Atnight project, designing the nocturnal landscape collectively

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1. Nocturnal landscapes: a main challenge in urban design

For decades, city lighting has been a highly complex task, subject to progressive technological limitations. Only specialists in this type of equipment could understand and therefore design public lighting. Cities still far from the dreamscapes imagined by Scheerbart (1998). In his essay the 'Glass architecture', the contemporary metropolis showed its true face at sunset, when artificial light built an illusory perception of a highly artificial territory, the city.

After the advent of electricity, night gradually shifted from this variety of contradictions to represent urban recreation and social life beyond the productive hours of day. However, nocturnal streets have been, at best, designed by transcending technological constraints, reducing the environmental impact of electricity consumption, taking care not to pollute the night sky, providing uniform intensities along road routes and controlling the excesses of a few agents to impose their position and privilege under the dark.

In this context, the urban night has become a major challenge for urbanism and architecture. We need novel design strategies that should address relevant questions such as (a) security, (b) the existence of a night-time economy as opposed to nocturnal rest, (c) energy consumption and (d) nocturnal perception.

First, night-time has embodied antagonistic concepts as party and danger. Indeed, light is one important tool to strengthen security against criminality, although better lighting does not increase the perception of safety; this is not a linear equation. Understanding the role of light in the feeling of protection at the expense of comfort or other qualities is imperative to assess the civic use of public space. On the other hand, we must ensure minimum standard levels of lighting to guarantee pedestrian and road safety.

Second, night-time economy is an important driver of tourism, leisure and business growth within our towns and cities. Nocturnal hours became an important moment for nightlife and socialization in cafes, restaurants, clubs, cinemas and theatres. Simultaneously, logistic centres, markets and small business (bakeries, hotels, etc.) are in full operation and urban services are deployed (cleaners, maintenance staff, etc.). Nocturnal transportation systems, tube and night bus, enable a wide range of employees to move from and across the city to work. In contrast, some streets are no longer busy and residential areas repopulate again. Night-time activity may conflict with inhabitants' need for a peaceful night's sleep. Actually, balancing the competing demands of economic development and quality of life will require effective partnership working and engagement with residents and businesses.

Third, night is also the landscape of energy that fuels streetlights, industries or households. Energy is invisible but sometimes becomes apparent. Knowing where energy is consumed and for what purposes is essential to efficiently organize the functioning of cities. Can we optimize power consumption in urban areas according to the city's changing behaviour? Precisely, one key challenge is designing public spaces, defining densities and building types in accordance with consumption patterns.

Finally, cities are intricate organisms with changing qualities that require variable interpretations and representations. The image of the city by day is continuous and made up of traces of the past (monuments as the collective memory), raising awareness of a social order which is visible by means of architecture.

By contrast, at night evokes presences and absences, taking the shape of a discontinuous landscape where nocturnal reference points depend on the presence and absence of light. These illuminated elements not only configure the image if the city but also the background of social relations, common imagination and collective memory. Unfortunately, entire buildings occupied by banks, hotels and shopping malls emerge as landmarks, uncovering a hidden cultural, economic and political order while public realm is treated homogeneously, regardless of its use and its population. If we consider this visual structure as a collective construction, new questions come into play. Who are the actors responsible of lighting buildings and who actually look at them? Who has the capacity to execute urban lighting?

In view of the above, there is still some work to be done regarding the city nocturnal design practices. Many experiences are necessary to shine light over a significant night-time imagination despite meaningful attempts from the field of art, in the form of ephemeral lighting festivals, or the discipline of urban design. Good example of Master Plans provide, at European level, urban lighting strategies both responding to technical and aesthetical complexity as Terzi (2001) in Rome, Antico (2011) in Antwerp and Narboni (2012) in Paris. However, a broad number of urban areas, especially in Spain, lack of nocturnal planning schemes that explore the complexity of the subject.

This is the particularly case of Barcelona where nightscape results from a series of regulations defining electrical consumption (organised by road importance) or meeting the requirements stipulated by the land register (generic and vague) -without providing a complete analysis of nocturnal urban question (*Figures 1-3*). Issues regarding the construction of the nocturnal space as a common background shaped by public and private stakeholders or direct participation of citizenship in the design of their immediate environment have been left aside.

This paper discusses the case of atNight, an ongoing research by the design studio 300.000 Km/s that addresses the question of nocturnal landscape as a necessary collective project. The project, in addition to developing hypotheses based on the city of Barcelona as a case study, seeks to propose new participatory design scenarios that are situated halfway between the traditional top-down planning and novel bottom-up new strategies. Before proceeding to describe the main results of the research, it will be necessary to go over a few cases of participation processes developed in the city in previous years. By contrast, these experiences serve as a starting point for constructing atNight project approach.

