29th IASP World Conference 2012

Barcelona Urban Lab: Barcelona`s initiative to foster pre-commercial and public procurements of innovative products and services

Parallel Session 6

What are the STPs evolving into?

Author:

Josep Miquel Pique Huerta (jpique@bcn.cat)

Co-Author:

Anna Majo Crespo

Barcelona City Council, Spain

Barcelona Urban Lab: Barcelona`s initiative to foster pre-commercial and public procurements of innovative products and services

Case Study: Barcelona Urban Lab: Barcelona's initiative to foster pre-commercial and public procurements of innovative products and services.

Urban Lab is a tool to provide a space in the Barcelona city to carry out tests and pilots on products and services that have an urban impact and are in a pre-commercial phase. The idea is to use of the city as an urban laboratory.

Executive summary

This document aims to reflect on how Urban Labs are instruments used by governments to encourage innovation in the management of cities and their businesses, in particular, based on experience led from the Barcelona City Council.

BARCELONA URBAN LAB was created as a specific line of action to foster use of the city as an urban laboratory. Through this project, the city is made available to companies with innovative projects to test their infrastructures and services for the future in a real environment.

SoBarcelona Urban Labbecomesaneffective toolfor theCity Councilto promotebusiness innovationandconsolidate Barcelona asan innovative city. Thanks to these pilots, companies innovate, the city improves the services by making them more efficient and sustainable, and citizens enjoy from improved services.

Since 2008, more than 50 pilot proposals have been received and more than 14 pilots have been installed in Barcelona streets, in domains as Enviroment, Mobility, Telecom, etc.

1. Introduction

Can the public administration promote business innovation? With which tools? Can the public administration innovate internally? Is the public procurement (or pre- procurement) an effective instrument for that? How can it be done?

This document aims to reflect on how Urban Labs are instruments used by governments to encourage innovation in the management of cities and their businesses, in particular, based on experience led from the Barcelona City Council.

The innovative public procurement as a public policy to promote innovation, a debate stated before 2005, is currently a proposal accepted by public institutions such as the World Economic Forum and the OECD. Also most European countries include such policies.

In particular, the city of Barcelona is known for its entrepreneurial attitude. The City Council has historically led processes of change and has encouraged policies to promote innovation and fostered the development of clusters and their relationship with the research, facilitating market transfer processes. Also the City Council has promoted and attracted talent to the city, and since many years ago, has fostered entrepreneurship and, in recent years, is very focused on supporting innovative companies. However, the market for innovation in our country is too small; large companies and institutions are not sufficiently used to incorporate these innovations, although it is obvious that, in general, they could improve their efficiency, productivity and competitiveness.

Nobody doubts that public procurement, which currently represents 16% of GDP in the EU, is an instrument with great potential to contribute to the transformation and improvement of the society. Public procurement has to meet its main goal which is to offer the best public services to citizens. However, to use it for other purposes (employment promotion, environmental improvement …), is not only licit but also a healthy obligation of governments. Needless to say that, with the current economic situation, promoting policies of sophisticated demand, as a tool to promote innovation, acquires even more strength. Thus, policies to encourage innovation, through public procurement, are widespread and are among the policies promoted by the European Commission and they are also included in the “Europe 2020” strategy.

There are many definitions of innovative public procurement, which could be summarized into two:

- The **purchase of innovative technology** related to the purchase of a finished product or service but which is technologically innovative.
- The **pre-commercial purchase** which purchases R&D results that often need further activities to become commercial products. It refers to buying products that do not yet exist but which may be developed in a "reasonable time".

Each has its specificities, but both have in common that they need a **legal framework** that makes them possible and a **buyer's attitude** which encourages them, creating what we call **sophisticated demand** (or early demand) that tries to find solutions that can incorporate a high degree of

innovation and that can be replicated later on. The European Commission first, and then local authorities have made a regulatory effort and have encouraged several studies and practical guides to develop specific tools to apply in this area and there has been much progress in recent years.

2. Benefits & obstacles

Thecreation of**sophisticated demand**hasclearbenefitsin, at least,fourdistinct areas: thecityitself, as well as itscitizens, its business network anditsscientific and technologicalenvironment.

