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

Amalia Velasco
General Directorate for Cadastre

- **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**,
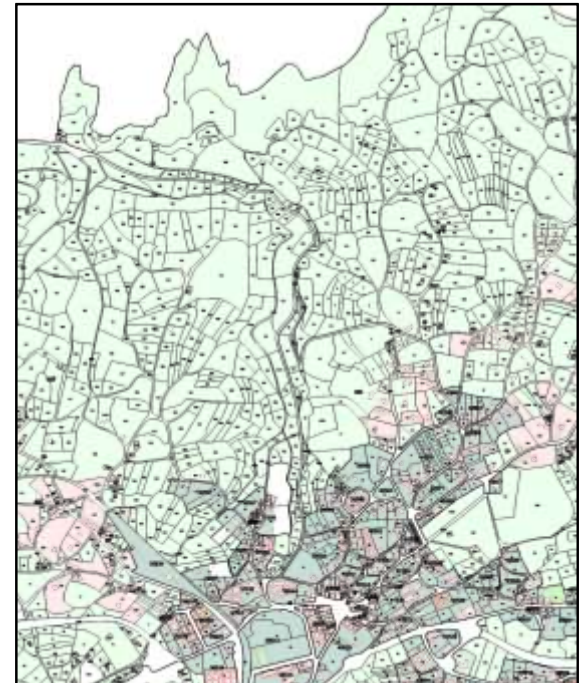
**Spanish law establishes that the Cadastre is a register describing rural and urban real estates.**

- *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...
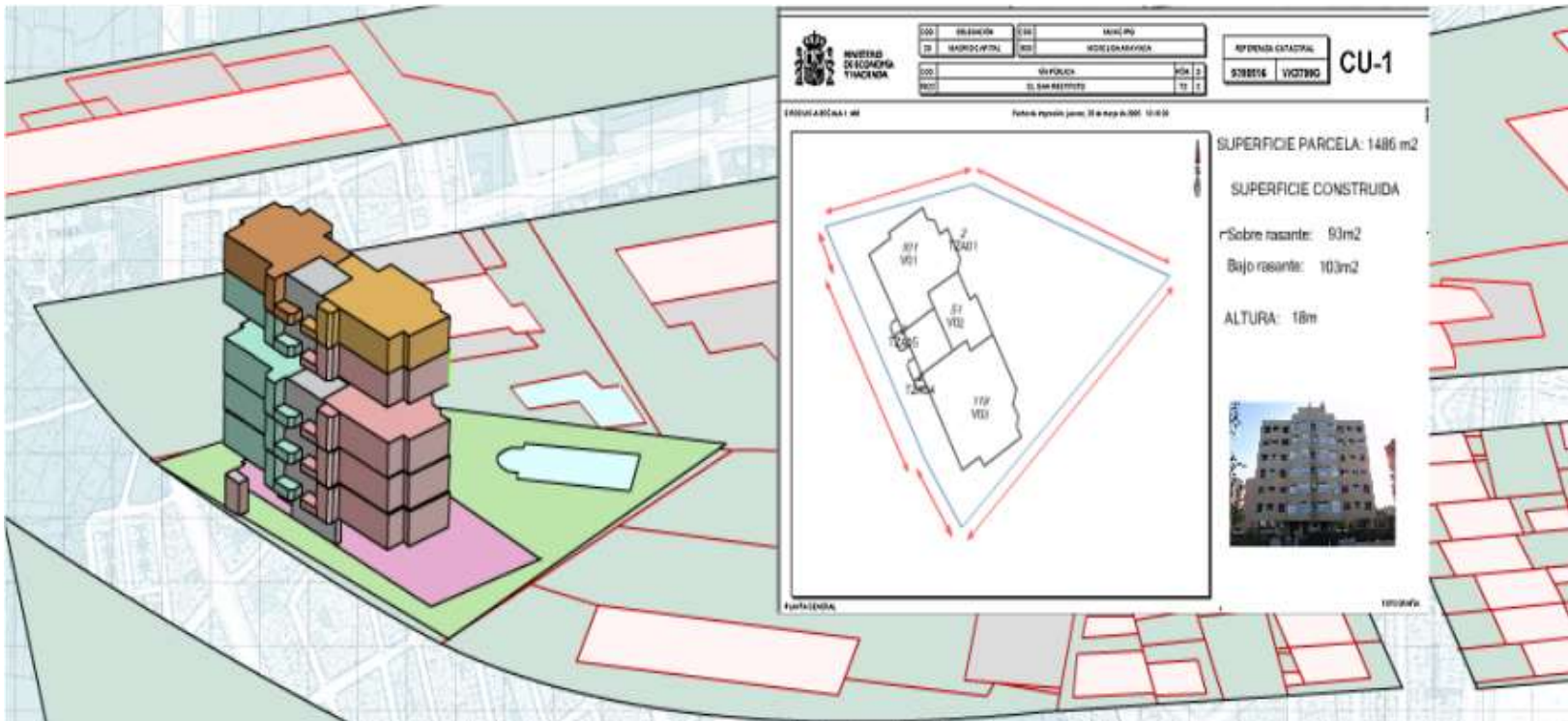
For every building we have a document with scaled graphic representation of the properties forming an urban real estate building.
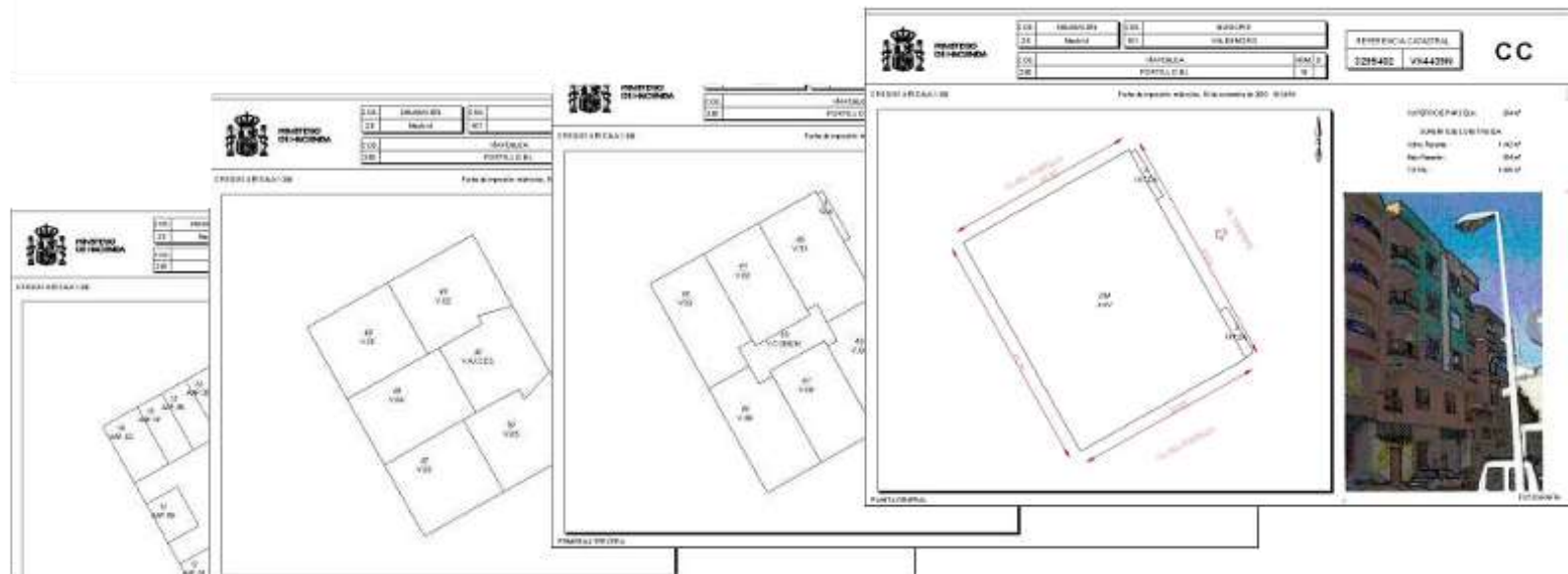
All the different floors and interior spaces are represented .

