



**Summary of the joint PCC/EuroGeographics information-meeting**  
regarding the draft guidelines on the INSPIRE Data Specification for the  
spatial theme 'Cadastral Parcels' held at BEV  
Vienna on the 3<sup>rd</sup> February 2009

**Goal of the meeting**

Objective of the meeting was to provide information on the draft guidelines specifically related to the cadastral parcel and to invite country representatives to ask questions in order to help them by providing their comments before the 20<sup>th</sup> February.

**Participants**

Attendees from several European countries were present. A list of the participants is available. Two Members from the INSPIRE, Thematic Working Group were present during the meeting (Dominique Laurent (DL), facilitator and Amalia Velasco (AV), member) and answered the questions.

**Presentation and raised topics**

DL presented the draft guidelines on the cadastral parcel as well as the general Draft Structure and Content. Her presentation is also available.

Based on this presentation several questions were asked and answered. Most of them were related to the specific country situation but there were some topics which can be identified as 'general' remarks that considered all. These are described below taking the answers by DL and AV into account:

- Voidable attributes;
  - These attributes are conditional; that means here that if you have these attributes available, you have to provide them. The question arises then if a country would provide this information taking the costs and benefits of provision into account.
  - Non voidable attributes are considered as mandatory.
- Feature Types:
  - Definition of cadastral index sets
    - Administrative units (cadastral index sets) and cadastral parcels; there are no consistency rules between cadastral parcels and administrative units but there is a voidable association between them.
    - Levels of cadastral index sets (no duplication of administrative units); upper level for CP should be municipalities – if used as cadastral index sets
    - Examples would be useful





- Definition of parcels
  - Meaning of “property rights”. TWG CP should give a list of what is considered as “property rights” and what not
  - Seems impossible as quite various national situations (see the definition in the Directive); generic description should be kept.
  - Important message was here that definitions could be interpreted differently not only by the text but also from a ‘cultural’ and/or ‘historic’ perspective.
  - Examples would be useful
- Definition of parcel boundaries
  - Full perimeter or line between 2 parcels? Rather second option
  - Legal or topographic point of view? Second option
  - Examples would be useful
- Accuracy:
  - Definition: DL provided information which explained ‘accuracy’ as ‘standard deviation’. ETRS89 shall be used as a reference (impact of coordinate transformation, if any, must be taken into account)
  - Discussion about accuracy carried on regarding cadastral parcels (not sure if it is used by NMCAs) and on cadastral boundaries (used by Finland)
- Area
  - Regarding the definition of ‘area’; this term should be clarified meaning either ‘calculated’ or ‘registered’.
  - There exists a risk of quality issues if area is not calculated in the same way (to be documented in metadata?). A better definition is recommended (in ETRS89, horizontal area at sea level).
  - The possible use of calculated areas is to enable queries “on-the-fly” related to areas. Alternative names suggested for this attribute (mapCalculatedArea, systemCalculatedArea)
- INSPIRE identifier:
  - DL explained how MS can provide the INSPIRE identifiers from their national identifiers
  - There are Members States where 2 unique identifiers exist (Denmark has a national cadastral identifier as well as an ‘external’ identifier). DL responded that in fact it is up to the Member State which identifier it provides, but:
  - It is important that the identifier is unique; this is a requirement within INSPIRE.
  - Acronym of data producer may be useful in the “name space” to ensure uniqueness but what happens if it changes? Might be useful to standardise the “name space”.





