

Future Internet Forum Ghent 2010



Ajuntament de Barcelona

Barcelona SmartCity

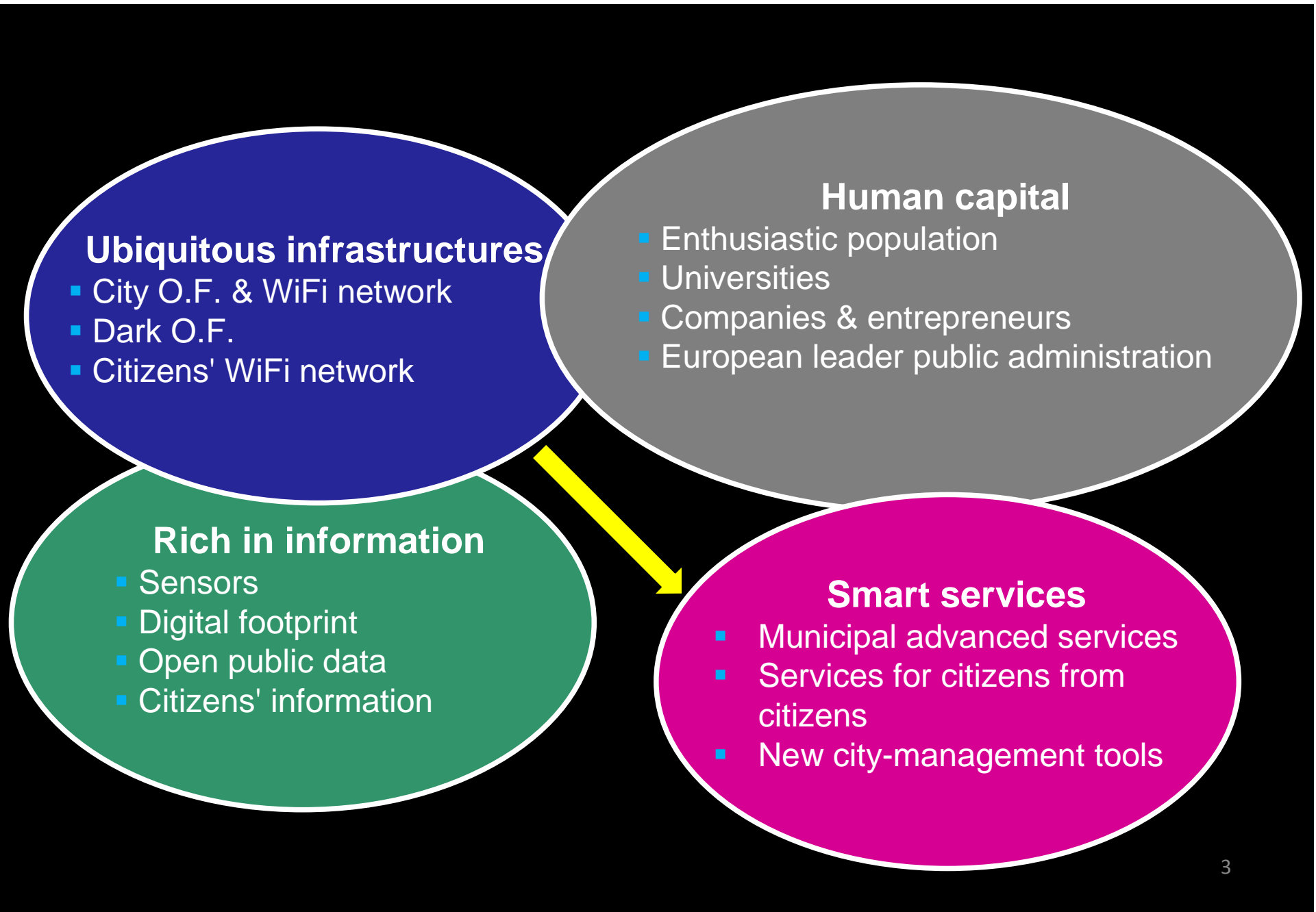
Smart City concept



A high-tech intensive and advanced city that connects people, information and city elements using new technologies aiming to:

