

Mapping permanence, change, data or the intangible. Urban and territorial graphic narratives in the digital era

Graphic representation of the city and the territory has traditionally been connected to the idea of permanence. Not surprisingly, architecture -and by extension the city- has been conceived as a stable embodiment of stasis (Lynn 1999). The physical limits of its materiality, conceived and built to endure in time and to shelter humanity against the changing inclemency of nature, have been graphically coded based on the projection of their geometry onto the plane, distinguishing between the built and the habitable space -a void that makes them useful- (Tse 376 BC).

Temporality, on the other hand, impervious to the graphic dissection of reality until now, was not part of that codification. Neither data nor change -apart from physical limits, dimensions, building mass or singular buildings, to name the

most common- have been a consubstantial part of these graphic narratives until the development of the contemporary mappings elaborated with G.I.S. tools (Rankin 2016).

The initial hypothesis of this research sustains that contemporary representation of the city is able to encode not only its physical permanence but also the events taking place within its limits or the information that exceeds the scope of the simply visual. This implies that both, the qualification of space (be it urban or not) or the understanding we may have of it, may be as significantly influenced by the built limits as they may be by the intangible that these embed. The aims of this research try to determine the validity of this hypothesis while comparing and analysing the graphic evolution of urban representation.



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Keywords:
Mapping; drawing; city; territory

BACKGROUND

Graphic representation of the city and the territory has traditionally been connected to the idea of permanence. Not surprisingly, architecture –and by extension the city– has been conceived as a stable embodiment of stasis (Lynn 1999). The physical limits of its materiality, conceived and built to endure in time and to shelter humanity against the changing inclemency of nature, have been graphically coded based on the projection of their geometry onto the plane, distinguishing between the built and the habitable space –a void that makes them useful– (Tse 376 BC). From ancient times, man longed to control the territory to dominate it and to be able to travel through it. In order to achieve it, its graphic representation has always remained as a challenge (Chías 2018). For centuries, drawings and maps of cities were drawn up and they were perfected over time with the development of topography, geography, representation systems and new technologies. However, two very different approaches have always coexisted: the perceived reality or the *visible city* (views and perspectives) and the objective reality or the *measurable city* (plans or maps) which can already be found in El Greco's famous canvas *Vista y plano de Toledo* (Calduch 2012).

Temporality, on the other hand, impervious to the graphic dissection of reality until now, was not part of that codification. Neither data nor change –apart from physical limits, dimensions, building mass or singular buildings, to name the most common– have been a consubstantial part of these graphic narratives until the development of the contemporary mappings elaborated with G.I.S. tools (Rankin 2016).

One of the earliest and most eloquent examples of envisioning data in a time-space context is indebted to Joseph Minard. His diagram of Napoleon's Russian Campaign is especially relevant. It shows the possibility of synchronizing in different layers of information numerical data displayed within a spatial context –something that plans had already achieved– as well as within a temporal framing –something that was undoubtedly a novelty

at the time–. Also photography, in the last third of the 19th century (for example, the movement studies by Edward Muybridge) and Italian Futurist painting during the second decade of the twentieth century or Marcel Duchamp himself in his famous *Nude descending a staircase* in 1912 –a painting based on a photographic study of human dynamics– had already posed the problem of the representation of change, of dynamics and speed, within the context of their respective graphic media in spite of the original static nature of such media.

AIMS OF THE ARTICLE

The initial hypothesis of this research sustains that contemporary representation of the city is able to encode not only its physical permanence but also the events taking place within its limits or the information that exceeds the scope of the simply visual. This implies that both, the qualification of space (be it urban or not) or the understanding we may have of it, may be as significantly influenced by the built limits as they may be by the intangible that these embed. The aims of this research try to determine the validity of this hypothesis while comparing and analysing the graphic evolution of urban representation. A certain selection of contemporary images of the city generated with digital tools may help us to draw some conclusions to gauge the implications of this new graphic realm, on the one hand, and to clarify the direction that research on the representation of the city must take, on the other.

Thus, confronted to a traditional architectural graphic representation based on the projection of the materiality of its limits that accurately describes how architecture, the city or the territory are configured, that is to say, what they are in a context of permanence, it is also possible to consider the possibility of a narrative that addresses the problem of what really happens within those limits. Therefore, a representation not of the city itself but, more precisely, of what it happens in such a frame of social and experiential relations considered in a dynamic context that may also include a representation of the intangible. Something that

indeed, in some cases, may contribute to qualify the urban space in such a decisive way as the built limits themselves.

