BARCELONA 5.0
Smart City
Smart city management means ensuring citizen quality of life, who will have further and more complex needs, and to efficiently allocate resources. Technology plays a key role.
There are multiple definitions of a Smart City but if you ask us to choose one... for us a Smart City is.....

“City based on a sustainable development in order to answer/cover the needs of our citizens, tourists, companies, institutions, etc. both at economic and service (social, environmental and operational) level using the technology as an enabler if it is required ”
Barcelona: city of people
2 goals: quality of life; economic activity and job creation
HOW? Technology
POLITICAL VISION AND FRAMEWORKS

City of people

Improving the well-being and quality of life of city residents

Economic progress; activity, jobs

Social project

Using the new technologies to foster economic growth and the welfare of our citizens through:

- Open data initiatives, offering valuable information to individuals and private companies
- Sustainable city growth initiatives on smart lighting, e-mobility, and energy (heating and cooling networks)
- Social innovation, with projects ranging from Fabrication Athenaeums to Vincles
- Promotion of alliances between research centres, universities, PPP within the scope of the project

EUROPEAN COMMISSION
BARCELONA CITY COUNCIL
BARCELONA CITY MODEL
Barcelona 5.0 is...
Inclusive City
Productive City
Self-Sufficient City
Smart and Innovative City
City of Communities and Public Spaces

Long-term project
“To become a self-sufficient city of productive neighborhoods at human speed, inside a hyper-connected zero emissions Metropolitan Area”
Barcelona Mobile World Capital
Being the Mobile World Capital until 2018 represents a unique opportunity to work along the GSMA and MWC to further develop the mobile industry in Barcelona. The MWC concentrates +85,000 delegates from over 200 countries every year in Barcelona

Barcelona UN-Habitat Resilience Office
The UN have established in Barcelona its international office for resilience, which aims at exploring new tools to promote a more rapid response in the event of emergencies

Barcelona UN-ECE Center of Excellence for PPP in Smart Cities
The UN will establish in Barcelona their international center of excellence to research PPP models for developing Smart cities world wide

Barcelona World Bank Knowledge Hub
The WB has established a knowledge hub in Barcelona to explore along the city the use of ICT to improve the city management and services quality
CONCEPTUAL MODEL OF BARCELONA
BARCELONA 5.0: 22 SMART CITY PROGRAMS

End-to-end Smart City strategy, that impacts almost every urban service

- Telecommunications networks
- Urban Platform
- Smart Data
- Smart Light
- Energy self-sufficiency
- Smart Water
- Smart Mobility
- Renaturation
- Urban Transformation
- Smart Furnishings
- Urban Resilience
- Citizenship
- Open Government
- Barcelona in the pocket
- Smart Garbage Collection
- Smart Regulation
- Smart Innovation
- Health and Social Services
- Education
- Smart Tourist Destination
- Infrastructure and Logistics
- Leisure and Culture

High complexity
22 programs
200 projects
Operative monitoring
GOVERNANCE MODEL

Stakeholders map

Smart City Stakeholder Map

External
- Citizens
- Entrepreneurs
- Businesses
- Investigation centers
- Universities
- International Events (Smart City Expo, Mobil World Congress,...)

City Council
- Mayor
- Corporate departments
- Service Departments
- Other public sector organizations/agencies

Operative
Program n
- Head of program
  - Responsible for monitoring
  - Technical leader
  - Business leader
    - Project leader
    - Project leader
    - Project leader
    - ...
MEASURING IMPACT: Outcome Based City Transformation project