- Lineage.
  - Which size/limits for lineage information (e.g. may it be 5 pages)?
  - More examples should be given by TWG CP.
  - DL answered that also the ESDIN project might provide (later) useful feed-back on this topic, after practical experience. This point may not be specified in detail at this early stage but should be improved, based on data producer experience and user requirements.
- Rights and restrictions
  - Rights and restrictions are not related to the term cadastral parcel in the INSPIRE context.
  - A cadastral parcel in INSPIRE is a 'locator' and its representation has geographical/ topographical status.
- The Land Administration Domain Model
  - and the way how the cadastral parcel is described in INSPIRE are compatible:
  - NMCAs should work on and encourage the compliance between both LADM and with INSPIRE specifications, when possible .
  - Information regarding owners, rights and restrictions can be provided by this LADM model.
  - Important is that other INSPIRE themes can be connected by this model as well. Therefore it is encouraged that the other INSPIRE data spatial theme groups (for example regarding addresses) are aware of the developments of this model.
- Topology
  - Examples about topology would be useful
  - Cadastral gaps and overlaps are due to national regulations and topological gaps and overlaps are due to data quality issues
  - Edge matching: Member States have to provide a 'true' or 'false' answer regarding if edge-matching has been done. A percentage was suggested as more accurate information but would be more demanding. The TWG CP wants to make sure that answering is easy.
- Updating of cadastral parcel information;
  - Updating information is a responsibility of the Member State itself.
  - The TWG CP requires to report about update frequency.
- Which time is relevant for INSPIRE?
  - Options: When partition is made in the field, when registered or when validated? DL advised to publish data for INSPIRE only when it has been validated. Date to be indicated should be related to data as published for INSPIRE.





PCC

The explanation of the Draft Guidelines and the discussions resulting in the responses proved to be useful. This was the case for the participants of the countries; (especially, it enabled some countries not yet involved) to participate in the process as well as the Members of the TWG, who got extra information about existing data and potential feasibility issues.

Attached: List of participants, Presentation DL

www.eurocadastre.org





Permanent Committee on Cadastre  
in the European Union



**INSPIRE Information Meeting  
Vienna, 3<sup>rd</sup> February 2009**

**Venue:**

BEV- federal Office for Metrology and Surveying, Schiffamtsgasse 1-3, 1020 Vienna, 8<sup>th</sup> floor, A 802

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# INSPIRE Thematic Working

## Cadastral parcels

EuroGeographics-PCC meeting

3 February 2009



### Role of INSPIRE TWGs

- TWGs have to define Data Specifications
  - Data Specifications will be converted in:
    - Binding Implementing Rules
    - Non-binding guidelines
- ⇒ 2 documents open for comments:
- Draft Structure and Content of the Implementing Rules on Interoperability of Spatial Data Sets and Services
  - D2.8.1.6 INSPIRE Data Specification on Cadastral Parcels - Draft Guidelines



### Plan of the presentation

- INSPIRE Data Specification on Cadastral Parcels - v2.0
- Draft Structure and Content of the Implementing Rules on Interoperability of Spatial Data Sets and Services
- Next steps



### INSPIRE Data Specification on Cadastral Parcels - v2.0



### Template for Data Specification

- Same template for all INSPIRE themes:
  - Based on ISO 19131 (Data Product Specification)
  - Adapted to INSPIRE:
    - By adding introduction to explain INSPIRE context
    - By adding some INSPIRE specific requirements specific:
      - Identifier management
      - Object referencing
      - Consistency between datasets
      - ...
    - By deleting the maintenance clause
- Template supplied by JRC
  - With cooperation of DT DS (D2.6 Methodology)
  - Updated after internal review



### Template for data specifications

Foreword, Summaries	Summary	By JRC
1. Scope	Generalities	
2. Overview		
3. Specification scope		
4. Identification information		
5. Data Content and Structure	Data content, schema	By TWG CP
6. Reference System		
7. Data Quality	Other components	
8. Dataset level metadata		
9. Delivery		
10. Data capture		
11. Portrayal	Various	
12. Additional information		
Annex A: Abstract Test Suite		
Other annexes		

## Foreword



- Prepared by JRC
- More or less the same for all Annex I themes
- Content:
  - Gives some advice about how to read the document
  - Says the document is open to comments by SDIC/LMO

## General Executive Summary



- Prepared by JRC
- More or less the same for all Annex I themes
- Content:
  - Remind INSPIRE principles
    - Based on national infrastructures
    - No new data collection
    - Participative approach (Reference Material, review, TWGs)
  - Remind the general approach
    - Framework prepared by DT DS
    - Registers (glossary, Feature Concept Dictionary)

## Executive Summary – Cadastral Parcels



- Prepared by JRC point of contact (with review from TWG CP)
- A priori, within a SDIC/LMO:
  - Executive summary to be read by managers
  - Full document to be read by technicians
- Content:
  - Main characteristics of the data specifications
  - Some explanations about the methodology, the reasons for choice

