# City smartness - tool or aim? A possibility

**Technical University of Catalonia**

**Centre of Land Policy and Valuations**

**NOVEMBER 2016**

# City smartness - tool or aim? A possibility

**Author:**

Rolando Biere Arenas. M. Sc. Architect.

**\*** This document present the discussions held in the framework of the interdisciplinary panel 7; titled city smartness - tool or aim?, developed in the context of the thematic axe 4: virtual cities, theory and technology of the 11th International Conference on Virtual cities and territories, 11 CTV, "Back to the Sense of the City", in Krakow on 6th-8th July 2016.

In this context this document resumes the preliminary, but no definitive results, obtained by the participants of the panel 7, including the author, during two days of work.

**Technical University of Catalonia**

**Centre of Land Policy and Valuations**

**NOVEMBER 2016**

# City smartness - tool or aim? A possibility

## Index of contents

# City smartness - tool or aim? A possibility

## 1.  Abstract

This document present the discussions held in the framework of the interdisciplinary panel 7; titled *city smartness - tool or aim?*, developed in the context of the *thematic axe 4: virtual cities, theory and technology* of the *11th International Conference on Virtual cities and territories, 11 CTV, "Back to the Sense of the City",* in Krakow on 6th-8th July 2016.

In this context this document resumes the preliminary, but no definitive results, obtained by the participants of the panel 7, including the author, during two days of work

## 2.  CTV Background

The 1st International Conference of the Virtual City and Territory (CTV) ([http://www-cpsv.upc.es/ctv](http://www-cpsv.upc.es/ctv)) took place in Barcelona and was structured as a meeting place for the presentation of a number of developments of virtual models and tools, for the representation of the built environment, against the background of the activities related to the Forum of Cultures - Barcelona 2004. At this event, organized by the CPSV-UPC, some 100 researchers were drawn together and over three days debated projects and advances in three thematic areas: Virtual Cities in the World, Virtual Territory and 3D Cartography and Virtual Representation of Heritage.

At the close of this event, was taken the decision to continue this "meeting place" on an annual basis, alternately in America and Europe. The Barcelona event was followed in 2005 with a conference in Concepción (Chile) on the campus of the University of Bío-Bío. In 2006, the Foundation Tecnalia, organized the third conference in Bilbao (Spain). The next conference took place in October 2007 in Guadalajara and Port Vallarta (Mexico) and was organized by the University of Guadalajara, under the theme of *"re-thinking the city"* considering a different kind of its problems.

Whit this new approach, opening new topics the fifth edition of the congress returned to UPC in Barcelona in June of 2009, with the theme of *"Strategies for transforming and managing the city; perspectives and new technologies"* and in the same line the sixth edition took place in October 2010 in the University of Baja California in Mexicali (Mexico).

The next two editions was organized in Portuguese-speakers countries, the seventh edition was co-organized by the University of Coimbra and the University Nova of Lisbon (Portugal) on Lisbon on October 2011 and the eight edition was in September 2012 in Rio de Janeiro (Brazil), organized by the Universidad Federal de Rio de Janeiro.

The ninth edition took place in Rome (Italy) in September 2013 organized by the Department of Architecture of the Roma Tre University based in the concepts *"city · memory · people"* and the last one, the tenth edition have been in September 2014 in Monterrey (Mexico) in the Faculty of Architecture of the Autonomous University of Nuevo Leon with the theme *"dispersion / concentration of urban territories in the light of the technologies of the XXI century."*

### 3.    11th CTV in Krakow

In this previous context, the 11th CTV Congress was developed considering the contents and the works developed during the previous 10 CTV Congresses and more aspects than ten international conferences held at the Institute of Urban Design, Faculty of Architecture, of the Cracow University of Technology has generated. This is the basis for *"a new opening" to a debate on a city: its essence when compared to its contemporary situation as well as the circumstances and perspectives of returning to its lost essence.* (11th CTV Organizing Committee, 2015)

Therefore, the idea was generate an interdisciplinary debate aiming at drawing and phrasing specific conclusions, guidelines and action plans for multidisciplinary research and creative cooperation. For that reasons was decided the call sentence: *Back to the Sense of the City* and the definition of the structure in five lines and 10 panel session, as is presented in the next table.