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
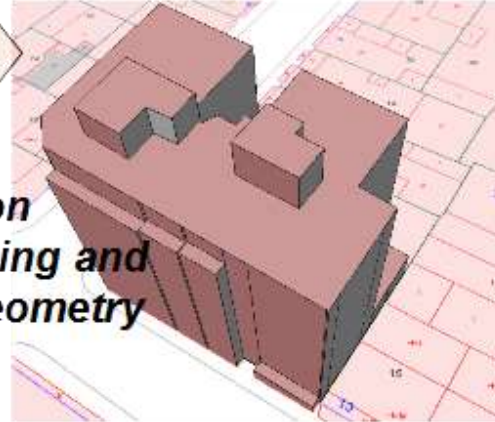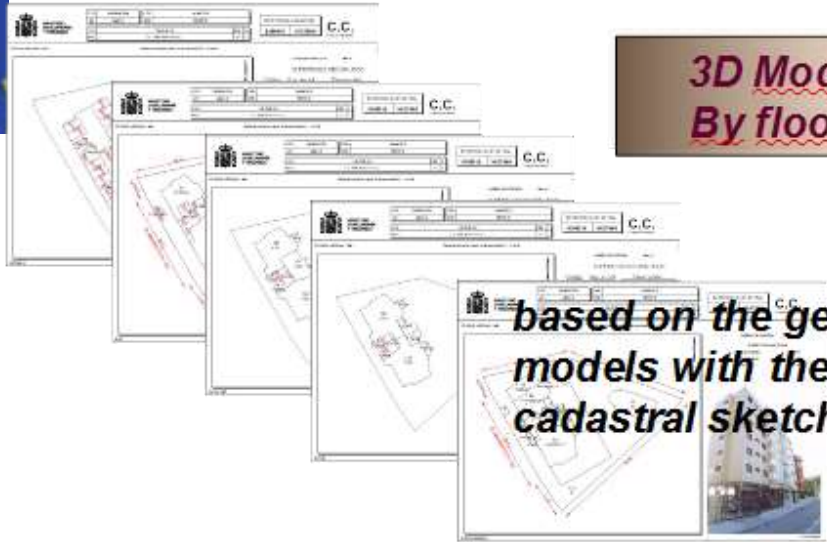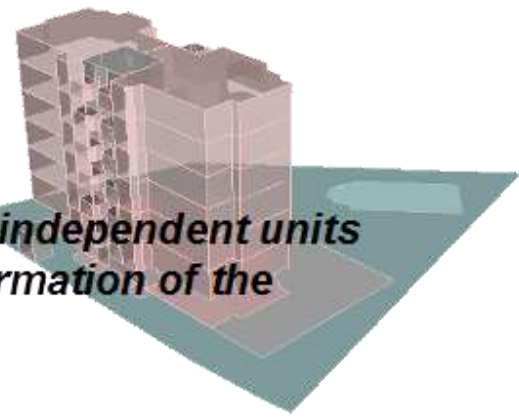
3D MODELING