METHODOLOGY

This paper aims to rethink the ways of envisioning architecture in an urban and a territorial scale. The fundamental reflection lies in the role played by the graphic representation of the city or the territory as a tool for the analysis of structures, systems, relationships or actions. The methodology is, accordingly, based in establishing relationships, analysis of their scope and their impact from images generated with a series of digital tools. In this context GIS or Space Syntax are shown as specific modes of working on the territory or the city, sensitive not only to the spatial component but also to temporal and intangible factors. In addition, we must bear in mind that thanks to the graphed results and the corresponding analysis generated with this type of contemporary tools we are able to determine series of relationships that would otherwise be impossible to show. G.I.S. are a good example of the latter by allowing the selective display of massive databases filtered *ad hoc* evidencing these relationships and connections within the spatial realm which every graphic representation implies.

In order to establish the conditions to analyse the drawings of the city or the territory we can define a taxonomy of them, a certain structure that allows us to sort not just the graphic information itself but the series of consequences that we intend to infer from these kind of varied representations. Thus, we can differentiate between those drawings that are generated through the 'projective cast' (Evans 1995) of the physical limits of the city or the territory obtained as an analogy of their material existence, on the one hand, and those representations that include the coding of information into this analogic representation of space. It is to be noted that this kind of representation based on analogy can be either generated with traditional means or with digital tools, that is irrelevant to this regard. We refer here to the distinction that

Deleuze (1988) establishes between the graphic representation based on projections, on the one hand, and the necessary codification of discrete information that characterizes the digital realm.

ON PERSPECTIVES AND CARTOGRAPHIES

The image of the city that we show in a drawing is elaborated through the graphic decisions that finally determine it. Not only the object of representation will condition that image but also the technique itself as well as the tools used will have an imprint in this process of representation together with the more or less visible intentions of the draughtsman. There are two ways of understanding the depiction of the city considering it the subject of representation: the perceived –*filtered*– versus the existing –*original*–, on the one hand, and the physical space of architecture versus the processes that take place in it (Fernández Galiano 1991), on the other. In the following paragraphs we try to exemplify and to analyse different cases of both types, but it is important to note that both forms intersect: just as the processes can be understood as objective data the physical space of architecture can also be represented in a customized way.

Regarding the kind of drawings produced by the impression that architecture or the city produce on us, we can differentiate two different approaches: one that directs its attention to the material and spatial aspects of the city, that is, the representation of it through perspectives, views, drawings, renderings or photographs that strive to *subjectively* reproduce an *objective* fact: the built artefact; and another one, which tries to represent the city as accurately and objectively as possible using plans and maps. The first kind of drawings make extensive use of linear perspective whereas the representation system used in the second is based on parallel projections. We can trace back the distinction already established between the differences of these two kind of representations as early as 1485 in Alberti's *De re aedificatoria* where he relates these drawings and plans with painters and architects, respectively [Alberti 1991, p.95]. Halfway between the aseptic information

and the more personal visual impression, we can observe the following paradigmatic examples.

THE DRAWING OF PERCEIVED REALITY

In figure 1 we observe a depiction, no doubt about it, of a real place. However, and despite the fact that this masterpiece bases its effectiveness on the references it serves (the city of Venice and its iconic piazza San Marco) the author's successful decisions have helped the canvas to achieve the repercussion it deserves. Not only the time in which it was painted but also the careful selection of the framing –we know that Canaletto had to be on one of the balconies of the first floor facing the central nave of San Marco–, the direction of the view, the technique used, the time of day, the atmosphere and even the small details that (including the nature of the actions represented) make the painting a fantastic collection of successful intertwined decisions. The canvas invites us to travel in space and time thanks to the wonderful representation of a 'snapshot' in which the memorable space of the city is the absolute feature in Canaletto's (1697-1768) graphic narrative.

Digital renderings, to a certain extent, are the current equivalent to this kind of perspectival city representations. In figure 2 we observe the invitation of Jean Nouvel, an international renowned architect, to imagine a series of proposed spaces, and how they would affect the final image of the territory. Atmospheres, relationships, uses and the scene itself is now reproduced by rapidly computer generated images rather than by the slow painter's work over the canvas. More than a substitution of techniques we face an adaptation of purposes: the role of digital graphic tools is usually to recreate the physical spaces of the city and explain the impact that these can have on the lives of the citizens as well as on the actions that they may develop. In summary, these images help us to envision and anticipate with great realism how the building or the city will look like before the construction on site has even begun. A second approach would be one in which the drawings, in addition to describing the material world that surrounds us, contain features expli-

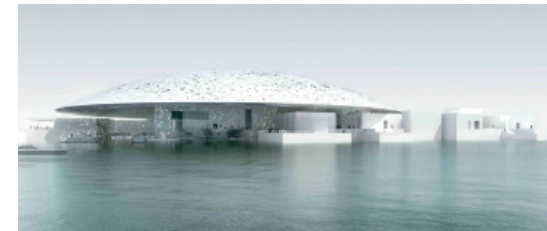


Figure 1. Canaletto, Piazza San Marco and the Basilica (1730). Oil on canvas.