Table 1: **Conference structure**

| |
|---|
| *1. Urban theory* |
|     I.  The contemporary sense of polis - if and how? |
| *2. Urban process* |
|     II. How built up and nature dimension balance affect the quality of cities? |
|     III. Urban composition - desired, possible, required? |
|     IV. Will contemporary cultures expressiveness help to bring the sense of the city back? |
|     V.  Primum non nocere? Importance of responsibility for urban/ architectural values |
| *3. Urbanization and de-urbanization* |
|     VI. Could urban growth be sustainable? |
| *4. Virtual cities, theory and technology* |
|     VII. City smartness - tool or aim? |
| *5. Governance, social cohesion and urban policies* |
|     VIII. Will urban politics/policy bring us the sense of the city back? |
|     IX.   Is balance between top-down and bottom-up urbanism required? |
|     X.    Are contemporary planning tools effective for cities improvement? |

Source: 11th CTV Organizing Committee, including the author.

### 4.    Interdisciplinary Panel 7

During the sessions of the panel, participated researchers from Lisbon, Valencia, Alicante, Barcelona, Warsaw and Krakow. These researchers were professors Krzysztof Bojanowski, José António Tenedório, and Andrzej Szarata as Moderators, Rolando Biere as secretary, and as participants Pablo Marti Ciriquian, Sabina Kuc, Przemysław Markiewicz, Bianca Chavez Custodio, Rossana Estanqueiro, Karolina Studencka, Luis Marques, Alfonso Moya and Pawel Grodzicki.

During the first day were presented five papers, a little bit explained in a previous report.
* **Remote Sensing from unmanned aerial vehicles for 3d urban modelling: case study of Loule, Portugal**
  Jose António Tenedório, Rossana Estanqueiro & Luís Marques from Nova University of Lisbon (Portugal)
  URL: http://upcommons.upc.edu/handle/2117/91244
* **APP R-Alergo. Allergy-healthy routes in Valencia**

Rafael R. Temes Cordovez, Dolores Hernández Fernández de Rojas, Alfonso Moya Fuero & Jaume Martí Garrido from University of Valencia & Cartographic Institute of Valencia (Spain)
URL: http://upcommons.upc.edu/handle/2117/91240

- **Application for a barrier free tourism in Valencia**
  Alfonso Moya & Rafael Temez, from University of Valencia & Cartographic Institute of Valencia (Spain)
  URL: http://upcommons.upc.edu/handle/2117/91243

- **City without barriers, ICT tools for the universal accessibility.  Study cases in Barcelona**
  Rolando Biere, Blanca Arellano & Josep Roca, from Technical University of Catalonia (Spain)
  URL: http://upcommons.upc.edu/handle/2117/91235

- **Valorization of urban heritage; modeling UAV 3D data for mobile platforms**
  Luís Marques, José António Tenedório, Malcolm C. Burns & João Marques from Nova University of Lisbon & Technical University of Catalonia (Spain)
  URL: http://upcommons.upc.edu/handle/2117/91232

During the second day were presented five papers;

- **The use of smartphones in public spaces in the smart cities era**
  Bianca Chaves-Custodio & Pilar Garcia Almirall from Technical University of Catalonia (Spain)
  URL: http://upcommons.upc.edu/handle/2117/91034

- **Reading the social preferences of tourist destinations through social media data**
  Leticia Serrano-Estrada, Pablo Martí, Almudena Nolasco-Cirugeda & Taras Agryzkov from University of Alicante.
  URL: http://upcommons.upc.edu/handle/2117/91237

- **Hamburg 2013 - the way of creating new landscape**
  Sabina KUC

- **From stone device to technology device**
  Pawel Grodzicki
  URL: http://upcommons.upc.edu/handle/2117/90420

- **Geo-position technologies in city use research: accuracy evaluation in the context of university students mobility**
  Bianca Chaves-Custodio, Mireia Ballús Martínez, Fernando García Martínez, Sandra Karina Meza, Liya Yang, Francesc Valls Dalmau & Carlos Marmolejo Duarte from Technical University of Catalonia (Spain)
  URL: http://upcommons.upc.edu/handle/2117/91031

## 5.   Discussion

The discussion was organized in two days as has been indicated in the previous item. During the first day it was centred basically in the use of the Remote Sensing technologies, and work with GIS routes (in vector format) as tools to define different urban type of models (for example to the urban heritage) and to evaluate urban routes, considering different aspects of the reality, as accessibility, healthy situations, tourism, etc.