2. A new approach to participation

A large number of initiatives centred on citizens' participation have flourished in Barcelona over the past decades. Public authorities have organized several participation processes allowing residents to contribute with their knowledge and experience to major urban operations. Social dialogue and mediation between neighbours, technicians and municipal representatives has been widely practiced, although not without controversy.

The ‘Ateneu of Nou Barris’ is among the first experiences of citizen involvement in Barcelona. Within the framework of the increasing civic demands under democracy (1978), social movements and neighbourhood associations started to occupy abandoned industries to reconvert it in social and cultural spaces for the community. In Nou Barris, one of the poorest boroughs of the city, a group of neighbours occupied an ancient industry converting it into an Immigrant integration centre and an independent cultural facility, the Circus School. The self-management model, which was at the origin of the process, has served as an example of good practice for other communities. At present, the shortage of own resources has led to a loss of independence.

The case of ‘El Forat de la Vergonya’ illustrates a second aspect of participatory processes: the lack of consensus between social movements and public authorities. Between 2000 and 2006, the city council started a major urban regeneration in Santa Caterina neighbourhood. Along with the refurbishment of the existing market, various housing blocks were demolished

giving place to a new empty space that was occupied by local residents and transformed into a small park with a garden, playgrounds and stage for community meetings. Serious confrontations between police and neighbourhoods lead to the dismantling of the original communal space in 2006, ultimately transformed into an anodyne square.

At the other extreme, the example of the citizen consultation process for the transformation of Diagonal Avenue, one of the main civic axes in Barcelona, embodies the failure of participation policies. In 2009 the city Council launched a procedure in several steps (information, gathering opinions, feedback, draft of proposals and consultation) that was unsuccessful. The combination of a substantial reduction of cars with powerful articulated public transport system, and a strengthened and responsible use of cycling involved a qualitative leap forward in public commitment to sustainable mobility. Sadly, citizens rejected the proposal and therefore the possibility to considerably improve the quality of life and the city's long-term growth and competitiveness.

At last, the 'Pla Buits' (Vacant Sites Plan) is a recent illustration of the council strategies in line with European transparency and open governance directives. The initiative is aimed at getting public and private non-profit organisations to propose a use or activity and short-term management of 25 municipally owned sites for a period of one year (extendible to three). The interventions have to be reversible, and for social and environmental purposes. This case is a perfect example of the paradox that can emerge from participation processes. In a context of severe economic crisis and emerge of housing, the council is investing important resources in temporary interventions that will be deconstructed once the economic recovery will allow privates give these voids its planned use. Meanwhile, these traditionally abandoned and latent spaces offer a happy face instead of being occupied or showing a decadent scene. The owners of these sites also benefit from this transitory situation while waiting for the increasing of profitability.

In the light of the previous examples, we can draw useful conclusions regarding further experience. On the one hand, one of the main challenges of civic participation lies in citizens' capacity to take decisions against their own interest and work for the common good. On the other hand, it is also necessary to facilitate decision-making on issues concerning the future of the city and not addressing urgent needs. Another interesting line of action would be to mainstream alternative points of view to the classic duality of top-down and bottom-up approaches.

atNight project delves into this last line of research using new technologies and cartography to propose new collaborative design scenarios. Technical advancements over the past decade have completely changed the way we sense, seize, use, plan and build present and future cities. Besides architecture of stone and space, we should recognise an expanding landscape of invisible networks. While physically experiencing the city, inhabitants also generate a digital footprint, a generous amount of data which describes people needs, beliefs and reactions.

Mobile devices and the Internet have hybridised with social behaviours, enabling a more active role of citizenship in design process. We made the transition from traditional urban planning (passive model), based on big numbers and geographical/physical parameters, to new planning schemes (active model) that can actually take into account how citizens use and perceive the city.

This process, from a passive top-down to a more active bottom-up approach, should be leaded by architects and urban planners, playing a role of facilitators and translators of people needs. In this regard, we architects can use representation to mediate in the design process using drawing and cartography to empower individuals. Cartography permits a more conscious use of the territory, making citizens able to master space in their favour. From navigational charts to GPS, people have invented and used maps to help them define and order their world. Four hundred years ago in the Age of Exploration, cartographers employed compass lines to depict coastlines, rivers and harbours in the New World. Today in the Age of Participation, entities are re-envisioning mapping practices and adapting representation tools to the evolving need

of personal registers and micro geographies; at the same time, public bodies and private companies are opening Big Data for measuring the living condition of the city.

