FACING THE OVERTOURISM CHALLENGE IN CULTURAL AND NATURAL HERITAGE SITES USING OPEN/BIG DATA

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TURISME COMUNITAT VALENCIANA

Interreg Mediterranean HERIT-DATA

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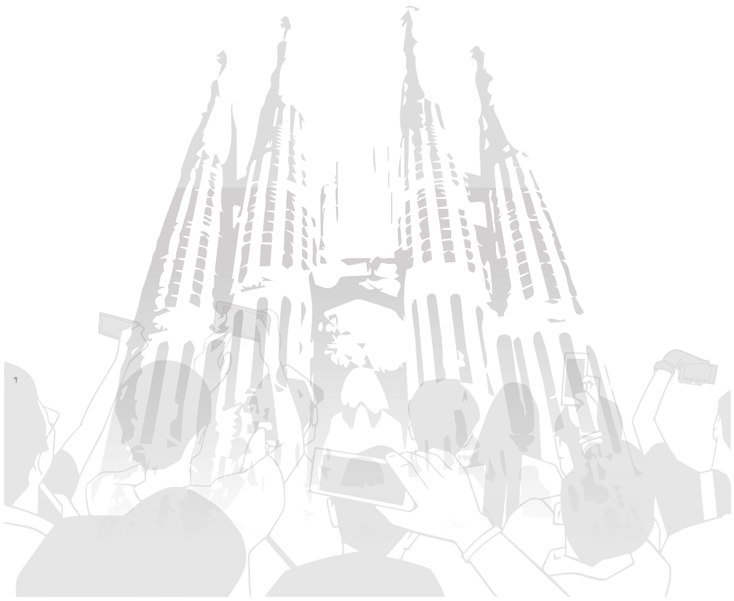

01 Introduction

02 State of the Art

03 Case studies and Good practices

04 Conclusions and recommended actions

FACING THE OVERTOURISM CHALLENGE IN CULTURAL AND NATURAL HERITAGE SITES USING OPEN/BIG DATA

page

INTRODUCTION

1

7

1 1 Herit-data. The role of TURISME COMUNITAT VALENCIANA (TCV) as a partner of the project 8

1 2 Objetives of the research 10

1 3 Study methodology 11

STATE OF THE ART

13

2 1 Progression of urban tourism and its primary challenges 14

2 2 Primary flows and tourist crowds 18

2 3 The heritage city, overcrowding and impacts 22

2.3.1. PROBLEMS OF TOURIST OVERCROWDING IN CITIES 22

2.3.2. THE HERITAGE CITY IN THE FACE OF TOURIST OVERCROWDING 25

2 4 Managing tourist flows 29

2.4.1. ACCOMMODATION CAPACITY AND CURRENT SITUATION OF TOURIST-HERITAGE DESTINATIONS 31

2.4.2. MANAGING TOURIST FLOWS 36

2 5 The role of technology in the analysis and management of overcrowded tourist cities 38

2.5.1. TRENDS IN THE DIGITAL TRANSFORMATION OF TOURISM 38

2.5.2. USE OF TECHNOLOGY BY TOURISTS 39

2.5.3. SMART CITIES AND REGIONS: BIG DATA IN THE SPOTLIGHT 40

2.5.3.1. BIG DATA PRINCIPLES

2.5.3.2. CAPTURING DATA IN THE IMMEDIATE SURROUNDINGS: INTERNET OF THINGS

2.5.3.3. SMART CITIES

2.5.3.4. SMART DESTINATIONS

2.5.3.5. SOME COURSES OF ACTION FOR DATA HANDLING AND CONTROL OF MASSIVENESS

2

CASE STUDIES AND GOOD PRACTICES

3

CONCLUSIONS AND RECOMMENDED ACTIONS

4

3.1 Introduction 60
3.1.1. CURRENT AND FUTURE CHALLENGES 62
3.1.2. STRATEGIES TO MITIGATE THE NEGATIVE EFFECTS OF MASS TOURISM 64
3.1.3. SHARED CHALLENGES FOR MITIGATING THE NEGATIVE EFFECTS OF MASS TOURISM IN CITIES OF HERITAGE VALUE 66

3.2 Region of Valencia. Valencia y Benidorm 70
3.2.1. VALENCIA 70
3.2.2. VALENCIA_SMART CITY 74
3.2.3. LA MARINA. VALENCIA 76
3.2.4. BENIDORM. ALICANTE 78

3.3 Barcelona 80
3.3.1. CITY OF BARCELONA 80
3.3.2. LA SAGRADA FAMILIA 84
3.3.3. TURÓ DE LA ROVIRA 86
3.3.4. BARCELONA MORPHOLOGIES OF TOURISM 88

3.4 Occitania 90
3.4.1. PONT DU GARD 90
3.4.2. SAINT GUILHEM-VALLEE HERAULT 92

3.5 Florence 94
3.5.1. CITY OF FLORENCE 94
3.5.2. UFFIZI GALLERY 99
3.5.3. DATA-BASED PLANNING FOR A SUSTAINABLE TOURISM IN TUSCANY 100

3.6 Western Greece 104
3.6.1. OLYMPIA 104

3.7 Amsterdam 106
3.7.1. CITY OF AMSTERDAM 106
3.7.2. SCHIPHOL AIRPORT 109

111

4.1 General conclusions 112

4.2 Guidelines 114
4.2.1. UTILITIES OF NEW TECHNOLOGIES IN MASS TOURISM MANAGEMENT IN HERITAGE SURROUNDINGS 114
4.2.2. TOWARDS A COMPREHENSIVE TRIPLE AXIS MODEL: TOURISM, URBAN PLANNING AND MOBILITY 116
4.2.3. OVERTOURISM AS A PROCESS 118
4.2.4. TOWARDS A REGIONAL MODEL 120

4.3 Recommended actions 121

INTRODUCTION

1

1 1 Herit-data. The role of TURISME COMUNITAT VALENCIANA (TCV) as a partner of the project

1 2 Objetives of the research

1 3 Study methodology

1.1 HERIT-DATA. THE ROLE OF TURISME COMUNITAT VALENCIANA (TCV) AS A PARTNER OF THE PROJECT

One of the objectives of the so-called cohesion policies of the European Union (EU), is to work to reduce the existing inequality among its different regions. In this line, the community Executive promotes different actions in order to achieve a more innovative, sustainable and inclusive European area. All of these actions, among which is included the Interreg Europe financial instrument, are set within the growth and employment agenda known as the Europe 2020 Strategy (2014-2020), financed by the European Regional Development Fund (ERDF). This financial instrument is different regarding objectives, execution, and funds, from other cohesion programmes, case for example of transnational and/or cross-border cooperation. The primary purpose of Interreg Europe is to support all types of interested agents and institutions belonging to the different European regions, implementing a series of concrete development and knowledge policies and actions, sharing experiences and implementing good practices when these are transferable.

The eligible countries for the development of the project include the 28 Member States, and the outermost regions of Norway and Switzerland. Furthermore, the entities of other countries may participate in the different calls, provided that they incur their own costs. The scale approach of this type of European project is regional, according to the sharing of its different objectives, problems or interests. For instance, the MED projects bring together partners from countries in the Mediterranean region.

In this context, the Integrated Territorial Project "HERIT-DATA" emerges, in which Turisme Comunitat Valenciana (hereinafter TCV), in one of the participants. In accordance with its data sheet (https://herit-data.interreg-med.eu), this project has as its objective "to reduce the impact of human activities related with tourism in the areas of culture and heritage". A project that coincides with the celebration of the Year of European Cultural Tourism 2018, promoted by all of the EU institutions (European Commission, European Parliament, and Council of the European Union, in addition to the Committee of the Regions and the European Economic and Social Committee). All of them have been organising different events to celebrate this year, launching different activities focused on the protection and enhancement of cultural heritage (https://europa.eu/cultural-heritage/about_es).

The "HERIT-DATA" project, is expected to identify the best techniques and tools for sustainable planning and responsible tourism management in certain MED regions and cities, selecting for this some cities or regions with mass tourism and that treasure significant cultural heritage.

It intends to visualise the harnessing of new technologies and innovation, in particular, by using management tools, in the context of the smart cities and the use of Big Data. Furthermore, it includes, any other social or urban management policy or measure, that helps to improve the general state of the cities, including their touristic and heritage part.

The project seeks to first develop, then test and finally transfer, a series of knowledge and solutions, in line with the changes and characteristics of the tourism sector at present. Many of the tools used for this, requires the recognition of the rapid technological advances in a global and competitive scenario, in which cities embark on the complex race to be the most efficient and innovative, thanks to the use of new technological platforms and applications. The most clear case of the foregoing is the appearance of those known as Smart Cities at a general level, or the development of Smart Tourism Destinations (STD) particularly. All of these cities gather data in a massive way, they process them and look for effective solutions to certain problems, among them the overcrowding of their urban areas and their primary touristic resources.

The same data sheet as the project also indicates that the recommendations given by the EU in matters of Integrated Coastal Zone Management (ICZM) should be taken into account, without forgetting the cultural, heritage and urban environment protection objectives (European Commission, Quality of Life in European Cities. 2015).

Any result of interest obtained derived from the application of this European project, should contribute to the proper diffusion and improvement of the processes, especially directed at decision making in the heritage and touristic cities, always from a holistic, multidisciplinary and inclusive approach.

Once presented these motives, TCV offers in its capacity as partner of the HERIT DATA project, a solid commitment to work and collaboration. Prepare and present the present analysis, by means of a complete State of the Art of the heritage situation of some cities, testing the level of implementation of certain technological tools for the analysis and management. In this respect, TCV has found the analysis of the cases of the following destinations interesting: Valencia, Barcelona, Region of Occitania, Florence and western Greece (Olympia). In the same way, Amsterdam is proposed as a city of analysis and contrast, all this without overlooking any other world or European experience that may be of interest in order to comply with the objectives of the present work. To summarise, it is about making known different works that are being developed in the MED community space, and with it the possibility of sharing ideas, techniques and knowledge, some of them with a history for their exchange and adaptation in different cities and regions.

KEY WORDS:
Cultural heritage, management of man-made threats, management of risks, tourism, load capacity, monitoring, UNESCO World Heritage, cruises, smart destinations, support system decisions and Big Data.

KEY DELIVERABLES OF THE PROJECT:

- Benchmarking of touristic overcrowding experiences.
- Measurement of indicators of load capacity for each selected destination.
- Informatic application for tourists and visitors.
- MED strategy for the destination of sustainable cruises towards the cultural heritage.
- Model for the management of mass tourism.
- HERIT-DATA memorandum of understanding.

Partner Leader: Regione Toscana - Department of Infrastructure & Technology (IT).

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More information and intro: https://herit-data.interreg-med.eu

1.2. OBJECTIVES OF THE RESEARCH

The primary objective of this research is to prepare a benchmarking study on the management undertaken by diverse tourist destination in relation to mass tourism, its planning and lines of action; especially when new technologies are used to manage the flows of tourists.