Method

1. Build input/output model adapted to Barcelona for GDP and employment results
2. Calculate social impact

Model calibration and impact calculation

Input Output methodology

- Investment in smart city projects
- Multiplier effect
- Economic impact

Agents

- Economic sector

ICT

- Real state
- Coding activities
- Retail
- …

Partners

GDP Creation

- Job maintenance

Input/Output tables
MEASURING IMPACT: USE CASES HIGHLIGHTS

22 programs / 200 projects / 12 use cases: highlights

- 85M € of GDP impact in 2014 related to 12 use cases analyzed
- Last year 21,600 jobs were created in Barcelona. 1,870 jobs were created or maintained as a result of 12 smart city programs sponsored by Barcelona City Council
- 53.7M € of investment made by Barcelona city council in smart projects in 2014
- 0.53 € attracted of additional investment from partners for each euro of municipal budget
- The projects delivered 43M € of benefits between 2011-2104 and are expected to deliver cumulative economic benefits of 832M € by 2025
- Will save 9,700 tonnes of CO2e and 600,000 liters of water each year in the long term through reduced lighting power consumption, reduced travel and office space from OVAC and smart park water
- Will increase the attractiveness of the city for entrepreneurs by improving quality of life and increasing Barcelona’s brand strength
With a network of 500km of fiber optic and 670 WiFi hotspots, Barcelona creates new services, richer experiences and unprecedented economic opportunities for people, businesses and partners. The WiFi has capacity of optical fiber termination and media conversion. A new business model has been developed to improve the network by means of exploiting the excess of network to repay investment costs.
New model where the management and exploitation of municipal ICT infrastructures (fiber optic and Wi-Fi) is integrated in a single contract. It has enabled the completion of the city's ICT transformation process, since it has enabled the provision of ICT-related services. The model is based on the Integrated Management of all the city and municipally-owned telecommunications infrastructures in a unique contract; the model guarantees the upgrade and technological evolution of the network, the requested investment for its service and the repayment of the initial investment by means of exploiting the surplus network capacity for the private use of the tenderer.
Most of the energy consumption in a city comes from street lighting. Installing highly efficient streetlights which are remotely managed to save energy, optimize maintenance and provide a safe environment for citizens is the goal of the Barcelona Lighting Masterplan. The Plan also establishes the criteria to promote efficiency, energy optimization and functional intelligence. Lamp posts become telecommunications towers, integrating sensors, WiFi, FO and the capacity to regulate LUX intensity depending on needs.
Based on the Hydric Balance system, the city remotely controls irrigation systems in parks across the city, enabling watering and irrigation optimization through sensors and electrovalves. The information from the sensor (is it humid or raining already) goes to a platform that operates the electrovalves for irrigation. Automating, testing and remotely controlling the irrigation systems, fountains and sewerage in order use hydric resources in a more efficient way. http://governancaraadioelectricagencat.cat/
Currently, the network consists of more than 420 stations to lend and return over 6,000 bicycles distributed throughout the system. It requires an annual subscription, is operated through a RFID card and its purpose is to allow for intermodal use, along other transportation means. The service, which has been operative since 2007, is introducing the electric bike in 2014.
Metropolitan Transport of Barcelona (TMB) is currently a reference bus operator in environmental terms, because it has one of the cleanest and most advanced fleets since 2012: 411 compressed natural gas buses, more than 130 hybrid and a system for high performance filters has reduced drastically the emissions from the other diesel buses. Two 100% electric buses circulate in Barcelona more than 200 km per day.
Barcelona fabrication athenaeums is the network of municipal fabrication laboratories, which are spaces where citizens learn the basics of digital fabrication as well as other technology and scientific processes, based upon education, integration and social cohesion to promote the creation of new jobs and activity along the civic and private actors. Fabrication athenaeums is about creating a network of centers of production, investigation and education, that uses the latest computer-assisted design software for the creation of prototypes and scale models through 3D printers and digital fabrication machines. The Plan also establishes the criteria to promote efficiency, energy optimization and functional intelligence. Lamp posts become telecommunications towers, integrating sensors, WiFi, FO and the capacity to regulate LUX intensity depending on needs.
CITIZEN VIRTUAL OFFICE
Open Government

Consists in a kiosk equipped with a videoconference screen, printer, scanner, where the citizen can interact in real time with the city council to carry out municipal procedures. The service is also available on-line through any connected device so that municipal procedures can be dealt with anywhere. A new business model has been developed to improve the network by means of exploiting the excess of network to repay investment costs.
• Social project: Barcelona, city of people
• Technology is an enabler
• Long term project: City mantra, vision
• 22 Smart City programs, 200 projects
• Governance and impact evaluation
• Stakeholder engagement, PPP, alliances, new b-models: BIT
  ✓ Reinforce local innovation ecosystem
  ✓ Exporting urban & IOT solutions

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Thank You for your assistance!

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