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
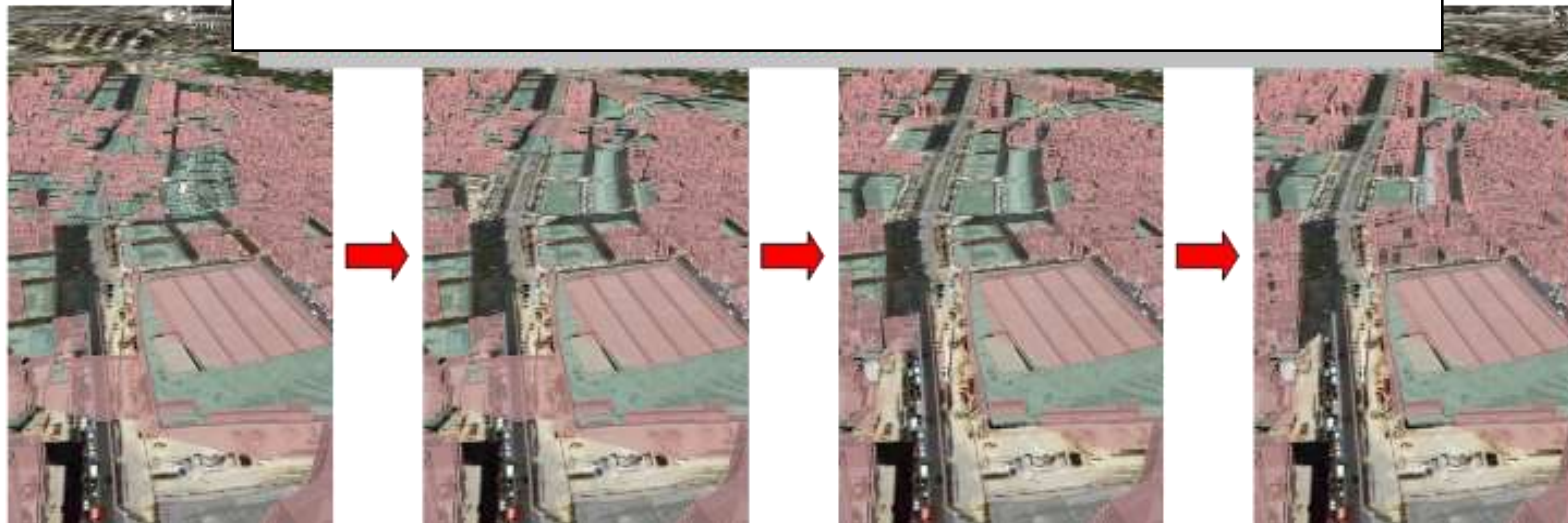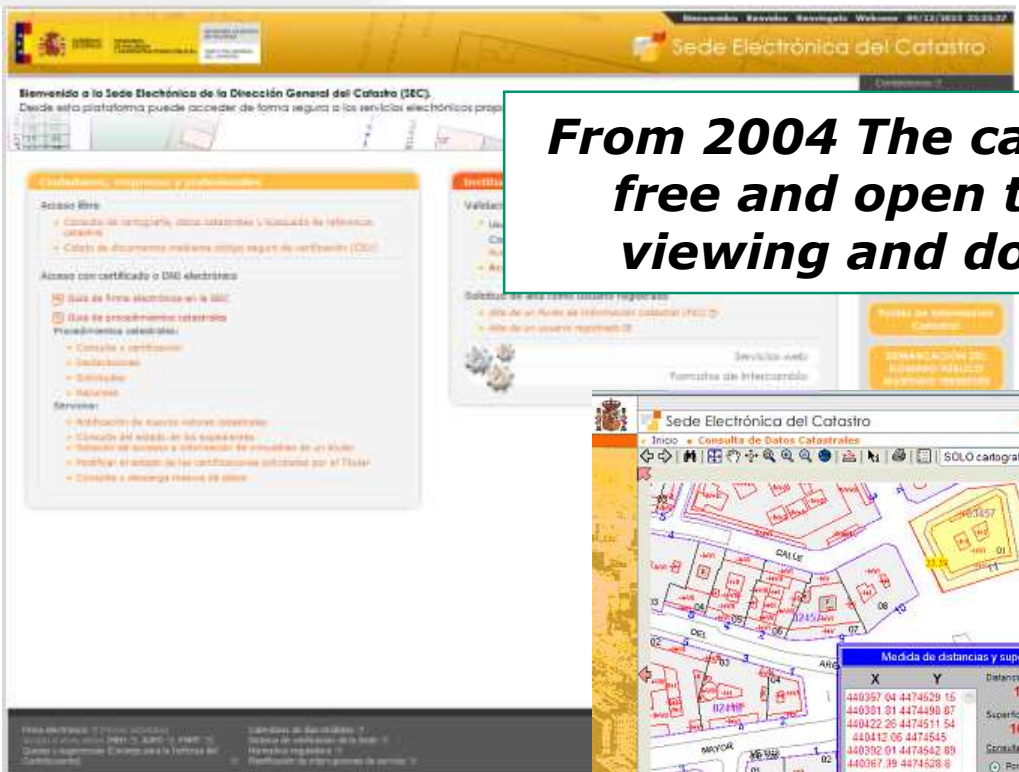
2002   2008