## 1. Scope



- INSPIRE specifications
- Technical guidelines = data specifications

## 2. Overview



- 2.1 Name and acronyms
- 2.2 Informal description
- 2.3 Normative references
- 2.4 Information about the creation of the data specification
- 2.5 Terms and definitions
- 2.6 Symbols and abbreviations

## 2.2 Informal description



- Definition (from the Directive)
  - Description (from TWG CP)
    - To define the scope of the theme
    - Short chapter
    - But including the main decisions and choices
- ⇒ a key chapter

## 2.2 Informal description



- Reminds the main conclusions from WG - CPI survey:
  - Focus on geographical part
  - Parcels to be used mainly as locators of geo-information

## 2.2 Informal description



- National cadastral registers generally contain more data than just cadastral parcels:
  - Rights and owners out of INSPIRE scope
  - Buildings
  - Addresses
  - Land use
 } in other INSPIRE themes

## 2.2 Informal description



- Article 7 (INSPIRE Directive)
 

*Where organisations established under international law have adopted relevant standards to ensure interoperability or harmonisation of spatial data sets and services, these standards shall be integrated, and the existing technical means shall be referred to, if appropriate, in the implementing rules mentioned in this paragraph.*




⇒ Joint work between INSPIRE and LADM working groups  
 ⇒ Make INSPIRE and LADM specifications compatible

more about LADM



## 2.2 Informal description



- Definition (from the Directive): “areas defined by cadastral registers or equivalent”
- Description (from TWG CP):
  - single area 
  - area on Earth surface 
  - under unique ownership and homogeneous property rights 
  - forming a partition of territory

## 2.2 Informal description



- **Only vector data**
  - At beginning, TWG CP envisaged 2 options:
    - vector
    - raster
  - Vectorisation considered by the Commission as new data capture not compulsory ⇒ no feasibility issue
  - Survey among NMCAs ⇒ most MS will have vector data on whole country by 2016 ⇒ no big gaps due to raster data

## 2.5 . Terms and definition



- Cadastral gaps
  - Cadastral overlaps
- } due to national regulations
- Topological gaps
  - Topological overlaps
- } due to data capture or manipulations
- ⇒ for clauses about quality and metadata
- Basic property unit
    - Unit of ownership recorded in land books, registers,...
    - In most countries, basic property unit = parcel



### 3. Specification scopes



- Only one scope

### 4. Identification information



- Main characteristics
  - Title
  - Abstract
  - Topic Category: planningCadastre (from ISO 19115)
  - Geographic description
  - Purpose (normally with use cases)
  - Spatial representation type: vector
  - Spatial resolution: local level

### 5. Data content and structure



- Some general explanations
  - Modelisation concepts (enumeration, codelist, ...)
  - « voidable » attributes
    - Are conditional: value to be filled if available from data producers
    - If not, give reason for this (unknown / unpopulated)
  - Attributes which are not voidable are considered as mandatory
- General requirements
  - Be compliant with the application schema

#### 5.1.1 Application schema description



- Application schema
  - As graphic (UML)
  - As text (narrative description)
- 3 feature types:
  - Cadastral parcels } **core data, mandatory**
  - Cadastral index sets }
  - Parcel boundaries } **auxiliary data, optional**

[Implicit rule in INSPIRE: All feature types are conditional (to be provided if available)]

#### 5.1 Application schema description



- 5.1.1.3 Identifier management
  - All features must have an **INSPIRE identifier**
  - Having the characteristics required by the Generic Conceptual Model
- 5.1.1.4 Object referencing:
  - Cadastral parcels must have **national cadastral reference**
    - To make link with cadastral register (to find rights, owners, history, evaluation, ...)
    - Thematic identifier of the basic property unit
- 5.1.1.5 Geometry representation
  - Only linear interpolations (no circular arcs)

