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Session: B1 New Tools and Strategies for Urban Risk Assessment

Presentation title: Barcelona Urban Resilience: A real model of implementation

Valdés López, M.; Fernández-Armesto, M

Abstract:

In 2007 Barcelona suffered a series of incidents, including a blackout, a drought, and disruptions in the railway services caused by the high speed railway works, that stressed the need to develop new strategies in order to increase the Resilience of the city and guarantee the continuity of its services.

At that point, a diagnose process started, to identify weak points and related risks for critical infrastructures. However, the assesment was not enough. Diagnose does not translate into real value, so an integrated Resilience strategy, the TISU, was launched in 2009. Consisting of more than 40 improvement projects involving 37 different partners and leaded by a coordination team, it is an ongoing project focused on the reduction of urban vulnerability by constantly improving the reliance and continuity of the city's services supply, and an example of public-private partnership.

This presentation aim is to present and explore how links between Resilience thinking and Urban Management work within Barcelona case experience and actual programmes for building infrastructures resilience. Bridging theoretical aspects of resilience and practitioners' perspective on city managing, it illustrates the patterns of development for urban networks resilience, underlining challenges, potentialities and crisis of such complex systems thinking, hoping to exchange the knowledge learned from experience with cities facing similar challenges.

Keywords: Urban resilience, infrastructures, methodology, implementation, continuity of sevice

Located in the Mediterranean coast, Barcelona is an historic city with a dense and compact urban grid facing the challenges of a productive and dynamic city of the XXI century. Eventhough it is relatively small as a municipallity (surface of 100 km²) it is an important economic engine and the core of one of Europe's largest metropolitan regions in terms of demography (3.5 M inhabitants), the most influent in the mediterranean area.



Figure 1. Geographical situation of Barcelona in Europe.

Its urban development follows the model of a compact and dense city (15.813 inh/km²), and is therefore highly sustainable and efficient regarding the relation between land occupation and services supply. However, like most historical settlements, it has grown overwhelmed by population pressure. These expansions, not always planned, established in adjacent territories and generated a continuous urban area where infrastructure is intensely concentrated.

With an economy mostly based on the services sector –it employees 88% of people working in the city- it is the social and economic environment where not only 1.6 M people live, work and enjoy their time, but also hosts over 7 M tourists/year. Such an intense occupation and usage of the urban space, entails big challenges when it comes to providing a proper functioning that guarantees the safety and quality of life of its inhabitants and visitors. In terms of mobility, for instance, 5 M internal trips (48% of which are on foot/bike and 33,75% on public transportation) take place daily together with and a ¿large? number of connection trips 42,3% of which are on private transportation.

Another conditioning the city has to face are weather related hazards, having to deal with the inclemencies typical for the Mediterranean climate, such as the alternation of drought periods with heavy

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rain episodes, and the uncertainty of climate change effects, which will presumably intensify these phenomena and entail a rise in the sea level.



Figure 2. Barcelona today. Google.

On the need of improve resilience levels. Background

During the year 2007 the city of Barcelona suffered from a series of incidents that highlighted its vulnerability: disruptions in the railway services caused by the high speed railway works, a threat of severe drought and above all a blackout event from which the city didn't fully recover until after 3 days, that caused disruptions in the infrastructure and services supply and generated restrictions on use and operation to citizens.

Awareness of this situation called into question the city model. The concern for reducing city vulnerability and its impact on citizens brought about a new world line of action that focuses its efforts on improving urban resilience and to guarantee the security of its services.

At that point, the City Council with the collaboration of other institutions developed the project 3Ss (Security of Services Supply) that, with the help of owners, operators and different City Council departments, conducted a preliminary assessment of the vulnerability of services supply and their inter-connection with other services and infrastructure.

TISU- Building urban resilience

In order to translate the information obtained during this diagnose process into real value, the TISU (Board of Urban Infrastructure and Services) were launched in 2009. The aim of the project was to develop transversal projects for the reduction of urban vulnerability and to guarantee the city continuity in terms of functionality.