4D cadastre….3D + time

Cartography in the electronic website

From 2004 The cadastral maps are free and open to everyone for viewing and download , 24x7
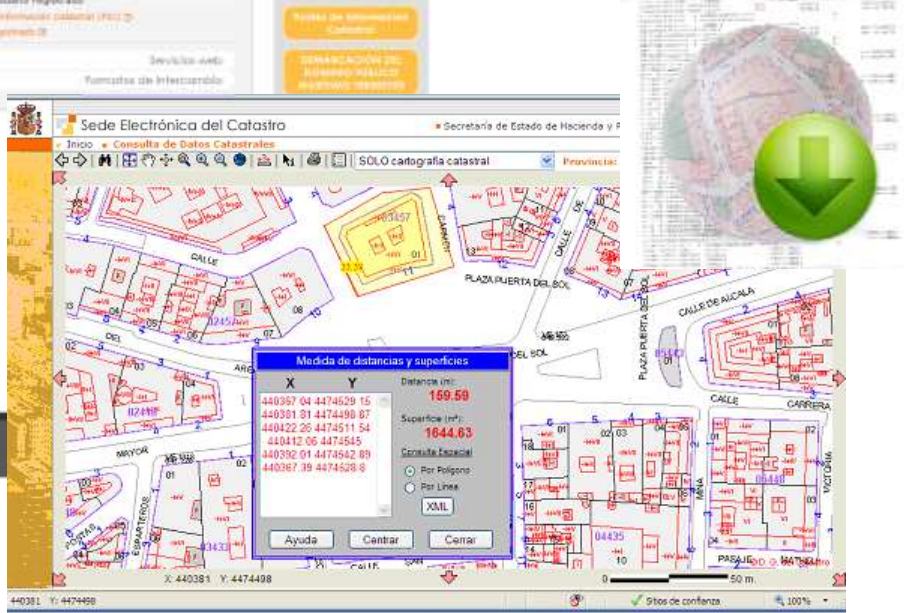
Annual maps download: over 180 M

Cartography in the electronic website

Viewer

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 WFS INSPIRE Services

WFS Cadastral Parcel (CP)
http://ovc.catastro.meh.es/INSPIRE/wfsCP.aspx?
METADATA
Description of the service

WFS Addresses (AD)
http://ovc.catastro.meh.es/INSPIRE/wfsAD.aspx?
METADATA
Description of the service

WFS buildings (BU)
http://ovc.catastro.meh.es/INSPIRE/wfsBU.aspx?
METADATA
Description of the service

ATOM ATOM Services INSPIRE of Predefined Data Sets

This services allow the completed download by municipality of the INSPIRE data set.
Description of the service

ATOM Cadastral Parcel (CP)
http://www.catastro.minhap.es/INSPIRE/CadastralParcels/ES.SDGC.CP.atom.xml
METADATA

ATOM Addresses (AD)
http://www.catastro.minhap.es/INSPIRE/Addresses/ES.SDGC.AD.atom.xml
METADATA

ATOM buildings (BU)
http://www.catastro.minhap.es/INSPIRE/buildings/ES.SDGC.BU.atom.xml
METADATA

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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
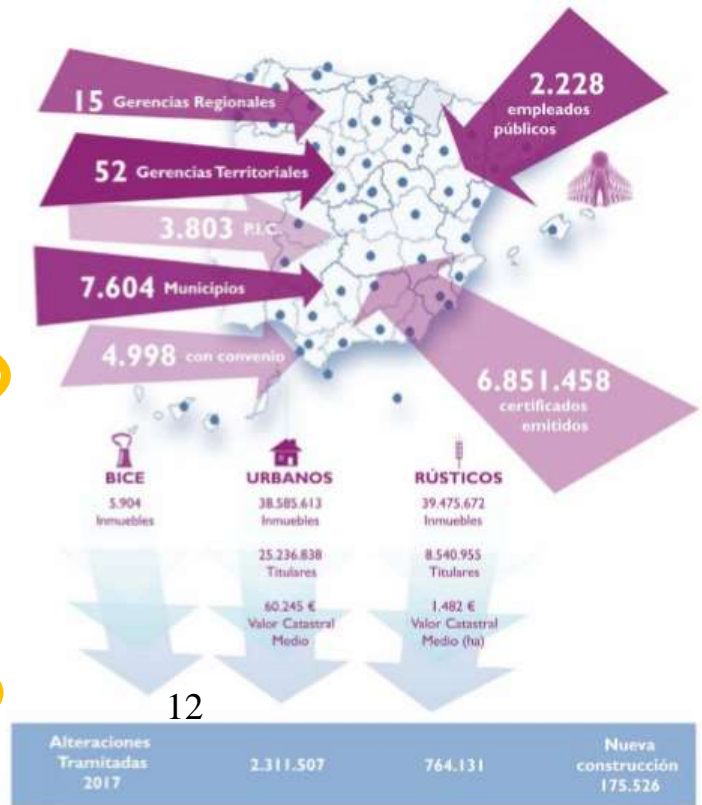
Cadastral basic data / Daily updating

Urban Cadastre

- 1.062.636 ha maps 1/1.000 o
- 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

INSPIRE GEOPORTAL

Enhancing access to European spatial data

Home   **Priority Data Sets Viewer**   **INSPIRE Thematic Viewer**   **Harvesting status**   **Find out more about**

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

    Code:

    Namespace:

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

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European Commission

Enha

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📘 Find out more about ▾

📄 Cadastral Parcel

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Simple Viewer	Lay		Service metadata
Preview Data Set ⚠	Cad		📄
Preview Data Set ⚠	Cad		📄