Inafirstreading, the creation ofsophisticated demandby public institutionshasa clearbenefitfor thecitizenwhich turns out to be anoffer ofbetterproductsand services that are also more sustainable. Innovationalso meanslearning tolearnand, therefore,if there isan effortto systematicallyincorporatethecore ofinnovationin those possible purchasing processes that can include it, **there will be furthermaximization of thevalueprovidedtocitizens** on productsandservices.

Secondly, thepurchasing capacity,as a capacityofdemand generation, is a leadingtractor ofbusiness innovation. Promoting projects ofsophisticated demand,pressureonemployers increaseswhile favoringthe creation **of** a **morecompetitive business networkwhich locallylearnshow to competeglobally**.

Thirdly, thesearchfor innovative solutionsalso impliesthe involvement of different stakeholdersin the innovation systemof acountry(universities, technologycenter, clusters, investors...) and is, therefore,a**powerfulinstrumentto promotescientific andtechnological knowledge transfer**and to commercializeresearch.

Asafourth andfinalpoint, the city/region/countrythatmakes use ofpublic procurement as atoolfor innovation, it **ispositionedasapioneerregionin innovation,**strengthensits brandandincreases itscapacityto attracttalent and companies.

However, there are fewercases than expected inwhichgovernments develop policies to promoteinnovativepublic procurement. Some ofthatthemainreasons could be:

- **Buyer'sAttitude**: Littlewillingness ofbuyerstobuyproductswhichhave notbeen previouslytestedandconsolidated. That islittlewillingnessof buyers to takerisks.
- **Legal framework**: Complexityof thelegislationconcerning the public procurement,and lack of knowledge about innovative public procurementprocedures by thelegaldepartments.
- **Buyer's lackofknowledge**of theexisting trendsinmarketsandthe latest technologies.

Akey factorto reduce risksinaninnovative procurementand to remainattentivetothelatestexistingtechnologiesisto developasmall-scale **pilot** that allows learningfrom the processbothto companiesandgovernments, assessing thebenefitsandanticipatinganyproblemsinsettingit upata larger scale.

3. Actions, the 22@UrbanLab project

Underthis framework, seekingto promoteexistinginnovative public procurement, BarcelonaCity Councilstarted,in2008,the 22@UrbanLab Project. Thisprojectoffersthe22@Barcelona districtto thosecompanieswithinnovative projectsin pre-marketing stage and whichneedto betestedin a real environment and in"real fire".

So22@UrbanLabbecomesaneffective toolfor theCity Councilto promotebusiness innovationandconsolidate Barcelona asan innovative city. With22@UrbanLab Project:

- We can learn during the process(Governmentand Business) and identifypotentialproblems
- We can evaluatethe real benefits
- We can evaluatethescalability