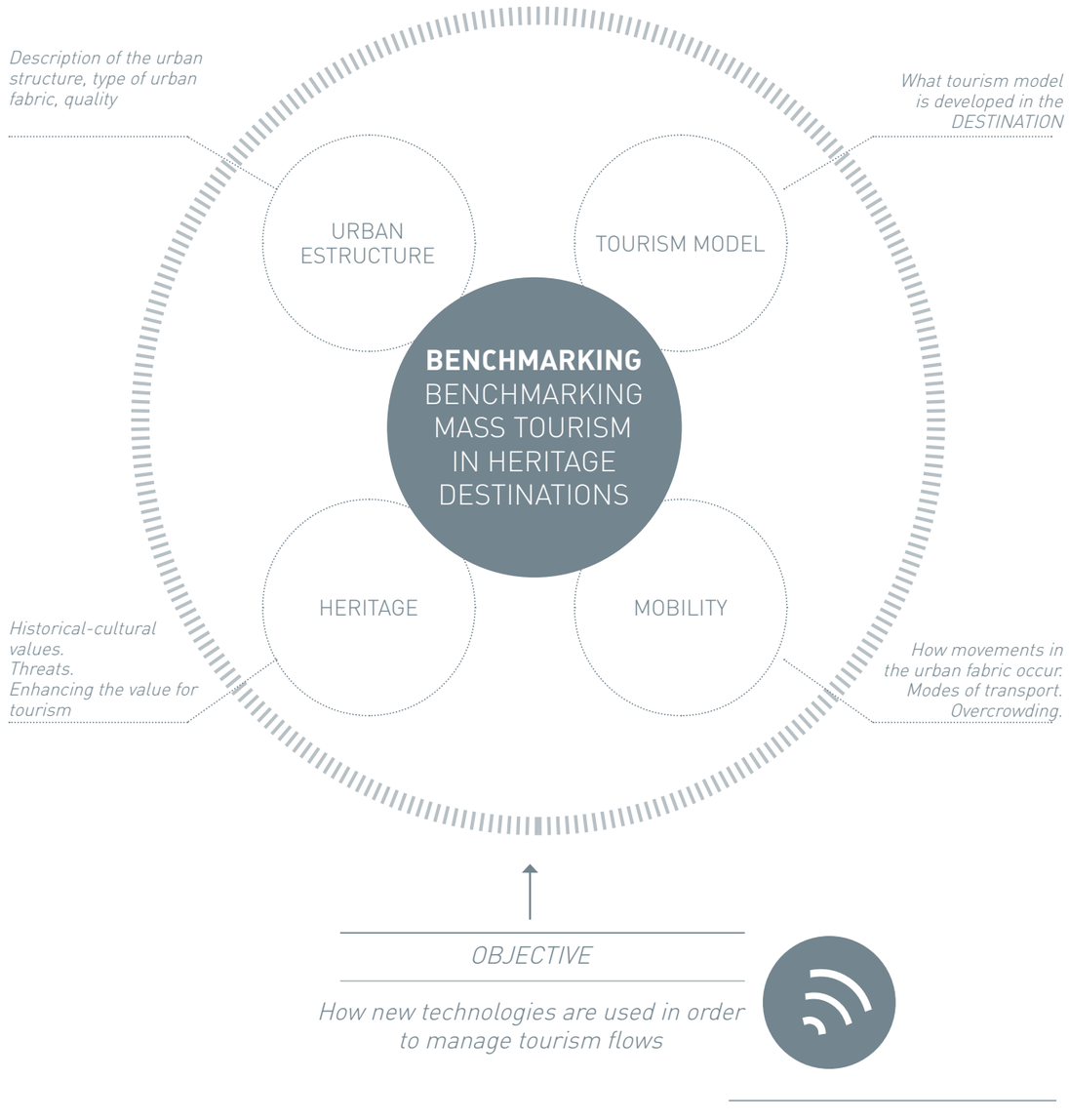
The contribution of TCV in the HERIT-DATA project seeks to comply with the following objectives:

1. Review the state of the art. How the problematic nature of the tourism overcrowding on a global level is being approached, trends and current challenges.

2. Analysing case studies through research and interviews with key actors. For these case studies the following objectives are sought:

- Identify the initiatives implemented for the purpose of taking on the challenge of tourism overcrowding in matters of urban planning, mobility and tourism management.
- Research the use of technology for the management of tourism overcrowding. And where applicable, what devices, what data is gathered, and if possible, what measures have been adopted based on the gathered data. Analysing the use of Open/Big Data for that purpose.
- Collect good practices that are being implemented.

3. From the study carried out recommended actions are defined for the management of tourism overcrowding by means of the new technologies.



1.3 STUDY METHODOLOGY

The development of the works being done from a progressive and sequential methodological approach, to ensure the quality and consistency of the results that are pursued:

1. Preparing a complete preliminary report called "State of the Art". In which the primary general tendencies of the problem that is addressed (present block or volume) are identified.

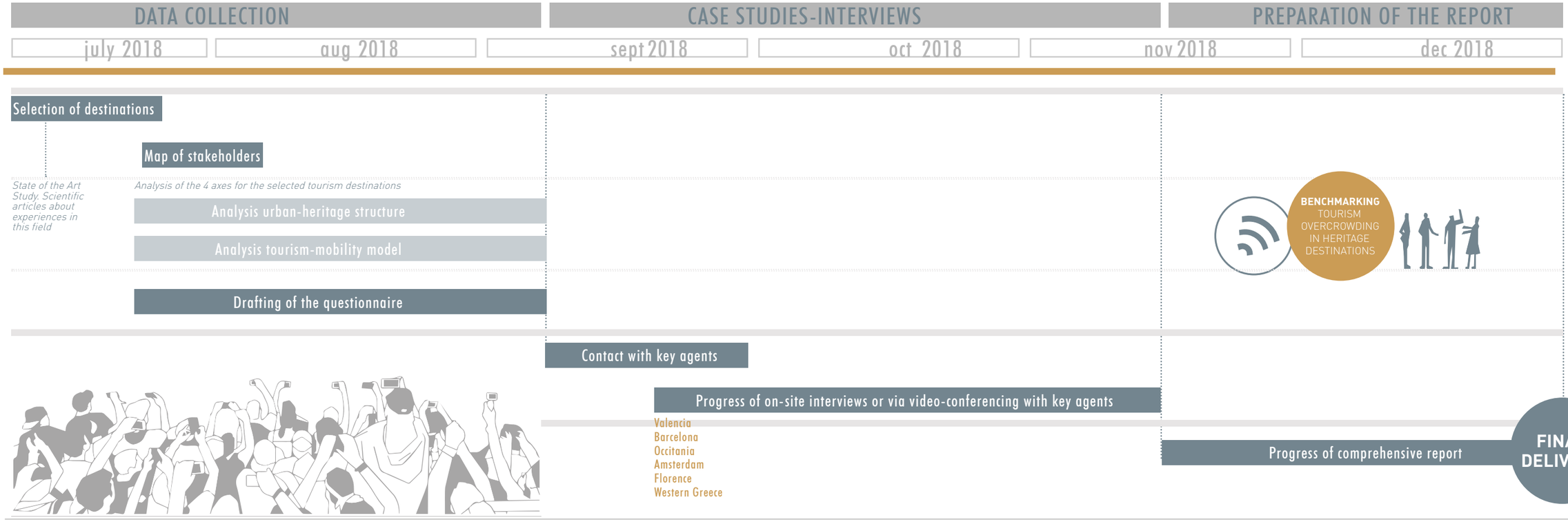
2. Analysis of the available information regarding the general state of the mass tourism in the cities subject to the study, as well as their primary resources. In the same way, those methods or tools of analysis and management will be identified, related to the handling of the new technologies and Big Data, especially emphasising in those that seek certain solutions to the problems posed.

3. Preparation of a questionnaire with the intention of gathering first-hand information with the actors that undertake planning and tourism management functions of the destination, as well as of more notable touristic resources.

4. Identification of the key informants (actors) of each destination, establishing contact with them, so that by means of interviews (either in person or virtually), they may provide the available information.

5. Preparation of a final report with the results obtained, verifying the information, expanding it if that was the case.

For this, the instruments of urban or tourism management and planning are identified that are considered best practices, prospecting that successful initiatives in the management of mass tourism. In the same way, those actions or experiences that are producing undesired or unexpected results will be taken into account. It will be particularly interesting when the identified solutions or working methods can be supported in the management of new technologies, capturing, processing and ultimately using large amounts of information.



STATE OF THE ART

2

2.1 Progression of urban tourism and its primary challenges

2.2 Primary flows and tourist crowds

2.3 The heritage city, overcrowding and impacts

2.4 Managing tourist flows

2.5 The role of technology in the analysis and management of overcrowded tourist cities

2.1 PROGRESSION OF URBAN TOURISM AND ITS PRIMARY CHALLENGES

As a consequence of the degree of maturity presented by the tourism industry on a global level; in some of the world's primary tourism destinations, it has been observed the need to further the analysis and designed proposal to diversify and modernise both the cities and their touristic offerings. In a highly competitive context, the aim is to achieve a greater positioning in emerging markets that arise as a result of the growing heterogeneity and preferences manifested by a tourist demand that is increasingly more connected and digitised.

Also, through the use of new techniques and digitized tools, the impact generated by mass tourism, which orbits the main tourist and heritage resources existing in the cities, can be minimised.

The **World Tourism Organisation (UNWTO)**, has been advocating for years for the development of more sustainable actions, that involve improving the quality of life of tourist attractions. Furthermore, tourism should be understood as an activity of economic size that serves to ensure the profits of the investors and at the same time generate wealth for the host communities. The latter are also responsible for the care and management of the natural or cultural heritage that is normally the object of the visits.

In 2017, more than 60 Ministers of Tourism , representatives of the European Parliament and leaders from the private sector met in London at the **UNWTO & WTM Ministers' Summit**, in which the problem of "mass or excessive tourism" was addressed. The primary conclusion reached in this summit was that the situation required more coordinated actions in order to manage the growth of tourism on a global level, always sustainably, responsibly, and smart; in such a way that the benefit must always remain in the hands of the citizens. The EU committed itself to analyse in depth the most common problems, finding possible solutions in order to overcome the negative effects derived form the overflowing of tourists in certain tourism destinations (General Directorate for Internal Policies and General Directorate for Structural and Cohesion Policies).

Thus, in 2018 the last report of the UNWTO was published, which has as its objective to help manage the increased flows of urban tourism, as well as its effects on the cities and residents. This report was titled "Overtourism? To understand and manage the increase in urban tourism beyond the perceptions" and it was presented as part of the VII Global Summit on Urban Tourism, held in Seoul

In this event, how to manage tourism in urban destinations for the benefit of both visitors and residents was examined in depth; a document was presented proposing 11 Strategies and 68 Measures to help understand and manage the increase in visitors. This report is the result of the collaboration between the UNWTO, the Centre of Expertise Leisure, Tourism & Hospitality (CELTH) of the Breda University of Applied Sciences, and the Europa Tourism Futures Institute (ETFI) of the Stenden University of Applied Sciences.

This work allows us to visualise the recent growth of urban tourism, as well as the need to guarantee a series of measures in favour of sustainability that reduce the negative effects generated by uncontrolled tourism (in terms of the maintenance of natural resources, the need or sufficiency of infrastructure, mobility and saturation, without forgetting the social and cultural impact). Regarding this point, it is noteworthy that there are increasingly more cases of hostile attitudes of local populations towards visitors, who perceive, many adverse effects in the arrival of tourists. It is therefore not surprising that new terms are appearing in order to describe this situation: the so-called **«overtourism» and «tourismphobia»** are some of them.

In this context, the Secretary General of the UNWTO, Zurab Pololikashvili, states that "governance will the the key to tackling the difficulties presented by urban tourism. It is without a doubt a much more complex task than what is commonly acknowledged. We need to establish a sustainable roadmap for urban tourism, and integrate it into issues of interest to municipal policies," he also adds, "we have to make sure that local communities understand and benefit from the positive aspects of tourism."

To better understand the difficulties of managing visitors in urban environments, especially the relationship between residents and visitors, the report contains an analysis of residents' perceptions of tourism in eight European cities of reference: Amsterdam, Barcelona, Berlin, Copenhagen, Lisbon, Munich, Salzburg and Tallinn.

As it has been emphasised in these lines, one of the segments in which the primary problems are concentrated and identified, is that which is associated with **"city or urban tourism"**. And this would be nothing other than the visit to the city itself. Arriving to this point, we should recognise and introduce the holiday, behaviour and leisure patterns that the tourists show. However, the city is much more than a tourist or holiday destination... It must also perform its administration, production of goods, commercial dynamics, services, culture, heritage, leisure space or place of housing duties... A sum of complexities that go beyond tourism as a phenomenon to be managed, given that equipment and management skills are required for the proper management of urban centres.

Focusing on the psychological or motivational aspect of the urban tourist, the resources to which the tourist will be attracted to can be both real and imaginary, usually unique and exclusive, representing historical facts or events in which the city is the star.

However, the city also focuses on almost cloned spaces or buildings around the world, marked by the indistinct offers (especially visible in the commercial aspect), bringing together a type of public eager to buy, sometimes compulsively, and that go beyond the tourism

phenomenon.