However, mapping should go beyond geographical illustration to unmask invisible urban relationships. atNight proposes to develop new instruments to capture the 'ephemeral' besides the geometry of urban plots and facades, taking information from citizens' interactions (actions, activities, emotions) as the basis for a better planning of urban environments.

3. atNight 2012-2013: Drawing the city with data

As explained earlier, atNight involves ongoing research and inquiry focused on the (re)definition of the nocturnal landscape of contemporary cities and the role of night-time in the construction of "urbanity". Since nightscapes rely on intangible elements, the project handles data analysis and cartography as fundamental tools for a better understanding of artificial milieu. The first phase of the research, developed during two semesters in 2013, resulted in a series of cartographies and registers of Barcelona nightscapes.

We aimed at designing, testing and deploying strategies to collect, analyse and represent information. Specifically, we used data visualization to set up a possible interpretation of night values by harnessing the immense power of visual communication to explain the relationship of meaning, cause and dependency established between citizens and their environment.

We classified the data into three main categories according to the source. First, we used information from Open Data and public geographic services regarding cartographic features and general statistics (demography, land use, streets layout, etc.). Second, we obtained mobility trends and energy consumption averages through agreements with public and private local agencies. Finally, we collected geo-social data sets by a systematic crawl of several location-based social networks API.

For example, we analysed geolocated Flickr, Panoramio and Instagram pictures, Twitter messages, Google Local markers or flow of movement across the city by taxi, bicycle or public transport. Availability of data collection in space provides an intensive and precise method of sensing citizen's activity in one to one scale.

The basic technological idea behind the project was to set up a platform that harvests data from geo-social streams and local Open Data providers, applies mining functionalities, extracts key elements and plots them on a series of maps. The research followed several phases -from the design of capture engines to the management of data via Geographic Information System, allowing parameters to be set and tuned in accordance with specific datasets.

From thematic cartographies, we identified hierarchies and relevant values, patterns and symbols, traces and absences, transforming data sets into meaningful urban stories. To illustrate, we highlighted the relationship between the busiest and populated streets, the most photographed sites in contrast to the most 'experienced' areas or the sentiment that swings at different time of day. The cartographies, classified in the three main guidelines of the project (visual structure, mobility patterns and activity), represented a first attempt to describe the uncharted territories of Barcelona.

3.1. Design opportunities at an urban scale

The elaborated cartographies draw conclusions with regard to future work. In terms of replication of the methodology, results suggest that the city can be represented using data from urban sensors and social networks. Unique architectural elements and most representative public spaces appear faithfully highlighted through many points of interaction that these places generate in the *Big Data*. Such approach denotes a direct relationship between the urban space and the data it generates *(Figures 4-5)*, allowing interpretations that not only speak about geometry but also about value structures. In fact, certain singularities within the urban fabric require innovative viewpoints related to the subjective interpretation that citizens make of their own environment.

Cartographies also shed light on some very specific issues regarding nocturnal urban planning. First, we verified that places of diurnal activity correspond to a greater degree with visual structure (*Figure 5)*. For example, synchrony between day and night appears to be dissimilar when comparing Twitter (short text messages expressing opinions, moods or reporting events) to Flickr activity (where the user uploads pictures). Visible city is directly associated to the places of daytime action –Twitter and Flickr match spatially *(Figures 9-10)*. By contrast, nocturnal activity occurs regardless of the presence and absence of light. If massive citizenship interaction is linked to highly illuminated areas, inhabitants make also use of other spaces situated at the dark margins.

On the other hand, cartographies revealed certain patterns at a local scale, probably influenced by topography of the existing territory and the economic level of neighbourhoods. For instance, analysis of the use public bike sharing system indicates increased number of stop and go movement during day-time (*Figure 7*). The decrease of the journeys during night-time may be explained by the fact that people changes mean of transport or that certain neighbourhoods concentrate more activity. Similarly, the number of trips by private vehicle shape a mutable urban fabric, which remains fairly uniform during day as opposed to night, when road hierarchy is redrawn based on variable intensity of traffic -while lighting sources illuminate uniformly the streets regardless of its fluctuating character (*Figure 6*).

Briefly, urban fabric reorganizes at night: activity shifts from the city centre to the periphery, traffic flows change, activities giving order to urban plot diversify and citizens use the city differently (*Figure 8*). Places of meeting, celebration and citizens' interaction are non-identical from the diurnal ones. Take as an example Passeig de Gràcia, one of the main civic axes of the city. It is a very crowded street with a large number of social interactions and a constant traffic flux during the day. The activity drops dramatically at nightfall, as the ground floor is occupied by commercial activities and there are practically no residents. However, it concentrates a large amount of illuminated buildings, due to its monumental character, along broad and profusely illuminated sidewalks -trying, unsuccessfully, to translate the same visual structure from day to night.

