

**United Nations Expert Group on the Integration of  
Statistical and Geospatial Information**  
**First Meeting**  
**New York, 30 October - 1 November 2013**

**Agenda: Item 6**

**Geographic data linking in statistics – Norwegian practices**  
**- With focus on the Norwegian Cadastre <sup>1</sup>**

Prepared by Norway

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<sup>1</sup> This document is being produced without formal editing

# Geographic data linking in statistics – Norwegian practices

- With focus on the Norwegian Cadastre

**Presentation for Item 6** on the agenda for meeting  
of The Expert Group on Integration of Statistical and  
Geospatial Information

# Outline

- **Backdrop**

- **Statistics Act**
- **The Norwegian Mapping Authority / Norway Digital**
- **Registers and geospatial data**
- **The Cadastre**
- **Geo-coding populations in Statistics Norway**

- **Geographic data linking**

- **Identifiers**
- **Brief description of linking processes**
- **Statistics – some examples**

# Statistics Act

## § 2-2. *Obligation to provide information*

The King<sup>1</sup> may by regulation or resolution impose upon **any person** an obligation to provide the **information** which is **necessary** for the production of **official statistics** in so far as any legally prescribed obligation of secrecy is no obstacle thereto.

1= Ministry of Finance pursuant to Regulations of 16 June 1989 No. 387. Delegated to Statistics Norway pursuant to Regulations of 13 February 1990 No.1228.

- The **Board of Directors** approves of new official statistics and the kind of data collection necessary.
- Statistics Norway's possibilities to share data after having linked datasets to achieve new information is **limited** by the same act.

# The Norwegian Mapping Authority (NMA)

- **National geo-data coordinator**, according to the Geo-data Act
- Collates, systemises, manages and communicates public geographical information
  - National geodetic frame
  - General feature catalogue: SOSI-standard
  - Judicial registration authority of land register and cadastre data
- Collaborates with municipalities and other public sector suppliers and users of geographical information in **Norway Digital**.
- Organised in four divisions:
  - The Geodetic Institute
  - Mapping and Cadastre
  - The Hydrographic Service
  - The Land Registry
- See more at:  
<http://www.statkart.no/en/About-The-Norwegian-Mapping-Authority/The-Norwegian-Mapping-Authority/#sthash.QsDSpZEU.dpuf>

# Norway Digital

- The national geospatial infrastructure
  - Launched in 2005 and coordinated by the NMA
  - NMA in collaboration with ministries and their agencies, county administrations, municipalities, different regional public bodies
  - Various forms of cross-cutting working forums
- Embraces more than 100 operational web map services, geo-data portal and other services
- Platform for the implementation of the INSPIRE-directive:
  - Including establishing reference and thematic data/map services
    - ♦ Statistics Norway is responsible for: “Statistical units”, “Population distribution and demography” as well as “Land use”