#### 5.1 Application schema description



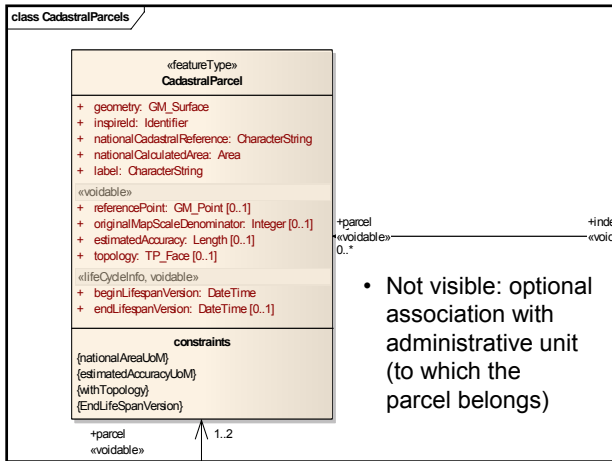
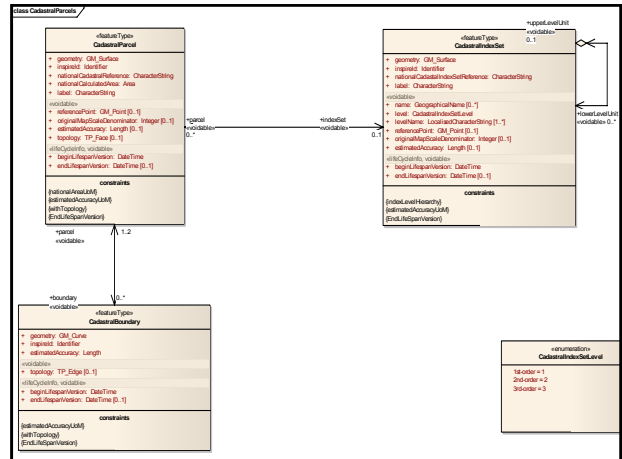
- 5.1.1.6 Temporality representation
  - TWG CP has adopted the common solution: a set of 2 attributes for each feature

```
<voidable, lifeCycleInfo>
+ beginLifespanVersion: DateTime
+ endLifespanVersion: DateTime [0..1]
```
  - Represent the date a version of a feature:
    - has been inserted in the database
    - has been taken away from the database
  - Example provided to illustrate how it may work
  - Should enable delivery of change-only updates (by means of queries on these attributes with WFS)

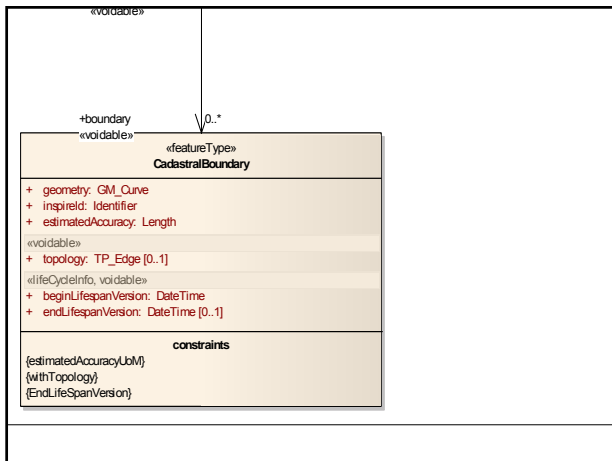
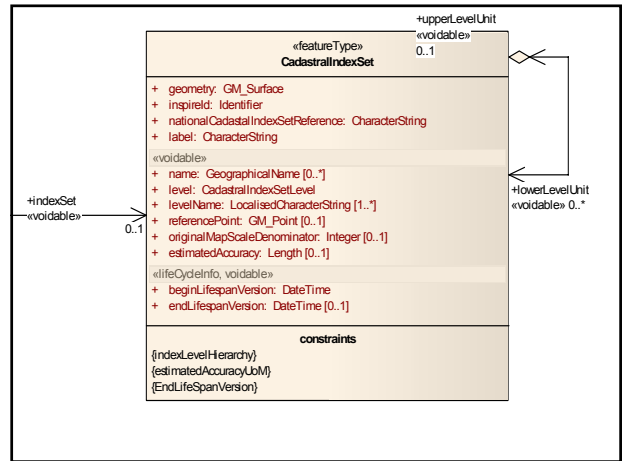
## 5.1.2 Feature Catalogue



