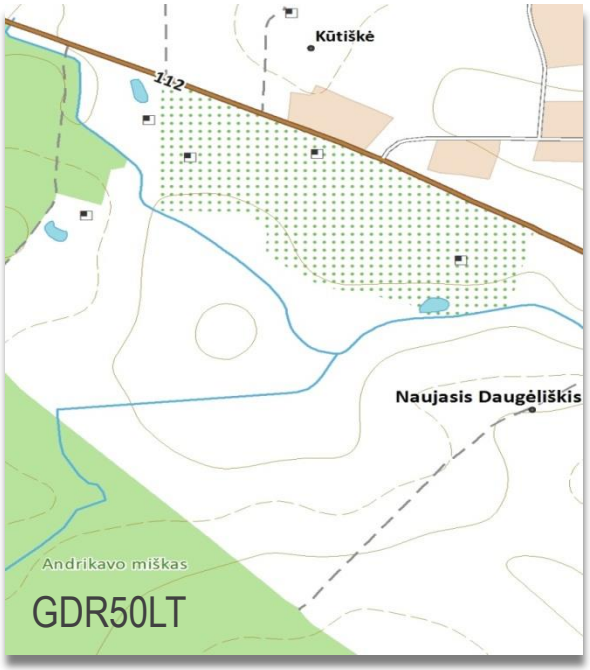
# Traditional updates of GDR10LT and GDR50LT

- Other official data providers
- Geodetic Points IS
- National Roads IS
- Cadaster of rivers, lakes and pounds
- Register of Address
- Land IS
- Surveyors
- Municipalities

continuously




GDR10LT

GRPK

GDR50LT

1-2 years

+ 1-2 years

+2 years = 4-5 years!

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# The beginning (2013)

| | |
|---|---|
| Project: | The research of the possibilities for automated or semi automated update of GDR50LT |
| Contractor: | National Land Service |
| Implementer: | GIS-Centras |
| Duration: | 5 moths |
| Main task: | to analyse the possibilities of the automated or semi automated update of GDR50LT by using the spatial data of GDR10LT in territory of Lithuania |

**PRECONDITIONS**

Have to be use:

- ✓ Current specifications of GDR10LT and GDR50LT
- ✓ Current spatial data of GDR10LT
- ✓ ArcGIS software esri

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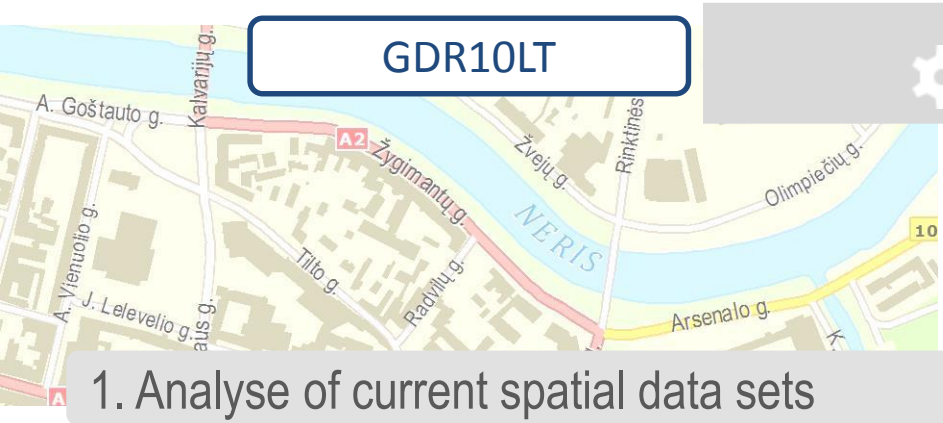
# Tasks of the Project



GDR10LT

GDR50LT

1. Analyse of current spatial data sets

2. Prepare updates of specifications of GDR10LT and GDR50LT

3. Analyse of algorithms

4. Design of conception model

5. Design, develop and test of update processes

6. Prepare recommendations for the process

Prepare the prototype model of automated process

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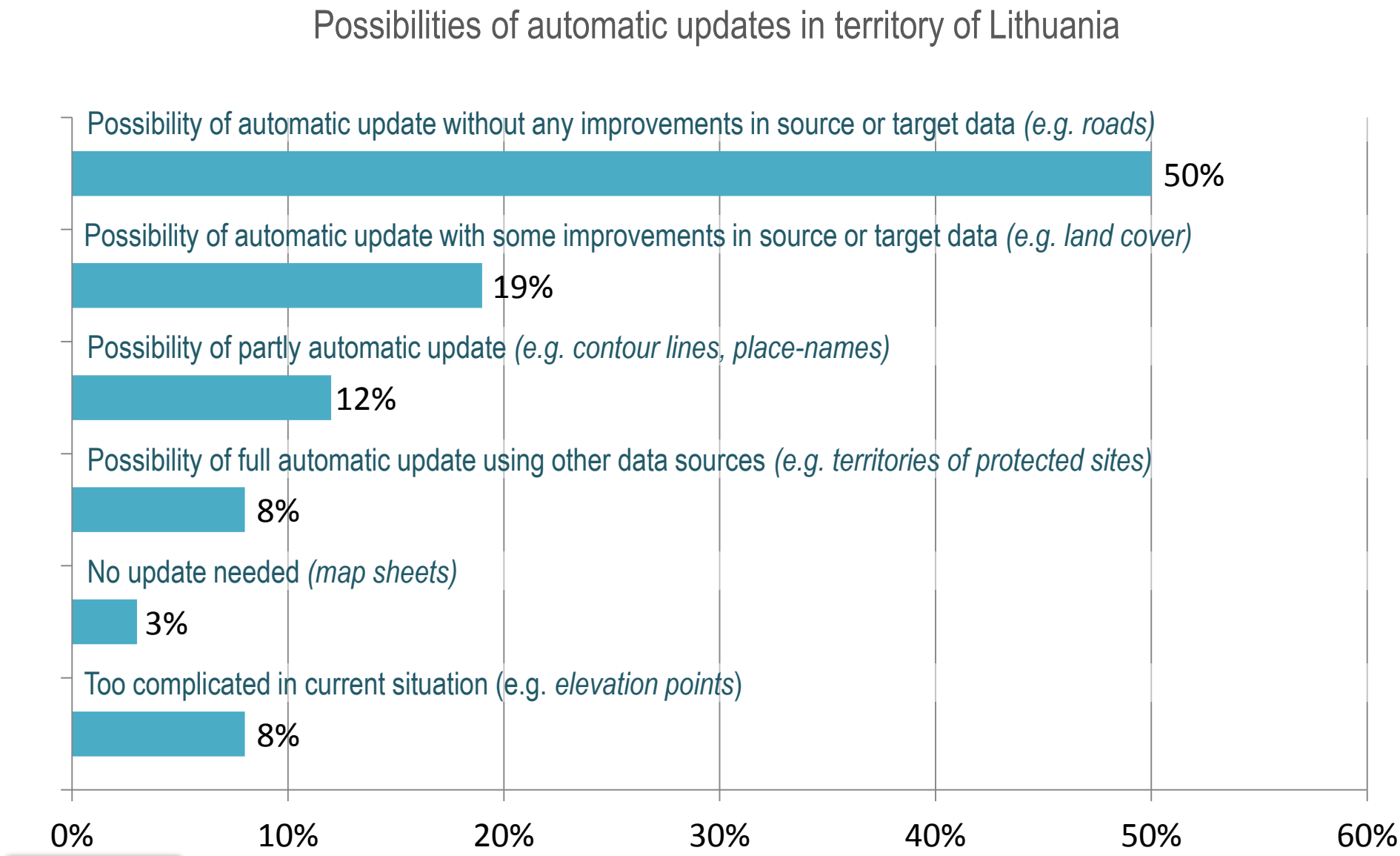
# The results