In conclusion, we must realize the existence of two cities, divergent images of the same Barcelona, which has a "double life" as Keppes (1967) would affirm: one under the sunlight and another under cars headlamps, neon advertising and streetlights. Comprehending how these separate perceptions interact with each other is one of the main points of the design of nocturnal landscapes and, therefore, of atNight research (*Figures 11-12*).

4. Atnight 2015-2016: Understanding behaviours

As described on the previous section, the earlier stage of the project introduced the first steps towards the future research that will be conducted during 2015-2016 in partnership. We verified that data capture and visualisation is a valid and accurate methodology for urban analysis. We also developed data mining tools and workflows between different environments and explored the limits of graphic rendering of *Big Data* forcing a redefinition of the own tools. In addition, we tested and confirmed, from the first elaborated cartographies, the methods we will use to aggregate and cluster the data.

On this second stage of the research, we will develop a cartographic model based on the description of the road system according to various time slots and time sequences. We will incorporate data from social networks, public transportation systems, urban morphology and economic activity to road infrastructure in order to propose flexible and dynamic scenarios of public street lighting. We will develop a predictive model responding both to citizen's behaviour patterns and energy consumption assessment.

Finally, we will identify relevant public spaces with fluctuating activities along the day. Owing to its variability, these sites will provide the appropriate setting for an experiment of participative lighting. We will design the pilot experience and involve public and private actors needed for its implementation in a subsequent stage of the investigation. Participation strategies will go

from the design phase, as cartographies will again be constructed from the citizenship interaction perspective, to the direct involvement of inhabitants in a pilot experience.

It is important to recall the collective character of nocturnal landscape. For instance, power consumption derived from illuminating either monuments or streets should be a shared responsibility. It should be noted that the excesses of some actors may penalize the whole of society (as determined by the Kyoto Protocol): The use of energy resources must be consensual, since they are limited. Illuminating a facade of a building can be an individual decision. Yet, in a dark environment, it models our social background in a decisive way.

In addition, the nocturnal metropolis is neither the complement nor the counter part of the daylight city but rather manifests special conditions. There is a dependency (extension, reflexion or translation) between them despite their uses are divergent and its inhabitants have changed. They are two cities that share fragments of the same scenario. In this regard, nocturnal landscapes should be reinvented as a completely different but complementary landscape.

Eventually, nocturnal city exists devoid of the memory we have preserved as individuals, due to gross breaches in lighting directives. If monuments shape the identity of many contemporary cites, at night these main architectonic symbols fade into darkness. The cityscape that contextualizes us as a society no longer belong to citizens. Still, nocturnal planning may not only be based on the enhancement of historical buildings. As Berque (2008) “ states "landscape should be an environment in which we recognize ourselves, by means of a mutual identification”.

In conclusion, these issues are particularly relevant to the discussion on nocturnal urban design. Questions such as energy resources, the invention of new nocturnal symbols and the impact of lighting in the construction of historical memory will involve a transformation of traditional design processes and tools, enabling us to translate decisions from the realm of the subjective to the objective evaluation and finding new hybrid formulas of participation.

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Figure 1, 2,3: Barcelona under sodium lamps. CC: Julio Martínez https://flic.kr/p/9mkhD6. CC: @J_Martu https://flic.kr/p/dmoqPj CC: SpirosK photography https://flic.kr/p/9chuvg