The different boards are organized in eight sectorial clusters to develop several improvement projects based on the collaboration of a network of seventy-two professionals involved in thirty-seven entities: Municipal Services, Urban Tunnels, Electrical Supply, Water Cycle, Fuels, Public Transport, Telecommunications, Underground Works and Tunnels, the key element to its success was to identify and get involved all stakeholders that work interconnected to develop projects aimed to reduce risks and vulnerabilities

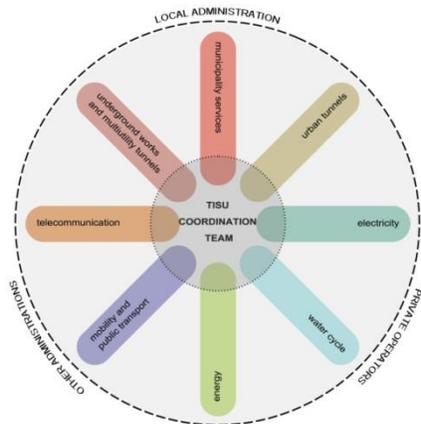


Figure 5. TISU- working fields and coordination.

TISU's Methodology

In order to achieve its objectives, there's the need of establish a methodology. As a summary, the established methodology for the TISU (5) was:

1. Definition of a Coordination Team (CT) who will act as a secretary.
2. Definition of the Improvement Projects in each one of the working fields.
3. Coordination of the Improvement Projects meetings with the goals of:
 - a. program the project
 - b. identify transversal problems
 - c. identify the risk
 - d. improve the crisis protocols
4. The coordination team will report to the organization the conclusions of the improvement projects.

The entire working field had common targets. These are (5):

- To study similar situations occurred in other cities in order to detect potential crisis
- To promote new improvement areas on the security of services supply
- To establish priorities by the use of qualitative risk analysis versus defensive investment cost
- To collaborate with the emergency management of the city and sharing information about new potential crisis and/or non realized defensive investments.
- Re elaborate the 3Ss process
- Promote outside of the TISU organization the need of defensive investments.

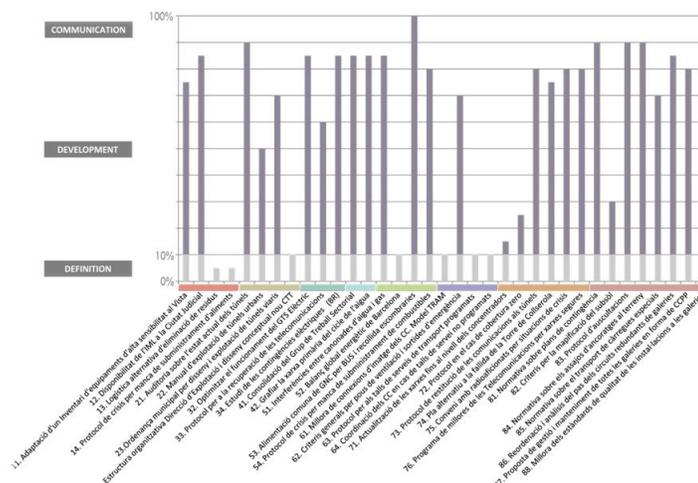


Figure 6. Programme of the TISU Improvement Projects

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The continuity of process

The dynamic and changing nature of risk means that in order to get a degree of resilience, a long term commitment is necessary as part of a cycle of continuous improvement. Each improvement project generated by this process, besides determining the desired achievements and an action plan, needs to establish a monitoring system to evaluate its degree of success, completing this way the cycle that goes from definition to communication and update.

