Automated Generalization

From Base Models to 1:50k Map – the GIS based Approach at BEV

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Software Framework

DLM50 → Symbolization → Resolve conflicts → Symbolization processes

Cartographic Generalisation

ArcGIS Modelbuilder - Python

Model Generalization

DLM

final map DCM50V → Output

Online, Print, App

12.11.2015

EuroCarto 2015, Andreas Pammer
Main Principles for generating DCM50V

• Keep traditional appearance but allow change of symbology
• Follow principles of cartographic generalisation
• Keep good cartographic quality
• Keep manual intervention at minimum
DCM50V – What we achieved so far
Automated Generalization

Pre processing

1. Database Setup → Integrated Generalization → Create Partitions → Distribute Partitions

for each partition.... Main processing

1. Create Builtup Areas → Simplify Roads → Thin out Roads → Displacement → Generalize Buildings

2. Collect Partitions → Post Processing → DCM
Base Data

- DLM - Digital Landscape Model
- Land Cover
- Cadaster Data (Buildings)
Database Setup

- Collect base data
  - DLM
  - Cadaster
  - Landcover
  - ...
- Bring data to common projection
- Set up a common database
Integrated Generalization

- Low data volume of some feature classes
- Therefore nationwide generalization e.g. railways, power lines

- Generalization of primary road network
  - Needed for partitions
Create Partitions

- To reduce data processing volume
- Build partition polygons based on primary roads & national border
- Distribute partitions
Automated Generalization

Pre processing

*1) Database Setup → Integrated Generalization → Create Partitions → Distribute Partitions

*1) Create Builtup Areas → Simplify Roads → Thin out Roads

Generalize Water → Other Generalization → Displacement

for each partition...

Main processing

Generalize Buildings

Post processing

*2) Collect Partitions → Post Processing → DCM

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Simplify Roads

- Reduction of geometrical complexity
- Merge dual/parallel roads
Simplify Roads

- Resolve Junctions

- Straightest line remains
- Calculate curvature
- Calculate mid-point
- Reconnect line
- Delete most curved lines
Thin Roads

- Generate a road network with reduced density

Red segments are deleted
Displacement

• Resolve graphic conflicts among symbolized line features
Generalize buildings

- Simplify building polygons
- Resolve symbol conflicts
Conclusion / The Road Ahead

- Map production as analytical process
- Out of the box tools are very helpful but cannot solve every cases
- Generalisation process depends very much on base data
- The role of cartographer is going to change
- Further optimization of automated process
- Proof of concept to finish in 2016
Questions?

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