Figure 2. Louvre Abu Dhabi (2009) Digital infographic. Jean Nouvel architects.

citly belonging to the draughtsman himself; either derived from his way of perceiving it or as a result of a personal way of expression. Thus, the drawing will be connected to a series of referents beyond those contained in the physical world and the result will be rooted in a phenomenology. Whether the aim is to depict the impression on the artist of a certain atmosphere or if it is about evoking a certain sensation in the spectator, the graphic expression will refer to a series of subjects different from those deployed by the ideal geometry.

Giovanni Batista Piranesi renders his *vedutas* –literally 'views'– (Figure 3) based on the physical architectural limits of the city trying to express feelings that go beyond the precise and rigorous dimensions of their real geometry.



Thus, vigorous use of chiaroscuro techniques and a picturesque election of the vantage points dramatize the depicted spaces evidencing a deep admiration of the pre-existing architecture and an unprecedented (phenomenological) way of representing it, rising space itself to an aesthetic category (Marcos 2014).

Something similar happens in Turner's (1775-1851) paintings. The intellectual leap proposed by him is based on a sort of geometric references of a real landscape; however, he manages to masterfully immerse us in a series of impressions and sensations that such a landscape produces, we know not if generated by the place itself or by the carefully chosen moment with its particular colourful light effects and the misty ambience. The rich assortment of tones and colours evoke a suggestive sunset atmosphere at Lake Petworth (Figure 4), portrayed more as an oneiric approximation to the landscape rather than that of a real, measurable, geometric and mathematical place represented through the physicality of its limits. The drawing of the territory as a tool for the representation of a sensorial experience, Turner seems to tell us, or is it more the transmission of the experience through the painting of the landscape?

THE CARTOGRAPHY OF THE EXISTING

Focusing on what we have referred to as the *measurable* city (understood as that part of reality conformed by its material limits) we find, first of all, what has been called cartography. This way of graphing bases its effectiveness thanks to a rigorous drawing that represents an architectural and urbanistic reality explained through the built limits that shape it. The representation of this reality is usually carried out on the most aseptic point of view, that

is, the infinite from above –bird's eye view as seen from an unlimited distance-. Parallel projection is the representation system used to represent the cartographies that deal with such material space.

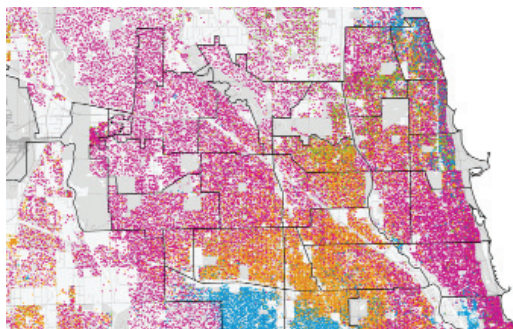
Numerous are the examples in the history of representation that direct their attention to the urban space in one way or another. Perhaps the case of the famous survey plan of Rome by Giambattista Nolli (1701-1756) that we have chosen to analyse (Figure 5) is especially interesting since, considering the premise exposed above of drawing the static city, it implements an additional purpose in the representation of the public space: the city is understood as a series of buildings (represented as solid limits) that are articulated thanks to the public space of the streets (which are codified as voids). This criteria is applied consistently throughout the whole survey plan taking advantage of the powerful perceptive ground-figure relationship and the association of such codification with a clear meaning. Accordingly, Nolli includes the representation of the ground floor of the numerous churches and palaces of the Italian capital using the same graphic codification. Thus, these spaces, despite of being proper interiors, are shown as part of the complex and rich network of public spaces, something which clearly shows the continuity of these spaces within the city, regardless of their private ownership or not. These, added to the *piazas* and the streets rigorously represented, make up a spatial body that, faced with the rest of the elements, allows for an additional, interesting and unprecedented reading of the whole truly *public* Roman space.