# Registers and geospatial data essential to Statistics Norway

## Registers

- Central Population Register
- Central Coordinating Register for Legal Entities
  
- Several other registers are also used in statistics production

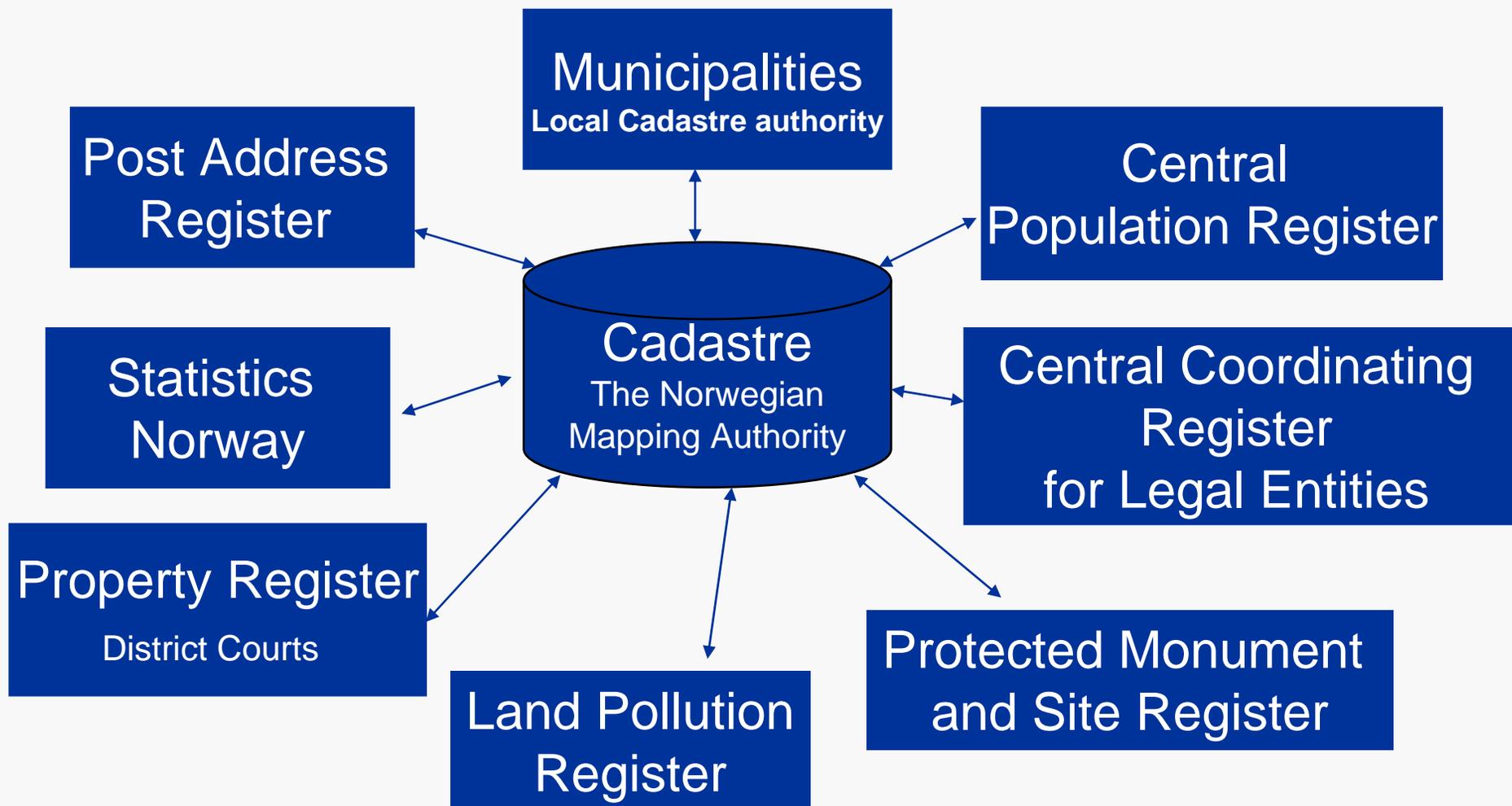
## Geospatial data

- National topographical data series
  - 1:5 000 - 1:50 000
  - The NMA
  
- Topographical data of Svalbard and Jan Mayen
  - Norwegian Polar Institute
  
- Land cover data (AR-STAT)
  - Norwegian Forest and Landscape Institute

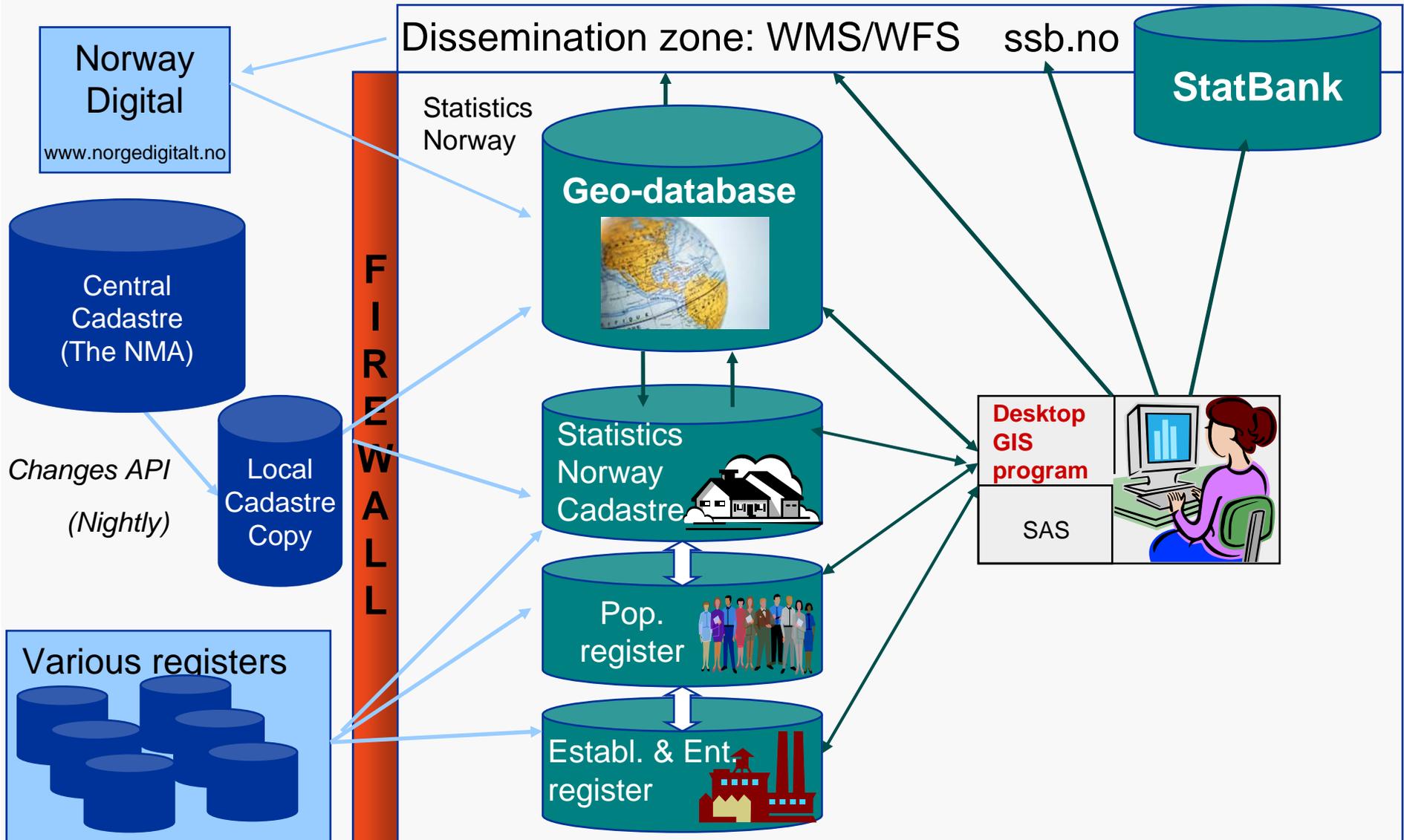
## A combination

- The Cadastre

# The Cadastre; an example of institutional collaboration



# Geo-coding populations - conceptual model



# Geo-coding/Geographic data linking

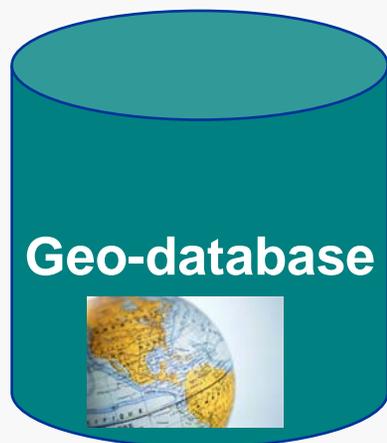
- **Identifiers** – the most important ones:
  - Numerical “Street address”
  - Numerical “Cadastral address”
  - Coordinates
  - Municipality code + Land and holding codes
  - Business register code
  - Personal identification code
  
  - Regional levels
    - ◆ Municipality code
    - ◆ Basic statistical units/Basic regional units
    - ◆ Statistical tracts, parishes etc
    - ◆ Grids, with unique cell coordinates

# Brief description - Linking resident/person to a coordinate (geo-coded place of residence)

## Central Population Register

- Add information from **the Cadastre**:
  - ◆ Coordinates for Numerical address
  - ◆ Basic statistical unit
  - ◆ Statistical tract, parish
  
  - ◆ **Identifier for linking: Numerical address**
  - ◆ Precision level – correspondence on first 17 (of 26) digits to achieve sufficient regional level
  - ◆ No registers are perfect/complete
    - Necessary to make additional other types of linking to achieve sufficient coverage
  
- Residents with coordinates:
  - ◆ Can add education, income, occupation, gender etc. to place
  - ◆ **Identifier = personal identification code**
  - ◆ Can be assigned to a grid cell
    - Numerous of possibilities for statistics by combining various geo-coded datasets.