Rossana Estanqueiro, Jose António Tenedório & Luís Marques from Nova University of Lisbon, introduced the initial idea than *"(…) the smart city is the automated city where the goal is to*

*improve the efficiency of how the city functions. (…) new technologies tend to improve the performance of cities (…)"* Batty (2014). In this initial context they explained the main question of their presentation, **is a smart city plan technology-based?** And this question was the base to explain the methodology of UAV 3D data modelling, developed in the case of Loulé, considering **acquisition, processing and processing 3D data UAV.** (Figure 1) Finally they showed interesting results.

Figure 1: **Methodology steps**
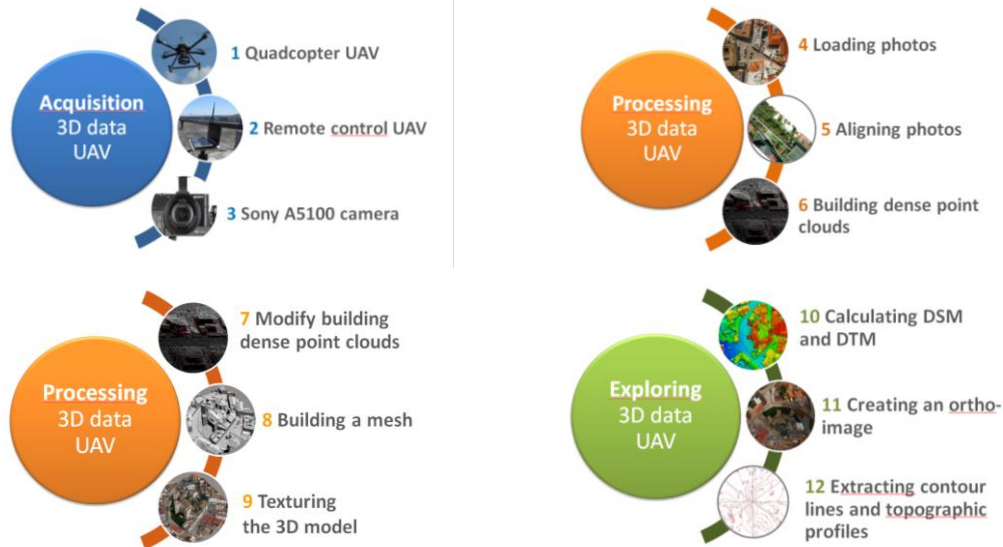


Source: Tenedorio J.A. *et al.,* 2016

To continue Alfonso Moya presented two interesting application to evaluate urban routes, considering, the first one, the location of different factors (for example) tree species in the city to evaluate the impact on allergic people and, the second one considering the accessibility for the disabled people in touristic situations.

The main idea of the first presentation was to develop an application for mobile devices that allow citizens to help her get around the city compatible with your situation regarding allergies. To develop these analyse the authors used GIS system adding specific information in the network of the city streets, using different technical and thematic parameters.

A similar system was used in the case of the **Application for a barrier free tourism in Valencia,** presented by Mr. Moya and developed in collaboration with Rafael Temes. In this, the study case was the city of Valencia and the analysis was developed to generate best conditions of accessibility, considering different values in the axis network on one city area, generating a specific and detailed classification. (Figure 2)

One of their main conclusions was that *"The tourist accessibility has gone on to become an intrinsic factor in tourist quality can no longer conceive of quality tourism, when it is not accessible to all."* And *"Is because of this reason that both the design and rehabilitation of facilities or tourism resources shall prevail technical criteria that make a space and its use, contemplating at all times the principle of Design for All or Universal Accessibility accessible concept directly related to the accessibility unnoticed."*

Figure 2: **Motivation of the research**



Source: Temes, R. *et al.,* 2016

In the same line to evaluate the urban accessibility, was the presentation of Rolando Biere, that explaining two study cases in Barcelona (Figure 3) In this case was considered work using the Terrestrial Laser Scanner (TLS) and the Geographic Information Systems and GPS, as technologies to be integrated, for the development of an integral methodology to evaluate physical accessibility, considering not only predefined routes as different possibilities in the analysed cases.