In either case, cities pursue their unique brand in the globalised world, focusing their efforts on promotion, when not managing the desired flow of tourists. These cities have a common goal: "to put the city on the map", or what is the same, to keep or position the city in the most important urban tourism circuits (Granados V. 1999).

And although tourism is an important driver of economic growth, it can also create a burden that is often difficult to manage, since it usually involves several impacts, both in the local society and the environment in which the activity is based. This is reflected in overcrowding on infrastructure, services, or in the conservation of historical and cultural heritage.

Authors such as Postma A. and Schomuecker D. (2017), note in their studies that the impact of tourism has evolved since World War II, its characteristics and perception varying as time has passed. They claim that during the first phase in the 1960s-1970s, the emphasis of the tourism impact in the studies was focused on the positive approach of the economic impacts. In that way it was achieved that tourism was perceived as a means to strengthen economies. However, in the 1970s and 1980s, the focus gradually moved towards social, in some cases with a more negative focus. The attention focused on cultural and environmental impacts, influenced by the existence of urban environments still marked by excessive industrialisation, sustainability and the need for citizens' quality of life. In the 1980s, the interest generated by the touristic impact in the studies focused on the holistic integration of the economic perspective, social vision and environmental balance. This trend continues with the arrival of the new century and into today's reality. However, the concerns of the main leaders in tourism, as well as the major operators, selectively capture and diversify tourist flows, taking advantage of the daily presence and evolution that new technologies have today, accessing or managing data, and definitively controlling information.

Deery et al. (2012), notes that the studies on the impact of tourism have become a well-developed, almost fully-grown, field. However, Williams (2009), maintains that there is still a lack of understanding in the relationship between tourism and the destination's communities, both for the number of empirical studies, non-conclusive or contentious, which still underlies a controversial conceptual basis.

If we focus on the sensationalist issue of the tourist phenomenon, it is obvious that this is not a harmless activity for the geographical spaces and cities where it is located. Its growth, when uncontrolled or massive, implies significant impacts in the surrounding environment. The diagnosis is quite common by laypersons and experts: overcrowding of public spaces, homogenisation of commerce, trivialisation of the urban landscape, detachment of the inhabitants to their own city, **processes of "assimilation" or "gentrification"** (Muñoz F. 2008).

In this sense Huete (2018) and previously Rasoolimanesh (2015), agree that normally the residents of a tourism destination, as a rule, will support any development as long as it is perceived that the anticipated benefits are greater than the costs as a result of the presence of tourists. Here the issue lies in what each society understands to be a limit: What is acceptable and what is not? What is the price and what are the benefits?

The **mass tourism of the 21st century,** is explained today thanks to **5 essential processes** (Muñoz F. 2015):

1) There is an evident diversification of the types of tourism, as demonstrated by the low-cost revolution, which has managed to expand the range of air transport users to unthinkable extremes.

2) The different types of tourism that appear every day are multiplying, from adventure tourism to survival, sports or cultural tourism in all its varieties.

3) The new types of tourism represent a splitting of the tourist consumer market. In other words, there are as many tourist experiences as there are potential types of consumers.

4) A temporary expansion of touristic use in the area is displayed: tourism goes from being something isolated or random in time, to becoming clearly regular and steady. If tourism has become global, touristic time has become absolute.

5) Today tourism is the emotional consumption of a place. Tourists calibrate the landscape according to their solvency to transmit an experience, explain a story or offer us a feeling. Therefore, the touristic cities see themselves as obligated to resemble the image most in line with this emotional consumption that the visitor hopes to find.

Once the risk or existence of suffering "mass tourism" is found, the **planning and management of the destination continues to be the only known answer**. This management should exist in every one of the stages of the trip: before, during and after travelling (please see the infographics). In your analysis and management of the phenomenon, the geographical study should not be neglected and scaled to the global level (global scale), but also its more direct effect at the local level. An comprehensive philosophy based on a logical sequential pattern, shared by millions of people from when democratised tourism and mass tourism came about in the middle of the last century (Vera JF y VV.AA, 1997).

Stages of the trip									
Before				*During*			*After*		
Inspiration	Search	Planning	Reservation	Arrival	Stay	Departure	Share	Evaluate	Build loyalty
Phases of the Touristic Trip	BEFORE THE TRIP (marketing, promotion, products/services offerings, decision, payment-reservation, preparation and reception).								
	DURING THE TRIP (assistance, charges, transportation, accommodation, recreation, information, excursions, flows, departures, consumption).								
	AFTER THE TRIP (charges, measurement of satisfaction, maintaining contact with the client, limitations of the destination, assessment, loyalty?...).								

Source: Author's own from Standard PNE 178501 "Management system of smart tourist destinations".

VARIABLES FOR THE REGIONAL AND URBAN QUALITY ASSESSMENT IN TOURIST DESTINATIONS

Density and influx	Evaluation of the accommodation capacity and concentration. Evaluation of the load or accommodation capacity around the resources.
Landscape	Aesthetic quality of the environment. Comprehensive perception of the elements that make up the city. State of the cultural/building heritage, public spaces, green areas, parks-gardens, cleaning, integration of infrastructure.
Public Use of Free Spaces	Qualifications of consolidated urban areas. Both in quality (aesthetics-landscape-functionality) and in quantity (proficiency standards).
Cultural Heritage	The existence of these elements is assessed, as well as their state of conservation and integration in the touristic experience
Accessibility and Mobility	External (from the broadcasting areas), to the recipients (within the tourist areas), with special attention to the congestion problems, both in transportation systems as well as in the access to touristic resources-products.
Infrastructures Facilities Services	Drinking water supply (water), the car parks (mobility), cultural, sanitary, and sports equipment, commercial services, etc.
Water Quality	Water as a natural resource and pull factor (inland and marine).
Pollution	Evaluation of noise pollution: noises and urban areas. Air Quality: CO2 emissions due to excessive traffic. Evaluation of the pollution caused by solid waste (rubbish dumps, filth, lack of urban cleaning) and liquid waste (waste-water, offshore sewage outfalls).
Social impact	Economic benefits impacting the society. Quality of life. Evaluation of inflation, speculation, detachment, acculturation, gentrification, tourismphobia?

Source: Author's own, from Vera J.F y VV.AA, 1997.

"Different urban destinations around the world have begun to face and see tourism as not only an environmental problem, but as a social one too. In the middle of the nineties, local reactions against mass tourism have already been recorded in different European contexts such as Spain, Italy, Malta or France... (Boissevain, 1996)".

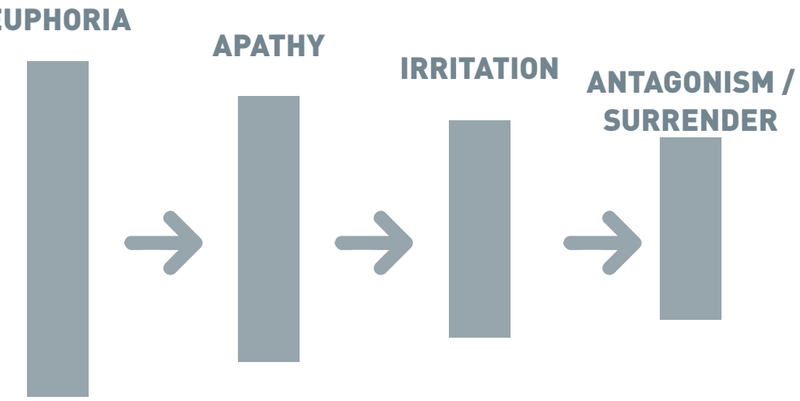
"London, Paris, Barcelona, Amsterdam, Rome..., today these large European cities are beginning to see a problem in their type of tourism."

"Venice, Dubrovnik, Santorini, Mykonos, Rhodes, Monaco, Corfu, Majorca... etc are the exponent of medium and small Mediterranean cities, which present significant problems of congestion derived from tourism..."

Initially, tourism activity could be understood as positive, as long as it was understood as a dynamic element and/or as a complement to traditional economies (rural economy, trade or industry).
When tourism begins to completely substitute that traditional economy, normally it is accompanied by overcrowding, generating considerable impacts.

Tourismphobia and the Saxon concept of Overtourism (formerly Overcrowding), without being the same, are understood in general terms as another manifestation of the negative effects that mass tourism can have (Trade Association. 2018)".

Overtourism: *Is defined as a situation in which the number of visitors surpasses the physical capacity of the infrastructure and/or the acceptance by permanent residents. (Hall M, 2018).*



According to the researcher George Doxey (1975) a tourist destination experiences 5 stages (euphoria, apathy, annoyance and surrender) of the local population's irritation, experiences as an effect of tourism. The study presented by Doxey in 1975 reveals that initially tourists are welcome in the destination, they even represent a novelty (euphoria) and positive change in the dynamics of the city, until they begin to be so common that there is certain apathy or indifference towards them, resulting in annoyance from being the burden they represent for the city. The last two stages (antagonism and surrender) form a part of tourismphobia, indeed it is where they begin to experience a rejection of the consequences of excessive visitors.

2.2 PRIMARY FLOWS AND TOURIST CROWDS

There are different reasons that cause tourism activity to tend towards the progressive overcrowding. Mass tourism (with all of the implications and considerations that activity entails), begins to take off in the 1960s. To a great extent, it involved another form of capitalist expression in the world. So much so, that the measurement of a variable such as overseas holidays, today represents one of the main indicators to assess the level of development in consumer societies.

From the point of view linked to the trip (geographical displacement), almost seventy years have passed since the international tourist movements represented only 25 million people in the worldwide. It involves travelers that enjoyed a more or less high economic status. Currently, **the number of international travelers or tourists exceeds 1.3 billion people** (Figuerola. M. 2018), with a clear upward trend if we look at the prospective studies published by the World Tourism Organization (UNWTO), and which anticipates **an increase of 1.8 billion international arrivals by the year 2030**. At the same time, entities such as IPK International (2016), **urban tourism is the most rapidly growing niche market.**

Spain confirmed its "record" of foreign tourists in 2017. According to official data, it added 8.9% more tourists, reaching 82 million visitors, who also increased their spending by 12.4%, to reach € 87 billion. Tourism in Spain currently represents 11% of the GDP and more than 2.5 million direct jobs.

Similarly, it is also appropriate to count the number of people that make up the tourist movements that occur in "domestic key". In other words, those persons that travel within its national borders (interregional trips or between cities of the same State). The most rigorous assessments of the estimates made indicate that currently the tourists who move within their borders exceed 4 billion travelers; and can reach the corresponding stays in these trips, to more than 8 billion.

Within these large flows, it is essential to understand the different motivations that the demand presents in order to justify your trip. The importance of both national and international travelers stands out in this regard, participating in events of global impact, for example, the beginning of the Chinese year with the "Spring Festival", domestic travel in the United States to celebrate "Thanksgiving", the Christian festivities of Christmas, New Years and Holy Week worldwide, in addition to the pilgrimage of Arab citizens with religious motives towards Mecca and Medina" (Figuerola M. 2018).

All these movements, due to their characteristics and nature, are of impact or global proportions, allowing us to get an idea of the global footprint that this phenomenon, well tourism, has, either by cultural basis or family reunification.

The development of transportation has decisively contributed to this revolution, with a thriving automotive industry first, and more recently with the liberalisation of air services. But the driving factor of all this change throughout the 20th century, was the recognition by Western countries of the right to a remunerated vacation for employees. In this way, tourism has consolidated as the economic activity that "drives" or stimulates the worldwide economy (Flores Ruiz et al., 2012).