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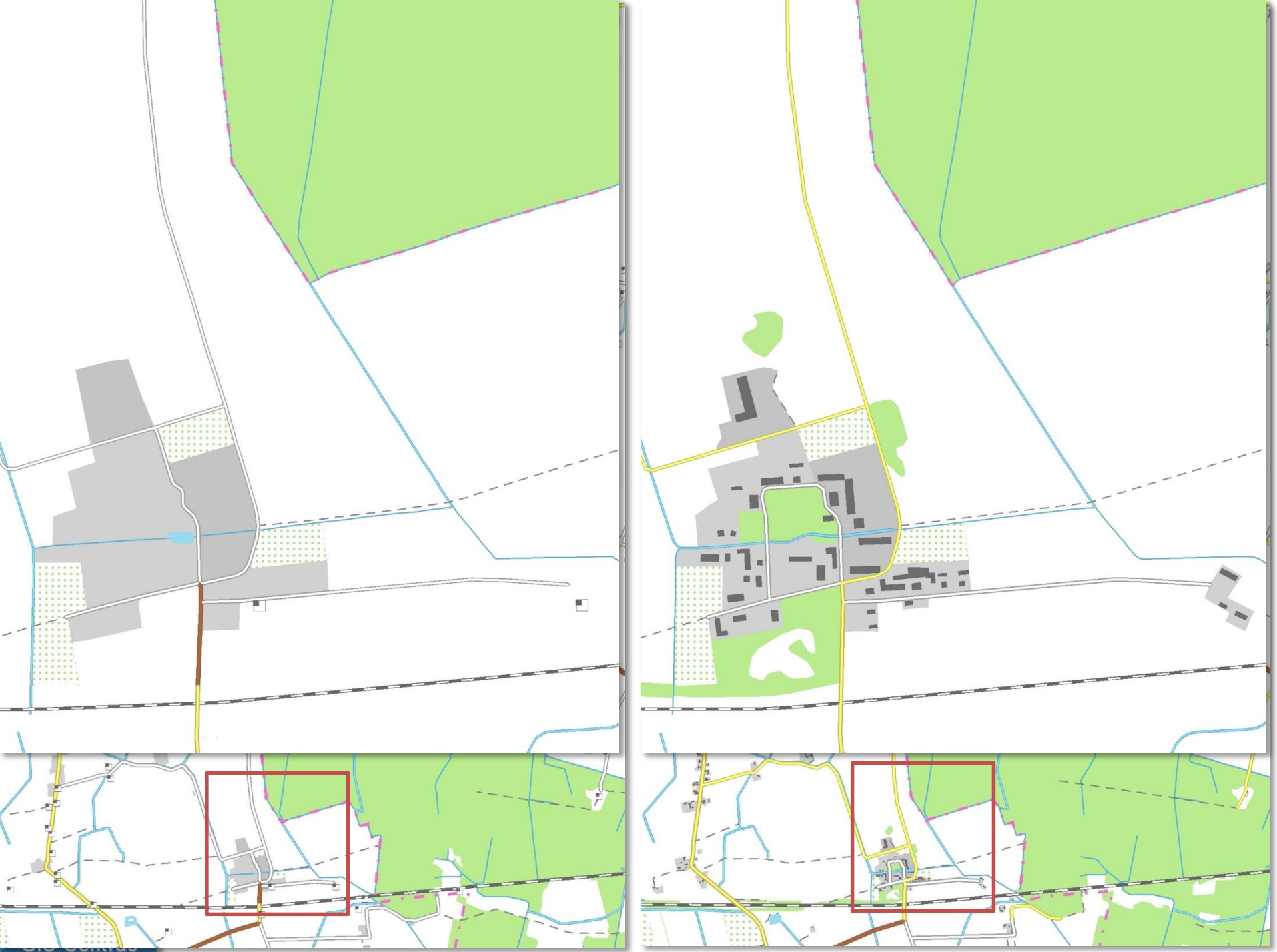
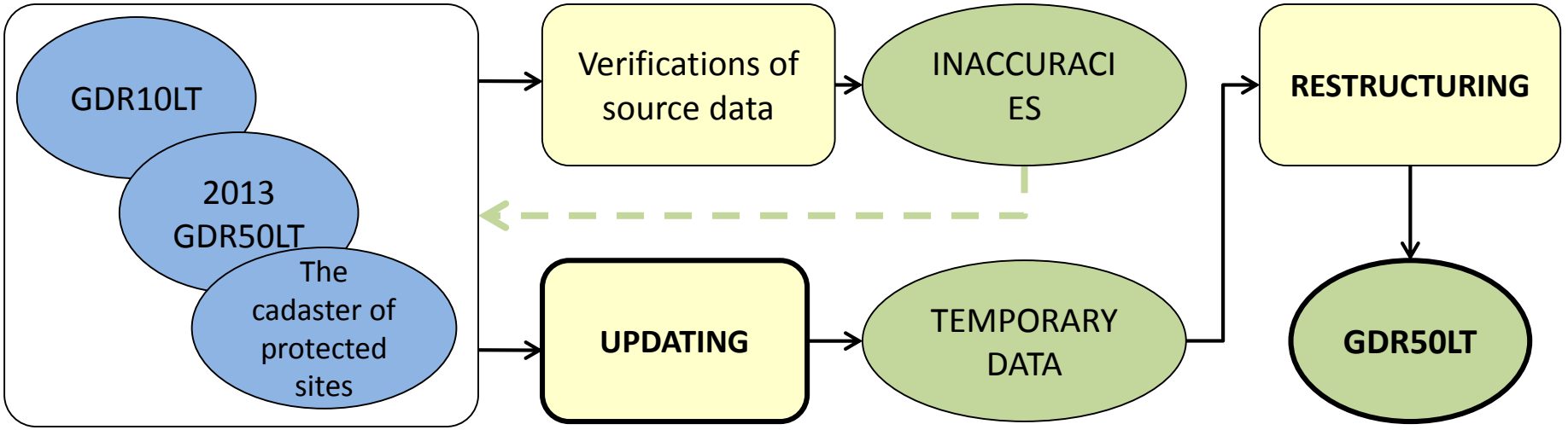


# Follow up (2014)

| | |
|---|---|
| Project: | The automatisation of updating GDR50LT |
| Contractor: | National Land Service |
| Implementer: | GIS-Centras |
| Duration: | 5 moths |
| Main task: | To develop models for automatic updating GDR50LT |

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# Generalization in the Project

Object interpretation

GDR10LT

cadaster of protected sites

Model generalization

Reduce the count of features

Reduce the complexity of features

GDR50LT

Cartographic generalization

Not now...