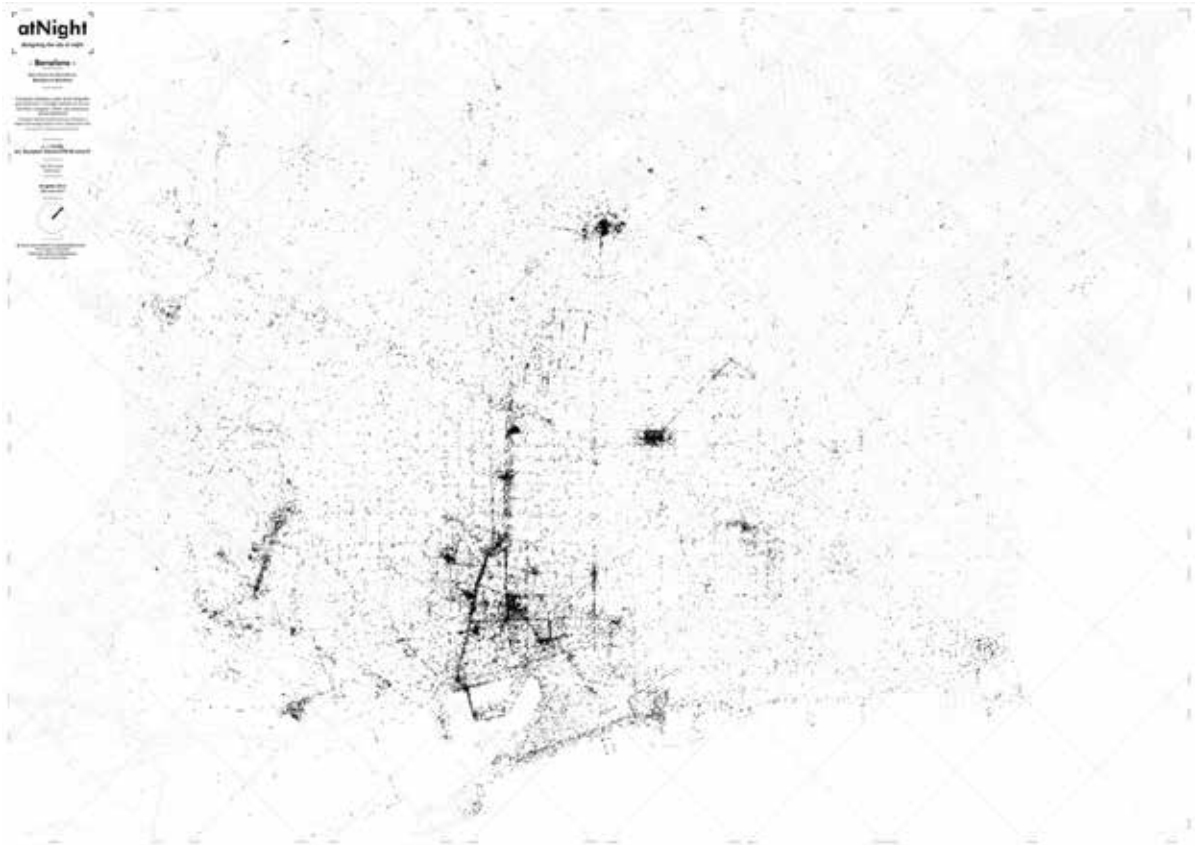

Figure 4, 5: cartographies Constellation Barcelona and Barcelona is Barcelona use Flickr and Twitter activity to define identity patterns.