CadastralParcel (CP.CadastralParcel) ✕

you might need to zoom-in to see the information

Leaflet | Credits: © OpenStreetMap contributors | EC-GISCO, © EuroGeographics for the administrative boundaries (disclaimer)

Legend

Spanish General Directorate
for Cadastre

OK

Data set Metadata ▾

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Cadastral Parcels. Urban and rural cartography. Territorial representation of cadastre

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General del Catastro" and the users should adhere to the 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

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📄 Cadastral Parcel

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View Options

Data set Met

INSPIRE Geoportal

http://ovc.catastro.meh.es/INSPIRE/wfsCP.aspx?typenames=cp:CadastralParcel&request=GetFeatur

Archivo Edición Ver Favoritos Herramientas Ayuda

<?xml version="1.0" encoding="ISO-8859-1"?>
<!--Parcela Catastral de la D.G. del Catastro.-->
<!--La precisión es la que corresponde nominalmente a la escala de captura de la cartografía-->
<FeatureCollection numberReturned="84" numberMatched="84" timeStamp="2018-11-23T15:24:39" xmlns="http://www.opengis.net/wfs/2.0" xsi:schemaLocation="http://www.opengis.net/wfs/2.0
http://schemas.opengis.net/wfs/2.0/wfs.xsd http://inspire.ec.europa.eu/schemas/cp/4.0 http://inspire.ec.europa.eu/schemas/cp/4.0/CadastralParcels.xsd" xmlns:gmd="http://www.isotc211.org/2005/gmd"
xmlns:cp="http://inspire.ec.europa.eu/schemas/cp/4.0" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:gml="http://www.opengis.net/gml/3.2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <member>
    <cp:CadastralParcel gml:id="ES.SDGC.CP.1707903VK4810F">
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      <cp:geometry>
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          <gml:surfaceMember>
            <gml:Surface gml:id="Surface_ES.SDGC.CP.1707903VK4810F.1" srsName="http://www.opengis.net/def/crs/EPSG/0/4326">
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                <gml:PolygonPatch>
                  <gml:exterior>
                    <gml:LinearRing>
                      <gml:posList count="19" srsDimension="2">40.474116 -3.688096 40.474115 -3.688088 40.474083 -3.68789 40.474058 -3.687728 40.474052 -3.687694 40.474044 -3.687697 40.474022
                      -3.687703 40.473954 -3.687721 40.473934 -3.687727 40.473929 -3.687728 40.473921 -3.68773 40.473936 -3.687825 40.473952 -3.687932 40.473953 -3.687933 40.473957 -3.687961
                      40.473983 -3.688125 40.473984 -3.688132 40.474005 -3.688114 40.474116 -3.688096</gml:posList>
                    </gml:LinearRing>
                  </gml:exterior>
                </gml:PolygonPatch>
              </gml:patches>
            </gml:Surface>
          </gml:surfaceMember>
        </gml:MultiSurface>
      </cp:geometry>
      <cp:inspireId>
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          <namespace>ES.SDGC.CP</namespace>
        </Identifier>
      </cp:inspireId>
      <cp:label>03</cp:label>
      <cp:nationalCadastralReference>1707903VK4810F</cp:nationalCadastralReference>
      <cp:referencePoint>
        <gml:Point gml:id="ReferencePoint_ES.SDGC.CP.1707903VK4810F" srsName="http://www.opengis.net/def/crs/EPSG/0/4326">
          <gml:pos>40.474018 -3.687913</gml:pos>
        </gml:Point>
      </cp:referencePoint>
    </cp:CadastralParcel>
  </member>
  <member>
    <cp:CadastralParcel gml:id="ES.SDGC.CP.1707904VK4810F">
      <cp:areaValue uom="m2">290</cp:areaValue>
      <cp:beginLifespanVersion>2002-02-14T00:00:00</cp:beginLifespanVersion>
      <cp:endLifespanVersion nilReason="http://inspire.ec.europa.eu/codelist/VoidReasonValue/Unpopulated" xsi:nil="true"/>
      <cp:geometry>

INSPIRE GEOPORTAL

Enhancing access to European spatial data

Address

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Data set Metadata ▾

Resource Title

Address

Resource Abstract

Address. Urban and rural cartography. Territorial representation of cadastre

Lineage

Addresses of the authoritative Cadastral data validated and quality assured by the conditions defined by the Spanish Directorate General for Cadastre (SDGC). Addresses are related to cadastral parcel. Each cadastral parcel contains as attribute one or more addresses. Address data is completed for all urban and rural areas for the 95% of the Spanish territory under the responsibility of SDGC. Addresses are georeferenced, when it is possible, to the entrance of the building and in other cases to the centroid of the cadastral parcel. Continuously updated. Transformed in its whole to INSPIRE AD model; populating Address, ThoroughfareName, PostalDescriptor and AdminUnitName features.

Unique Resource Identifier

Code:

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

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Geographic Bounding Box

INSPIRE GEOPORTAL

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🔲 📄 Building

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Data set Metadata ▾

Resource Title

Building

Resource Abstract

Buildings. 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. 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

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

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European
Commission

INS...

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English (en) ▾

European Commission > INSPIRE > Geo...