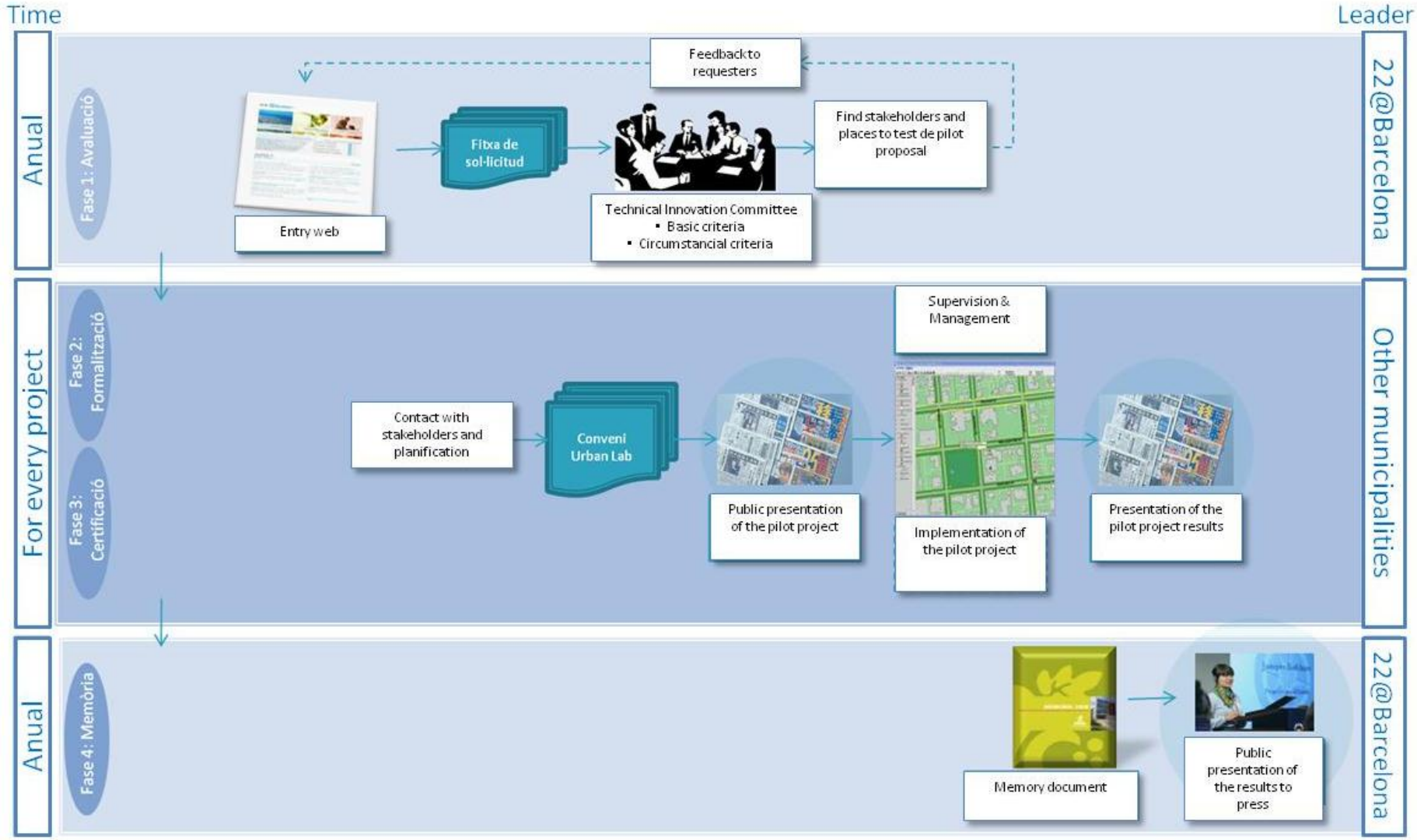
Benefits:

Thebenefits looked forinthis project are:

- **Citizens**: Betterproductsandbetterlocal services.
- **Companies**: Testonarealenvironmentwhich may allow them a faster market accessandincreasecompetitiveness.
- **City**: It facilitatesthe introductionof newsolutions(continuous improvement).
- **Science/Technology**: Knowledge transfer(localandinternational).

Methodology:

During these years, a working methodology has been developed, in order to reply to all the pilot test proposals received and for their development, which we can see in the following scheme:


Time
Leader
Anual
Fase 1: Avaluació
Feedback to requesters
Entry web
Fitxa de sol·licitud
Technical Innovation Committee
▪ Basic criteria
▪ Circumstancial criteria
Find stakeholders and places to test de pilot proposal
22@Barcelona
For every project
Fase 2: Formalització
Fase 3: Certificació
Contact with stakeholders and planification
Conveni Urban Lab
Public presentation of the pilot project
Supervision & Management
Implementation of the pilot project
Presentation of the pilot project results
Other municipalities
Anual
Fase 4: Memòria
Memory document
Public presentation of the results to press
22@Barcelona

1. Website: a website wasdeveloped (www.22barcelona.com/urbanlab)which introduces the 22@UrbanLab projectand wherethere is aformto be filled by allthose companies interestedin doinga pilot test.

2. Request Form: Theformgeneratesafilewith all the relevant information of the project. With thesedata it is intendedto haveas muchinformation of the projectbefore doing a feasibilitystudyandensuringthatit isinnovative.

3. UrbanLabCoordination: In thistable, which meets periodically,we studyall theproposalsreceiveddeterminingthe areasresponsibleforevaluatingthefeasibilityof eachproject.In the UrbanLab Table there arerepresentedall departmentsoftheCity Councilinvolved inthesetypes ofprojects(Environment, Urbanism, Infrastructure, Energy, Computer, Mobility...).

4. Project Validation: Thedepartmentordepartmentsdirectly involved inthepilot program,determine the interestinthe test and evaluate the proposal's level of innovation.Ifthe answerispositive, we proceed tostudytheirtechnical requirements and location.