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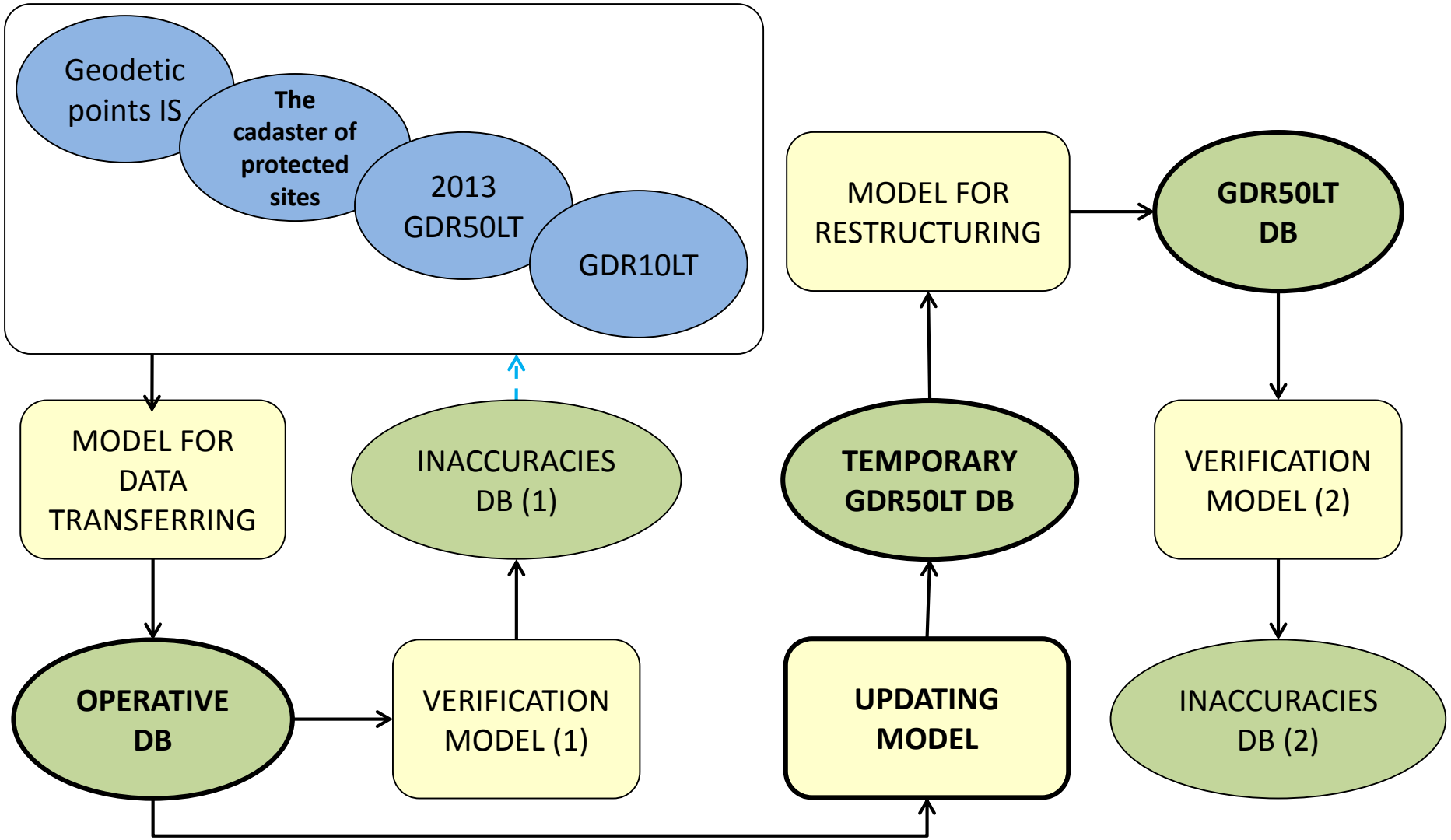
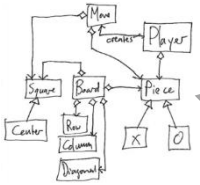
# Conception of models (implementation)

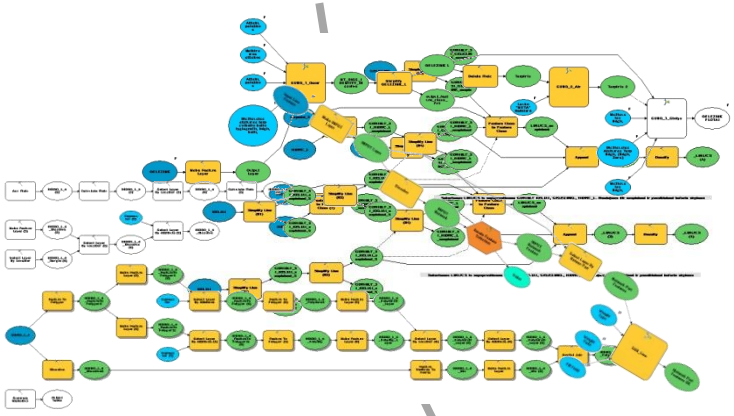


# Designing > Development > Testing

Designing



Development



OK?

FINISH

Testing

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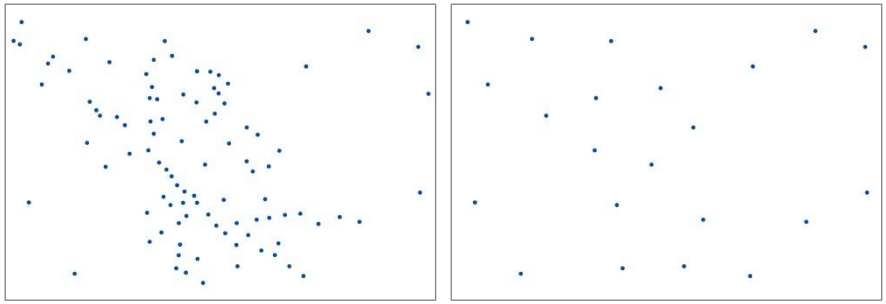
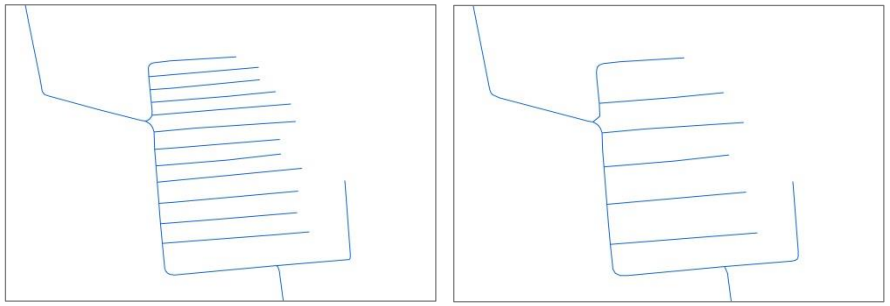
# The results