- increase quality of life
- having more competitive and innovative business
- make management and maintenance easier and cheaper
- having a more sustainable and greener city

Barcelona model



Role of the municipality

<u>Activity</u>	<u>Area</u>	<u>Role</u>	<u>Market</u>
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- Develop smart services

Smart Services

Provider

Open

- Facilities for Training & entrepreneurship
- Infrastructures for innovation
- Promote innovation and settlement of new companies
- Awards, Dissemination

Human capital

Promotion
Facilitator
Provider

Open

- Open Public Data
- Crowd sourcing
- Deploy own network of sensors

Information

Provider

Open

- Deploy common infrastructures
- Deploy infrastructures own use
- Deploy infrastructures for citizens
- Redesign of basic infrastructures
- Plan, regulate and reorganize commodities

Ubiquitous Infrastructures

Planner
Regulator
Facilitator
Owner

Open



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Barcelona SmartCity

16 Highlighted Smart City projects & actions

1- Urban Regeneration (water, power, cooling & heating supply)

2- Municipal F.O. Network

3- Dark F.O. Network

4- WiFi for Smart City

5- Barcelona WiFi

6- Sensors platform

7- Geo Portal (Open Data)

8- Urban Lab

9- Media-TIC

10- Awards & Dissemination

11- ibicing

12- IRIS (advanced Fix My Street)

13- Traffic status

14- Public Transport Virtual

15- Turistic Bus Virtual

16- Google Traffic



In a SmartCity traditional infrastructures can be re-designed and new common infrastructures could be added

150.000
commuters



New mobility plan

35 Km renewed streets
+114.00m2 green
+145.000m2 facilities



Public space renewal

28 Km power
network



New energy networks

built: 11,93 Km
building: 12,59 Km



**Selective pneumatic waste
collection**

Heating 38,5MW
Cooling 59,5MW



**New heating and cooling
system**

50 Km galleries
36 Km dark fibre



Underground galleries

Source: 22@Barcelona Project. 100m€ investment. 50% works finished

A SmartCity needs a strong telecom infrastructure

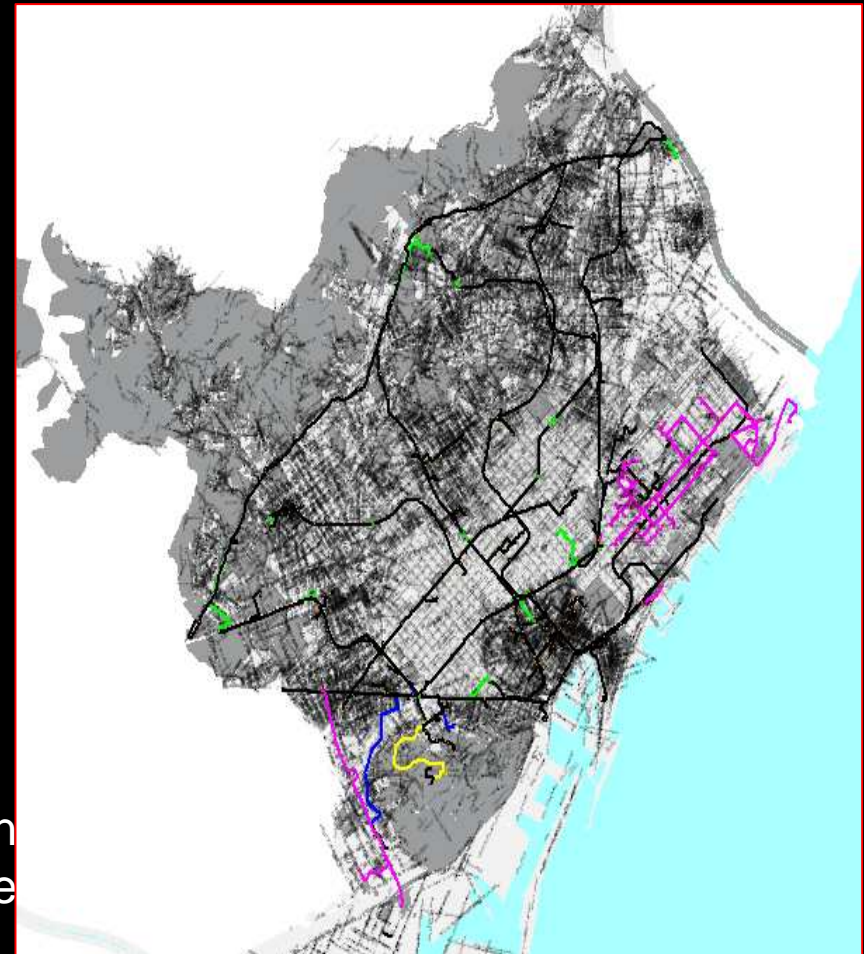
- Barcelona City Council property
- Started in 1994
- High capacity (100 Mbps to 10 Gbps)
- 156 buildings connected
- 325 Km optical fiber