5. Agreementofcollaboration: Withall the technical detailsof theprojectagreed upon, acollaborationagreement is signed, inwhich appear all the technical requirements, allthe commitmentsfor eachofthe partiesandthe objectivesandindicators to be metby thepilot.

6. Installing and running the pilot project: The project is installed at the location which has been determined.

7. First evaluation of the pilot: After 6 months of the installation of the pilot, the company presents an evaluation document with all the results of pilot, the success indicators, the incidents occurred and possible improvements.

8. Final evaluationof thepilot: Afterayearofinstallationof the pilot, the companypresentsa report on theresultsof the pilotproject, itsindicators,final conclusionsandpublic disseminationofthe results is made. At thispointit isdecidedwhether thecompanytransferstheinfrastructureinstalledtothe Barcelona City Council that becomestheownerandmaintaineror it isuninstalledby thecompanyat no costforthe City Council.

4. 22@UrbanLab pilots

Since the start of the project in 2008, more than 200 pilot proposals have been received (50 independently and more than 150 trough organized calls). More than 14 pilots have been installed. Mainly, pilots are being developed in the areas of:

- Mobility
- Environment
- Sensorization
- Energy
- Telecommunications

We present below the pilots conducted in the framework of this project.

Sensors for PARKING spaces

Installation of occupancy sensors in a street section in the 22 @ district of Barcelona. These sensors will be installed in the blue zone parking (cars) and spaces for loading and unloading.

Company: WorldSensing

Date of agreement: February 28, 2011

Installation: April 2011

Completion: April 2012 (planned)

Expected benefits:

• Possibility of testing sensors in the scope of the parking surface which can bring back occupancy data for parking spaces and study long-term measures to take and applications to develop

Sensors of GARBAGE containers capacity

Installation of sensors to detect garbage containers' load in a street section in the 22 @ Barcelona district. These sensors will be installed in dumpsters and in separate collection containers (glass, paper and packaging).

Company: URBIOTICA

Date of agreement: March 2011 (planned)

Installation: April 2011

Completion: April 2012 (planned)

Expected benefits:

- Possibility of testing sensors in the area of garbage containers which can report loading data of these containers. This data can be further used to study long term measures to be taken (which may change the routes of garbage collecting trucks) and to study applications to develop

Noise sensors for making NOISE maps

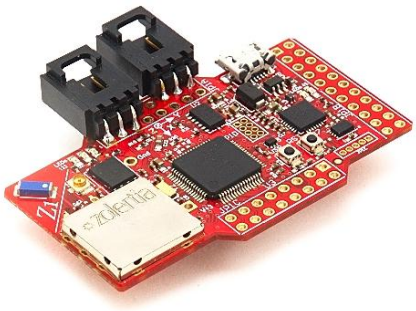
Installation of noise micro sensors, much more economical than traditional noise level meters, which can create a street noise map by mean of a network distribution.

Company: ZOLERTIA

Date of agreement: March 2011 (planned)

Installation: April 2011

Completion: April 2012 (planned)



Expected benefits:

- Possibility oftestingnoisemicro sensorsfor evaluating both theirreliabilityanddetectingnoise

Pilot for the use of a solar and ELECTRIC PROPULSION Police motorcycle

Testing of a motorcycle driven by electricity for the usage by the Barcelona Police. It is a high-powered motorcycle, with a range of 110 km and may be charged with its solar panels

.

Company: Sunred: Bradshaw, Gas Gas, Solution F, Modec Commuter Cars, A123 Systems, Altair Nano, Axeon Power, Delta-g, neo advertising, av, Coulomb technologies, Circutor, Applus, USABC, Battery Solutions

Date of agreement: March 30, 2009

Installation: April 2011 (planned)

Completion: December 2011

Expected benefits:

- Possibility of testing new solutions on sustainable mobility.
- Learning the necessary deployment to fulfill electric vehicles demand.

Pilot for TELEMATIC READING of water, electricity and gas meters

Installation of 144 automatic meter readers for gas, water and electricity at the public housing buildings.

Company: WIMET

Date of agreement: January 14, 2010

Installation February 2010

Completion: February 2011

Expected benefits:

- Easier access for the user to the values of consumption instantaneously via the Internet.
- Access to monthly, weekly, daily and hourly consumption profiles.
- Reading real counters by companies without need of travelling.