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📄 Find out more about ▾

🇪🇸 📄 Building

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Preview Data Set ⚠	B...	📄

Data set Metadata ▾

BuildingPart (BU.BuildingPart) ✕

you might need to zoom-in to see the information

+ −

Plaça de
la Vila
©D./G. del Catastro

©D./G. del Catastro   St. Adrià B.
Badalona sud
210

C-31

C-31

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boundaries (disclaimer)   Plaça del

Legend

Spanish General Directorate
for Cadastre

‹ ━━━━━━ ›

OK

INSPIRE

Knowledge Base
Legislation
Library

NEWS & EVENTS

News
Events
Conferences

INSPIRE Tools

Toolkit
Geoportal
Validator

Geoportal

Home
Priority Data Sets Viewer
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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 / Tax ation/ Contracts / Valuations

Social and aid policies

Policies, infraestructures, 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
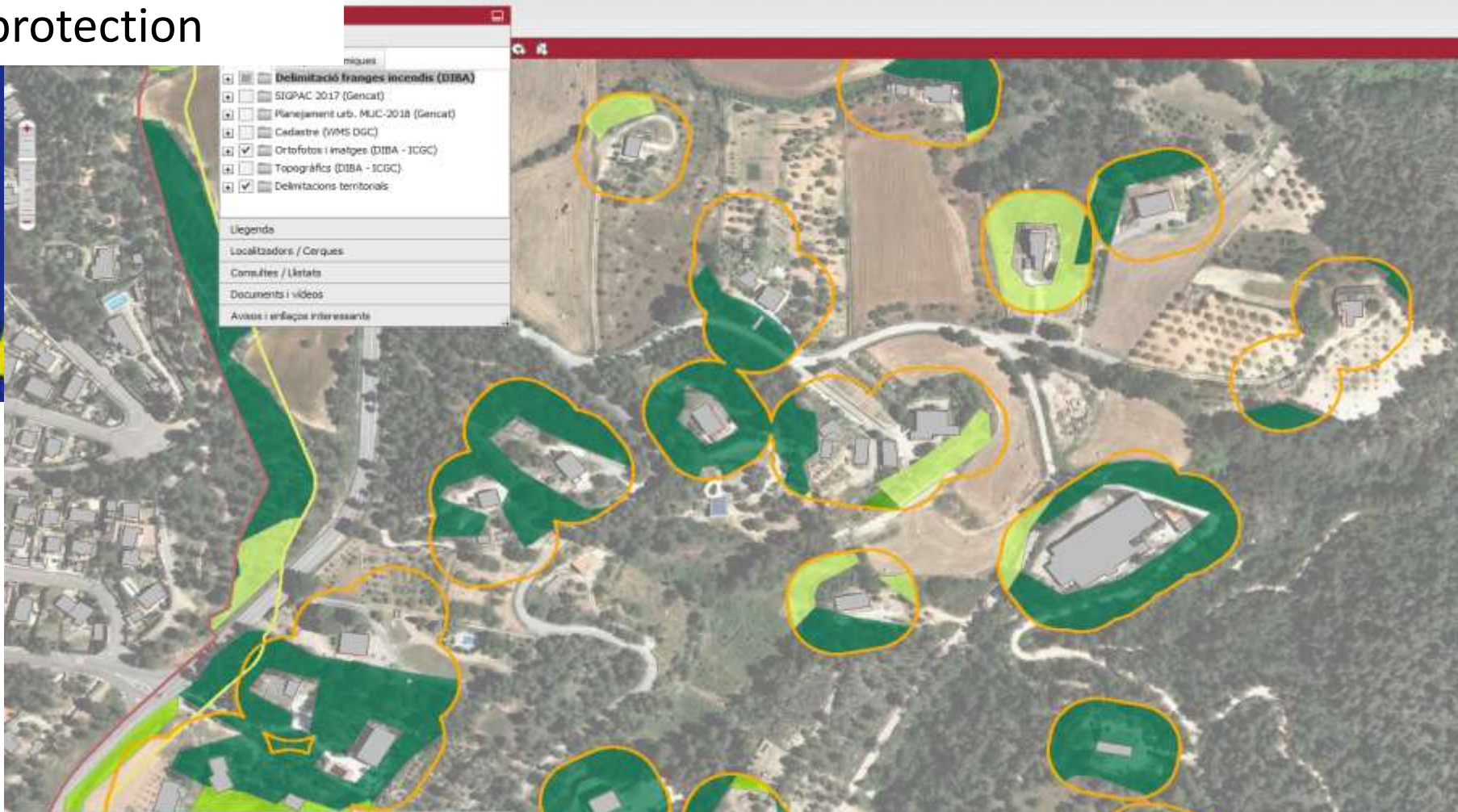
With the surface of swimming pools (other constructions) we can calculate an approximation of water consumption in summer, very useful in dry season

Superfície piscines (m2)
Total: 4.319.645,26

Escala = 1 : 2000   X: 411540.31 Y: 4569528.89 [UTM31N-ETRS89]   Territori   Aplicació

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)

Studies on empty housing: they intersect addresses and cadastral ref with other information

