INSPIRE GML used as exchange format of CP in the real estate traffic in Spain

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The cadastre has information on all rural and urban parcels in a homogeneous way, as a territorial continuum.

Spanish Cadastre is
- An Administrative Register (Ministry of Finances)
- Available to public policies and citizens requiring information from the Territory (by Law)

Main task for the Spanish cadastre: Valuation
Our values are the base for taxation
Main income for municipalities

Cadastral GIS
The cadastre has information on all rural and urban parcels in a homogeneous way, as a territorial continuum,
Spanish law establishes that the Cadastre is a register describing rural and urban real estates.

- **Real Estate Identification data:**
  - cadastral reference, province, municipality, addresses or location.

- **Juridical data of real estate:**
  - Titleholders’ name and national identity number, addresses of titleholders and the notification address, date of acquisition and rights data....

- **Physical data of real estate:**
  - land area, buildings area, class of crops, coordinates, conservation status, use (legal and actual one), construction typology, year of construction.....

**Economic data of the real estates:**
value of land, value of construction and cadastral value, criteria and valuating module, real estate taxable value, exemptions and benefits.
Because we are a fiscal cadastre.
We can not have only information about the parcel or the building, we need more information.
We need the information inside the building, the distribution of each property, the common areas etc...
For every building we have a document with scaled graphic representation of the properties forming an urban real estate building.

All the different floors and interior spaces are represented.

Also a digital photo of the building

This document is stored in the system as documental information and link up to parcel data by means of the cadastral reference.
3D MODELING

3D Model General floor

Based on modeling by extrusion on the basis of cadastral mapping and the attribute of construction geometry to get the "z" component

3D Model By floors

based on the generation of independent units models with the vector information of the cadastral sketch by plants
4D cadastre….3D + time
From 2004 the cadastral maps are free and open to everyone for viewing and download, 24x7.
viewer that allows users to navigate from an overview of the complete territory to approach each one of the parcels, buildings and units and also through the map access to the most relevant alphanumeric characteristics of them.
INSPIRE Services of Cadastral Cartography
General Directorate for Cadastre

Download Services

Download services with INSPIRE information offered by General Directorate for Cadastre are:

**WFS INSPIRE Services**

WFS Cadastral Parcel (CP)
http://wms.cadastre.meh.es/INSPIRE/wfsGP.aspx?
METADATAS
Description of the service

WFS Address (AD)
http://wms.cadastre.meh.es/INSPIRE/wfsAD.aspx?
METADATAS
Description of the service

WFS buildings (BU)
http://wms.cadastre.meh.es/INSPIRE/wfsBU.aspx?
METADATAS
cDescription of the service

**ATOM Services INSPIRE of Predefined Data Sets**

This services allow the compared download by municipality of the predefined data set.

Description of the service

ATOM Cadastral Parcel (CP)
http://www.cadastre.meh.es/INSPIRE-CadastralParcels/V3.DIGI.CP.aspx?
METADATAS

ATOM Address (AD)
http://www.cadastre.meh.es/INSPIRE-Address/V3.DIGI.AD.aspx?
METADATAS

ATOM buildings (BU)
http://www.cadastre.meh.es/INSPIRE-buildings/V3.DIGI.BU.aspx?
METADATAS
Factors to be taken into account in the implementation of INSPIRE

- 1. We have a huge amount of data and not all of them are included in INSPIRE.

- 2. We can not only think in our corporative system but in the many collaborators and users of our information.

  creation, maintenance and diffusion of cadastral data is done either directly or in collaboration with local authorities, notaries, land registrars and other public entities that work in the territory.

- 3. We update continuously.
Urban Cadastre

- 1.062.636 ha maps 1/1.000 or 1/500
- 12 M de buildings
- 14 M cadastral parcels
- 39 M urban units
- **6.500 real estate updated daily, 480 new constructions**

Rural Cadastre:

- 47.387.942 ha maps a 1:5.000
- 39.2 M parcels
- **2.500 real estate updated daily**
INSPIRE Services of Cadastral Cartography

General Directorate for Cadastre

INSPIRE SERVICES IMPLEMENTATION

We do not change our data base...too much implications-

We produce the INSPIRE services only with some of our data

- Metadata and WMS and WFS service are already implemented
- Own Developing
- Continuous map for the whole territory
- Integrated in the Cadastral Virtual Office
  - 7 days, 24 hours, free of charge
Cadastral Parcel

**Download Options**

**View Options**

**Data set Metadata**

**Resource Title**
Cadastral Parcel

**Resource Abstract**
Cadastral Parcels. Urban and rural cartography. Territorial representation of cadastre

**Lineage**
Authoritative Cadastral data validated and quality assured by the conditions defined by the Spanish Directorate General for Cadastre (SDGC). Completed for all urban and rural areas for the 95% of the Spanish territory under the responsibility of SDGC. No topological gaps or topological overlaps between cadastral parcels in adjacent data sets. Continuously updated. Transformed in its whole to INSPIRE CP data model, populating Cadastral Parcel and Cadastral Zoning features.