Entities such as **Euromonitor Internacional, World Travel Market e Incorporating Global Travel Trends (2017)**, point to a new model that is currently being is being pursued that is transforming the most traditional patterns in relation to the main flows in the field of tourism. It must be considered for its importance, certain economic or geopolitical contexts that may be determining factors for the performance of the travel industry... This is the case, for example, of the dragging that still produces the recent crisis in the Eurozone, the imminent arrival of "Brexit", or the migratory problem between Europe and the developing countries, without forgetting the importance of terrorist attacks in certain cities. In spite of all these destabilising factors, the resilience of the sector remains apparent, as a rebalancing derived from the activity itself has arisen at the same time. We are referring to the arrival of low-cost carriers, but also the emergence of new tourism networks with lines of entry in markets that have represented a real revolution in the sector (appearance of globalised companies such as Airbnb, for example). According to these consultants, **the factors set out are able to rebalance certain adverse situations, especially by their great capacity to establish themselves in the markets and in the region thanks, among other things, to new technologies and social digitalisation.**

For all the above and in relation to the feared overcrowding, the debate is still applying: Do so many tourists fit without the destinations being resentful? Beyond the proper preparation that the destination in question may have, the answer seems evident: **it will depend on good logic of how many, when, in what conditions the tourists arrive to the destinations.**

This situation urges us to find new formulas and strategies that maintain the high occupancy figures, with optimal levels of excellence and competitiveness. New possibilities to "control" and "capture" the tourists are being sought, which is increasingly more "volatile" and "digitalised". However, volatility is also observed in the behaviour of certain tour operators, capable of expressing overcrowding or dissatisfaction with a given offer, causing, as a reaction, the diversion of circuits to other emerging tourist areas.

Below the results of the research on displacements and collected tourism expenditure are compiled, published by the **Global Destination Cities Index by Mastercard** (2016). In this study, the 100 cities that receive the greatest number of international tourists that spend the night in different types of accommodations were selected. The figures of expenditure incurred are also included. In this ranking the weight and significance that urban tourism has in the world is observed from a "macro" perspective

For the present study cities are studied that are at the highest level of receiving tourists such as Barcelona and Amsterdam, as well as Florence, a destination with a significant flow of visitors as seen in section 3.

Ranking of 20 cities – expenditure per overnight stay of foreign tourists 2016.

2016 rank	Destination City	Country	Overnight International Visitor Spend (USD billions)						2016 Visitors (millions)
			2012	2013	2014	2015	2016	% Δ 2015 & 2016	
1	**Dubai**	UAE	$22.99	$26.69	$27.07	$28.20	**$31.30**	11.0%	15.3
2	**London**	United Kingdom	$15.97	$17.97	$19.47	$18.39	**$19.76**	7.4%	19.9
3	**New York**	U.S.	$15.52	$16.67	$17.62	$18.39	**$18.52**	0.7%	12.7
4	**Bangkok**	Thailand	$11.12	$12.39	$11.73	$13.50	**$14.84**	9.9%	21.5
5	**Tokyo**	Japan	$6.09	$6.30	$8.26	$10.57	**$13.48**	27.5%	11.7
6	**Paris**	France	$17.25	$19.50	$16.42	$13.00	**$12.88**	-0.9%	18.0
7	**Singapore**	Singapore	$15.23	$15.44	$14.47	$12.34	**$12.54**	1.7%	12.1
8	**Seoul**	South Korea	$9.87	$11.96	$14.31	$12.53	**$12.30**	-1.9%	10.2
9	**Kuala Lumpur**	Malaysia	$10.23	$10.85	$12.67	$10.17	**$11.34**	11.5%	12.0
10	**Taipei**	Taiwan-]China	$7.57	$8.96	$9.42	$10.08	**$9.60**	-4.7%	7.3
11	**Barcelona**	Spain	$7.61	$8.65	$8.88	$8.95	**$9.28**	3.6%	8.2
12	**Miami**	U.S.	$5.74	$6.75	$8.09	$8.17	**$8.15**	-0.3%	5.2
13	**Los Angeles**	U.S.	$6.58	$6.84	$7.51	$7.88	**$8.10**	2.9%	5.6
14	**Madrid**	Spain	$6.06	$6.40	$7.16	$7.78	**$8.02**	3.1%	5.3
15	**Istanbul**	Turkey	$6.31	$7.39	$8.73	$8.51	**$7.54**	-11.4%	12.0
16	**Hong Kong**	Hong Kong SAR of China	$7.11	$7.03	$6.93	$6.90	**$6.84**	-0.9%	8.4
17	**Sydney**	Australia	$6.55	$6.47	$6.39	$6.35	**$6.40**	0.8%	3.7
18	**San Francisco**	U.S.	$4.80	$5.32	$5.57	$5.82	**$5.93**	1.9%	3.9
19	**Munich**	Germany	$4.98	$5.45	$5.96	$5.10	**$5.32**	4.3%	5.3
20	**Berlin**	Germany	$4.64	$5.11	$5.63	$4.82	**$5.00**	3.8%	4.9

Historical data in each time series presented above has been updated with the latest figures or estimations and may not be comparable to the time series from previous editions of this report.

RANKING 10 CTIES. expenditure per overnight stay of tourists 2016 (Europe).

2016 rank	Destination City	Country	Overnight International Visitors (millions)						2016 Visitor Spend (USD billions)
			2012	2013	2014	2015	2016	% Δ 2015 & 2016	
1	**London**	United Kingdom	15.46	16.81	17.40	18.58	**19.88**	7.0%	$19.8
2	**Paris**	France	15.76	17.20	17.19	17.66	**18.03**	2.1%	$12.9
3	**Istanbul**	Turkey	8.82	9.87	11.27	11.91	**11.95**	0.3%	$7.5
4	**Barcelona**	Spain	6.91	7.18	7.42	7.70	**8.20**	6.4%	$9.3
5	**Amsterdam**	Netherlands	6.10	6.65	7.35	7.78	**8.00**	2.9%	$4.2
6	**Milan**	Italy	6.88	6.99	7.30	7.51	**7.65**	1.8%	$4.6
7	**Rome**	Italy	6.66	6.66	6.76	6.95	**7.12**	2.3%	$4.5
8	**Vienna**	Austria	5.38	5.55	5.85	6.23	**6.69**	7.5%	$4.5
9	**Prague**	Czech Republic	4.92	5.05	5.32	5.73	**5.81**	1.5%	$2.7
10	**Madrid**	Spain	4.30	4.06	4.47	4.97	**5.26**	5.8%	$8.0

Source: Mastercard. Global Destination Cities. 2016.

Illustrating worldwide flows

RANKING OF WORLDWIDE TOURISTIC CITIES AND LIST OF OVERCROWDING

Study carried out by the World Travel and Tourism Council and the consultant McKinsey (2016), regarding the levels of uncertainty that may be generated when faced with the mass influx of tourists.

Depending on certain risk factors, the risk coefficient they present can be known.

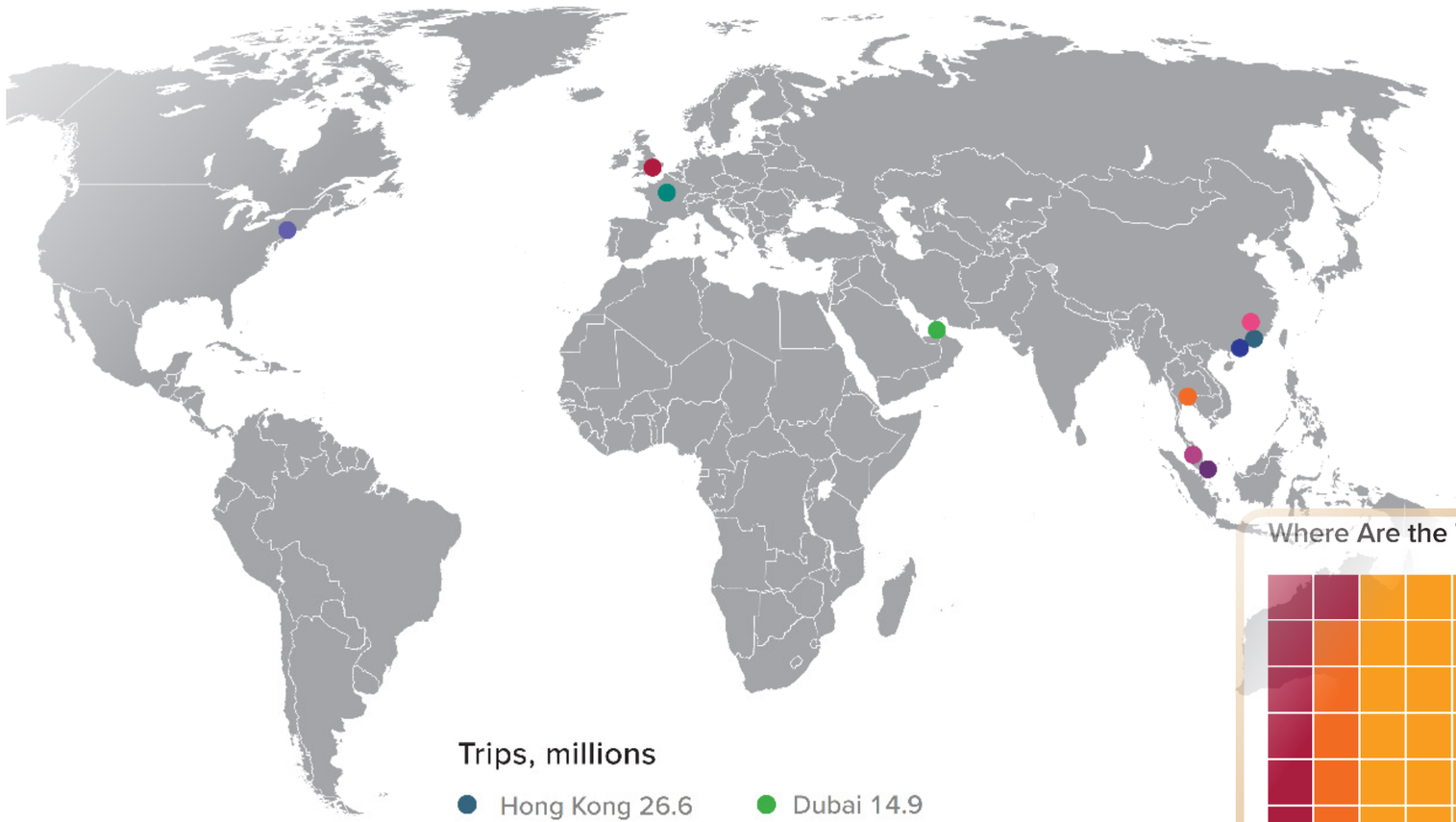
The six variables that consider and qualify from 1 to 5 the cited study are the following:

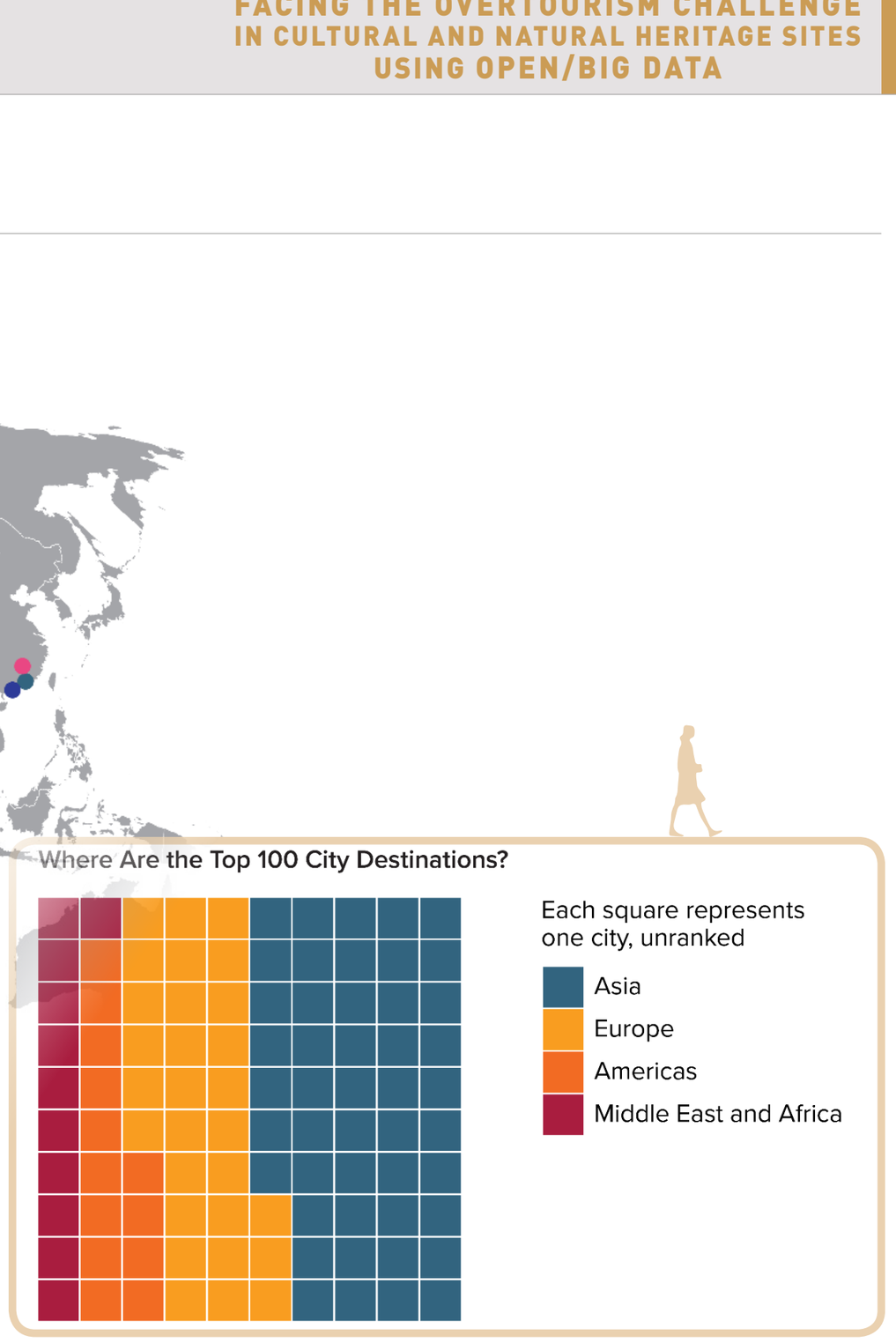
1. *Tourism density in the most visited area*
2. *Tourism intensity, also in the most visited area*
3. *Degradation of the tourist experience*
4. *Tourist seasonality*
5. *Concentration of visits*
6. *Pressure on the heritage*

Ranking of tourist cities according to risk factors before the phenomenon of mass tourism

City	1	2	3	4	5	6	∑	City	1	2	3	4	5	6	∑
Ámsterdam	5	5	4	4	4	3	**25**	El Cairo	1	1	4	4	3	5	**18**
Antalya	4	4	3	5	5	3	**24**	Dubái	1	5	4	2	5	1	**18**
Bangkok	5	4	4	2	3	5	**23**	Pekín	3	3	1	2	3	5	**17**
Barcelona	4	3	3	5	4	4	**23**	Riad	1	1	4	3	5	3	**17**
Berlín	4	4	3	4	2	3	**20**	Hong Kong	2	4	2	1	3	3	**15**
Budapest	3	3	2	5	2	5	**20**	Nueva Delhi	1	1	3	3	2	5	**15**
C. Ho chi Minh	4	1	5	2	4	4	**20**	Shanghái	5	3	3	1	1	2	**15**
Cancún	3	5	5	5	1	1	**20**	San Francisco	2	3	2	4	3	2	**16**
Chongqing	5	4	5	1	1	4	**20**	Nueva York	5	2	2	3	2	2	**16**
Ciudad México	4	5	1	3	3	5	**21**	Madrid	3	2	3	3	1	4	**16**
Dubrovnik	5	5	2	5	5	4	**26**	Chengdu	3	3	3	1	5	3	**18**
Estambul	4	1	2	4	3	5	**19**	Moscú	1	1	3	5	2	3	**15**
Estocolmo	4	4	3	3	5	3	**22**	Teherán	3	3	4	1	4	1	**16**
Kuala Lumpur	5	5	5	2	3	2	**22**	La Meca	2	5	1	3	1	4	**16**
Lagos	2	1	5	5	5	2	**20**	Toronto	3	2	4	4	2	1	**16**
Macao	5	5	4	2	5	4	**25**	Abu Dhabi	1	3	5	2	5	2	**18**
Manila	3	1	5	1	4	5	19	Los Ángeles	1	2	4	4	3	1	**15**
Marrakech	4	4	5	3	1	4	**21**	Guangzhou	3	2	4	1	4	2	**16**
Múnich	3	4	2	4	3	4	**20**	Tokio	4	4	2	2	1	2	**15**
Osaka	3	3	5	2	5	3	**21**	Londres	4	3	1	4	1	3	**16**
Paris	5	4	2	4	4	4	**23**	Lisboa	2	3	3	5	1	4	**18**
Praga	5	4	2	5	3	5	**24**	Honolulú	1	4	3	2	4	4	**18**
Roma	5	5	4	5	4	5	28	Dublín	4	4	2	5	1	3	19
Varsovia	5	5	3	5	4	5	**27**	Orlando	2	5	5	4	2	1	**19**
Venecia	5	5	2	5	5	5	27	Las Vegas	4	5	5	3	1	1	19

Source: World Travel and Tourism Council. Mckinsey. 2016.





Source: Euromonitor Internacional 2017

2.3 THE HERITAGE CITY, OVERCROWDING AND IMPACTS

2.3.1. PROBLEMS OF TOURIST OVERCROWDING IN CITIES

Once what the destination will be is determined and the trip is formalised, the real challenge begins for public administrations and specialised companies in managing the tourism experience. It is the moment in which the accommodation machinery and operation of the city as a host place are initiated.

When the tourist activity of the city exceeds for different reasons, the urban problems spread, complicating the urban reality itself. These problems are especially acute in terms of water supply, waste generation, in transport systems, in noise and gas emissions, or in the same protection of the natural, heritage or landscape environment. This is evident in both the "sun and sand" destinations and large cities.

Ortuño A. (2015), notes that the analysis and study of the cities, as well as their management, is located in a border area where may disciplines come into play. Mention may be made, among other things, geography, sociology, urbanism, engineering, economics, law... In this respect, the concept of urban tourism is also complicated as an activity, especially when it takes a substantive body, capable of specialising the city's own dynamics.

As it was point out, the massive emergence of tourism involves worrying impacts in the cities. Undesired effects occur, with final consequences that are counterproductive to the interests of the tourism sector itself. But it is not only the most harmed sector by overcrowding, you also see the residents and local communities being seriously affected.

Having reached this point, it is important to differentiate the mass attraction strategies used by some destinations, especially when these are based on the mere positioning of the activity by accumulation. A build-up of tourists, which comes on the heels of an effective regulation and conduction of the flows. It seems that some European cities are incapable of reaching a balance and "social peace", given that some of their cities experiment first-hand an environmental and operational degradation that formerly were not perceived (or when less expressed). From a social and anthropological point of view , many authors indicate that tourism unequally benefits both tourists and the business promoters responsible for promoting processes, leaving the most negative issues for the residents of the cities themselves. As a matter of fact, the urban environment is the normal framework of coexistence for the resident population, while for promoters and drivers of the tourism business it is only a context to generate business.

Authors such as Greenwood (1972), Rosemberg and Reiter (1973) arrived to this conclusion years ago, and affirmed that **"the sale of culture" increases the already poorly distributed local income, with the resulting social inequality and hierarchical organisation.**

After many failed experiences and a multitude of cities damaged by overcrowding and mass tourism, the primary lines of work that today drive the urban managers are four:

1. **The projection of the city as a tourism destination.**
2. **The heritage and urban renewal.**
3. **The application of Sustainable Urban Mobility Plans (SUMP).**
4. **Smart and digital cities (smart cities / smart destinations).**

Illustrating the touristic phenomenon in the city

"Beyond the inconvenience and frustration created, congestion and overcrowding in the city favors pollutant emissions into the atmosphere, thus accelerating the process of climate change."

"It is expected that the Mediterranean tourist cities lose their agreeable climate. The effects will be reflected with the rise in sea level, coastal erosion, the reduction of the snowy season in mountain etc.". All these issues will alter the patterns of tourists traveling to colder regions of northern Europe (Olcina J. and Miró Pérez J.J. 2017).

"Environmental sustainability in tourist cities is to minimise the use of resources as elementary as water, especially in the Mediterranean regions." A tourist in Spain uses 800 L/day, compared to the 125 that any citizen usually needs, in addition to concentrating overproduction of waste or the generation of greater environmental noise" (Romagosa. F. 2018).

"Roll out policies inspired by the "European Charter for Sustainable Tourism (ECST)", encouraging the necessary collaboration among agents and sectors".

"It is necessary to modernise, digitalise and make cities more technical at the pace that our society does".
"Tourism is an activity that is adapting quickly to all these changes."

FORMS OF TOURISM THAT AFFECT THE ENVIRONMENTAL BALANCE

Touristic growth that overcrowds the available resources.

Transformation of the city into an urban space contaminated by noise; dominated by traffic, which makes it uncomfortable to stay in squares, markets and symbolic corners of the city.

Recreational routines or animators degrading historical values.

Abandonment by residents to visit the historical and cultural heritage of their city, due to the overcrowding and build-up of an excessive number of visitors.

Pollution of the air, flora and fauna, by the excessive influx of tourists.

FORMS OF TOURISM THAT UNDERMINE LOCAL COEXISTENCE

Social anomie and dysfunction in neighbourhoods. Gentrification shifts and substitutes certain population groups in the neighbourhoods of the cities.

Insecurity to travel and move around the urban environment (crime, aggressive, violent and dangerous individuals, contrary to the peace on the streets).

Increase in prostitution and drug consumption by the local population, before the intensification of those practices,

incentivised by the intense arrival of tourists.

UNDESIRED EFFECTS OF TOURISM IN LOCAL COMMUNITIES

Prioritisation of the economic criteria ahead of other effects (inflation, rise in rental prices, tax burden).

Increase in the seasonality of employment and degradation of the quality of work, due to a densified demand and reduced expenditure.

FORMS OF TOURISM THAT NEGATIVELY AFFECT THE ECONOMY

Propagation of false customs and traditions.

Loss of the authenticity and the faithfulness to the feelings and historical heritage

FORMS OF TOURISM THAT UNDERMINE LOCAL COEXISTENCE

Source: Author's own from Figuerola M. 2018.

INDIRECT AREAS OF CONFLICT	CONCRETE AREAS OF CONFLICT
"Overtourism" and agglomeration	1. City centre, shops, shopping 2. Bus and train, train stations 3. Roads, trails, car parks (bicycles and segways in the walkway) 4. Museums, cultural and leisure facilities 5. Gastronomy and clubs 6. Events, popular festivals, etc.
Inappropriate behaviours	1. Noise (in particular at night) 2. Waste, dirt 3. Recklessness, curiosity 4. Crime, theft, violence 5. Drug consumption
Foreignness and lack of adaptability	1. General: Too many outsiders 2. Foreign languages, lack of German knowledge 3. Lack of familiarity with the tourists with rules and standards
Privacy	1. Remaining in the residential area 2. Intrusion of privacy (looking through the window, knocking on doors, for example)
DIRECT AREAS OF CONFLICT	**CONCRETE AREAS OF CONFLICT**
General increase in prices	1. Public transportation 2. Shopping 3. Cultural and leisure facilities 4. Gastronomy and clubs 5. Events, popular festivals, etc.
Foreignness	1. Sensation of strangeness in the city itself 2. Sensation of strangeness in the district /neighbourhood itself ("there are always tourists around") 3. Loss of authenticity, culture, lifestyle, habits 4. Feeling of exploitation / commercialisation of the hospitality itself
Disfunction	1. "Touristic gentrification" of the residential and commercial space: undesired change in the neighbourhood 2. Increase in rent prices (unfair competition among permanent and vacation homes) 3. Lack of housing
Competition	1. Excessive use of areas and infrastructure 2. Competition for residential and commercial space through high investments (tourism)
Employment	1. Only low-qualified works in the tourist service 2. Many employees with migrant backgrounds

Source: Adapted from Postma (2013).