Considering a number of different reasons, the plan that Ildefonso Cerdá (Figure 6) drafted to defend his famous proposal for the extension of Barcelona in the ninetieth century proposes another form of representing the built space of the city displayed in the graphic information. The design of its proposal sharply differs from the urban landscape and pre-existing urban grid with medieval imprint. The extension proposed for Barcelona by Cerdá establishes a large area around the old quarter of the city on a clear hipodamic grid while fixing a series of parameters such as streets, inte-

Figure 3. Veduta del la Fontana di Trevi (1778) Aguafuerte. Piranesi (1720-1778).

Figure 4. Turner, The Lake, Petworth, Sunset (1828). Oil on canvas.

Figure 5. Giambattista Nolli. The large survey plan of Rome (1748). Ink on paper.



rior spaces, buildings, gardens, that determine a successful set of urban relationships of the urban tissue. Graphically, all this information is elegantly codified in a clear and precise way that helps to read the new future of the city to come, with its characteristic features of the chamfered corner blocks and the open spaces within them that is still a hallmark of Barcelona's urbanism.

THE IRRUPTION OF CONTEMPORARY MAPPING

Nevertheless, in addition to this way of drawing, traditional and effective but merely based on projections, it is also possible to address another type of contents of a different nature, that is to say: pure information. This allows us to achieve a result that we can properly refer to as mapping (Juan, Marcos 2007). Although it is possible to code information in architectural and urban plans independently of the tools employed to draft them, in as much as these kind of graphic representations are what Godman (1976) refers to as notational drawings: information beyond the mere constructed fact, it has been the irruption of new technologies and, above all, the potentialities inherent to the digital world and its networked connectivity, what has improved the possibilities of such 'graphic writing' to be further developed. This referred mapping is capable of synchronizing georeferenced information and built space, either statically (data) or dynamically (actions, flows). The series of possible displays is simply overwhelming, not only because of the varied methodologies that are deployed choosing the kind of information we want to work with, but also because the content far exceeds the one derived from visual perception. Perhaps one of the examples that most obviously inaugurates this symbiosis between data and graphing in a territorial context, is the cholera map represented by John Snow (1813-1858) for nineteenth-century London (Figure 7).

Figure 6. Ildelfonso Cerdá. The Cerdá plan (1860) Ink on paper.

Figure 7. John Snow. Lodon's cholera map (1854) Ink on paper.

Figure 8. William Rankin. Mapping social statistics (2009) Digital media.

Over the traditional representation of the city (using a line to delimit the built city from the streets -which are also named-) a point cloud dataset encoding the number of detected and georeferenced cases of cholera is superimposed on what we could envision as the state of the art -at its time- of a primitive Geographic Information System. The reading of this plan implies a fascinating experience since a part of the invisible city is unveiled to our eyes, and it urges us to ask ourselves about the possibilities that mapping, understood as the superposition of different data bases and methods of graphing them, is able to display. The cholera cases were as real as the city's built limits, but a plan only based on the analogic projective system would not have been able to show their existence. It was only through Snow's ability to codify this information that he made it possible to envision the concentration of cholera cases and their location on the city map, an information vital for the local authorities to prevent the epidemic spread out.

This way of displaying -and managing- codified georeferenced information implies a decisive step in the organization and drawing of the city and the territory, and can therefore be considered a precursor of contemporary eloquent examples. Such is the case of the mapping done by William Rankin on a cartographic basis of the city of Chicago (Figure 8). Using point clouds, Rankin, codifies the information regarding the origin of the inhabitants: one colour for each ethnic group and a number of inhabitants for each point. Thus, not only the variety of ethnic groups or their concentration is shown in the map but, what is more important from a town planning point of view, this is a georeferenced information. That means that we know the number of significant ethnic groups living in Chicago, the density of the different areas as well as their distribution within the city limits: a certain ethnic *ghettification* can be clearly observed in this case. It is to be noted that Rankin no longer worries about drawing the visible and recognizable part of the cities -beyond its coastline-, that is to say, the main communication avenues, streets or the built urban tissue with the exception of the limits of the districts studied.