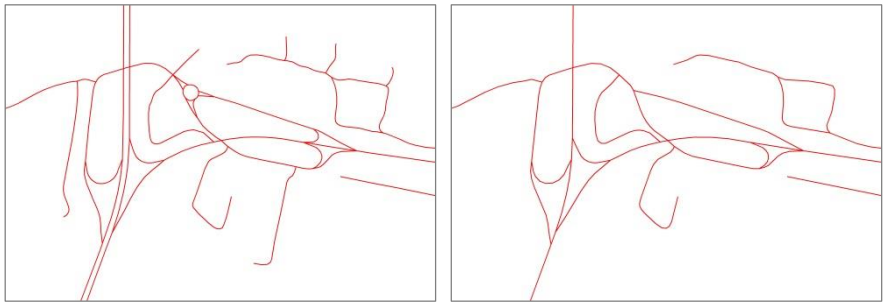
GDR10LT GEODEZ GDR50LT



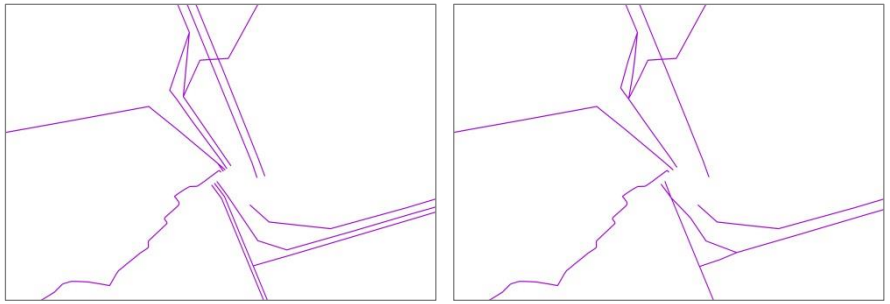
GDR10LT HIDRO_L GDR50LT



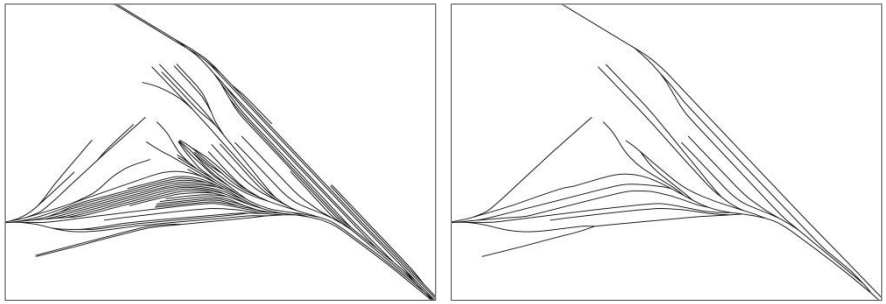
GDR10LT KELIAI GDR50LT



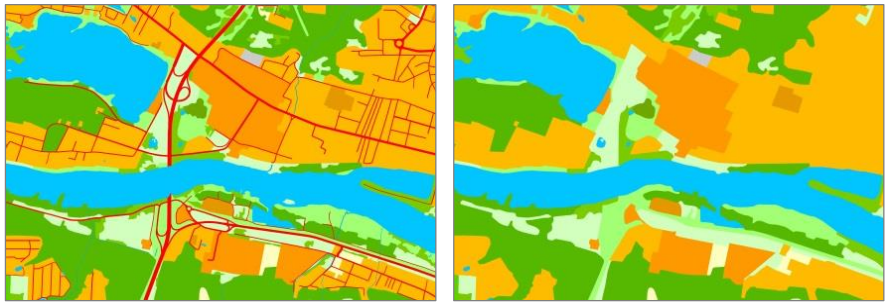
GDR10LT ELEKTRA_L GDR50LT



GDR10LT GELEZINK GDR50LT



GDR10LT PLOTAI GDR50LT



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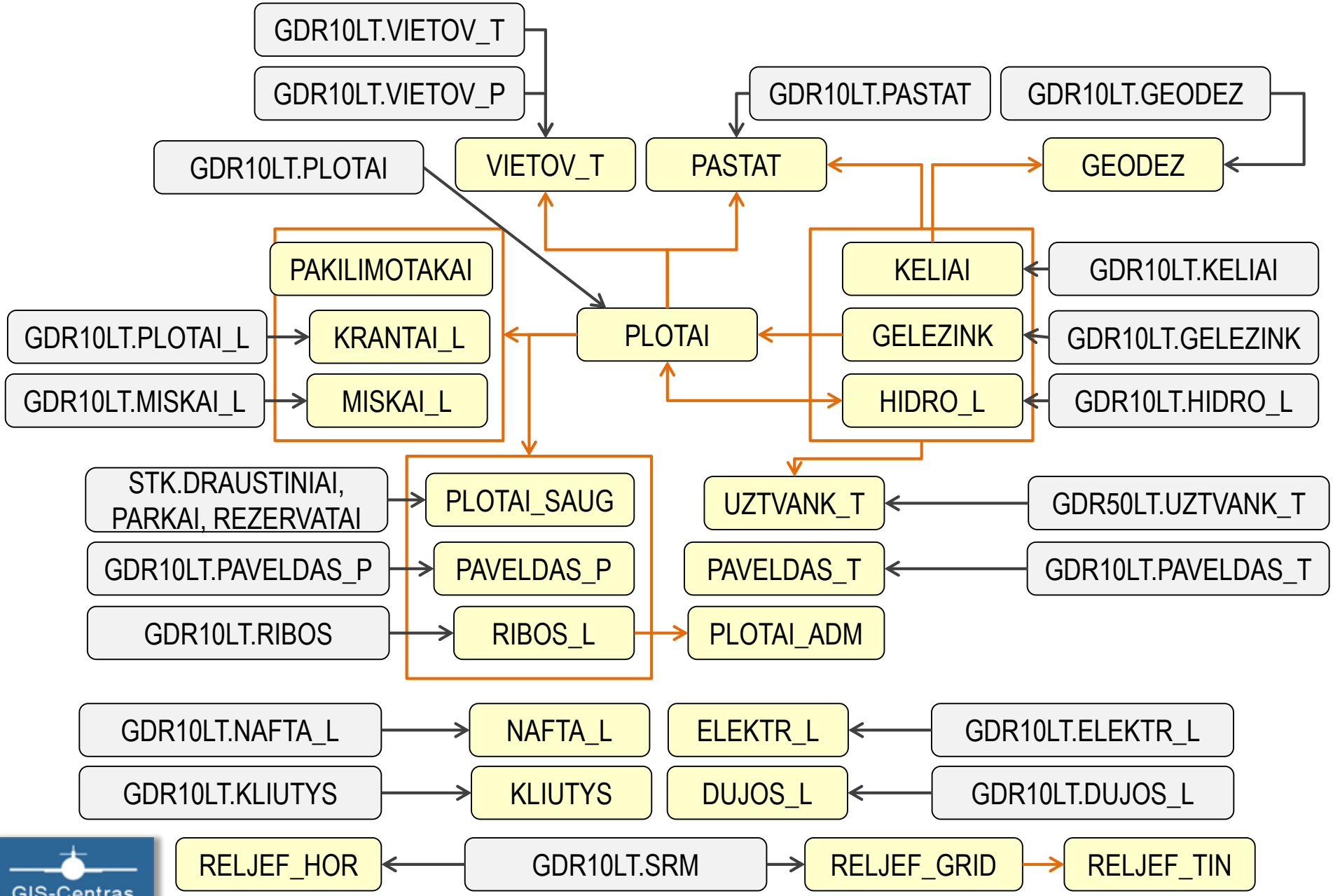
# Links between data layers (conception of update)