OBJECTIVE

Updating the national topographic
Base in a continuous way

WFS Catastro

Gestión de Cambios

Altas, bajas y modificados entre 2 fechas

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

85%

Actualización Automática

15%

Conflictos: resolución manual

BTN25 actualizada

Leyenda
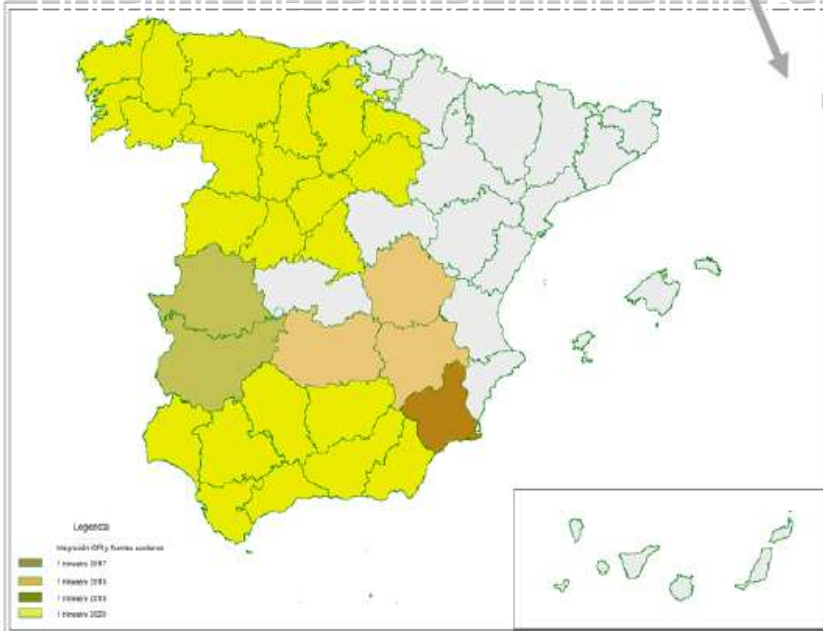
Private company create an aap

Simple solution to the problem of developing apps that are both offline and multyplatform.
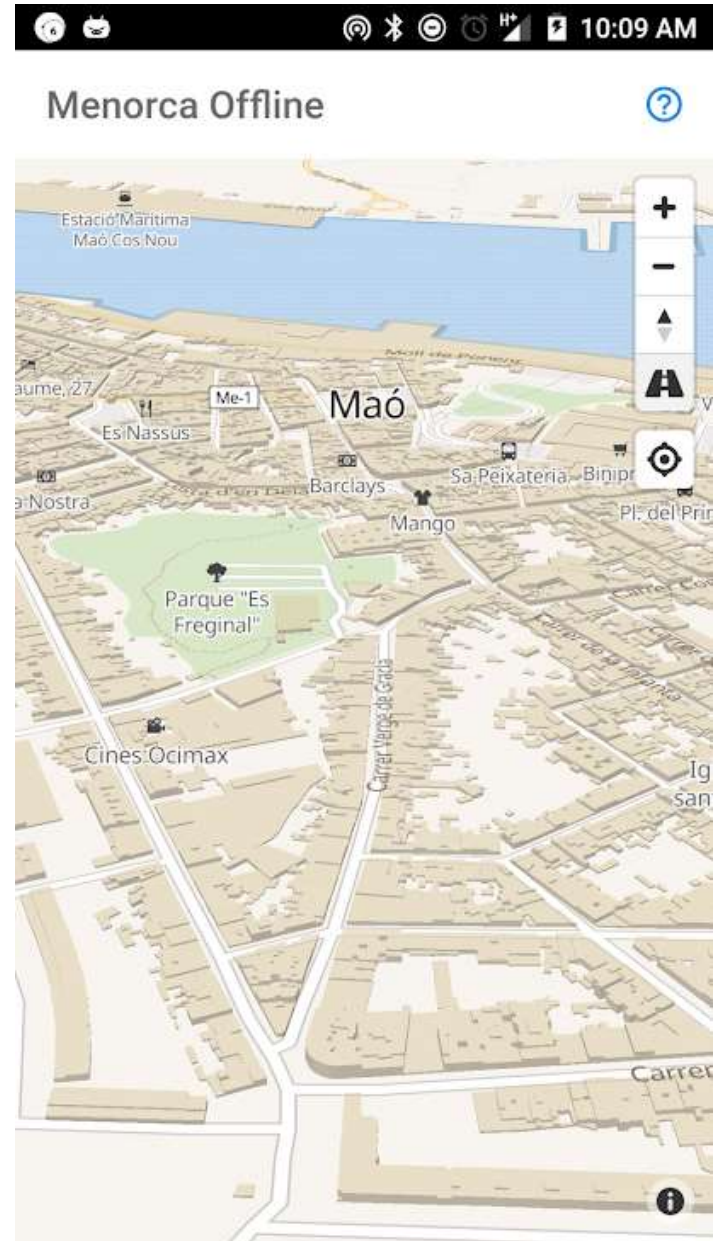
After many attempts for coordination between the Cadastre and Property Rights Registry

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

28

-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.

Web Services

include embedded the GML INSPIRE

el.

Sede Electrónica del Catastro
www.sedecatastro.gob.es

www.sedecatastro.gob.es

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 anotation
must include a cadastral certificate

The cadastral certification is an electronic document (PDF format)

It includes embedded the GML INSPIRE of cadastral parcel.