Figure 3: *Montjuïc, Fosar* **original case and extended case, with urban route**



Source: Biere, R. *et al.,* 2016

Luís Marques & José Antonio Tenedorio in their presentation *Valorisation of urban heritage: modelling UAV 3D data for mobile platforms*, focused in the *"3D data acquisition and modelling (terrestrial and UAV), their integration with GIS technologies and visualization through mobile platforms and augmented reality environments,"* presented a detailed procedure to develop 3D models and their representation in Augmented Reality. This methodology combining 3D acquisition & 3D modelling, (Figure 4) was basic to obtain the results.

Figure 4: **Tests carried out: 3D acquisition + 3D modelling**



Source: Marques, L. *et al.,* 2016

As a conclusions they explained that *the advantages of using a 3D point cloud and UAV systems consist of the ability of acquisition and processing spatial information, quickly with a low cost and a high frequency* and finally that *"the high interest on this theme allows to foresee a revolution (especially) in applications to (valorisation) cultural heritage."*

Following our discussion, during the second day, in the case of Bianca Chaves, she presented ***the different kinds of use of smartphones in the public spaces***, based on the results of survey and field observation, with the motivation to know how the widespread use of smartphones frames people's behaviour and interaction with public spaces and create new forms of urban dynamics. (Figure 5) Maybe the most important conclusions was ***than residents use their smartphones basically as a complement for their activities,*** and the public space is used as an extension of the private space, for example listening music, reading e-books, watching videos, talking by Skype, etc., **but in the case of tourists are used basically to get information** (for example using apps like trip advisor), but not always obtaining a general comprehension of the public space and of the general context in which they are, how happened time ago (for example) using paper maps to find a place where they want to go.

Figure 5: **Motivation of the research, different uses**



Source: Custodio, B. *et al.,* 2016

In the case of Pablo Martí he explained the activities and public references of tourists, based in information obtained from the social media data, detecting the patterns of use for the public space in this case. (Figure 6) In the presentation was cited **Kenneth Goldsmith, who said If it does exist on the Internet, it doesn't exist.** The starting hypothesis was than social media + geolocation data mobile device can give information regarding the users. In this context is important answer the **question if is possible establish social patterns network.** A lot of networks have been developed by people during centuries. For a long, long time.

Figure 6: **Physical Vs. Virtual Public space**



Source: Martí, P. *et al.,* 2016

In this sense, regarding the question¸ about the importance of virtual public city, we think that is only a way to **sharing where I'm and what I do?** But this space **never will replace** the real space. *Virtual city is just another vector of the city, another dimension, another kind of sense, gives us a different perception.*

In both cases presented is important that during the discussion was clear than the use of the public space with these new ICT devices is not different by the users than the previous with the use of a traditional book or a radio, etc. The main is that *"these new devices and the existence of new networks add the possibility of interconnection more there than in the immediate environment."*

This possibility doesn't change the perception of our public spaces but generate a new dimension of our reality, not only the virtual city, but the virtual communication at the same time.
- The locality is more than historically,
- We don't need to move, we don't need necessarily the trips, and
- The possible navigations and connections are almost unlimited.

But one preliminary sentence was obtained; **the virtual space and their virtual possibilities can't replace the real public space and the social interaction in the traditional sense of the city.**

In the case of Pawel Grodzicki he was talking about the **new sense of connectivity and the relation between this new forms and the historical tradition with the traditional technologies.** (Figure 7) In this context during the afternoon was opened another discussion in the sense than *today we talk about technologies we refer to ICT, but the technologies are much more than they, and all contribute to create a smart city.*