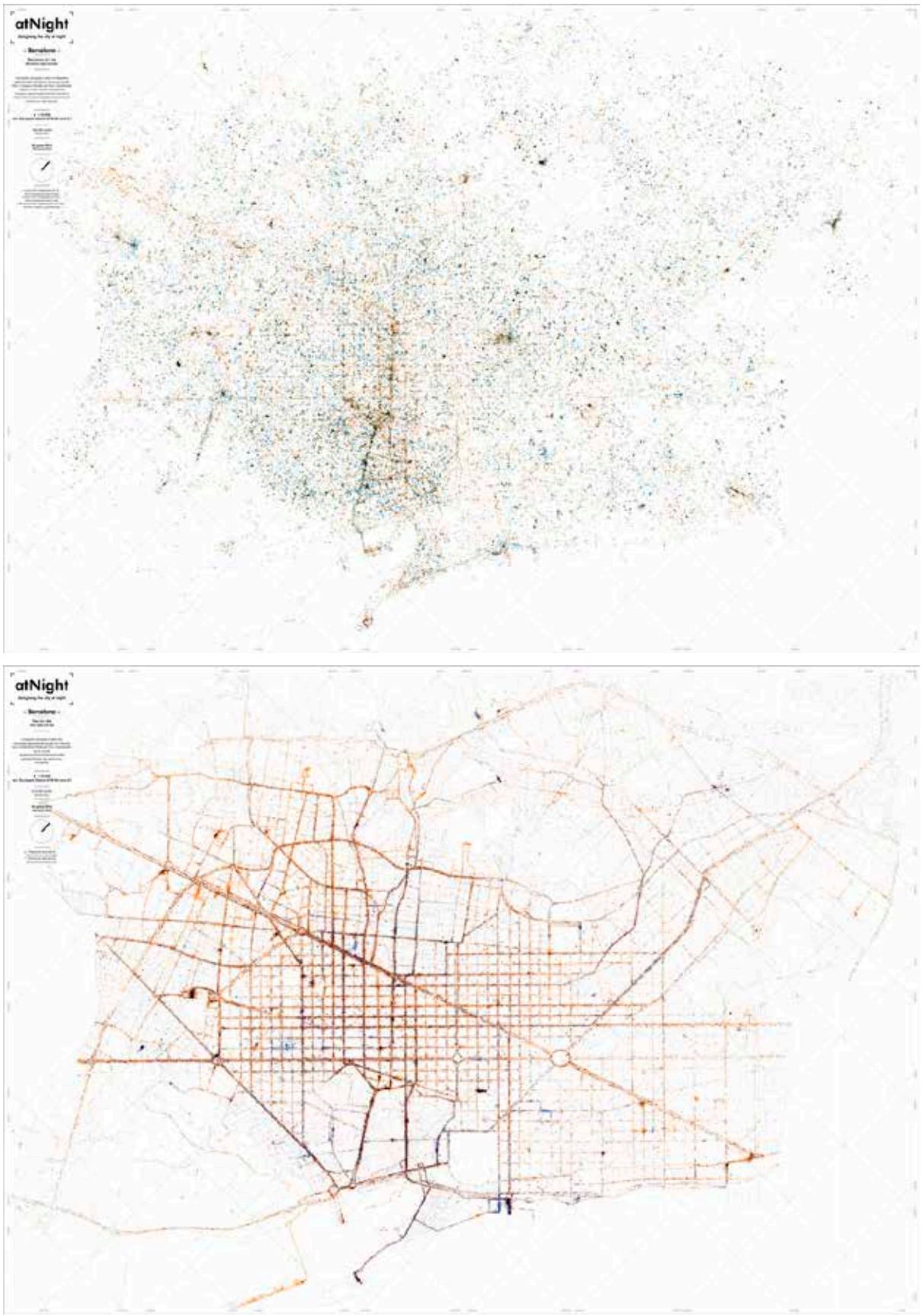

Figure 5, 6: day and night behaviour patterns from Flickr and Twitter social networks and taxi.