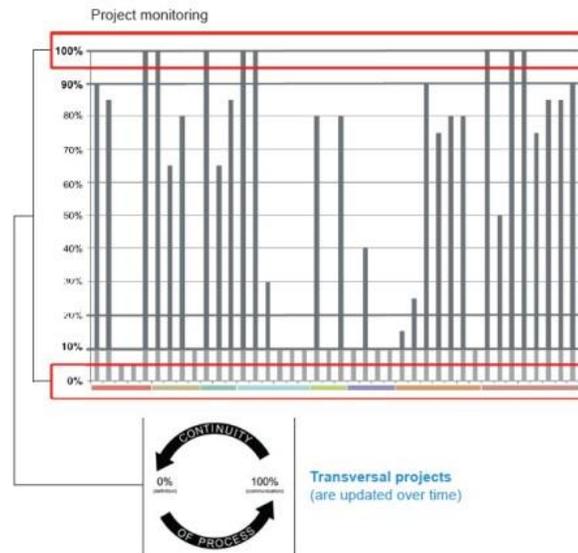


Figure 7. Continuity of the process

Facing the future: City Protocol

Barcelona City Council is aimed to create a task force, in collaboration with other stakeholder, to develop a protocol of urban resilience related with the infrastructure and services supply base on the existing experiences.

This protocol should:

- be focused on citizens
- be a customizable city model, applicable to all cities
- include standards

- include indicators and indexes
- face the financial sustainability
- describe a governance model

By now, there are (6):

- forty city councils involved (New York, Helsinki, Milan, Moscou, Nairobi, Paris, Roma, Seoul, Taipei, Stockholm, Venice, Viena, Yokohama, etc)
- twenty-five companies (IBM, CISCO, AGBAR, Microsoft, Indra, Scheneider-Televant, Abertis, Siemens, etc)
- twenty universities and research centres (UPC, University of Chicago, Imperial College of London, University of Sidney, University of Virginia, Younsei University, London School of Economics, etc)
- twenty five other corporations (Major Cities of Europe, Citilab, Eurocities, European Commission, Green Building Council, etc)

The international dimension

Looking at the global context, apparently different cities share similar problems arising from urban reality: the concentration of people and the needs of services supply related to urban areas generate, in terms of infrastructure and services, delicate overlaps and interactions in reduced areas. Fragility of the different systems increases, as well as impact on the people they serve. Despite awareness of the need to improve the capacity of cities to protect the lives and human interests against possible disasters, to reduce risks and improve the resilience of the city is a long and expensive process if analysed in a unilateral way. It requires the participation of various interveners, public and private, and a vast knowledge base that can gather comparable cases in different cities.

Barcelona has a will of sharing its experience at an international level so the City has enrolled for the UNISDR Making Cities Resilient Campaign, where it holds a City Role Model in Infrastructures and Services.

Also, Barcelona has been selected as one of the ten pilot cities for the UN-HABITAT City Resilient Profiling Programme. The objective of this Program is that selected cities will provide data for the analytical framework, calibration and profiling of city resilience as well as test the tools and software interface systems.

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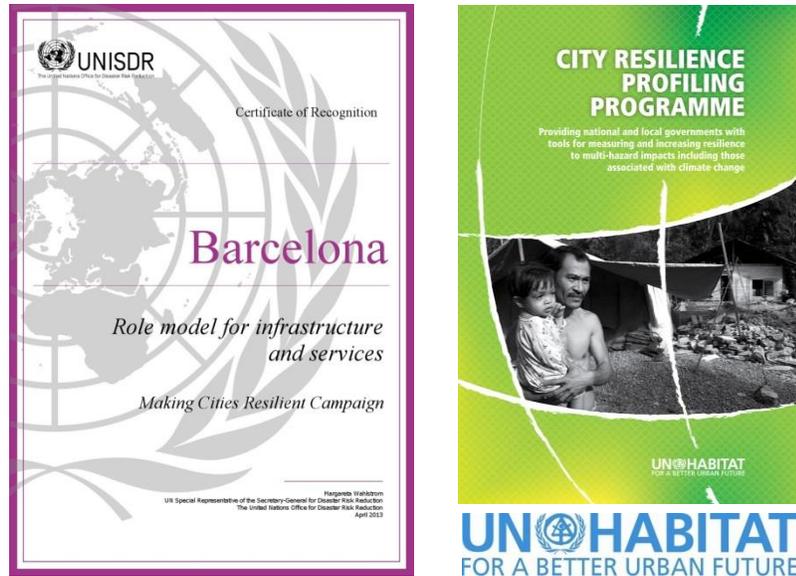


Figure 8. International dimension

URB-is. The Resilience Exchange Platform

In Bonn Resilient Cities 2012, Barcelona City Council offers to create a Task Force in collaboration with other cities, to develop a Protocol of Urban Resilience related with the Infrastructures and Services, based on the existing experiences.