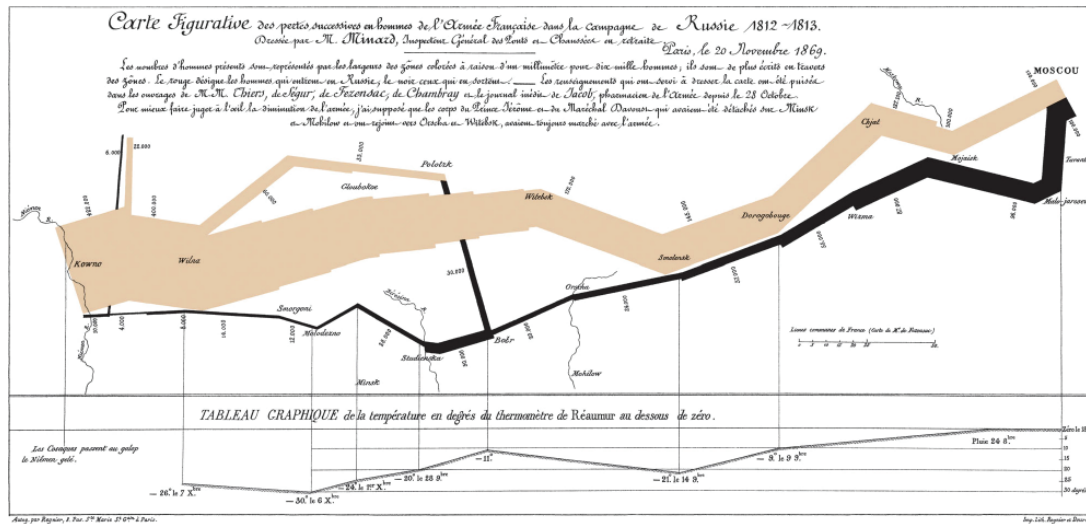


Figure 9. Map of Napoleon's disastrous Russian campaign (1812) Ink on paper. Joseph Minard (1781-1870).
Figure 10. Eric Fischer. Flickr and Twitter locations (2011) Digita media. Source: <https://www.flickr.com/photos/walkingsf/5912946760>

On the contrary, the cloud of qualified points with colour show the city according to an existing but unnoticed reality.

CODING INFORMATION

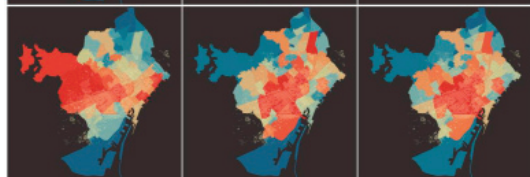
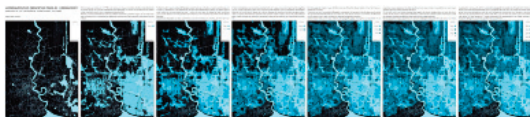
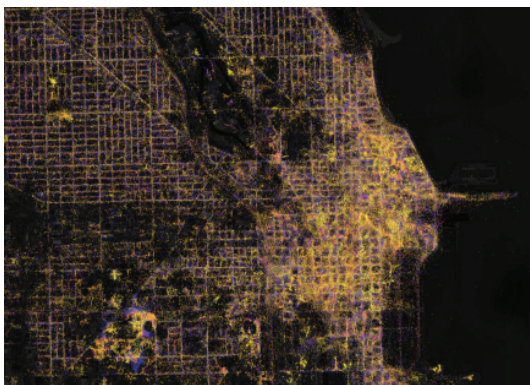
The map of Napoleon's Russian Campaign (Tufte 2007) by Joseph Minard (Figure 9) seems to us, as mentioned in the introduction, especially significant since it inaugurates a new way of displaying and envisioning information based not so much on graphic georeferencing but also on the possibility of including timely processes and their relationship with complete datasets of different nature. On a spatial basis in which only a series of significant water flows or rivers are drawn, a plan is developed showing a process taking place through a route, a series of related events, a temperature record, the information of the number of people in the army that were able to survive at each step of the campaign, and a long etcetera: the readings of the map are not necessarily linear. In addition to the analogy (to which the rivers weakly refer to) Minard incorporates the coding of information and its organization (something that

Snow would use years later in his London's cholera map) and, moreover, he adds something that, in one way or another, will condition the rest of the map of contemporaneity: the introduction of the temporal variable and the possibility to merge datasets of different nature and magnitude. This information allows the analysis of events taking place in an unprecedented way, something which provides architects and urban planners an incredible tool to study not only the city's morphology but what can be more important in many cases: the events, the processes, the sequences, the flows, the gradients of intertwined data that escape from the traditional visual representation of the built city.