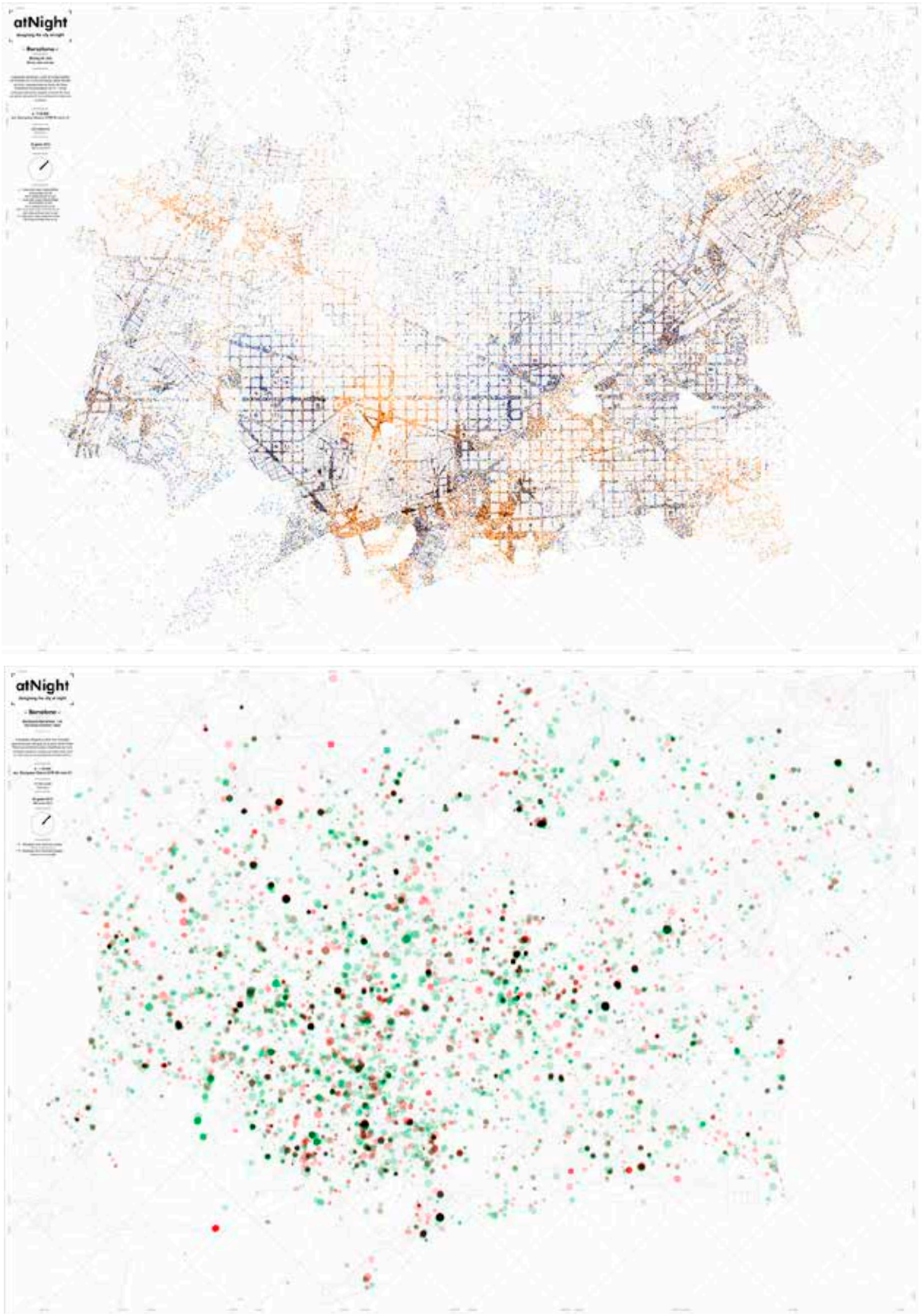

Figure 7, 8: mobility patterns of public bicycle sharing system; sentiment analysis via Twitter messages.

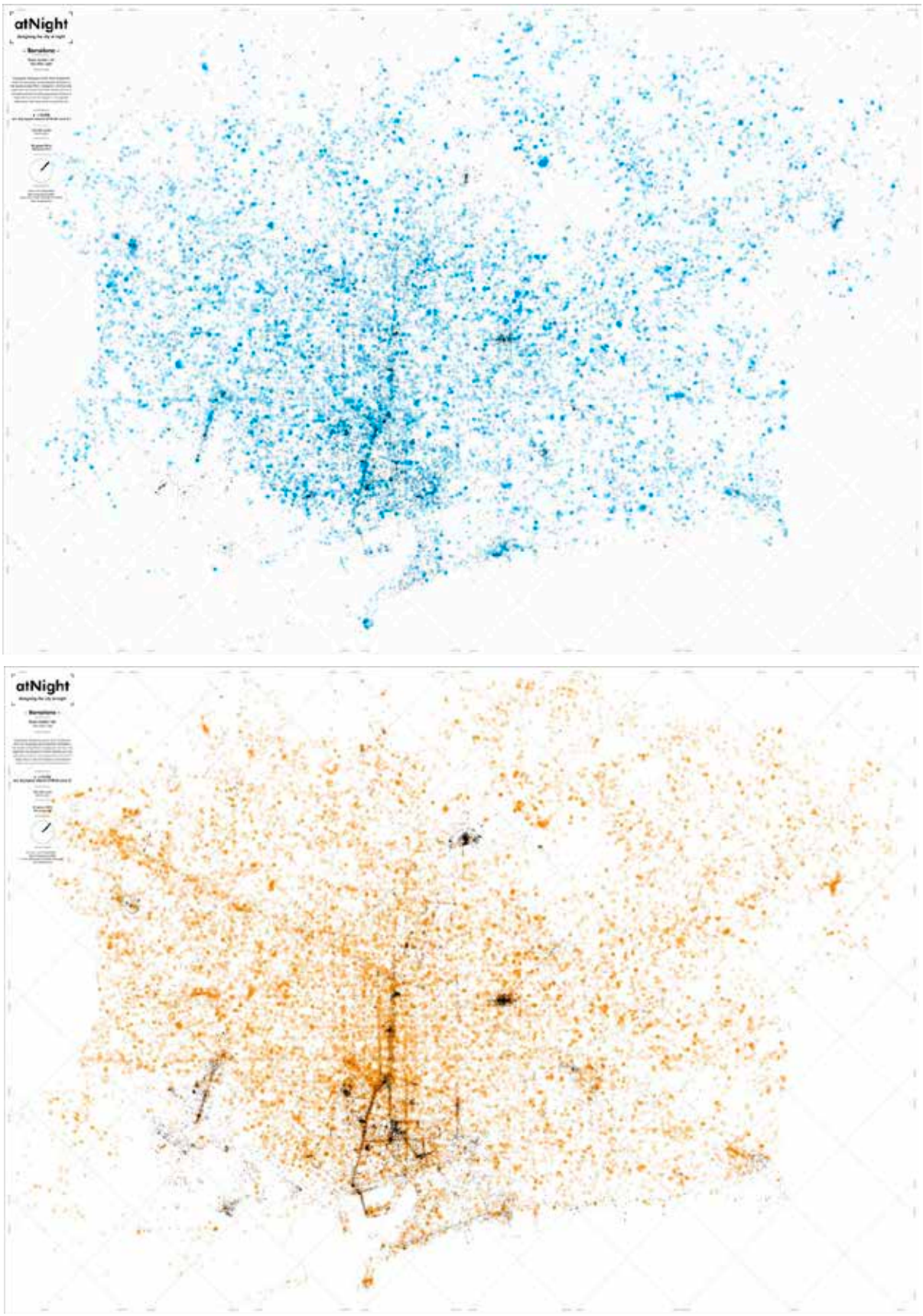

Figure 9, 10: comparison between Flickr visual structure and Twitter activity during daytime and nighttime.