Deployed through:

- Subway tunnels
- Services galleries
- Sewer system
- PPP with telecom operators

Used for:

- Internal communication (data & voice)
- Police, firefighters and municipal buildings
- 7.000PC, 2 Datacentre, 2 Controlcentre
- Traffic management

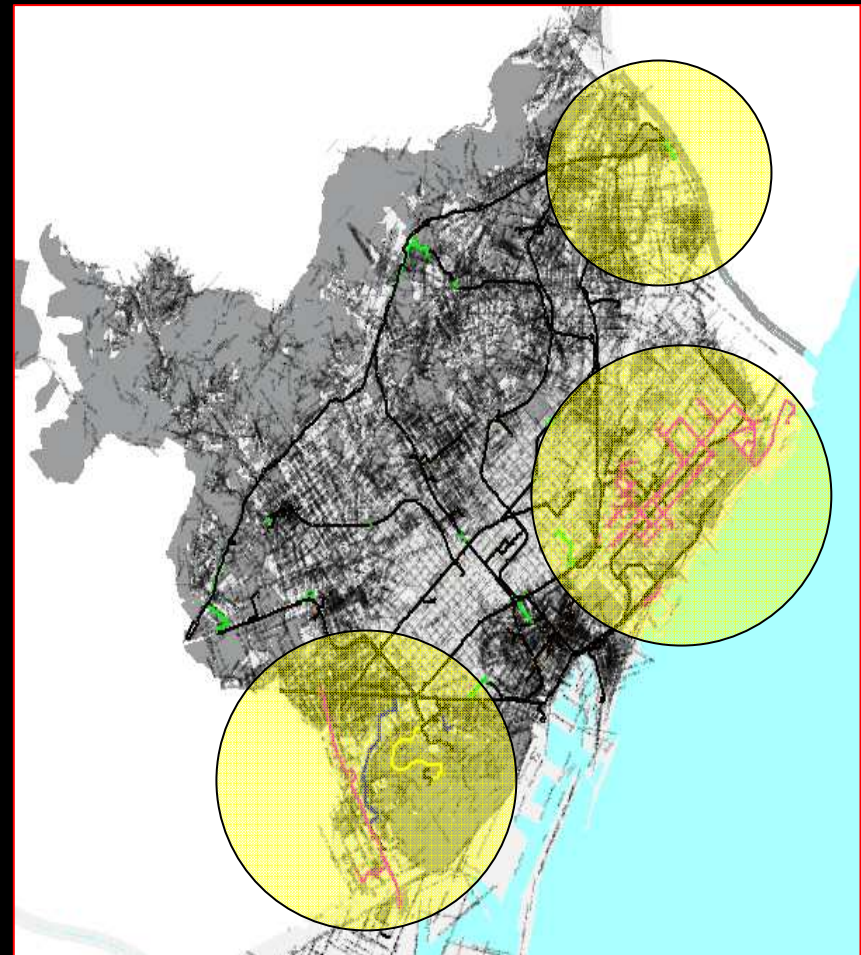


Source: corporative optical fiber network - layout of the trunk network (Barcelona City Council)