2.3.2. THE HERITAGE CITY IN THE FACE OF TOURIST OVERCROWDING

According to the architect Fernández-Baca. R (1996), the heritage city reinforces **the ideal of a city that seeks to protect its cultural legacy, in order to preserve it from a critical position. It aims to improve conservation work; and it incorporates new uses and a current culture to finally generate the valuation and social profitability. Therefore, the terms of a historical city and historical set used from urban science and the heritage legislation, respectively, they are currently insufficient.**

This idea from Fernández-Baca enables the discussion of urban management to be elevated, given that it begins from the inherent value that the cultural heritage of the cities has. In his definition, he considers the role played by human creativity, understood as a necessary asset for human, social and economic development of the heritage city. He defends that the heritage city and touristic city should progress in the same direction "as one", unloading in the current society the challenge of transferring the heritage legacy to future generations. Therefore, there is an important responsibility that is achieved by keeping the touristic development within workable and acceptable boundaries and within the cities. 2014). In this context, tourism should be understood as one of the primary tools to protect the heritage city; therefore, it should not be in any case a "threat". The issue is no doubt to prioritise the preservation of cultural heritage, and once resolved, to make use of the heritage resources, channeling them for a specific use or tourism service.

In order to avoid the possible disfunctions between heritage city and tourist city, **UNESCO** itself is collaborating with different cities promoting the integration of the environmental, social, cultural concerns, in the planning and undertaking of the urban design. Its approach may offer very positive results for many European cities.

If every cultural city is unique, the protection, planning and management of cultural heritage objectives may be shared in many instances. It should be combined with the economic development, functionality and livability of the city. In that manner it responds to the needs of today's inhabitants, at the same time sustainably strengthening the existing natural and cultural resources.

The different approaches should always be integrated: at the level of patrimonial conservation, in terms of economic promotion, or in its environmental approach, with special emphasis on the preservation of social and cultural values.

In the case of large cities, it is important to clarify that their heritage wealth is joined by a broader tourist offer (be it commercial, services or as an event or conference centre...). All of this summary manages to attract a constant and massive flow of visitors almost all year round. These are normally found to be **hyper focused** around certain resources or hubs of attraction; this issue involves large overcrowding problems.

In these cases, in addition to providing protective measures that must be evaluated by specialists in the preservation of cultural heritage; the challenge is to better redistribute the flow of visitors, reducing and rebalancing the pressure exerted by tourists in time and space. In many European cities, it is one of the main lines of work, which requires a decisive cooperation between all actors working in cultural, tourism and urban governance.

In this line, both public and private management have a great responsibility, so it is also necessary to strengthen the levels of dialogue and cooperation, taking into account different administrations based on their competencies, including the concerns and proposals that emanate from the local population (Romero. 2009).

Tourism planning should point in this direction. But this should be carried out by means of adequate forms and intensities appropriate for its scale. Overall it is that tourism does not aggressively assert itself into the preexisting socioeconomic fabric, nor does it go against determined interested and/or affected actors.

DUBROVNIK
Source: amanderson2.

Some of these actions have been made operational with relative success in some destinations; but we also recognise other means are still widely discussed today (for example, implementing a tourist tax that can have a direct or positive impact on the local community, or alternatively deterring the massive arrival of tourists to certain hot spots). There are also other policies that may be directed at the strict regulation of the activity, or also the touristic accommodation itself when the city finds itself excessively overcrowded.

According to Fernández-Baca, the whole cultural protection program that is open to tourism, should consider the following actions:

a) Historical Research and Heritage Protection generic actions: Begin their activities with the classification, inventory, cataloguing of Heritage, including the definition from the legal framework.

b) Conservation and intervention actions in the city: With the establishment of the general diagnosis of the collections (movable and immovable) in the general context of the city. The interventions abide by three fundamental criteria:

b.1 Systematic Conservation: Establishment of the investments based on the criteria of urgency, value, and heritage property.

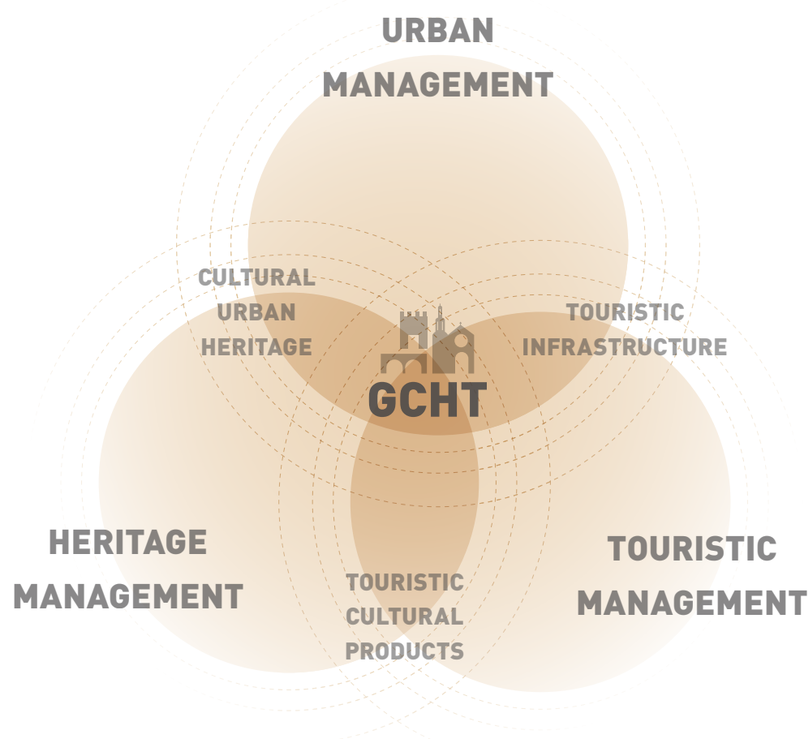
b.2 Preventative Conservation: Actions that affect the causes of deterioration and ensure the safeguarding of collections of moveable and immovable property.

b.3 Strategic and Comprehensive Conservation: Actions conducive to investments, generating social profitability (promotion of employment, new and appropriate uses, rehabilitation of depressed areas, etc.), or that affect the link with other related policies (Environment and Tourism ...).

b.4 Maintenance of Cultural Assets: By means of recommendations, regulations and directives, as well as those derived from the observation and monitoring of the actions carried out.

c) Dissemination and Development generic actions: They must enhance the heritage, or create new uses through relevant studies. It happens to implement and establish a diffusion network; guardianship of visits by specific groups or the general public; the creation of Interpretation Centres, or establishing visitor information points. All this in coordination with other types of touristic, employment initiatives or those derived from environmental protection.

In the case studies in the Sections 3 and 4 the existing relationships are analysed between the axes of action in the heritage cities. Mobility is another important axis, that will be seen below, for the management of the urban space and the application of new technologies.



GCHT Management of the Touristic Historical City

Source: Brito M. 2008

Milestones and recommendations in order to protect Cultural Heritage in Cities according to UNESCO.

	1968	1976	1987	2005	
	Recommendations regarding the preservation of cultural assets at risk due to public or private works	*Nairobi Recommendations about the safeguard and current role of historical areas*	*Washington Charter for the conservation of the Historic Cities and urban areas*	*Vienna Memorandum on World Heritage and Contemporary Architecture: Managing the Historic Urban Landscape*	
Definitions	(a) Fixed or immovable: Archeological, historical or scientific sites that include traditional structures, historical neighbourhoods in urban or rural areas with ethnological values. (b) Mobile (not important)	a) Historic and architectural areas: group of buildings, open spaces in urban and rural areas, and their cohesion regarding the values for which the heritage (archaeological, architectural, prehistoric, historical, aesthetic or sociocultural points of view) is reorganised. b) Environment: Natural or man-made configuration that directly influences the social, economic or cultural space.	Historic urban areas, large and small, including cities, towns and historic centres or neighborhoods, along with their natural or humanised environments.	(a) The historic urban landscape goes beyond the notions of historic centres or its developments. It includes its surroundings in a wider territorial and landscape context. (b) Made up of elements that define character: land use and patterns, spatial organisation, visual relationships, topography and grounds, vegetation and elements of the technical infrastructure.	(c)
General Principles	(a) Conservation of all the structures and their effects from private or public works. (b) Salvation or rescue of the property in the area must be transformed, including the preservation and removal of the property.	(a) Historical areas and their surroundings should as a whole be considered a cohesive whole whose specific balance and nature depend on its consisting parts. (b) Elements that must be conserved including human activities, constructions, space organisations and their environments.	(a) Conservation must be an integral part of cohesive policies of economic and social and urban and regional planning development. (b) The qualities that should be conserved, including urban patterns, the relationship between the buildings and open spaces, the formal appearance of the buildings, the relationship with the environment and the functions.	a) Continuous admissible load as a part of that tradition of the city: The answer to the development dynamic should facilitate changes and growth respecting the inherited urban landscape and the original urban landscape, as well as the authenticity and historical integrity of the city. (b) Improvement of quality of life and production efficiency, helping to strengthen identity and socialcohesion.	(c)

	1968	1976	1987	2005
	Recommendations regarding the preservation of cultural assets at risk due to public or private works	*Nairobi Recommendations about the safeguard and current role of historical areas*	*Washington Charter for the conservation of the Historic Cities and urban areas*	*Vienna Memorandum on World Heritage and Contemporary Architecture: Managing the Historic Urban Landscape*
Identified Threats	a) Urban and renovation projects that eliminate structures surrounding preexisting monuments. (b) Individualised imprudent modifications of buildings. (c) Dams, roads, bridges, cleaning and levelling of land, mining, quarries, etc.	(a) Recently developed areas that could ruin the environment and character of the adjacent historical areas. (b) Alteration and transformation of the historical areas areas caused by infrastructure, pollution and other environmental damage. (c) Speculation that undermines the community's interests.	(a) Physical degradation and destruction caused by urban development and industrialisation. (b) Uncontrolled traffic and parking problems, construction of motorways within the historic cities, natural disasters, pollution and vibrations.	Socioeconomic changes and growth that don't respect the authenticity and integrity of historic cities, as well as its inherited urban landscape.
Proposals Actions Strategies	(a) Adopt and maintain legislative measures in order to ensure the preservation of the heritage at risk. (b) Ensure adequate public budgets for said preservation (c) Encourage the preservation through tax rates, loans, etc. (d) Task the responsibility of preservation to the bodies (national and local level). (e) Advise the population and develop educational programmes.	(a) Prepare surveys of historic areas and its surroundings including architectural, social, economic, cultural and technical data. (b) Establish plans that defend the historical areas and their elements to be protected (standards that must be observed, conditions that govern, new constructions, etc.) (c) Prioritise the assignation of public funds. (d) Protect and restore accompanied by a social revitalisation and economic policy in order to avoid any tear of the social fabric.	a) Conservation must be directed at all important elements, including history, architecture, sociology and economics, ensuring harmonious relations between historic areas and the city as a whole. (b) New functions and activities compatible with the character of the historic area. (c) Special education establishing special educational programmes.	(a) The process of planning in historic and urban landscapes requires an exhaustive formulation of opportunities and risks to ensure a well-balanced development. (b) Contemporary architecture should be complementary to the values of the urban and historic landscape and should not compromise the city's own historical nature. (c) The economic development must be linked to the objectives of the long-term preservation of the heritage.

Source: UNESCO 2010 (own translation). Managing Historic Cities. WHP. No. 27

With the intention of providing information and experiences on the local level, **UNESCO** itself incentivises the development and work in the different countries through the creation of Working Committees. In the case of Spain, these committees are organised through the **Group of World Heritage Cities (GWHC)**
http://www.ciudadespatrimonio.org/

The cities that belong to this working group are:

- Alcala de Henares
- Avila
- Baeza
- Caceres
- Cordoba (municipality that requires deference due to specific mass tourism).
- Cuenca
- Ibiza
- Mérida
- Salamanca (municipality that requires deference due to specific mass tourism).
- San Cristobal de la Laguna
- Santiago de Compostela (municipality that requires deference due to specific mass tourism).
- Segovia (municipality that requires deference due to specific mass tourism).
- Tarragona
- Toledo
- Ubeda

After 25 years since its formalisation, this group has been adding experiences in the different fields of action, in which there are some solutions that can be considered of great interest. Therefore, progress has been made in the commitments undertaken with the milestones established by UNESCO throughout the last decades (please see above table).