In this context, our proposal is URB-is, conceived as a project platform of information exchange that can integrate those cities, research centres, services and consulting firms that share aspects related to the development of resilience of infrastructure and urban services supply.

The aim of the platform is to create a working environment and information exchange among cities and entities interested in reducing the potential or actual risks of collapse of the various infrastructures and services supply, and minimize the effects of these risks in citizens.

In conclusion, the local governments need to share their problems related to resilience, research centers have a need to experiment with real models that give meaning to theoretical models and companies need to adapt a model where cities are smart clients.

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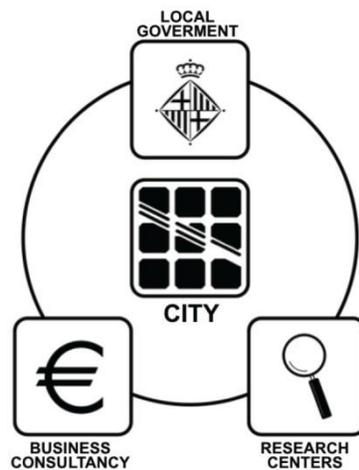


Figure 9. URB-is partnership scheme. URB-is.

The major benefits of get involved (7) in this project are:

- To reduce risks to citizens, sharing problems, solutions and working methods of similar cases with other cities.
- To establish and strengthen partnerships among cities that will allow the creation of joint action mechanisms for the defence of citizens in situations of crisis with services and their suppliers.
- To benefit from the technical work of risk mitigation done by other cities, universities and consultancies.
- To collaborate with universities and research centres to apply studies and methodologies of analysis to each city model.