SOME PARADIGMATIC EXAMPLES

The drawings that we analyse below are part of the set of maps generated thanks to the use of contemporary technologies. Either through the incorporation of the processes derived from their use (information derived from GPS, social networks, Wi-Fi networks, etc.) or thanks to the processing of millions of operations necessary to elaborate

information with databases never before within our reach, the advent of the digital potentialities embedded within the tools of graphic expression has introduced a continuous challenge. We can observe, for example, the result of drawing on a georeferenced two-dimensional space the posts within the social network Twitter in which the location has been shared via GPS in Europe. The final drawing, logically limited temporarily, is an unpublished representation of the territory of our cities through this information coming from the address of the device's internet protocol (IP) showing the frenetic activity in some metropolitan areas in the use of this social network (Figure 10). As it can be easily seen, not every country is as keen in the use of these social network as could have been expected; the English and the Dutch seem to be more addicted to their use. Researchers and contemporary cartographers, as is the case of Eric Fischer (Figure 11), making use of a tool that has only been available for a couple of decades, are beginning to sketch, as if the discovery of a new continent were taking place –and to some extent it can be considered so beyond the



metaphor-, new maps as a result of the chosen datasets. For instance, big data of the wireless networks of the American cities, begins to be an information with which, properly parameterized, filtered and conveniently codified and represented, we are able to produce knowledge and gather valuable information. The drawing of the city, freed from the physical condition of the spatial limits that configure it has been transformed into a dynamic representation system in which processes, and events, are as important as the space where they take place. In this way non-visual stimuli (sounds, temperatures, textures, Wi-Fi activity, demographic features, social networks activities, traffic or pedestrian flows, to mention only a few) deployed in time and in space, will be part of the graphic representation of the city, giving us relevant information impossible to relate without this graphic envisioning. In a field of knowledge characterised by a static approach, such as that of traditional graphic representation, digital tools allow to merge temporality and space in new ways that were simply unimaginable a couple of decades ago. Architecture and the city, in this eloquent way, may be stored, transmitted and, what is more important, taught, not only through the construction of the material space that undoubtedly conditions and defines it, but also, thanks to the repercussion and the reach that these physical elements have in our society and how the perpetually changing and evasive urban reality can now be graphically displayed. It is interesting to compare the very different codification and appearance that the mappings of figures 8 and 11, both envisioning different datasets and type of information, on, however, the same city (Chicago). Relating the in-

Figure 11. Eric Fischer. Chicago Wi-Fi networks mapped out (2015) Digital media. Source: <https://www.mapbox.com/blog/world-wifi/>

Figure 12. Illustration of territorial movement studies in London (2018) Digital media. Source: <http://spacesyntax.org/>

Figure 13. (above) Study of flood hypothesis. Student Pablo Comino Silla (below) Different analysis related to the "tardeo" in Alicante. Student Carlos Pastor. 2018. Subject: Graphics tools for planning. University of Alicante.

formation in both mappings we can deduce which ethnic groups are more 'Wi-Fi active'. With initiatives like the one developed by Bill Hillier and Julienne Hanson at the Bartlett School of Architecture since 1984, the theoretical basis for the use and specialization of software applied to the representation of flows and gradients over the territory began to be defined. The study of the movements in Figure 12 is a good example of the application of a graphic strategy that, thanks to a methodology that focuses on the human being (and his/her use of the architectural space), guides the analytical process of its development in a digital and contemporary context intimately linked with the problematic derived from the social. In this way the graphic results are presented more as a final part of a procedure, as an element of verification and testing, almost as a pulse of the city's liveliness, of the contemporary needs. The flows and intensity of the movements of the inhabitants of London –a complex problem- can be easily read and understood in the mapping of Figure 12. It is also important to note how all these representation digital tools have made extensive use of colour as a tool to code information. In this particular case we can relate the intensity of the flows that vary from the warm tonalities to the cold ones: a range easily read through this wise codification.

THE CHALLENGE OF TEACHING CONTEMPORARY GRAPHIC REPRESENTATION ON THE URBAN SCALE

In this new scenario that we have outlined, one of the fundamental pillars that we must bear in mind is the fact that teaching must implement these tools together with their incredible potentialities. The graphic expression of the territory has a character, currently, radically different from the one it had twenty years ago. We cannot miss the opportunity to introduce these lines of research within the learning of graphic skills amongst our architecture and town planning students. In the first place, the fact that we are more easily sensitive to temporality allows us to analyse the city introducing the sequence, the process or the event, so that students may more easily relate the space