The different **Working Committees** are organised around the following areas:

- City and Heritage
- Culture and Education
- Representation
- Promotion and Tourism

Source: UNESCO. GCPHE.2018. http://www.ciudadespatrimonio.org/

2.4 MANAGE COMPLEXITY: TOURIST RECRUITMENT, LOAD CAPACITY AND CONDUCTION OF FLOWS

The **heritage city and tourism** in their vast size, are two concepts intimately linked to the contemporary cultural model. Its relationship is not exempt from problems, given the use made of the city by tourists, may involve the excessive concentration of people in both areas more specific areas and places.

Regarding the strategies either to understand, or to soften the effects of mass tourism, the **European Cities Marketing (ECM)** association published the **"Managing Tourism Growth"** study. It seeks to provide tips and initiatives that can help better manage tourism flows. Also, **UNESCO** (2013) itself, thanks to its aforementioned studies and recommendations on landscape and urban heritage, clarifies what can be the necessary approaches for the best conservation of historical and cultural heritage.

To determine the evolution of sustainability levels in destinations, there are different models and tools that enable the monitoring or measurement of almost any type of variable. Some of the most well-known for analysis and assessment are known as Indicator Systems. In this respect, it is particularly interesting to know the work of the European Commission, which developed a tool known as "**European Tourism Indicator System, Toolkit for Sustainable Destinations".** This work managed to satisfactorily unite the control of the tourist system in its entirety.

This proposal is integrated around four Axes:

1. **Management model of the destination:** It integrates indicators related to the existence of a public tourism policy, the evolution of the application of sustainability criteria in companies, customer satisfaction, or the activities carried out on information and communication about the destination.
2. **Economic value associated with the destination:** It integrates indicators regarding the flow of tourists and the revenue they generate, the results of the companies in the sector, the amount and quality of the employment generated; safety and hygiene, or the supply chain of the sector.
3. **Social and cultural impact of tourism:** It integrates indicators related with the impact of tourism on the community, gender equality, equity and accessibility, as well as the protection of the cultural and historical heritage.
4. **Environmental impact:** It integrates indicators related to reducing the impact on transportation, climate change, urban solid waste management, the water cycle, energy consumption, landscape protection and biodiversity, as well as the management of brightness, noise, or the water quality for swimming.

Another one of the elements to bear in mind is the introduction of different measures that serve to mitigate or redirect the flow of tourists in the region. Authors such as Vera JF and others (1997) speak about, for example :

1. Direct measures:

- **Management of urban space:** A planning of urban areas that favours the concentration or dispersion of tourists. The regulation of the activity of tourists: May be come about from the regulation of uses, group sizes, length of the stay or time period.
- **Limiting flows:** Through opening conditions.

2. Indirect measures:

- **Physical alteration of the space:** improving access points.
- **Available information:** Today subject to new technologies and the handling of Big Data.
- **The pricing policy:** As an attraction or deterrent factor.
- **Explicit actions of deterrence:** By means of intentional promotional information in order to promote similar offers and destinations to other places that are not overcrowded (National Geographic 2018).

When you visit a particularly touristic or symbolic place of a city, the activity is conditioned from the outset by the **internal mobility flows**, but also by the degree of interest or prior knowledge that the tourist has about the place they visit. In fact, the entire city is typically not visited, so there is a choice limited in time, conditioned by a management policy of the resource itself, to which we must add the tourist's motivation. We mustn't forget that **the tourist ultimately decides what to see, how to see it and how to access said resource**

Ashworth (1990), discusses the **"highlight"** when normally controlled visits are undertaken, accessing the most important heritage monuments of a city. The majority of these are surrounded by a historical atmosphere, prepared to be consumed in a brief moment in time. When this "highlight" is not properly managed, many other problems arise, those derived from mass tourism or dissatisfaction.

Another concept of reference is that of **"reception or load capacity".** This is linked to the urban development phase of the city as a touristic product, but also in the characteristics of the visitors themselves. For almost four decades, an initial academic debate has been developing and then led to the governance of cities, around the need to develop **"tourist pressure indicators"** that are properly linked to the concept of **"load capacity".**

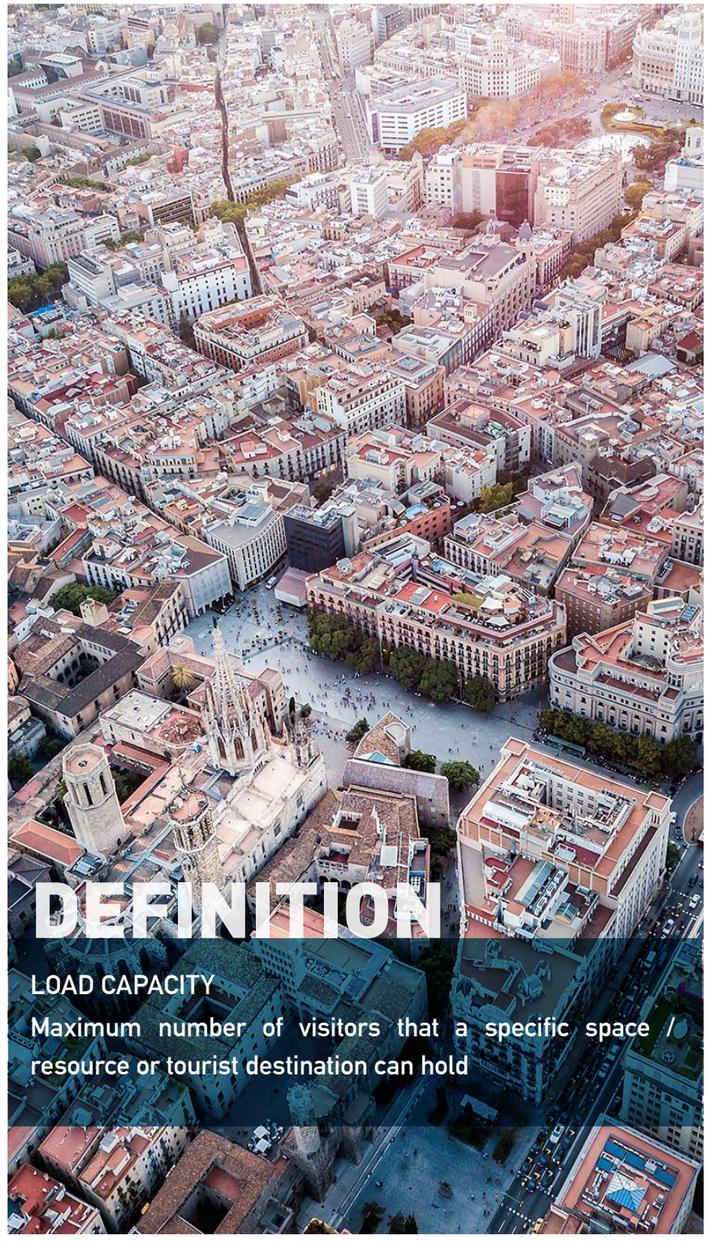
In fact, the **load capacity studies** are placed among the first instruments that emerged in order to make the concept of sustainability operative in relation to the management of the activity. They were, together with the environmental impact studies, one of the most used instruments in order to address the problems of affluence..

In its most simple definition, the **load capacity concept** references the **maximum number of visitors that a certain space/resource or tourist destination can hold.** In other words, it sets a limit beyond which the tourist exploitation of a resource or a destination is unsustainable because it is damaging. Nevertheless, there are almost as many definitions of touristic load capacity as there are authors that have written about the topic.

From an **exclusively environmental perspective**, the definition of **the load capacity is understood to be the level of recreational use of an area that ensures the maintenance of environmental quality and the recreational experience of visitors.** However, with the application of the same concept to tourist destinations in coastal areas, islands or cities..., reformulating its meaning as a touristic load capacity is required. Here other variables to consider come into play, such as the evolution and dynamics of the tourism market in relation to the behaviour of demand (Butler. 1991, Van der Borg. J 1998). With these latest contributions, linking the concept of load capacity with the life cycle of a tourist destination was achieved.

Another issue introduced are the **social perception thresholds,** beyond which tourist flows tend to degrade, because the visitors themselves begin to judge and understand how certain capacities of the tourist space have been surpassed. This may be reflected in a practical way, when some degradation of the quality in the offered services is detected, the decompensation of the price-quality ratio, or when the search for other alternative destinations takes place. The issue may also be corroborated in customer satisfaction surveys implemented by accommodation companies or municipal officials in matters of tourism.

As we will see in the case study section, cities apply direct and indirect measures in a combined manner and occasionally with a sector-wide approach. The global perspective on the tourist phenomenon is necessary and the trend leads us to a multisectoral approach in which load capacity studies become more relevant (please see section 4).



2.4.1. ACCOMMODATION CAPACITY AND CURRENT SITUATION OF TOURIST-HERITAGE DESTINATIONS

The increase of tourism flows associated with what is known as "cultural tourism" entails numerous effects caused by the mass influx of visitors, especially in those which are more sensitive or vulnerable. In the same way, it has been noted that although the **tourist load capacity** studies have a long tradition in academics, to date the publications and works that can be traced are limited, regarding the application of this concept in "historical and heritage" cities.

At the **historical city** level, we could reference the first works by Canestrelli and Costa (1991), or alternatively those by Van der Borg (1996). This author worked in detail on the socioeconomic load capacity in the city of Venice. Even earlier, Getz (1983) was of the pioneers in studying the accommodation capacity in the city of Oxford. From the perspective of monuments, in Spain we could emphasise the works undertaken by García Hernández M, providing as a specific example the management of the Alhambra of Granada (2003, 2011 and 2012).

The elements of monumental and historical heritage may be presented as individual buildings, large monuments that have been turned into museums, historical centres or archeological areas... It's level of touristic development (and therefore the magnitude and type of the generated impacts) notably differs depending on the touristic region of which they are a part..., but also depending on its positioning among the products and packages that are being marketed.

Up until very recently, there was a lack of thorough counts of the number of tourists that visited certain monuments or heritage resources. With the emergence of new technologies, this issue will undoubtedly change (it already is), in this way making some traditionally published surveys and estimates obsolete.

The precision of the figures is already evident in the world's primary tourist centres: 12 million visitors in the Notre Dame Cathedral in Paris, 10 million to the Great Wall of China, 6.7 million to the Eiffel Tower, 4.2 million in the Vatican Museums, 4 million to the Colosseum in Rome, or 1.2 million to Chichen Itza (in Mexico). In Spain, it's worth highlighting the Sagrada Familia, which welcomes more than 4.5 million visitors per year, the Alhambra of Granada with more than 2 million, or the Cathedral of Seville with more than 1.4 visitors annually. Case in point in this regard is the serious situation of the Cathedral of Santiago de Compostela, which in 2008 counted up to 23,000 visitors in one peak day (Study of the Accommodation Capacity and Organisation of Flows in the Cathedral of Santiago de Compostela).

It is never easy to set figures for the visits in public areas. The historic quarter of cities such as Toledo, Granada or Cordoba, confirm surpassing 2 million visitors annually, the registered figures being especially high in other tourist-heritage cities such as Salamanca, Segovia or Avila. The Region of Valencia could, in this sense, provide the "captive tourism" experience which occurs in the small town of El Castell de Guadalest, in its close relationship with the diversion of day-trippers coming from the city of Benidorm.

The same may be taking place throughout Europe in cities such as Bruges, Salzburg, Oxford, Carcassonne or Sienna...(for example). In these cities and in others of a monumental nature, the accommodation capacity of the local tourism system is overwhelmed. The visitors and residents collapse the access routes in the old quarter, flood the parking spaces, overflow the restaurant offerings and cause long entry queues at the primary monuments.