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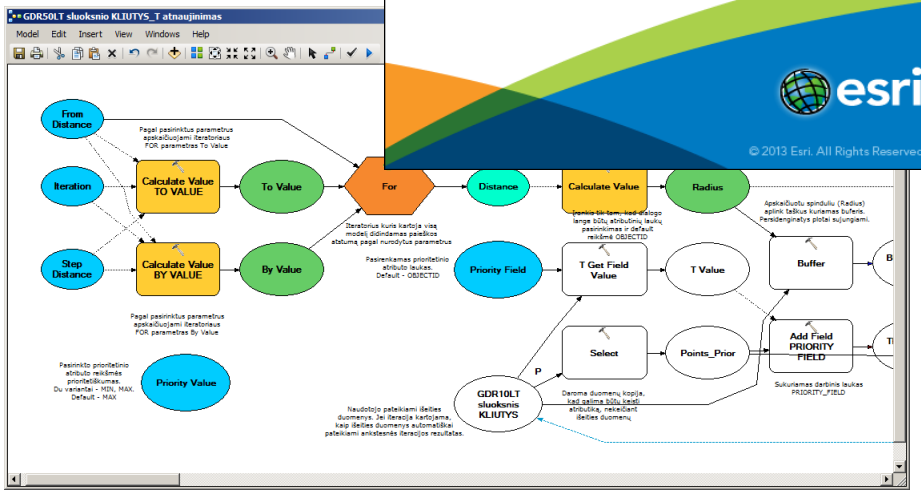
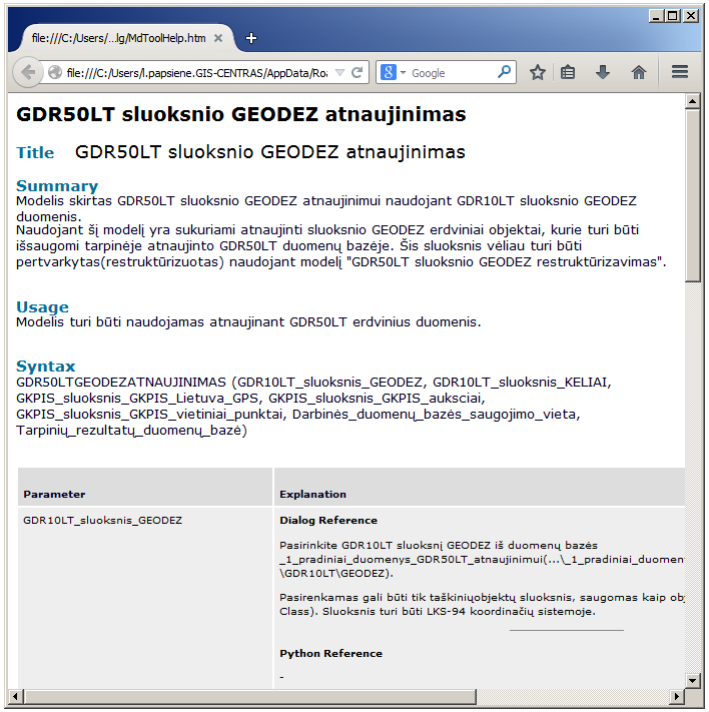
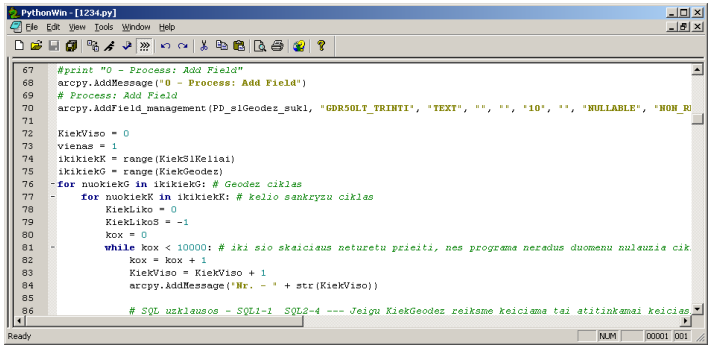
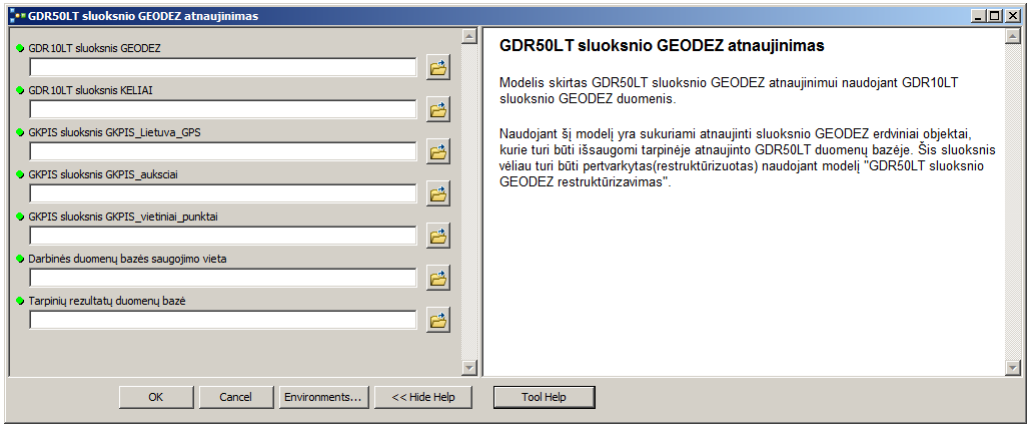
# Advantages of ArcGIS Model Builder

- Easy to use
- No needs special knowledge in programming
- Possibilities to prepare user interface, help
- And much more...

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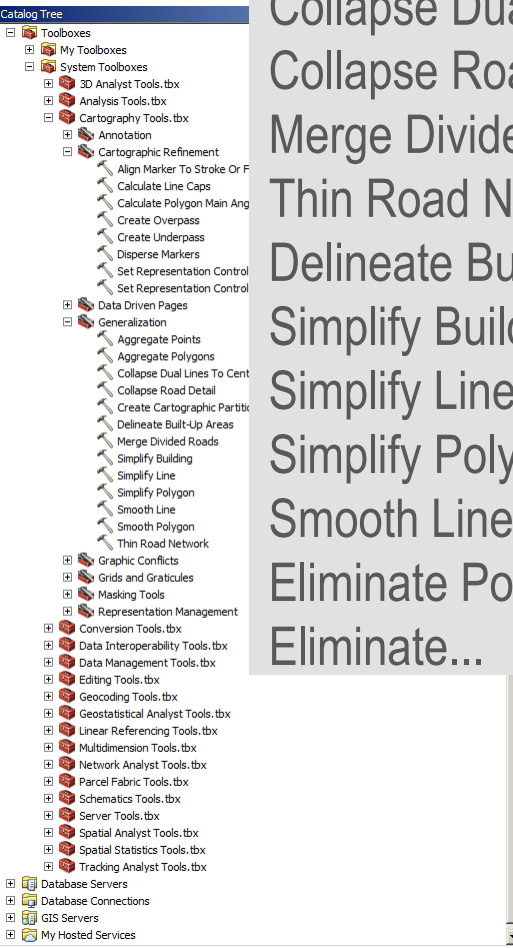
# Advantages of ArcGIS Model Builder

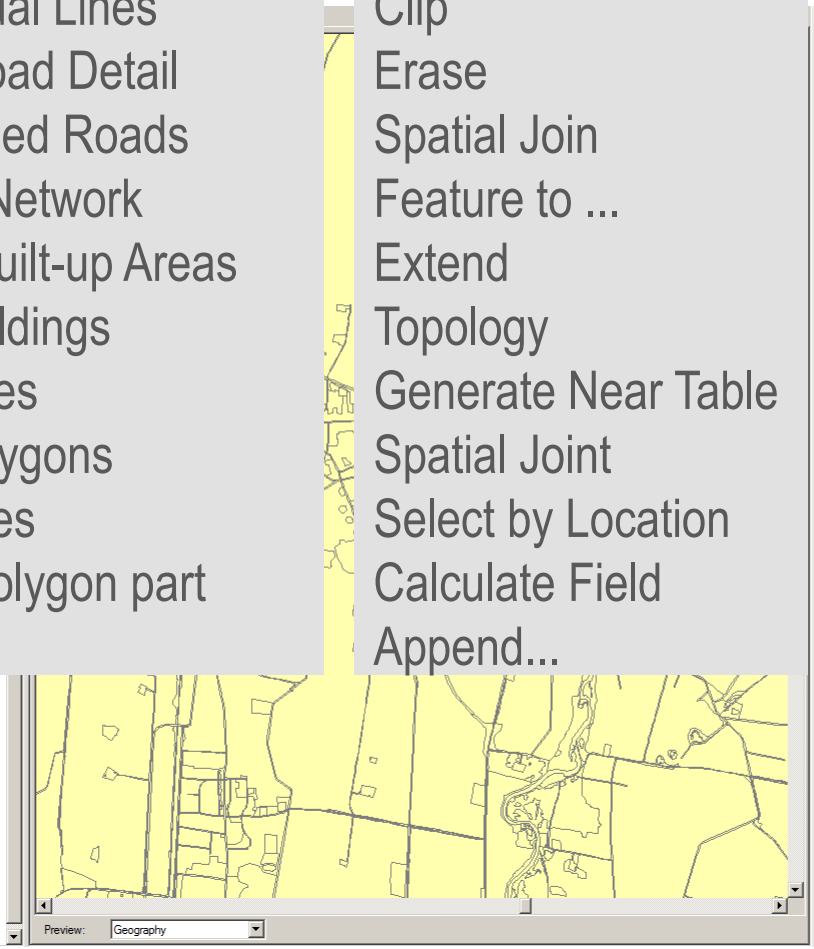
## Generalisation tools:

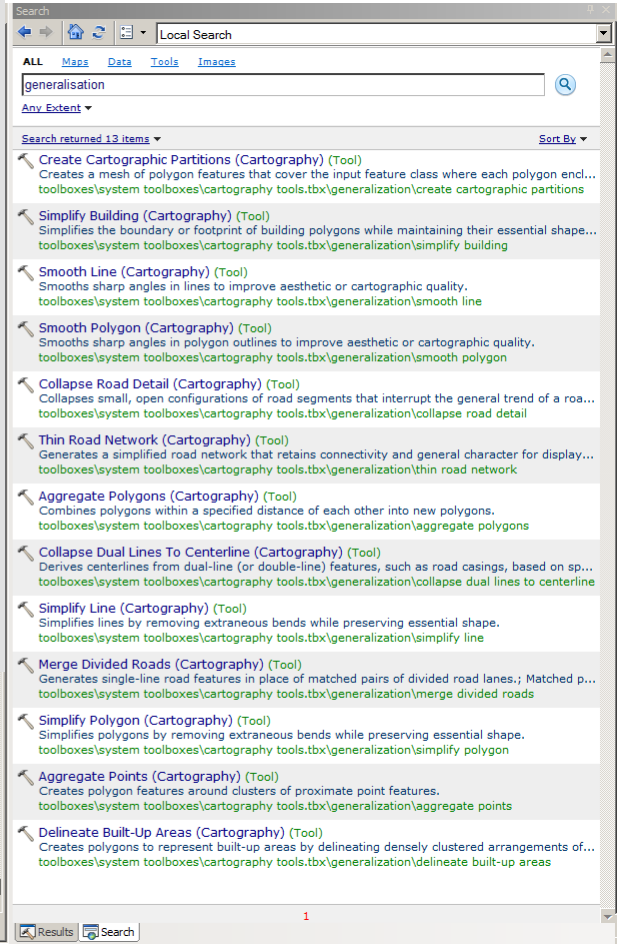
- Aggregate points
- Aggregate Polygons
- Collapse Dual Lines
- Collapse Road Detail
- Merge Divided Roads
- Thin Road Network
- Delineate Built-up Areas
- Simplify Buildings
- Simplify Lines
- Simplify Polygons
- Smooth Lines
- Eliminate Polygon part
- Eliminate...

## Other tools:

- Select
- Buffer
- Clip
- Erase
- Spatial Join
- Feature to ...
- Extend
- Topology
- Generate Near Table
- Spatial Joint
- Select by Location
- Calculate Field
- Append...

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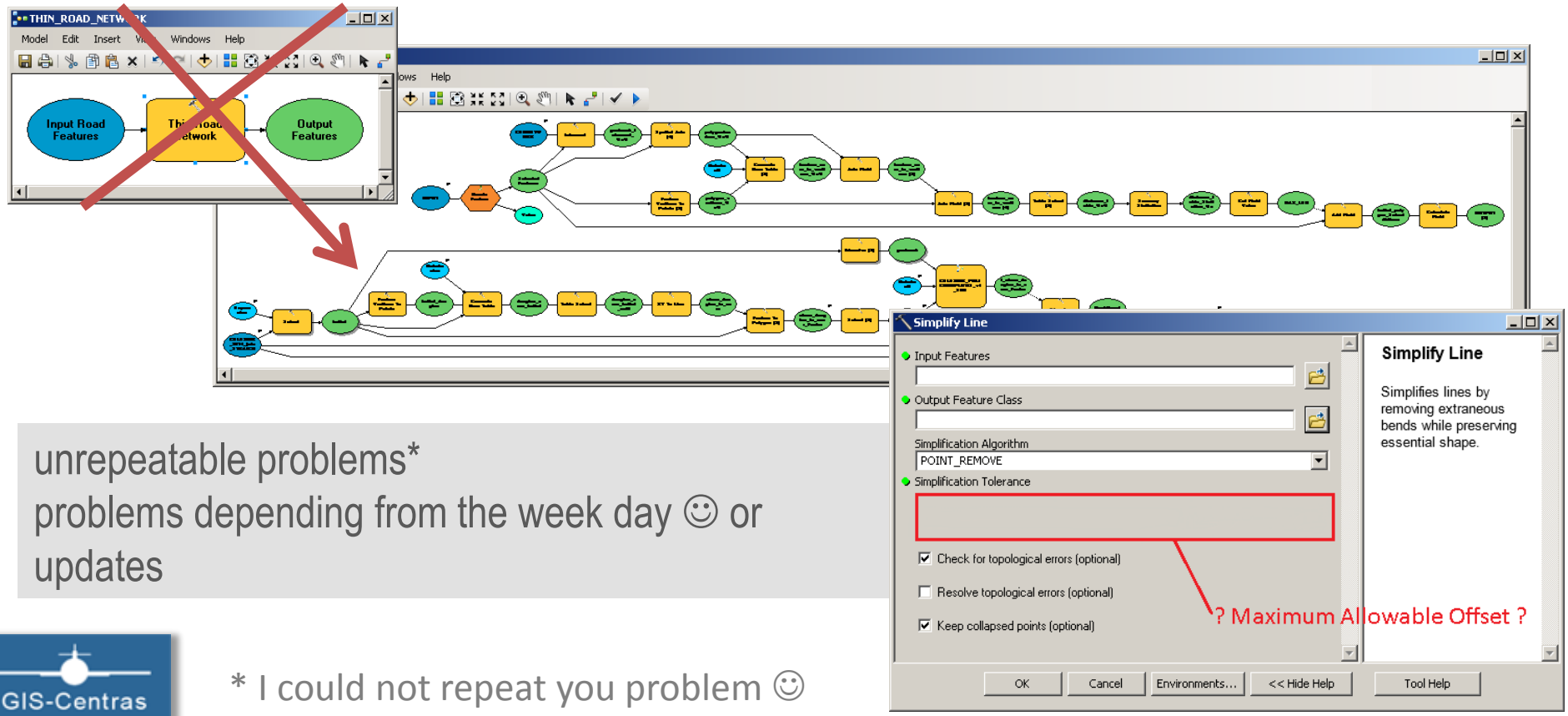
# Surprises of ArcGIS Model Builder

Standard generalisation tools do not fulfil our expectation (sometimes):

- Aggregate sometimes don‘t get good results
- Thin hydro features – source data: perfect network; required Production Mapping
- Thin road network sometimes don‘t remove dangles

GIS-Centras prepared several his own algorithm using other ArcGIS geoprocessing tools.