Installation of 2 STREET sections with LED STREET LAMPS

Installation of 15 street lamps with LED technology.

Company: ACISA

Date of agreement: 14 December 2009

Installation: March 2010

Completion: December 14, 2010

Expected benefits:

- Possibility of testing new solutions in urban lighting which may be energetically and economically more efficient.

Deployment of 12 LIGHTING points WITH LED technology

Installation of 12 street lamps with LED technology. These lamp posts also have sensors of presence, vibration, temperature, humidity, noise and pollution, GPRS antennas, Wi-Fi mesh access points and, webcam for video surveillance functions.

Company: Endesa Network Factory, Santa & Cole, ARELSA, UPC, SECE, CISCO, IREC, Orange, DEXMA, Semai, Prysmian, TELVENT, E-controls

Date of agreement: 16 February 2009

Installation: 10 June 2009

Completion: 31 April 2010

Expected benefits:

- Possibility oftestingnew solutionsinurbanlightingwhich may beenergetically and economically moreefficient
- Studyingthepossibleintegrationofseveralsensorsandmunicipal services inurbanlightingelements.

Installation of 2 RECHARGING bollardS for electric vehicles

Installationoftwobollardstorechargeelectric vehicleson the surface.

Company: CIRCUTOR

Date of agreement: 16 February 2009

Installation: 10 June 2009

Completion: 31 April 2010

Expected benefits:

- This pilot test was the one that laid the groundwork for the subsequent installation of bollards to recharge electric vehicles in the city.
- With this pilot we defined safety, use and installation regulations of this kind of infrastructures.

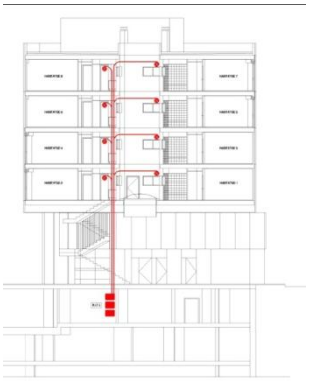
FTTH

The pilot wants to reach within the houses of Poblenou district with an optical fiber network to the home (FTTH) to multiply the bandwidth that can provide the traditional system with copper wiring.

Company: ADAMO, FOC, ELECNOR

Date of agreement: 6 February 2009

Installation: September 2010



Expected benefits:

- Technically solving the cabling from a neutral carrier and helping that with the new infrastructure and the knowledge acquired with the test, there is a proposal or creation of new services and new business models related to telecommunications.
- Creating a neutral infrastructure that enables the arrival of different service providers.

TRAFFIC LIGHTS adapted for blind people

Remote control to activate traffic lights and thus reduce the constant noise of traffic lights. It includes an automatic volume control device which will allow emitting acoustic signals based on

external noise.

Company: ACISA, INDRA, FUNDOSA i DOYMO

Date of agreement: December 2007

Installation: January 2008

Completion: June 2009

Expected benefits:

- Elimination of noise pollution caused by the activation of the sound signals only with the remote control and by the automatic volume adjustment system.
- It makes easier for blind people to cross the street

Implementation of a TRAFFIC OPTIMIZATION system by means of spires and traffic control cameras connected by optic fiber

The system is composed of spires (control system of the number of vehicles passing through a street) to control the needs of traffic lights and those connected by optic fiber in order to increase or reduce the frequency of the green light depending on the needs of the moment.

Company: ACISA, DOYMO, PANASONIC, LANACCES.

Date of agreement: December 2007

Installation: March 2008

Completion: June 2009

Expected benefits:

- Improvement of traffic control and monitoring of road incidences.
- Automatic regulation of the duration of traffic lights based on traffic load

BIKE lanes

Various types of bicycle lanes have been tested in 22@district to detect which of the pilots contributed to a better circulation and safety of cyclists and, at the same time, the traffic is not prevented from functioning with normality.

Expected benefits:

- Evaluation of different possible solutions for the implementation of bike lanes, adapting them to the characteristics of the streets.
- Possible exportation of the best solutions to the rest of the city.

RESULTS

The Urban Lab initiative can evaluate their results by several types of indicators. Measuring indicators of activity include the number of pilots and their duration, but also impact indicators are defined, much more relevant, which, given the youth of the initiative, are still difficult to evaluate. These can include the number of companies involved in pilots (and their nature - turnover, employees ...) and funding raised, among others, and especially how many pilots have become really future purchases in Barcelona or other local or international cities.