Dark fiber network

A dark fiber network to foster competitiveness and open a market for advanced services

- Barcelona City Council property
- High capacity (100 Mbps to 10 Gbps)
- 36 Km dark F.O
- Mainly concentrated in 22@ District
- Currently extending through the city
- FTTH & FFTB Pilots running



In a SmartCity city elements and city workers must be always on

- Connecting municipal workers on the street (police, inspectors, social workers...)
- Connecting sensor, actuators and city elements)

- 479 nodes running
- 105 ready to be connected
- 20 services
- 30% city coverage

Some services

- Parking meters
- Traffic light control
- Public lighting control
- Pillars
- Voice IP
- Informative panels
- Surveillance cameras
- Traffic control cameras

Estimated savings

400K€/year (30% coverage)

1.3m€/year (fully deployed)

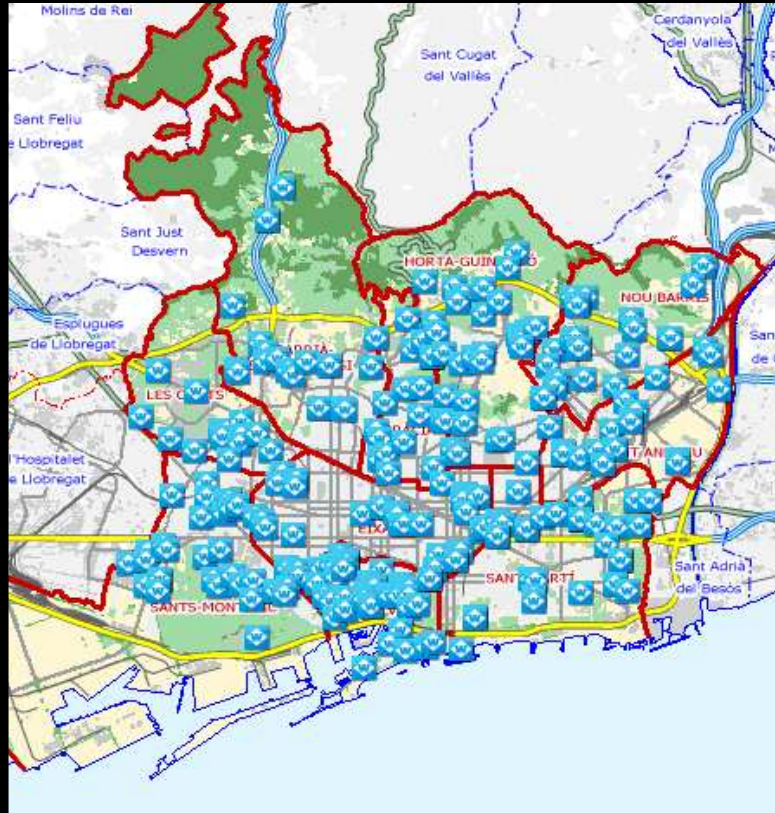


In a SmartCity citizens must be always on

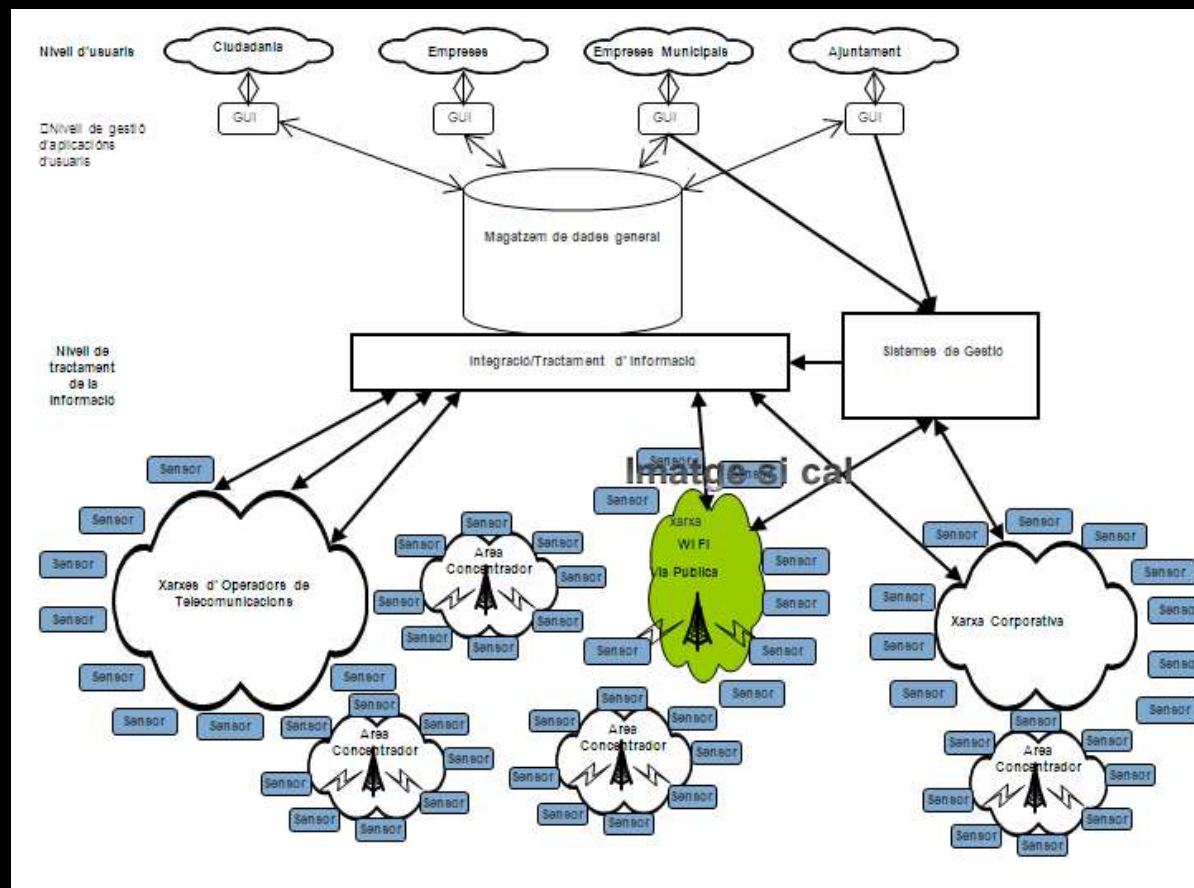
- Free Internet access in public spaces (312 hotspots)
- 21 are in parks
- 291 are in different municipal offices: museums, markets, civic centers, public libraries, customers support offices, etc