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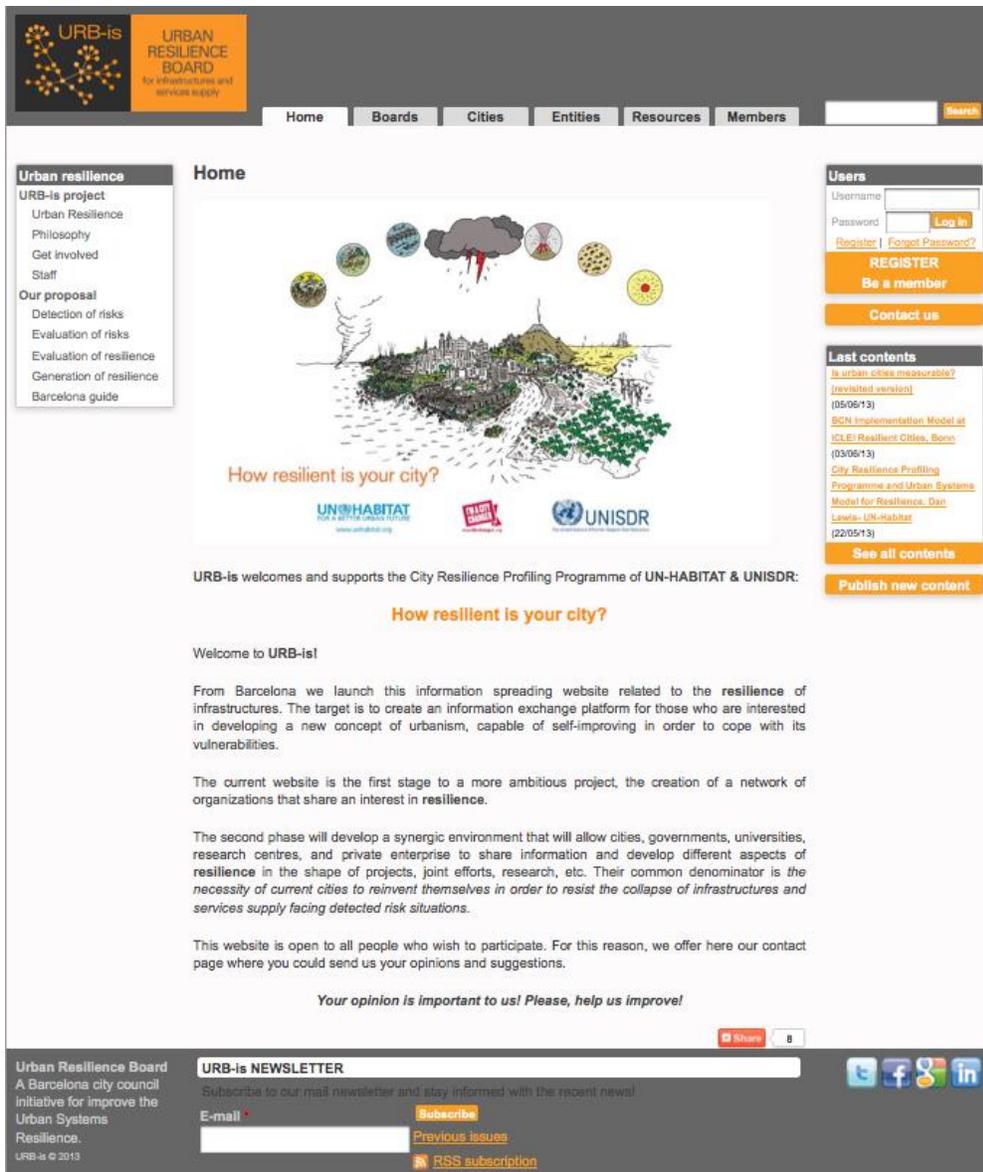


Figure 10. www.urb-is.org

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The author(s):

Civil Engineering, PhD

Manuel Valdés López

Function/Title: Infrastructures CEO

Department: Urban Habitat

Organization: Barcelona City Council

Email: mvaldesl@bcn.cat

Www: bcn.cat

Architect

Maíta Fernández-Armesto

Function/Title: Urban Resilience Responsible

Department: Infrastructures- Urban Habitat

Organization: Barcelona City Council

Email: mfernandezarmesto@bcn.cat

Www: urb-is.org

*Please note that the **email** provided above will be published unless specified otherwise. In addition, if you change your affiliation after you submitted your manuscript please notify resilient.cities@iclei.org.*

Bio:

Manuel Valdés López, 1966. Infrastructures and Urban Coordination CEO. Infrastructures Director since 2006. Associate Professor of Construction Engineering Department of ETSECCP Barcelona, UPC, since 1997.

Civil Engineering and Master of Science in Engineering from the Moscow's Institute of Engineers of Railway Transport, (MIIT) in 1990. Approved title of the Spanish equivalent civil engineer in 1997. Ph.D. from Barcelona's Civil Engineering School (ETSECCPB) in 1997. Graduated of the Advanced Management Program from IESE in 2010.

Secretary of the Committee for Construction and Mobility (COM) and of the Technical Bureau of Urban Services Infrastructure for Resilience (TISU), both of the municipality of Barcelona.

Maita Fernández-Armesto. Responsible for Urban Resilience in Infrastructure and Urban Coordination of Barcelona City Council since 2012. Formerly working on Public Space Projects in the Urban projects Department, has been working for Barcelona City Council since 2005.

Architect from the Architecture School of Barcelona, and Master of Landscape Architecture both from the UPC (Politechnic University of Catalunya). Previous working experience includes working for COAC (Catalan Architects Association) and several architecture studios developing projects on urban planning, architecture and historical monuments restoration.

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