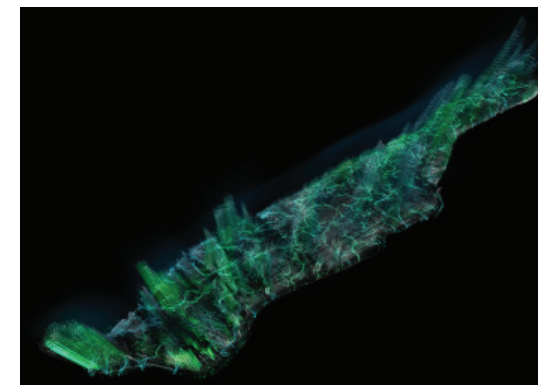
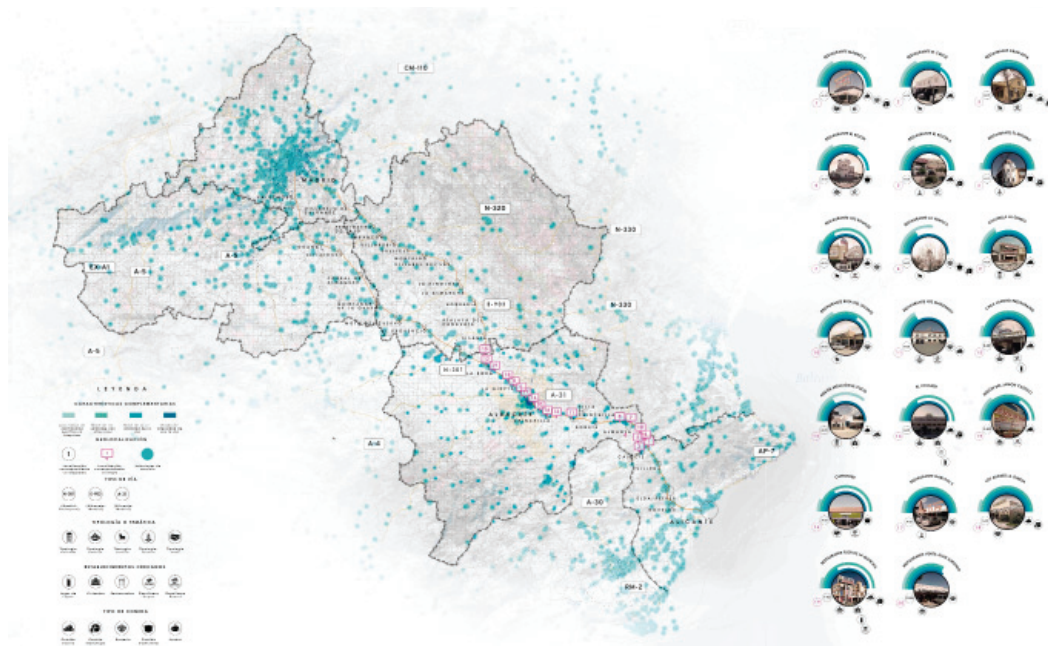


Figure 14. Geo-referenced information about Albacete service stations. Student María Jesús Salcedo. 2018. Subject: Graphics tools for planning. University of Alicante.

Figure 15. Rezoning of New York City as space-environment through Big Data Processing and simulation by e(airoa)-Architects: Pablo Lorenzo-Eiroa; designers: Alejandro Mieses Castellanos, Tamara Orozco Rebozo, Francis Egipciano Cruz, Linnette Guitierrez Ortiz (Lorenzo-Eiroa 2019).

with the activities that take place within it. In the sets of diagrams in figure 13 we observe how the students, through the printed sequence or the digital video have been able to map spatial data and temporal events.

Considering the commitment that contemporaneity has with digital technologies, social networks and big data, we must be able to organize information, whether coded or not, spatial or temporal, massive or discrete, following a series of pre-established strategies and hypotheses. Figure 14 displays georeferenced information from a web database with a series of additional graphs that help to contextualize the content and to guide the possible readings so that they serve as an instrument of conditioned analysis. Although the drawing and analysis of the territory is, no doubt, a field of continuous improvement as well as a frame in which to find answers, the questions we ask

ourselves are as important as the way to organize and codify the information with which we decide to work. It is in this sense we state that the way to codify and graph the information can be understood as a construction of a set of questions that may condition the answers as much as the considered data itself or its organization.

RESULTS / CONCLUSIONS

The final graphical results, partly drawn from the students' work for teaching assignments, will underline the main conclusion of the research. Namely, that this analytical and quantitative mapped information can decisively support project decisions, displacing the action of mapping what the city is to the operation of mapping what happens within it, in addition to inaugurating a field of research anew until the advent of these tools.