The deed and the registration anotation must include a cadastral certificate

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,
- reparcelling,
- 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"

Sede Electrónica del Catastro
www.sedecatastro.gob.es

Alternative geo-referenced representation

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,

New parcelation
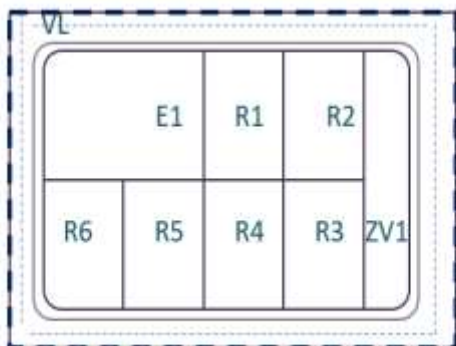
1. Download GML (or other formats: DXF, etc) from Cadastre

2. Modify by private tools (autocad, qgis, etc..)

3. Include the alternative geo-referenced representation

   that must be expreses in GML of CP

Cadastral original data

Alternative georreferen representation
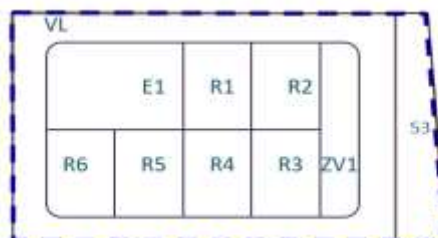
Validation service of alternative geo-referenced graphical representations", 34

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
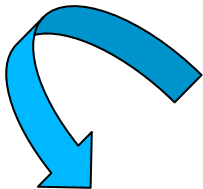
Captura y generación de ficheros por técnico competente

GML de parcela catastral
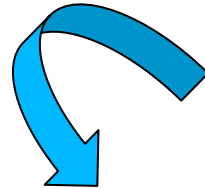
Validation service of alternative geo-referenced graphical representations",

INFORME DE VALIDACIÓN GRAFICA

Datos del **solicitante**

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

whose result is the "Graphic validation report".

CSV: 20DGC23SFVC24T5X

Especificaciones del trabajo profesional

It has also de INSPIRE GML file

Resultado de la validación

POSITIVO

Coordinates and boundaries of
new parcels

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INSPIRE - Infrastructure for Spatial Information in Europe

GOBIERNO
DE ESPAÑA

MINISTERIO
DE HACIENDA

SECRETARIA DE ESTADO
DE HACIENDA

DIRECCION GENERAL
DEL CATASTRO

In order to register a building in the Property Rights Registry, the georreference of its position is also required by the law 13/2015 and

Therefore we have done a step further,

GML

- 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*

BuildingExtended2D
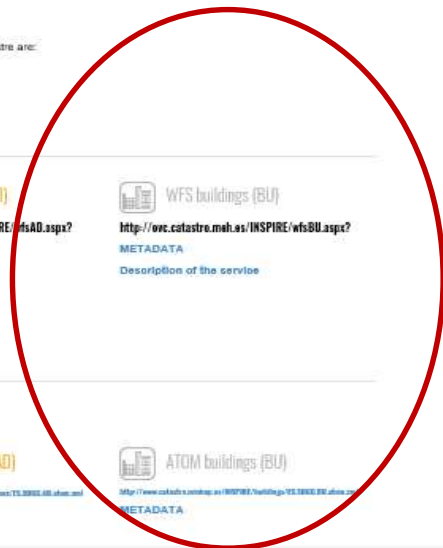
Error in the validation

INSPIRE Services of Cadastral Cartography

Introduction

License of Access and Use

Download Services

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

WFS WFS INSPIRE Services

WFS Cadastral Parcel (CP)	WFS Addresses (AD)	WFS buildings (BU)
http://ovc.catastro.meh.es/INSPIRE/wfsCP.aspx?	http://ovc.catastro.meh.es/INSPIRE/wfsAD.aspx?	http://ovc.catastro.meh.es/INSPIRE/wfsBU.aspx?
METADATA	METADATA	METADATA
Description of the service	Description of the service	Description of the service

ATOM ATOM Services INSPIRE of Predefined Data Sets

This services allow the completed download by municipality of the INSPIRE data set.
Description of the service

ATOM Cadastral Parcel (CP)	ATOM Addresses (AD)	ATOM buildings (BU)
http://www.catastro.minhap.es/INSPIRE/SelectaParcela/ES.SDGC.CP.atom.xml	http://www.catastro.minhap.es/INSPIRE/Addresses/ES.SDGC.AD.atom.xml	http://www.catastro.minhap.es/INSPIRE/buildings/ES.SDGC.BU.atom.xml
METADATA	METADATA	METADATA

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"
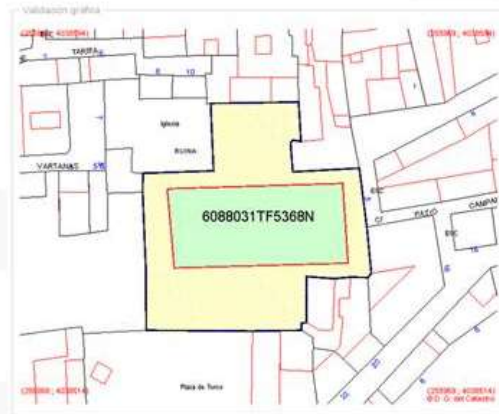   • featureMember OtherConstruction

3. Include the alternative geo-referenced representation

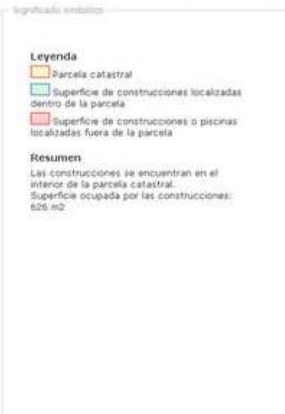   that must be expreses in GML of BU

           • Also the GML of the CP

Informe positivo

Informe negativo

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

It is signed with a CSV

The building must be inside the cadastral parcel

http://www.catastro.minhap.es/ayuda/vga/ayuda_ICUC.htm

[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 validan frente al 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

Conclusions

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**

Thanks for your attention!!!!

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

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