- Detailed description of:
  - Features
  - Attributes
  - Associations
  - Constraints
  - Enumerations



- Not visible: optional association with administrative unit (to which the parcel belongs)



## 6. Reference systems



- Horizontal component:
  - ETRS89 on European tectonic plate
  - ITRS elsewhere
- Vertical component: EVRS
- Projections:
  - Lambert Azimuthal Equal Area
  - Transverse Mercator (ETRS-TMzn) for scales larger than 1:500 000.
  - Projections with few linear alteration for national and cross-border applications

## 7 Quality



- Describes the quality elements to be reported at data set level (metadata)
- Gives recommendations (but no requirements) about quality to be achieved

## 7 Quality



- Positional accuracy
  - 1 m in urban areas
  - 2,5 m in rural areas
- Thematic accuracy (100% for national cadastral reference)
- Completeness (100%)
- Topological consistency
  - no gaps
  - no overlaps
  - edge-matching with neighbour data sets

## 8 Dataset level Metadata



- Core elements already included in IR about metadata for discovery
- Quality elements to be reported as metadata
- Use lineage to give more information about initial cadastral data (national specificities)
- Update frequency + date of next update
  - Recommendation: update frequency  $\leq 1$  year

## 8 Dataset level Metadata



- Positional accuracy must be reported:
  - either at feature level:
    - either on cadastral index sets
    - or on parcel boundaries
    - or on cadastral parcels
  - or at dataset level
- Some elements required by other TWGs and not (yet?) by TWG CP:
  - Coordinate reference system
  - Data format
  - Transfer size
  - Graphic overview
  - ....

## 9 Delivery



- Current use of:
  - industry formats
    - GIS (shape, MIF/MID)
    - CAD (dxf, dgn)
  - National standards
- Only GML until now required for cadastral parcels
  - Issues (if any) will appear during testing and review
  - Guess that GIS providers will widely implement GML (as mandated by INSPIRE)
- Current status:
  - GML v 3.1.2 available for review
  - GML v 3.1.2 and GML v 3.1.1 available for testing

## 10 Data capture



- Complements chapter 5 (application schema)
- Which features to be provided for INSPIRE
  - Cadastral parcels
  - Cadastral index sets
    - e.g. size equivalent or smaller than municipalities
  - Cadastral boundaries
    - If carrying accuracy information
- How to match existing data with INSPIRE specifications (recommendations and examples)
  - National cadastral reference
  - Inspire Identifier
  - Estimated accuracy



## 11 Portrayal

- Need for default styles for view services
- Two dedicated attributes:
  - Reference point
  - Label (generally last part of identifier)
- 2 styles, both discrete (parcel contour in thin black line, parcel label also in black)
  - Label on Geometry
  - Label on Reference Point
- Other styles suggested (e.g. for cadastral parcels with orthophotos)



## Annexes

- ANNEX A: tests to be compliant to INSPIRE specifications
- Annex B: examples of correspondence between INSPIRE and national levels for cadastral index sets
- Annex C (empty): to show compatibility between INSPIRE and LADM cadastral parcels, to be filled later
- Annex D: rationale for INSPIRE specifications
  - Methodology
  - Recapulative check-list
  - Evolutions (annexes II and III, LADM)



## Draft Structure and Content of the Implementing Rules on Interoperability of Spatial Data Sets and Services

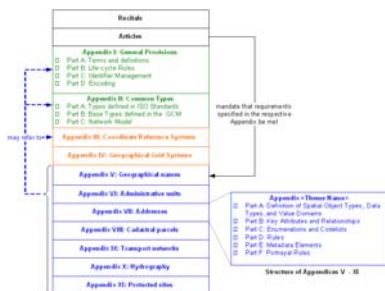


## Main principles

- Purpose of this document:
  - Show to SDIC/LMO how an IR will look like
  - Focus on main points (through questions) => hope to reduce number of comments
- One Implementing Rule for all Annex I themes
- Attempt to be more understandable (without UML schemas)



## Structure



## Content

- General parts
  - Introduction
  - Requirements from Generic Conceptual Model (or ISO standards)
  - Requirements for Coordinate Reference Systems and for Geographical Grids
- A structure for other theme specifications (requirements, examples and questions)
  - A: spatial object types, data types, enumerations/code lists
  - B: key attributes, relationships
  - C: enumerations and code lists (possible values)
  - D: rules
  - E: metadata
  - F: portrayal rules