Figure 7: **Representation**



Source: Grodzicki, P.*, 2016*

Proof of this was the presentation of Sabina Kuc, (Figure 8) who talked about the new forms of creating landscape, considering different topics; Hamburg City for 0 energy consume city, cities and climate change, building on water, etc. In this sense after, during discussion we generate the question **if the sustainability in a city, as concept and reality, generates necessarily a smart city?**

Figure 8: **Hamburg landscape planning**



CITIES AND CLIMATE CHAHGE, IBA DOCK

Source: Kuc, S., 2016

In a similar way to the fist presentation, was the exposed by Bianca Custodio, *Geo-position technologies in city use research: accuracy evaluation in the context of university students mobility* (Figure 9)*,* with the objective of evaluate the accuracy of geo-positioning tracking tools in the analysis of peoples' movement and flows in the city.

Figure 9: **Research motivation**
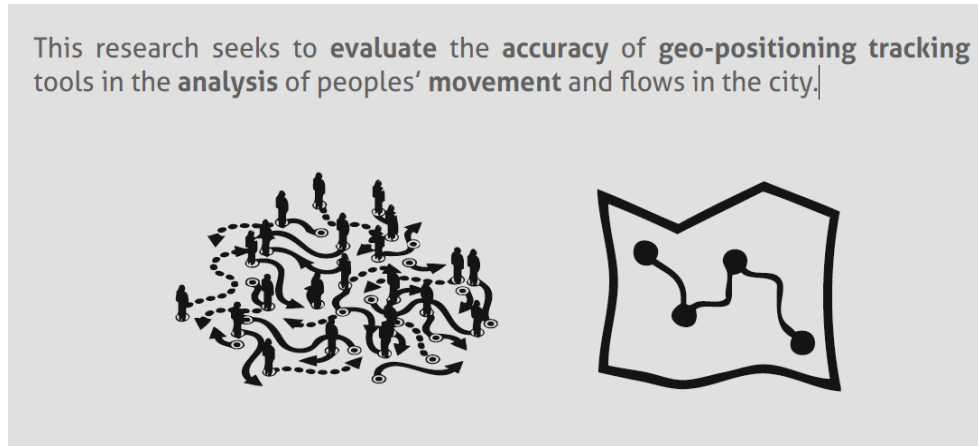


Source: Custodio, B. *et al.,* 2016

**After our discussion of the presentations, we tried to generate preliminary conclusions and answers for the main question of the panel,** maybe the most important ideas accorded yesterday was that here we'll present you not a definitive conclusion, because we aren't experts and this is not the forum to do it, but a preliminary lines to be developed we'll try to develop in the next topics, as a synthesis:

These topics were discussed:

- **The mobile devices** (smartphones, tablets...) can expand de public space, as well as sharing the emotions and connexions.
  The traditional public space (physical city) is prolonged by devices and "streaming" information (images, text, voice, video).
  Charing emotions and space perceptions in real TIME with de social network nodes (friends, professional...) can create a parallel virtual city? Or this is just a new layer of the city?
  Concerning public space: we can speak a new **sense of a public space or a new perception with a new dimension?**
- **That the topic 1 contributes to the discussion the question "smart city / tool or aim"?**
  It is difficult to complete. But one thing seems clear: **new data acquire of ITC SHOW (NEW) SOCIAL behaviour PATTERNS.**
- The **NEW SENSE OF CONNECTIVITY** is performed with interactivity.

Regarding the main question **TOOL OR AIM?** In the first plenary session was said probably both, but in the second was said probably neither…

The next sentences we were talking:

- **The city structure is completely different to the virtual structure;** the first one is in the soul and history of the citizens, for example, vernacular architecture was smart.
- The analysis is too much complex than only one vision, **so Smart city is for wellbeing.**

- **Smart city is a view in the framework of the "official" and "politically correct" discourse,** including in the official agenda, but not always the users knows what it is.
- Very topics must be included in the smart concept, **Human sense of Smart of city, Could be the key.**

## 6.   Final comments

Our group presented an open discussion, because we knew that we know, and we don't want give you any dogmatic position, but we're sure that is possible say than Smart City must be thought in the way to improve the quality of life of citizens.

Previously we said Smart cities for smart citizens, but now we say smart city for every citizen, because if the public space is improved with the technologies, and if is defined as smart, it is for every citizen.