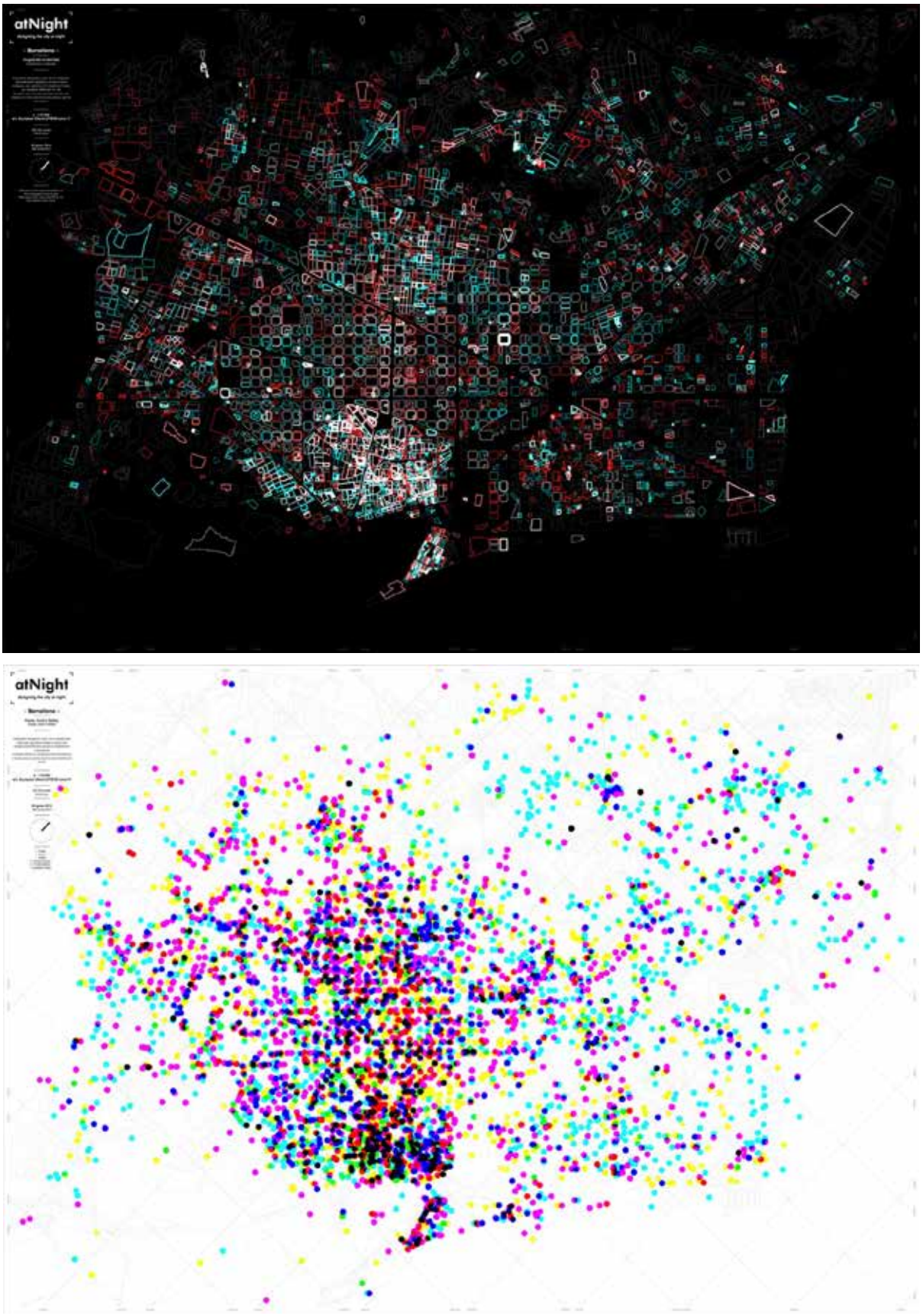

Figure 11, 12: synthesis of social network analysis and Google Places.