## Impact of the document



- Gives the structure of the template for comments
  - Need to find the relevant question!
- Provides information about what is:
  - Mandatory
  - Conditional (to be provided if available)
  - Optional

## Next steps



## Next steps



- From 19 December 2008 to 20 February 2009: review by SDIC/LMO
  - Guidelines (Data specification itself)
  - Draft Structure and Content Implementing Rule
- Testing running in parallel
  - Around 10 countries
  - Some projects (ESDIN, Humboldt)
- Comment Resolution Workshop (26-27 March 2009)
- Third draft of data specification (?)
- Adoption of Implementing Rules (May 2009?)

## Next steps



- Implementation:
  - At national level
  - Through projects as ESDIN
    - WP7 on ExM at large scale (including Cadastral Parcels)
    - WG-CPI expected as Reference Group
- Discussion Paper about Maintenance of Data Specifications (end of March)
- Development of specifications for Annex II and III themes:
  - By TWG or by projects (meeting in Brussels on 29/01/09)
  - Some themes (buildings) linked with cadastral parcel
- Development of LADM
  - Committee Draft (Molde – Norway- May 2009)
  - Adoption as ISO standard: ?

## Glossary




- CAD: Computer Assisted Drawing
- DS: Data Specification
- DT DS : Drafting Team Data Specification
- ESDIN: Underpinning the European Spatial Data Infrastructure with a Best Practice Network
- ETRS: European Terrestrial Reference System
- EVRS: European Vertical Reference System
- FIG : Fédération Internationale des Géomètres
- GIS: Geographic Information System
- GML: Geographic Markup Language
- IR: Implementing Rules
- ITRF: International Terrestrial Reference System
- ISO: International Standardisation Organisation
- JRC: Joint Research Center

## Glossary

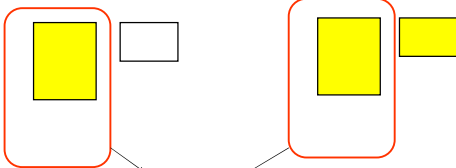


- LADM : Land Administration Domain Model
- LMO: Legally Mandated Organisation
- NMCA: National Mapping and Cadastre Agency
- PCC: Permanent Committee on Cadastre
- SDIC: Spatial Data Interest Community
- TWG : Thematic Working Group
- TWG CP: Thematic Working Group Cadastral Parcels
- UML: Unified Modelling Language
- WFS: Web Feature Service
- WG-CPI : Working Group on Cadastral Parcel in Inspire

## Single area




- Better for spatial queries




Area of interest (e.g.  
flooded/regulated/protected  
area)

Parcel as single area                      Parcel as multi-surface

## Single area




- Better
  - to attach user-defined attributes
  - for portrayal



Parcel as single area                      Parcel as multi-surface


Each parcel (polygon) may have  
different values for an attribute                      The two polygons composing the  
parcel must have same value for  
an attribute

## Area on Earth surface




- 3D cadastral objects are excluded from cadastral parcels theme
  - Buildings, parts of buildings, parkings, ...
  - Pipelines, mining, ..
- Requirements may come from Annex III themes (buildings, utilities)
- LADM may supply harmonisation solution in future for these objects

## Under unique ownership ...



- Rights and owners are out of the scope of theme Cadastral Parcels
- But some use cases require to find the owner
  - Soil Directive
  - State Land Management
- The owner will be found in national cadastral registers (not in INSPIRE)

## LADM (Land Administration Domain Model)



- LADM is proposed as a new ISO standard (ISO 19152)
  - by FIG (Fédération Internationale des Géomètres)
  - initiative supported by UN Habitat
- LADM not yet adopted, currently under development
- ISO standards not compulsory, to be adopted on voluntary basis
- LADM has a wider scope than INSPIRE (includes rights –restrictions –responsibilities, surveying points, documents,..)
- Joint work with LADM Working Group (Reference Material, common members, joint meetings)

⇒ INSPIRE model is compatible with and extensible by LADM