Likewise, the action of rendering cartographies is opposed to mapping with G.I.S. technologies that allow to 'make visible' -as Klee suggests regarding the drawings- (Deleuze, Guattari 1988) what we cannot see however present as it may be. Data and relationships that allow establishing bridges, connections, structures and systems related to each other.

All this information is only possible to edit and exploit based on the intrinsic operability and computational capacity of computers to graph and to relate data contained in large georeferenced databases, or with the use of G.I.S. For example, the images proposed to be built by Pablo Lorenzo-Eiroa (Figure 15) of the city of New York are unpublished, original and, at the same time, the result of a reading of the existing reality following current criteria. In this sense we can end by stating that we have the incredible opportunity almost anew, to re-

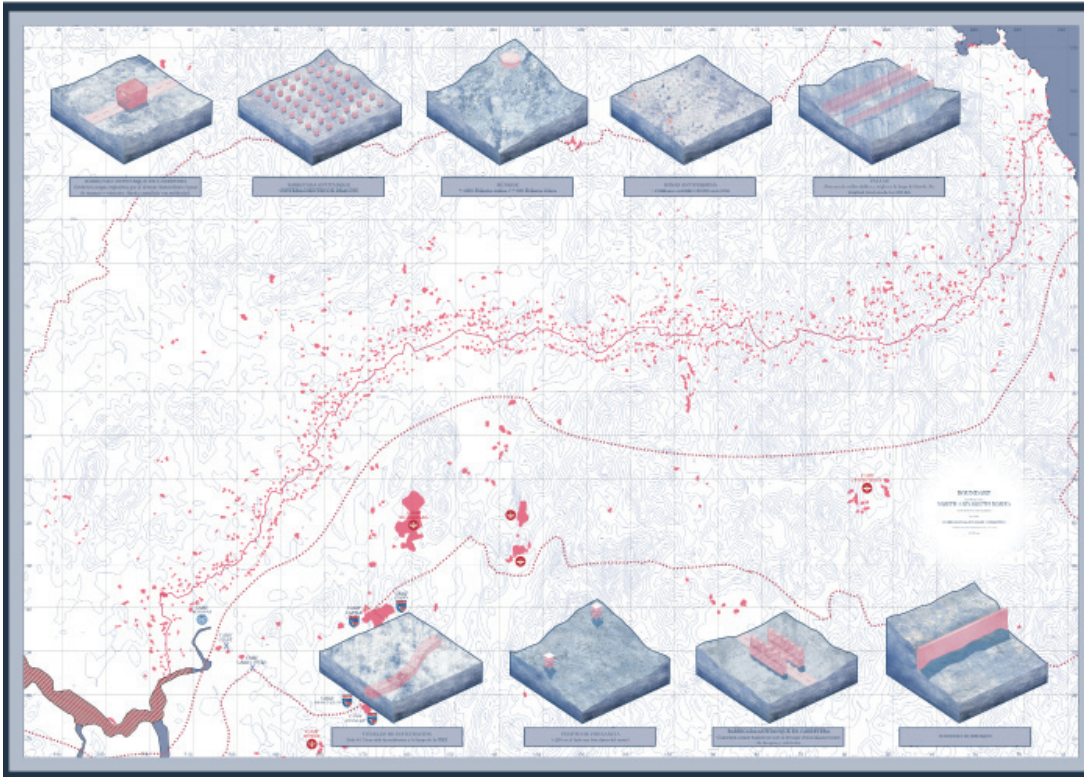


Figure 16. Geo-referenced information about north korea border. Student Nuria Martínez Martínez. 2018. Subject: Graphics tools for planning. University of Alicante.

present a sort of invisible cities –not imaginary as Italo Calvino’s suggestive text posed to us some years ago- that have never before been possible to represent. The paradigm that the digital technologies have drafted out in the context of the representation of the territory and the city has somehow dispelled the fog that concealed it presenting a new path for research that, boundless, extends before us for the first time in history.

The massive processing of information and Big Data, the georeferenced agents and events of the city, the accessibility to data provided by the Internet and public collections of datasets on cities

and the territory make up the new tools that the twenty-first century draughtsman has the need and the chance to use with maturity and rigour. Surveillance of public or even private data that social networks use for their own profit is a clear risk regarding our individual privacy for which authorities should work to control and limit. However, thanks to many of these datasets we are able to envision contemporary cities in unprecedented and wonderful ways that may shed light on how to tackle urban problems that some decades ago could only be fictionally envisaged but that have now become a promising and challenging reality which we must learn to face.

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