1. What is CartoCiudad?
2. CartoCiudad Web Services
3. CartoCiudad and INSPIRE DS on Addresses
4. CartoCiudad in EURADIN Project
5. Conclusions
What is CartoCiudad?

Objectives: a national and seamless streetmap

Goal:
To obtain digital cartography all over Spain, using official data, with continuity assured between urban and rural areas, in order to become the reference geographic data for everybody.

Harmonizing official data [IGN + Cadastre + Statistics + Post Office] and achieving their integration in only one database with national coverage.
Data sources: Involving public suppliers of geographic information

- **Cadastre:**
  - Blocks
  - Urban parcels
  - Buildings
  - Street axis
  - Building numbers
  - Toponimy

- **Statistical Office:**
  - Thoroughfare names, wards

- **Post Office:**
  - Post Codes

- **IGN:**
  - Roads, Municipality bound, orthophotos

- **Autonomous Regions:**
  - Production (País Vasco, Navarra, C. Valenciana)
  - Update (Rioja, Illes Balears, Murcia...)

**Data Production: CartoCiudad data flow**

Data sources harmonization

- **IGN**
- **Postal Office**
- **Cadastre**
- **Statistical Office**

**Data processing**

- Topological
- Geometrical
- Completeness
- Semantical

**Updating**

**WMS/WFS: Geoprocesses**

**Users**

Krakow, June 24, 2010
**Production planning: 8112 municipalities!!!**

- **2006**
  - Production: 323 municipalities → 51% Spanish population

- **2007**
  - Production: 1243 municipalities + Ceuta + Melilla → 17% Spanish population

- **2008**
  - Production: 1479 municipalities (9%)
  - Collaboration with Autonomous Regions:
    - C. Valenciana: 542 municipalities (11%) (ICV)

- **2009**
  - Collaboration with Autonomous Regions (6%):
    - País Vasco: 251 municipalities
    - Navarra: 272 municipalities
  - TOTAL 2006 + 2007 + 2008 + 2009
    - 94% Spanish population
    - 4081 municipalities

- **2010-2011**
  - The rest of production (6%)
CartoCiudad Web Services: Web Services and functionalities

- Map Service (WMS – SLD 1.0) (GeoServer)
  - Cartography visualization
    [http://www.cartociudad.es/wms/CARTO CIUDAD/CARTO CIUDAD](http://www.cartociudad.es/wms/CARTO CIUDAD/CARTO CIUDAD)

- Tiling Map Service (WMS-C) (TileCache 2.10)

- Gazetteer Services – SGM (WFS) (Deegree 2.1)
  - Location of entities:
    - Postal Address: Thoroughfare name + Building no
    - Wards
    - Post codes
    - Administrative Units

- Geoprocessing Services (WPS) (52north)
  - Proximity area calculation and Points of Interest location
  - Routing
  - Reverse geocoding

**CartoCiudad Web Services**

**Cartography visualization and navigation**
Locating entities using the gazetteer
Proximity area calculation

www.cartociudad.es

CartoVisor API: CartoCiudad Web Component

Users invoke CartoVisor in their web pages using a few HTML lines...

www.cartociudad.es/VisualizadorCartografico

...obtaining a light web component with the basic web services of CartoCiudad: WMS, Gazetteer and Routing

IGN (Server)

My web page

User Web Page (Client)
CartoCiudad and INSPIRE-DS on Addresses
There have been taken into account common and particular aspects of Spanish addresses.

**TWG – Addresses experts**
- Andrew Coote UK (Coordinator)
- Anders Fris-Christensen JRC/CT (Editor)
  - Alicia González Jiménez ES
- Jan Zindulka CZ
- Morten Lind DK
- Nick Griffiths UK
- Sara Greenwood UK
- Per Sundberg SE
- Udo Maack GE
- Yvette Elenkamp NL
- Ziggy Vanlishout BE

**CartoCiudad in EURADIN Project**
**EURADIN Project: EUROpean AAddress INfrastructure**

- European Address Infrastructure gathering 30 partners from 16 countries
  - eContent+ Project to harmonize European addresses
  - June 2008 - June 2010, 9 Work Packages

- **CartoCiudad Project contribution (IGN/CNIG)**
  - IGN participated in all WPs
  - WP4 Metadata: Leader
  - WP7 Data Model Validation: WFS/WS implementation

- **CartoCiudad as Best Practice**
  - Obtained through the harmonization and integration of data from several main providers of GI in Spain
  - CartoCiudad can be accessed by means of standard Web Services

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**EURADIN Local WFS fulfilling INSPiRE DS on Addresses v3.0**

- **Data Model Migration**: from CartoCiudad DM to IS-DS on Addresses DM
  - Oracle 10g DataBase (CartoCiudad Database)
  - Methodology: By means of “Materialized views” creating internal tables according to IS-AD DM

- **WFS implementation**: [www.cartociudad.es/wfs-addresses/services](http://www.cartociudad.es/wfs-addresses/services)
  - OGC WFS 1.1.0. GetCapabilities, GetFeature, DescribeFeatureType.
  - OpenSource software: Deegree 2.3
  - GML 3.2.1 according to INSPiRE Application Schema
  - Initial version: subset of Spanish addresses

- **Integration in EURADIN Gazetteer Prototype**: [www.euradin.statkart.no/wfs/](http://www.euradin.statkart.no/wfs/)
  - Central node distributor (hosted by NorMCA)
  - Local nodes from Spain, Denmark, Sweden, Germany, Italy, France, The Netherlands...
Local Architecture WFS: Distributed EURADIN Gazetteer prototype

EURADIN Local WS fulfilling a simplified INSPIRE DS on Addresses v3.0 DM

- **WS SOAP implementation:** [www.cartociudad.es/ws-euradin/services/WSILocationUtility](http://www.cartociudad.es/ws-euradin/services/WSILocationUtility)
  - Simplified IS DS Addresses DM v3.0
  - Linked to WFS via INSPIRE Identifier (inspireId)
  - Geocoding and Reverse Geocoding functionalities
  - OpenSource software: Apache Axis2.
  - All CartoCiudad addresses available (> 7,000,000)

- **Integration in EURADIN Gazetteer Prototype:** [www.euradin.statkart.no/ws/](http://www.euradin.statkart.no/ws/)
  - Central node distributor (hosted by NorMCA)
  - Local nodes from Spain, Denmark, Sweden, Germany, Italy, The Netherlands…
Conclusions

- Seamless street map all over Spain
- Collaborative project based on SDI Technologies
- Value added product available to all
- Close relation to European projects related to INSPIRE
- Feasibility of the adoption of the IS-DS on Addresses Data Model
Thank you for your attention

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