unrepeatable problems*
problems depending from the week day ☺ or updates

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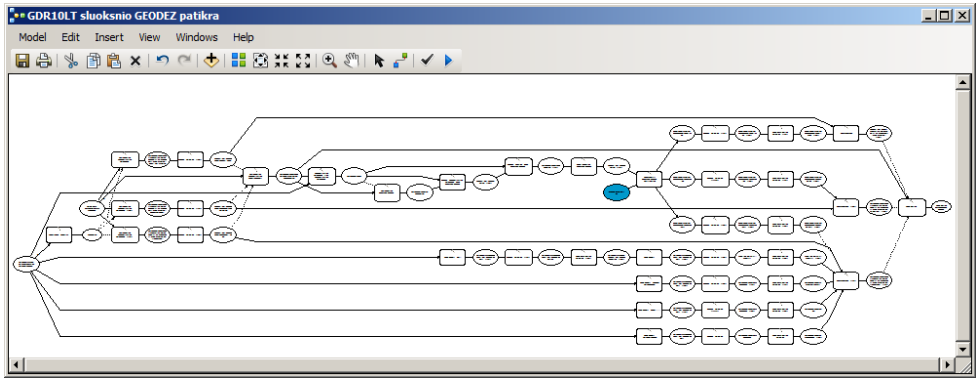
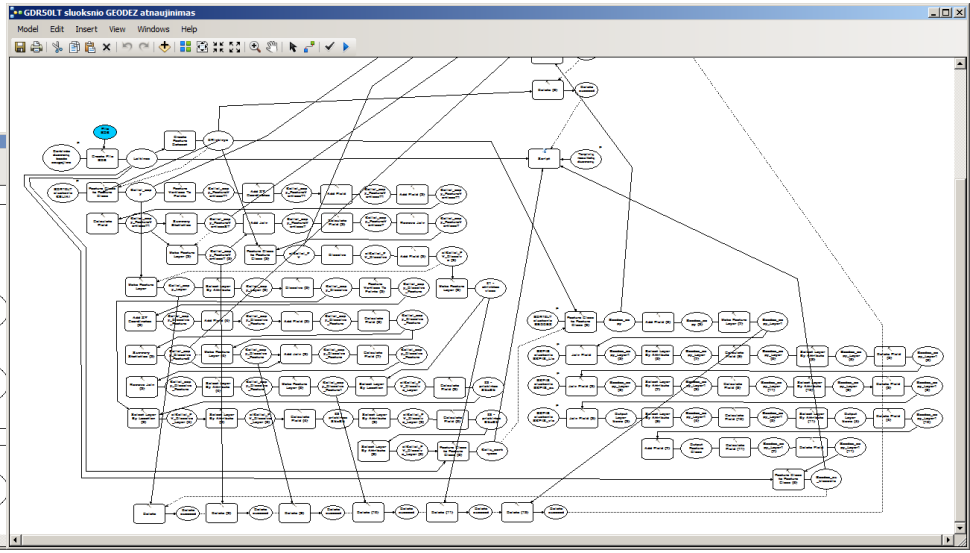
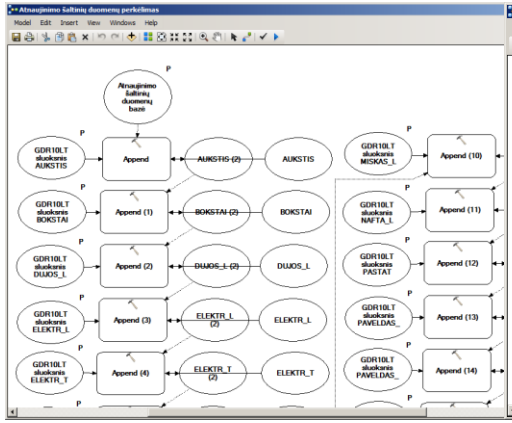
* I could not repeat you problem ☺

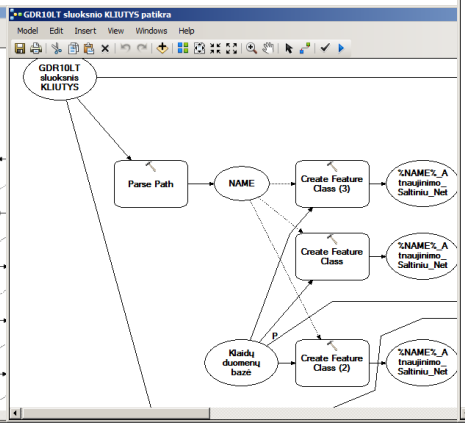
# Some statistics

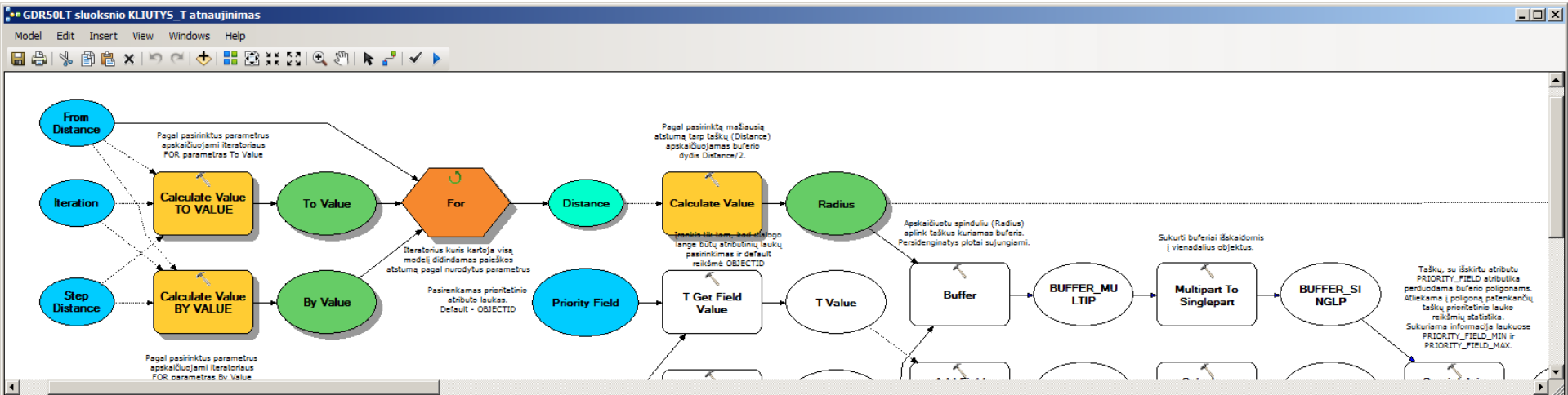
- Five main models
- Each of them have to include models for each Feature Class of GDR50LT
- Each of them might include n submodels
- And we use A LOT OF tools.