Impact

7.000 users/week
75% Laptops
20% Smartphones
50% New users



Concept platform to manage multivendor multipurpose sensor networks

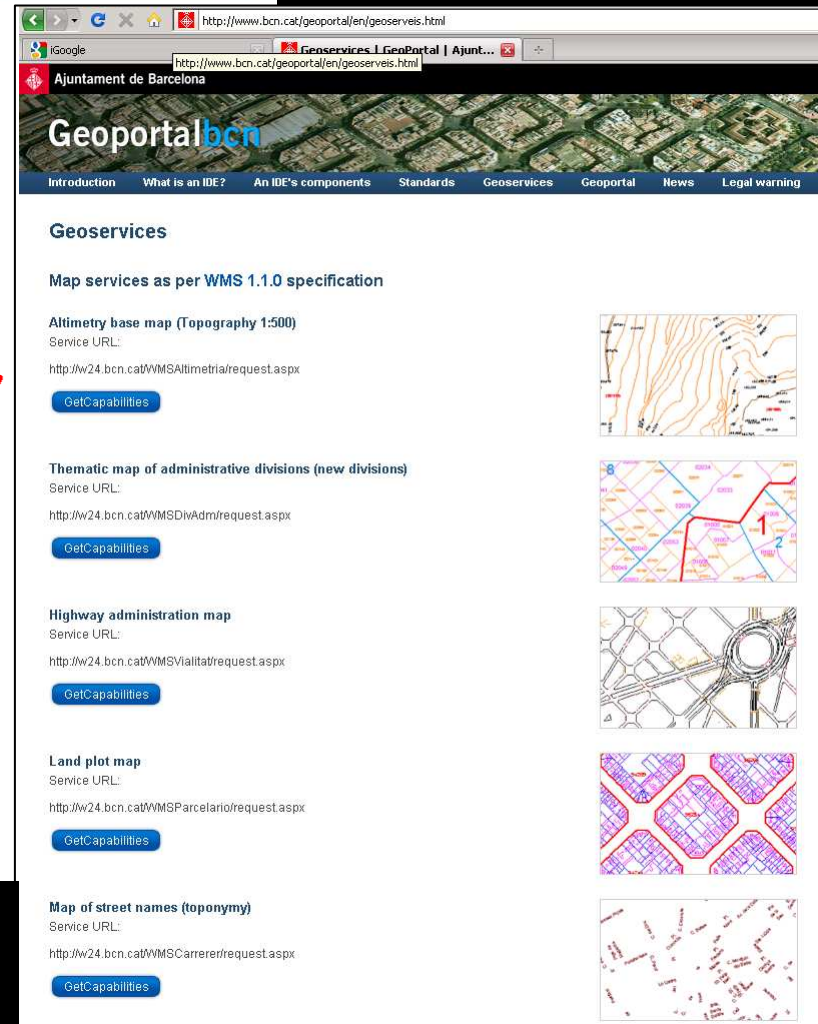
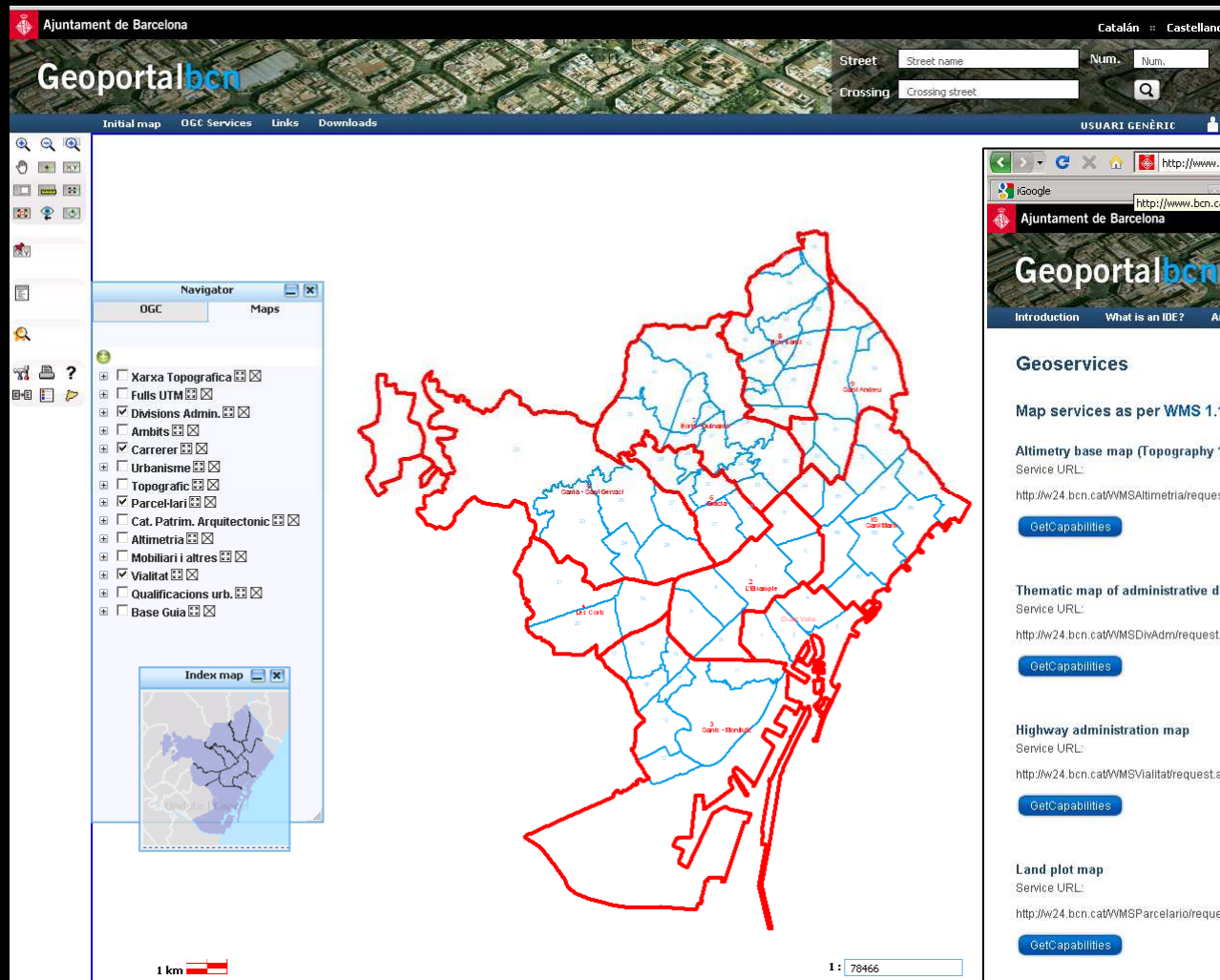