**Unique Resource Identifier**

**Conditions Applying To Access And Use**
Data should be attributed with “© Dirección General del Catastro” and following the Cadastral regulations in force, the users should adhere to the following restrictions: 1. Use of the original graphic cadastral data is not allowed. Use can only be made of data that have been subject to some previous transformation process that gives rise to a different copyrighted work. 2. The transformation of cadastral data shall not involve alteration of the content of the original data, nor distortion of the meaning thereof. The transformed product should not pass itself as a cadastral product, only as a product making use of cadastral data

**Limitations On Public Access**
Open Access

**Geographic Bounding Box**
CadastralParcel (CP.CadastralParcel)
you might need to zoom-in to see the information

Legend

Spanish General Directorate for Cadastre
Data should be attributed with "© Dirección General del Catastro" and following the Cadastral regulations in force, the users should adhere to the following restrictions: 1. Use of the original graphic cadastral data is not allowed. Use can only be made of data that have been subject to some previous transformation process that gives rise to a different copyrighted work. 2. The transformation of cadastral data shall not involve alteration of the content of the original data, nor distortion of the meaning thereof. The transformed product should not pass itself as a cadastral product, only as a product making use of cadastral data.

**Limitations On Public Access**

**Geographic Bounding Box**

[Map of Europe]
INSPIRE GEOPORTAL
Enhancing access to European spatial data

Building

Download Options

View Options

Data set Metadata

Resource Title
Building

Resource Abstract
Buildings. Urban and rural cartography. Territorial representation of cadastral Lineage

Authoritative Cadastral data validated and quality assured by the conditions defined by the Spanish Directorate General for Cadastre (SDGC). Completed for all urban and rural areas for the 95% of the Spanish territory under the responsibility of SDGC. Continuously updated. Transformed in its whole to INSPIRE 2D extended BU model; populating Building, Building Parts and Other Constructions (only open air pools) features. The geometry of Buildings is defined a multi-surface feature that represents the footprint of the all existing constructions above ground inside each cadastral parcel. BuildingPart is each of the parts of a building that has homogeneous volume (numbers of floors).

Unique Resource Identifier
Code:
Namespace:

Conditions Applying To Access And Use
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2. The transformation of cadastral data shall not involve alteration of the content of the original data, nor distortion of the meaning thereof. The transformed product should not pass itself as a cadastral product, only as a product making use of cadastral data

Limitations On Public Access
Open Access

Geographic Bounding Box
The fiscal Cadastre has become a Multifunctional Cadastre

Legal security and fraud control in real estate traffic:
Location and identification of the properties. The cadastral reference as "Real estate identifier" in deeds- Rg. Property / Taxation/ Contracts / Valuations

Social and aid policies

Policies, infrastructures, services

- Urban planning, land use
- Networks of services and supplies
- Agrarian, environmental, building features
- Other rights, limitations and restrictions
- Risk maps, civil protection, emergencies
- Linking or support of statistical data (geo-statistics)
INSPIRE data and services can be very helpful to users.
- Interoperable with other themes.
- Standard
- Less information that in our traditional exchange formats.
- Compatible with more tools

But still not very much known by our users
For example: delimitation of forest fire protection

Some examples of current uses:
With the surface of swimming pools (other constructions) we can calculate an approximation of water consumption in summer, very useful in dry season.
In order to know the year of installation of biomass boilers and taking into account that they are installed especially in buildings of new construction, the year of construction of the building is used (and is revised retrospectively).
Some examples of current uses:

Studies on empty housing: they intersect addresses and cadastral ref with other information
Updating the national topographic Base in a continuous way

CONFLACIÓN con BTN25
- Criterios alfanuméricos: REFERENCIA CATASTRAL
- Criterios espaciales

Gestión de Cambios
- Altas, bajas y modificados entre 2 fechas

WFS Catastro

Some examples of current uses:
Private company create an app

Simple solution to the problem of developing apps that are both offline and multiplatform.

Some examples of current uses:
After many attempts for coordination between the Cadastre and Property Rights Registry

**Cadastre – Property Rights Registry Coordination**

**Law 13/ 2015 Goals**

To give real estate traffic greater legal certainty by incorporating the **georeferenced** graphic information of the parcels in the Property Rights Registry,

- **the cadastral map** as the basis of its graphic representation,

- Mechanism to exchange INSPIRE CP GML

-allowing simultaneously the updating and correction of the cadastral data.
Cadastre, Registries and Notaries have designed a new technologically advanced model of institutional interaction that enables the use of geo-referenced graphical information in the real state transactions.