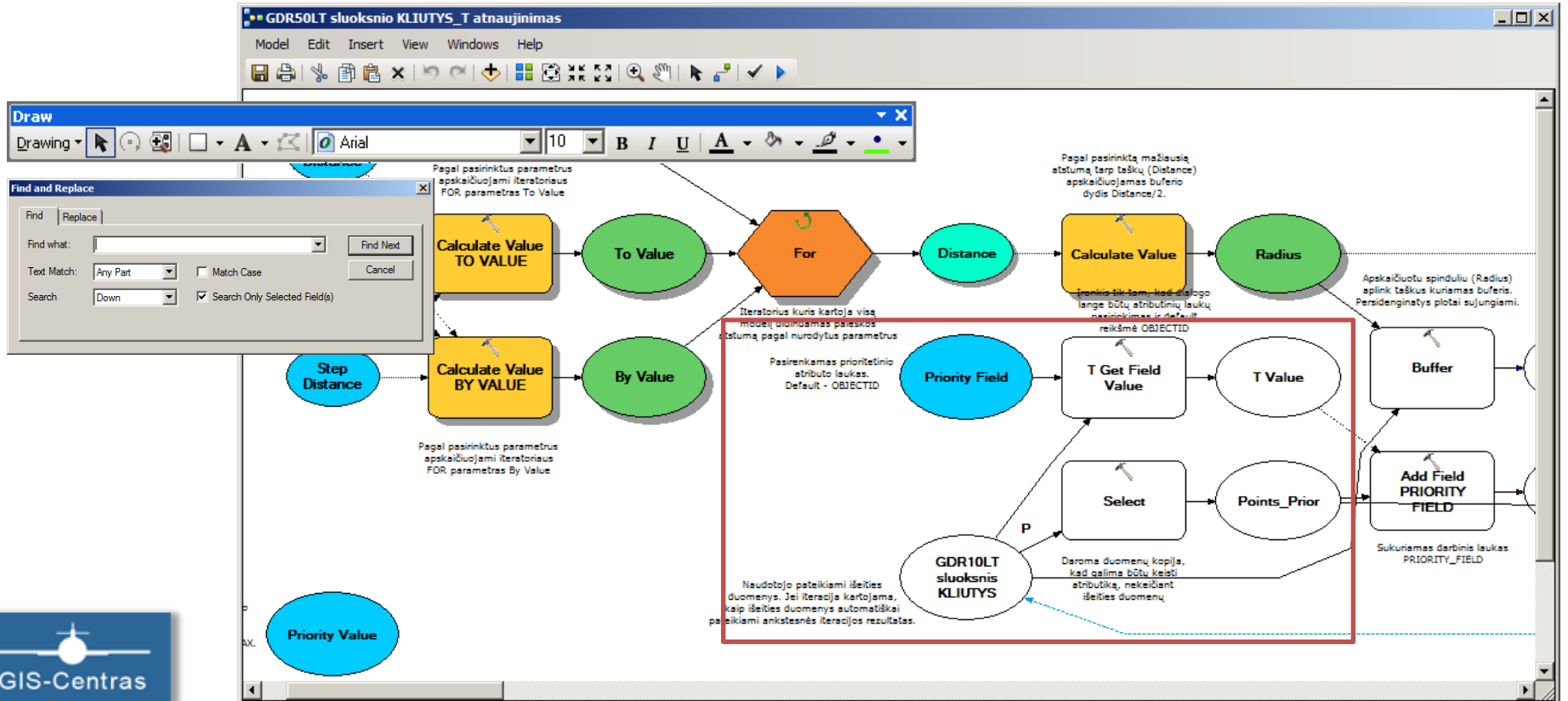



# We would like...

- To work less ☺
- More flexible Geoprocessing tools
- More friendly ModelBuilder user-interface
- Better compatibility with hardware and software
- Understanding difference between point and comma

LITHUANIAN GDR10LT GENERALISATION → GDR50LT

. or , ?

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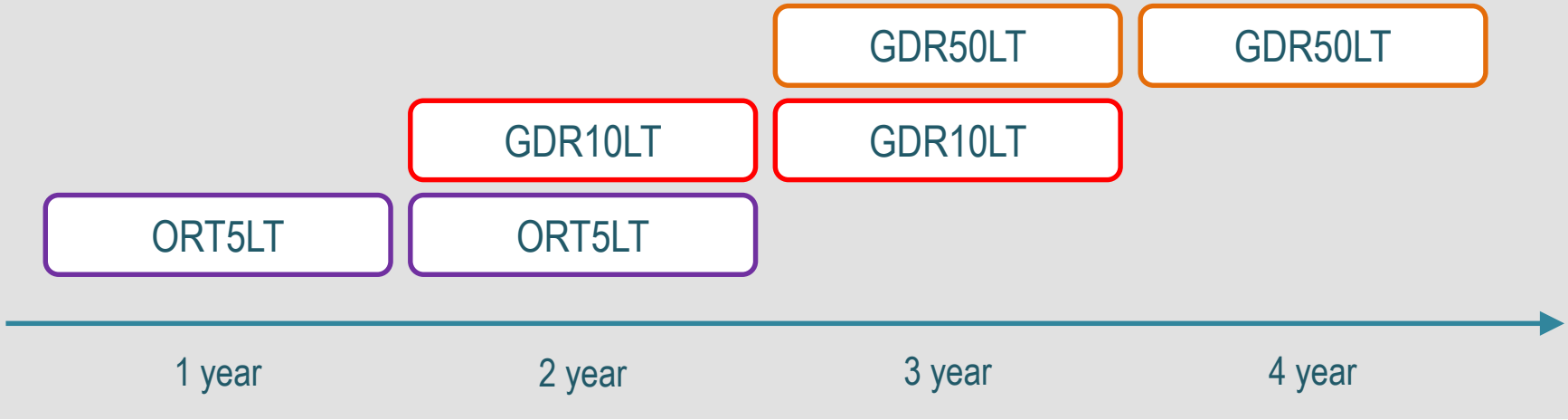
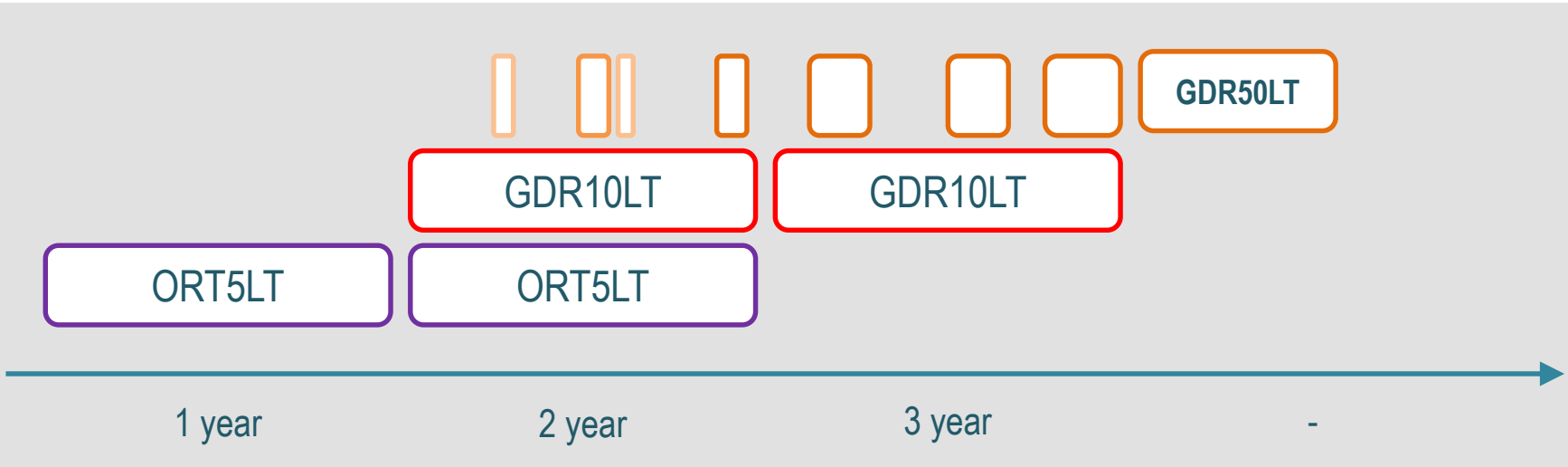
# Benefits




Time reduction • Costs reduction • Less recourses • Data integrity

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# Future

GDR10LT

- 1. GDR50LT ATNAUJINIMAS. Atnaujinimo šaltinių perkėlimas.tbx
  - Atnaujinimo šaltinių duomenų bazės sukūrimas
  - Atnaujinimo šaltinių duomenų perkėlimas
- 2. GDR50LT ATNAUJINIMAS. Atnaujinimo šaltinių patikros modeliai.tbx
- 3. GDR50LT ATNAUJINIMAS. Generalizavimo ar perkėlimo modeliai.tbx
- 4. GDR50LT ATNAUJINIMAS. Restruktūrizavimo modeliai.tbx
- 5. GDR50LT ATNAUJINIMAS. GDR50LT patikros modeliai.tbx

GDR50LT → Topographic maps

- GDR250LT ATNAUJINIMAS.tbx

GDR250LT → Maps

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# Thanks!

www.gis-centras.lt
info@gis-centras.lt