# Brief description – Data linking process for land use and land cover statistics 1

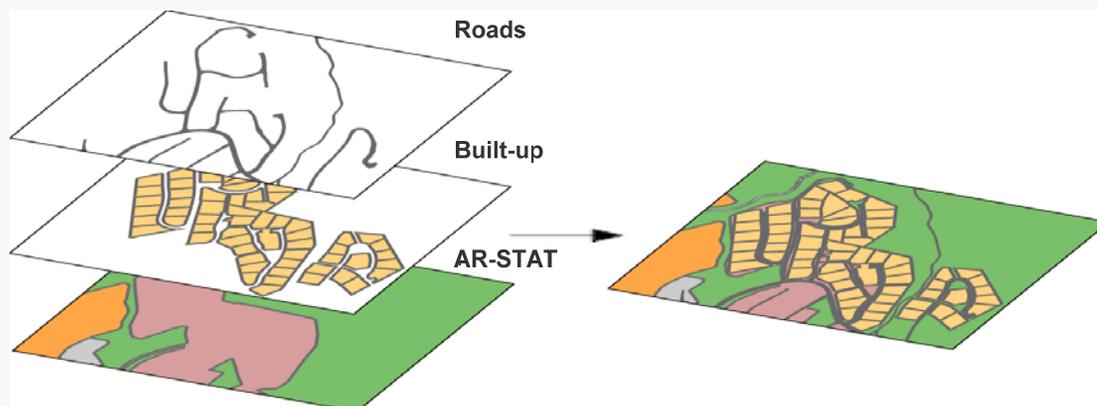


- Geo-database: built-in SQL-routines for automatic linking
- Other routines performed in SAS and ArcGIS

- Address coordinates
  - Building centre coordinates
  - Building type code
- } Cadastre
- 
- Real property polygons
  - Real property lines
  - Building contours
- } NMA
- 
- Topographical data
    - N50-N5000
    - Svalbard
  - Land cover (AR-Stat)
  - Roads
  - Several other datasets
- } -NMA  
-Norway  
Digital  
-Other

## Brief description – Data linking processes for land use and land cover statistics 2

- Merging data in ArcGIS
  - datasets in a specific order of priority



**Result:** New polygons – a “map” representing land use and land cover

[-http://www.oecd.org/std/OECD-Statistics-Newsletter-Sept2013.pdf](http://www.oecd.org/std/OECD-Statistics-Newsletter-Sept2013.pdf)

- Calculations
- Statistics dissemination
  - “Standard for classification of land use and land cover”
  - <http://stabas.ssb.no/ClassificationFrames.asp?ID=8372001&Language=en>
  - Harmonised with international standards
- National figures and regional breakdowns
  - Counties, municipalities
  - Urban settlements

# Statistics - where geographical data linking is vital, some examples

## • Statistics

- Building stock
- <http://www.ssb.no/en/bygg-bolig-og-eiendom/statistikker/bygningsmasse>
  - ◆ Also available in a grid map
- Price index for new detached houses
- <http://www.ssb.no/en/priser-og-prisindekser/statistikker/enebolig/kvartal/2013-09-20#content>
- Transfer of properties
- <http://www.ssb.no/en/bygg-bolig-og-eiendom/statistikker/eiendomsoms/kvartal/2013-10-29>
- Agricultural properties
- <http://www.ssb.no/en/jord-skog-jakt-og-fiskeri/statistikker/laeiby/aar/2013-10-15>

## • Map service

- <http://kart.ssb.no/default.aspx?gui=1&lang=1>
- **Population, by Basic statistical unit**
- **Dwellings**
- **Centre zones**
- **Urban settlements**
- **Agriculture**
- **and more...**

**Thank you for your attention!**