The latest indicator mentioned, the one which really measures the impact on "innovative public procurement", is still not possible to evaluate yet because the initiative is 2 years long, the pilots specificity, their duration and not having finished many of them. However, there are some indicators that suggest the effectiveness of the initiative and demonstrate the positive acceptance received by both companies and public institutions. Here are some examples:

- The bollards for recharging electric vehicles project, which was pioneer in Barcelona and Spain in this field and which allowed to establish the first regulations (security, public roads, ...) which currently is a bollard network installed in the whole city.
- Two more examples of projects testing LED technology to illuminate the street; which allowed the Barcelona Illumination Department to have a better understanding of this technology, its potential advantages and disadvantages to evaluate the future installation in the rest of the city.
- During ALL the pilot tests there have been corrections and redesigns in the actual testing of the initial solutions, and this has enabled companies to improve their products making them safer, more robust and competitive and has helped public institutions to discover potential new features.

Also worth mentioning that several companies have expressed a very positive evaluation of the experience, although not having published any tender related to the pilots made.

Some testimonials are:

- It has really been a wonderful opportunity to have such a space in our city. The possibility to install and test our system in Barcelona Urban Lab was not only useful to optimize our system in a real space but also to show our technology in a unique showcase like Barcelona! It is worth to say that around Barcelona Urban Lab is appearing a business network with an extraordinary potential. Overall, running a pilot in the Urban Lab offers an opportunity for companies to built products ready for the Smart city market, and makes a breakthrough for Barcelona to become the Mediterranean Silicon Valley". **IgnasiVilajosana, CEO at Worldsensing**

- "The Barcelona Urban Lab offered to Worldsensing the possibility to test and showcase our

FASTPRK solution in a real environment. The benefits are multiple. From the visibility to the real test scenario. The whole process of installing helped the company to define the operations involved in building FASTPRK infrastructure. Moreover, the synergies generated among other running pilots allowed us to incorporate new services which we will capitalize. Overall, running a pilot in the Urban Lab offers an opportunity for companies to built products ready for the Smart city market". **IgnasiVilajosana, CEO of Worldsensing**

- "The SIIUR project is a real example of how to use the model of Barcelona Urban Lab and the culture based on collaboration to generate competitiveness, develop new products, services and customized solutions through collaborative R&D business synergies. In doing so, we can learn from these results and compete in the global market." "As a result of an international contest, and based in the experience got by installing a pilot in Barcelona Urban Lab, the city of Eindhoven (Netherlands) has chosen SIIUR project to develop and implement innovative solutions for intelligent and sustainable lighting in one of the core districts of the city." **Gemma Batlle, Barcelona ICT Cluster Manager**

- "We have participated in Barcelona Urban Lab with a pilot consisting in the deployment of an improved noise monitoring system to make real-time sound maps as a useful tool to control the noise in the cities. For us, being part of the Barcelona Urban Lab has been essential for success, since all these systems need to be tested in a real environment as a mandatory step before deployments. Barcelona Urban Lab is also a powerful tool of marketing and the best showroom that an SME like ours could have had to demonstrate our capabilities to our potential customers. On top of it, people from the Barcelona City Council have made the piloting process really easy and have given the required support aligned with our goals. " **Marc Fàbregas, CEO of Zolertia**

- "The award was immediately providing a more direct access to decision-makers within the municipality regarding innovation and procurement of urban services. So we quickly started conversations with all the stakeholders involved in the waste collection service –including the environmental department, the 22@ Urban Lab coordination and also Urbaser, the service company in charge of the waste collection for that area of the city. Collaboration with the different stakeholders in the pilot has been constructive and fruitful. The results are positive and meet what we had expected initially: our system is now installed and running in a small area of Barcelona and we keep an active reporting with the municipality as well as the company in order to redefine the whole process and extract valuable practices, which can be used to extend the solution to larger areas of the city and/or to other cities." **Irene Compte, Urbiotica**

Information and contact:

JosepMiquel Piqué i Huerta

Strategic Sectors Director at Barcelona City Council

M: Josep.Pique@22barcelona.cat

Anna MajóCrespo

Innovation Director at Barcelona City Council

M: Anna.Majo@22barcelona.cat

T: (+34) 93.401.97.54