The INSPIRE GML cadastral parcel has been the instrument chosen to achieve the correct graphic description of the registered properties,
GML INSPIRE of a cadastral parcel, is now widely used by all agents involved in property transactions in Spain.

INSPIRE in Real life of people
The deed and the registration annotation must include a cadastral certificate.

The cadastral certification is an electronic document (PDF format) that includes embedded the GML INSPIRE of cadastral parcel.
The certificate and its attached file are signed electronically using a Secure Verification Code (CSV) composed by 16 digits. These 16 digits are the only information that is exchanged.
What happen when it is necessary to change the representation of the parcel?

- declarations of citizens: segregations, divisions, joints ..
- land consolidations,
- reparation,
- administrative demarcation,
- expropriation
- acts of urban planning and urban managing
- first registration in the PRR
- errors

Citizens and administrations must provide an alternative geo-referenced representation, also as INSPIRE GML Cadastral Parcel format

"Validation service of alternative geo-referenced graphical representations“
The cadastral cartography is the basis of the new representation.

The technicians are required to represent the reality as an overlay on the cadastral cartography,

1. Download GML (or other formats: DXF, etc) from Cadastre
2. Modify by private tools (autocad, qgis, etc..)
3. Include the alternative geo-referenced representation that must be expresses in GML of CP

Cadastral original data

Alternative georreferenced representation

Validation service of alternative geo-referenced graphical representations
1. Free access from the screen, as query results.

2. As a service using the WFS INSPIRE cadastral Parcel

3. With the cadastral certification, obtained by the title holders and public partners’ agents
Validation service of alternative geo-referenced graphical representations”,

whose result is the "Graphic validation report“.

The report is an electronic document signed with the secure verification code.

It has also de INSPIRE GML file
Coordinates and boundaries of new parcels
In order to register a building in the Property Rights Registry, the georreferencing of its position is also required by the law 13/2015 and therefore we have taken a step further,

• creating the mechanism to use for that the INSPIRE GML BU too
• and open the door to include other attributes of buildings in the future.
Spanish Cadastre can already provide the INSPIRE BU services with the cadastral attributes: geometry 2d, surface, use, number of floors, below and over the floor, conservation status, year of construction, number of dwellings, cadastral reference, address etc...

Core data is not enough for us because:

there are attributes as number of floors below ground, values of proprieties etc... that are important in cadastre.

And also other constructions openairpools are important for cadastre
BU extended 2D

- featureMember Building
  "horizontalGeometryReference" - "footPrint"
- featureMember OtherConstruction
1. Download GML CP (or other formats: DXF, etc) from Cadastre

2. Create by private tools (autocad, qgis, etc.)
   - featureMember Building
     - “horizontalGeometryReference” - “footPrint”
   - featureMember OtherConstruction

3. Include the alternative geo-referenced representation that must be expresses in GML of BU
   - Also the GML of the CP
In the same way

Validation report of georreferencing constructions

The electronic document includes as attachments, the provided GML files.

It is signed with a CSV

The building must be inside the cadastral parcel

(1) El esquema Building Extended 2D de INSPIRE (http://inspire.ec.europa.eu/draft-schemas/bu-ext2d/2.0/BuildingExtended2D.xsd) se encuentra aún en fase de draft, y tiene pendiente la incorporación de algunos detalles que figuran en el estándar. Entre ellos, añadir el valor openAirPool al atributo constructionNature del featureMember OtherConstruction. La D.G.C. usa dicho atributo con ese valor para calificar las piscinas al aire libre, lo que hace que los gml de edificio que incluyen piscina proporcionados por la SEC no validen frente el draft de esquema actual. Por ello las validaciones de esquema se realizan contra un esquema ligeramente modificado que se mantiene en local. La url de este esquema es: http://www.catastro.minhap.es/ws/esquemas/GML/inspire.ec.europa.eu/draft-schemas/bu-ext2d/2.0/BuildingExtended2D.xsd
There are not jet many uses of the INSPIRE services of Spanish Cadastre. It is only the begining….

But the new system of coordination between Cadastre and registre based in the INSPIRE GML:

has allowed to establish a fluid and safe exchange of information between all the agents involved in the real estate traffic and

has led to the development of applications, products and services by private initiatives.

GML file is now well known by surveyors, engineers, architect, notaries, register workers, etc. and it has become the standard in cartography exchange.

INSPIRE in Real life
Conclusions

With the introduction of this system, not only we are making advance in the coordination between Cadastre and Property Rights registry

but also **we are standardizing the data and processes within all the actors that work in the land management.**

The citizens, the public authorities that work in the territory have the duty to communicate to the Cadastre land consolidations, reparcelling, administrative demarcation, expropriation and acts of urban planning and urban managing

for this communication they are using now the INSPIRE GML.

In this way we are **enhancing interoperability between them, simplifying administrative procedures and reducing costs**
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Thanks for your attention!!!!