Pilot

Platform test at 22@ district involving:

- Parking sensors
- Traffic flow sensors
- Pollution sensors
- Noise sensors
- Public lighting sensors
- etc

Testbed for sensors development industry



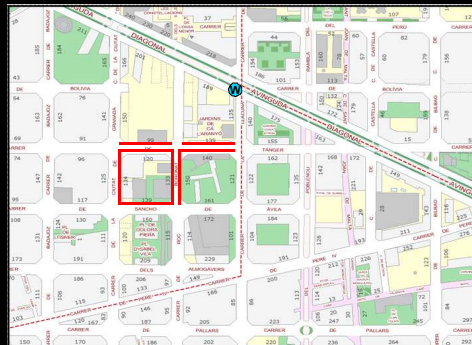
14 data sets
1 INSPIRE Geoportal



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Barcelona SmartCity

- Use the city to perform field trials in the last phase of product development
- Test of new products and services with urban impact in Barcelona as Smart City
- More than 20 applications on process
- You can apply >> **www.22barcelona.com**



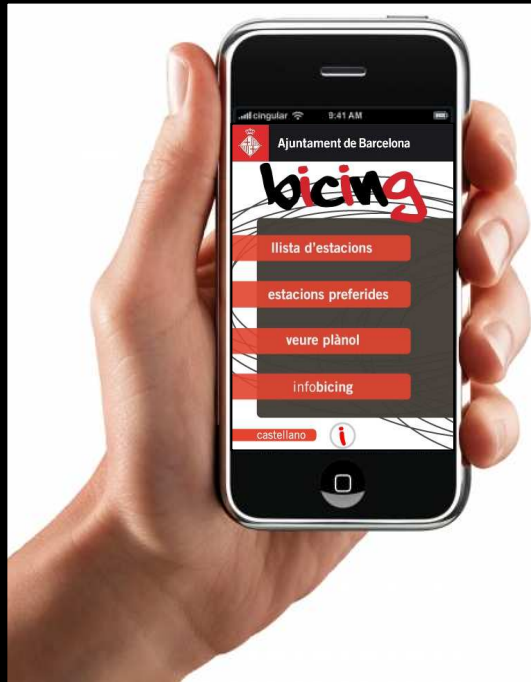
- Green mobility, electric vehicles
- LED public lighting
- FTTH
- Smart Metering
- Noise pollution sensors
- Car parking sensors
- Adapted traffic lights
- Traffic sensors





