Visualisation of quality in the Real Property Register and Cadaster Index Map

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The Mapping, Cadastral and Land Registration Authority
Since 1628 we have tried to map the country. It has been a little bit tricky to store it correct...
The Cadastral Index system

**Land Register Section**
- Title
- Leasehold
- Mortgage
- etc

**Address Section**
- Address list

**Building Section**
- Building unit

**General Section**
- Register and Index map
  - Properties
  - Designations
  - Area
  - Legal Survey
  - etc
- Plans/Regulation
- Rights (servitudes/easements)

**Tax assessment data section**
- Tax assessment value
- Basis for valuation
The Cadastral Index map
- Property, boundary, designation
- Plans, dossier designation
- Regulation
- Rights (servitudes/easements)

Topographic Basemap
- Buildings
- Address number
- Roads, names
- Railrods
- Hydrography
- Etc
System to show positional accuracy of property boundaries

Can we trust the information?
What can we use the information for?

Answer how to work in the cadastral procedure

Show where we have to increase positional accuracy
- Digitized boundaries from a map from 1950
- Topographic data measured by modern photogrammetry
<table>
<thead>
<tr>
<th>Accuracy</th>
<th>Count</th>
<th>Quota %</th>
</tr>
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<tbody>
<tr>
<td>Green 0,001 - 0,050</td>
<td>5310185</td>
<td>36,79</td>
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<tr>
<td>Yellow 0,051 - 0,200</td>
<td>1143881</td>
<td>7,93</td>
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<tr>
<td>Orange 0,201 - 0,500</td>
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<td>11,36</td>
</tr>
<tr>
<td>Red &gt; 0,500</td>
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<td>43,92</td>
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**Gränspankt, kvalitet**

<table>
<thead>
<tr>
<th>Kvalitet</th>
<th>Kvalitetsförbättrad</th>
<th>Fastighetsgräns, kvalitet</th>
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<tbody>
<tr>
<td>Transformerad</td>
<td>Ommätt</td>
<td>0,001 - 0,030</td>
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<td>0,031 - 0,050</td>
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<td></td>
<td></td>
<td>0,051 - 0,200</td>
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<td></td>
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<tr>
<td></td>
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<td>4,500 - 50,000</td>
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</table>

**Standard error (m)**

56 %
We have some work to do.

It’s divergency between densely populated areas and the agricultural and forest areas.
Goals with the system for visualisation

• A view of the quality in the cadaster index map today
• A basis for priority of quality actions
• Detect new error sources, get opportunity to preventing activities
• Follow quality increasing effort over time
FME Scripts, Excel, Subjective appraisal

The Visualisation system

quality check

visualisation

analysis

feedback

quality check

corrections

Cadastral Database

Database

The feedback analysis, corrections, and quality check are integral parts of the visualisation process. The FME Scripts and Excel are tools used in this process. The database is central, and the system involves a subjective appraisal.
The Visualisation system

Cadastral Database

Database

feedback

quality check

visualisation

analysis

FME Scripts Excel, Subjective appraisal

corrections
Five main parts:
- Property and joint property
  - property border
  - plans, regulation
  - joint facility
  - easement
- Land register
- Address unit
- Building unit
- Property tax part

Overview

Property register and index map

Count

Good
Acceptable
Poor
Errors in Cadastral Index Map

Level
- National level
- County
- Municipality

Choose area

Measure date
Result
Limits, decided at national level
Onclick to zoom...

... to municipality
Errors in Index Map
Day by day
Cadastral Index Map quality tests:

Missing item: Absence of Id in a property

Excess item: To many Id inside a property

Undershoots: Property boundary

Lack of conformance: Propertyys in the Cadastral Index Map in correlation to the Cadastral Index System

Description of the measure and its visualization
### Real property affected by ancient monuments

<table>
<thead>
<tr>
<th>Myndighet</th>
<th>Med berörkrets</th>
<th>Utan berörkrets</th>
<th>Total inom LM</th>
<th>Fullständighet (pct)</th>
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</thead>
<tbody>
<tr>
<td>KLM Stockholm</td>
<td>665</td>
<td>0</td>
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<td>KLM Täby</td>
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<td>KLM Huddinge</td>
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<tr>
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<tr>
<td>KLM Örebro</td>
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<td>0</td>
<td>967</td>
<td>100.0</td>
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<tr>
<td>KLM Västerås</td>
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<tr>
<td>KLM Ornsköldsvik</td>
<td>1 834</td>
<td>66</td>
<td>1 900</td>
<td>99.2</td>
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<td>1</td>
<td>48</td>
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<tr>
<td>KLM Sundsvall</td>
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<td>37</td>
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<tr>
<td>SLM Västerbottens län</td>
<td>7 227</td>
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<tr>
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<tr>
<td>SLM Västernorrlands län</td>
<td>4 299</td>
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<td>4 357</td>
<td>98.7</td>
</tr>
</tbody>
</table>

KLM=Municipal cadastral authority  
SLM=National cadastral authority

Best and poorest areas
Topological errors in Index map

Deregistered property, still in the map

Excess item To many Id inside boundary

Identification

Days without correcting
Topological errors in Index map

Undershoot

Days without correcting

Identification
Game over