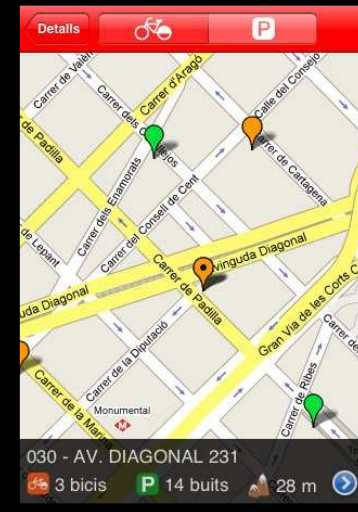
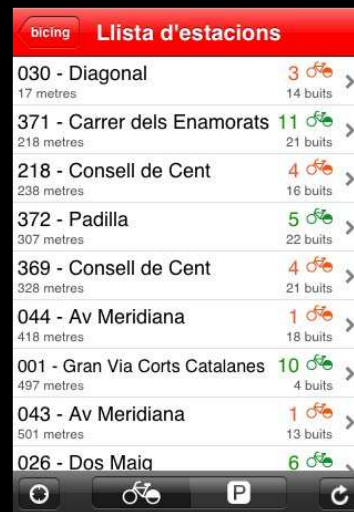
Public equipment allocated in
22@ district

- Business incubator
- ICT & Media Research Centre
- Technology Transfer Centre
- Showroom of new technologies
- Training center (Cibernàrium)
- LivingLab
- Conference centre
- SmartBuilding & energy efficiency
- And Bar & Restaurant



Location based service based on Open Data

- find the closest public bicycle stations
- consult availability and location
- station visualization in a map
- interactive browsing through all the city
- direct access to preferred stations
- iPhone and java phones



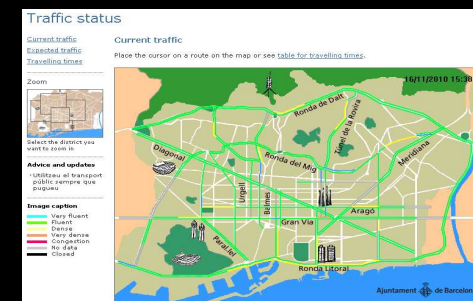
IRIS: fix my street on iPhone

- Web running since 2004, now available as an iPhone app
- Users will send images of their queries with their mobile phones **to be launched end of this year*



Traffic status

- Current traffic, expected traffic in 15min, travelling times
- Maps updated every 5 min
- Real time images from street cameras **to be launched end of this year*





- **TMB Virtual:** locate all of the closest bus stops, metro stations, trams and trains based on augmented reality
 - iBus: find out a what time the next bus arrives.
 - Vull anar (I want to go to...): plan your route on public transport
 - locate the TMB customer service points
 - Updated information on changes to the transport service

Also available...

- **Virtual Touristic Bus:** Information on the three Barcelona *Bus Turístic* service lines, with a description of each stop and all the points of interest along each of the routes.



- **Google Transit:** plan your journeys on public transport in the metropolitan area and consult them on your mobile phone
 - finds routes between two points, offering several various options, and provides information on operators, journey times, timetables and routes
 - Real time information on incidents, public works and traffic density
 - agreement between TMB and Google Maps to use public data
 - Will work with Bicing next year

Thank you!



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Joan Batlle
jbatlle@bcn.cat