In cities such as Barcelona, for example, through the **Observatory of the Autonomous University of Barcelona**, estimates and tallies of human accumulation are carried out, as a result of its known manifestations, while new technologies advance in order to more precisely tally the large agglomerations of people. It normally involves estimated calculations, which link the density of people captured by cameras in relation to the surface that accommodates them (overall counting and density).

Other sources that may be of interest are the **Studies and Sustainable Urban Mobility Plans (PMUS).** These have been prepared in different cities in recent years. Many of these studies reflect at least the points of conflict for urban mobility, finding interesting correlations between road traffic and the people that swarm around the tourist elements of increased visibility.

If we focus our attention on the accommodation offerings, the situation is reproduced in the same way. As Judith Güemes (CRM & Loyalty of the NH Hotel Group) notes, regarding the profound changes in the habits of consumers and tourists around the world: "In 2020 I don't think anyone will be willing to wait in a queue of 18 people outside the hotel waiting to check in".

For its rigour and contributions to this State of the Art, it is important to highlight the works and experience accumulated by the **Tourism, Heritage and Development Research Group (Complutense University of Madrid. Department of Geography)**. This university research group observes some realities that should be reflected, in summary:

- *On the one hand, there is a certain implicit concern in the management of some of the world's primary touristic-cultural resources due to touristic overload problems. In some places management measures are being applied that work intuitively with the notion of load capacity, gauging the entry to certain spaces from the realisation of "practical adjustments" that directly and empirically correct themselves on the spot in daily operation (...).*

- *On the other hand, in recent years diverse international bodies have generated certain doctrine regarding the need to control/regulate the touristic use of cultural resources in the interest of guaranteeing the conservation of the resources, but also emphasising the need to guarantee the quality of the visit.* ***(International Cultural Tourism Charter, ICOMOS, 1999)****. The UNESCO World Heritage Centre and the UNWTO in different documents, explicitly gather these concerns: Handbook Tourism Congestion Management at Natural and Cultural Sites (OMT, 2005), Tourism at World Heritage Cultural Sites. The Site Manager's Handbook (ICOMOS-OMT, 1993).*

- *Finally, there is some public opposition to implementing restriction of access systems; not so much among foreign visitors (21st century tourists are aware of the need to control the use of certain heritage elements), but rather by the local production sector, which considers it to be negative that these measures may involve certain "cuts" to their potential economic benefits. For instance, not only in analytic terms, but also in levels of management and flow impact, tourists should be differentiated from, for example, those known as travelers (or daytrip visitors). This diversity involves different procedures and strategic management systems that may well be differentiated. Both saturate specific urban areas and create conflicts of use that must be organised. As we have noted, the most common ones are the visits and movements around museum hubs or urban attractions, in a circuit of flows around transport nodes inside the cities.*

APPROACH IN THE LOAD CAPACITY STUDIES

Descriptive Component

It describes the touristic system with the undertaking of the visit. It determines the levels of use, number of people that visit each element, seasonal rates, logistics of displacement and distribution in space and time. They are data that discuss the objective characteristics of the recreational systems and specify the different situations produced by different administration alternatives (management policy decisions in the flows of visitors).

Evaluative Component

It gives an account of how the system should work from the evaluation of the impacts produced by the current conditions of the visit. This evaluation implies a value judgment that weighs the degrees of "undesirability" of the negative impacts and the "acceptability" of the consequences that the overcrowding has. Furthermore, it requires the implementation of monitoring and control systems.

CAPACITY CRITERIA IN LOAD CAPACITY STUDIES

Density and capacity criteria (physical dimension)

Number of people a space, building or container of specific dimensions can hold.

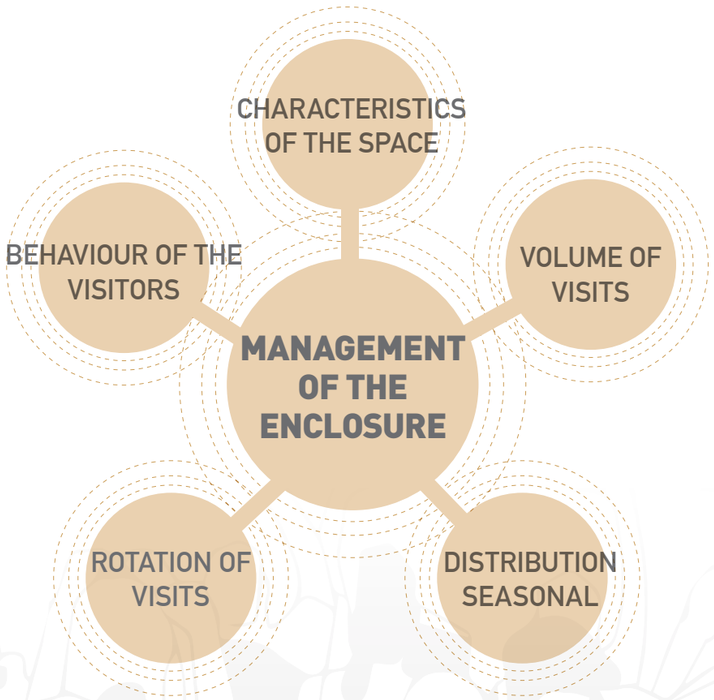
Management Criteria (operational dimension)

Security conditions of the enclosure, means of surveillance and control of use evacuation of the area in case of fire, emergency services, etc.).

Touristic behaviour Criteria (psychosocial dimension)

Conditions under which the visit takes place (stride rate, consideration conditions of the heritage, noise pollution...).

BALANCE AND MANAGEMENT VARIABLE OF TOURIST ENCLOSURES (MAXIMUM-OPTIMUM)



THE BIG LOAD CAPACITY QUESTIONS

How many people "fit" in the available space for the visit within the site?

How many people can stay at the same time within certain areas guaranteeing minimum conservation conditions of the heritage?

How many people can be accommodated assuring a few minimum conditions of contemplation of the heritage and progress of the visit?

How many people can be accommodated in relation to the management capacity (surveillance, security, flow management, carrying out guided visits, simultaneity of individual-group visits, etc.)?

Security conditions of the enclosure, means of surveillance and control of use evacuation of the area in case of fire, emergency, services, etc.).

Conditions under which the visit takes place (stride rate, consideration conditions of the heritage, noise pollution...).

Source: Author's own from the worlds of the Tourism, Heritage and Development Research Group (UCM).

In the present study, load capacity studies of tourist destinations acquire a fundamental role. The implementation of protocols must be based on transversal views of the process, which mark limits and restrictions in the region. Issue reflected in Section 4.

CALCULATION OF LOAD THRESHOLDS IN TOURIST-CULTURAL RESOURCES

CRITERIA

- **Density of Use**
  number of people a space of specific dimensions

- **Management Parameters**
  Structure of the visit offering, safety conditions of the building, means of surveillance and control of use.

- **Touristic Behaviour**
  Conditions under which the visit takes place.

VARIABLES

- **Physical characteristics of the space equipped for the visit:**
  Useful passage surface, itinerary design, visitor flows traffic systems, access points, explanation points, surface and characteristics of the passage spaces, of the rest areas and of the contemplation points, etc.

- **Number of visitors and their timing** (monthly, weekly, daily) and spacing (in relation to the use of the different elements of the resource)

- **Rotation of the visit:** average estimated duration of depending on the type of visitor.

- **Guidelines for visitor behavior:** points of interest, pace of the visit, contemplation needs, mobility guidelines according to the number and type of visitors, levels of perception of space congestion, etc.

- **Managing the visit:** available human and financial resources, structuring of the heritage offering, etc.

METHODOLOGICAL SEQUENCE TO DETERMINE TOURISTIC LOAD CAPACITY

Source: Author's own from the Tourism, Heritage and Development Research Group, Department of Human Geography (UCM).

Determining the Physical Load Capacity (PLC)	PLC: Simple ratio between the available space and the space needed per visitor.	CALCULATION Heritage Based Cultural-Touristic Resources • PLC = density of use (m2 available per person) • PLC x PCx1 x PCx2...PCxn (PCx1= perception or quality of the visiting experience) and PCx2 =conservation of the heritage) • ELC = RLC x MC (Management Criteria)
Determining the Real Load Capacity (RLC)	RLC: It is determined by submitting the PLC to a series of correction factors that are specific to each site.	
Determining the Effective Load Capacity (ELC)	ELC: It bears in mind the management capacity of the administration of the area/resource including variables such as the staff, infrastructure and equipment.	

2.4.2. MANAGING TOURIST FLOWS

Once the role of the **load capacity** is recognised in heritage cities, the behaviour and **flows generated by tourists** in the cities must be analysed, regardless of if they are cultural, recreational or if it follows events, conferences or professional matters.

Tourist flows are distinguished in three categories, depending on the duration of the stay:

1. **The short-term tourists/visitors:** Normally individuals in transit or moving from one city to another, by means of a circuit that may be perfectly organised. This is known as "passing tourist" (or traveller). The mode of transportation may vary, once they arrive to the primary city or region. In the first case they may normally be private vehicles, or either shuttle busses associated with the company organising the trip (also used in cruise tourism).

2. **The tourists/visitors that use the city as an activities centre:** Either because they use the city as a base in order to see the regional environment, or because they use it as a complement to their primary holiday destination.

3. **The long-term tourists/visitors:** They have chosen the city as their sole or primary destination and as a touristic experience need to explore it. .

The following means intervene depending on the control and management of tourist flows:

- Airlines
- International online travel agencies
- Internet search providers
- Tourist ratings websites
- Hotel reservation systems
- Local tourism value-chain (hotels, cruises, tour operators, transportation)
- Other tourism operators
- Technology companies
- Banking entities and payment methods such as credit cards

If we focus our attention on the means related with **Smart Marketing,** it is important to highlight that these are concentrating part of their management in the control of tourist flows. Indeed, it involves a change in the designation and roles in the tourism promotion companies in urban destinations. In English these have been referred to in recent years as **DMO´s – Destination Marketing Organizations**. With time, we have seen that the role of the promoting entity was not only to attract tourists, but also to manage the touristic ecosystem in the destination, so that now we are not only talking about a DMO, but also a **DMMO – Destination Marketing and Management Organization.**

If there is a rapidly changing discipline with the **technological revolution**, it is without a doubt Tourism Marketing. At present, we must rethink what is communicated, how the message arrives to our target public and what we want to achieve with that communication. In fact, it has gone from a marketing based on geographical and demographic profiles of tourists, to an approach based on psychographic profiles in the reasons for travel. All these factors condition the flows and the movements of the tourists while they carry out their activity.

Therefore, the smarter or more advanced tourist destinations prioritise their communication around sectors considered to be strategic. For example, they focus their attention on repeat tourists (redirecting their internal flows), on profiles with higher tourist spending or on sectors that contribute to the cultural life of the destination (such as artists, young entrepreneurs or the LGBTQ sector). In this respect, it is important that the **DMMO** defines, together with the local tourism sector, the most adequate tourist profile that should be attracted to the destination. Therefore, the tourist flows arriving to the cities may be more efficiently regulated.

It is also necessary to know how to expand the tourist footprint of the destination, in order to distribute (or in its case redistribute) the tourist flows in a larger geographical area, limiting the crowds and the overcrowding sensation in certain points. The destinations have to provide plans, activities and experiences to the tourists that allows them to discover other lesser-known areas of the cities. For this, it is important to convey the personality of each neighbourhood or area of the city, highlighting the elements that set it apart and make it unique. In the same way, the destinations also have to focus their marketing on local citizens and residents. They must be informed of the steps and measures that the destination is taking in order to manage the tourist flows. This detail is important in order to promote social participation and cohesion, at the same time agreeing to the aforementioned psychosocial accommodation capacity.

MEASURES FOR MANAGING THE TOURISM FLOWS

Anticipation and/or containment policies within the city

1. Regulation and control of the basic offerings	7. Increase the number of personnel assigned to control areas with a large influx of tourists.
2. Extend service and visiting hours of tourist resources and attractions, in order to accommodate better, or more, visitors (depending on the case).	8. Prepare public spaces in order to accommodate a greater flow of visitors, reducing urban furniture and architectural barriers.
3. Traffic restrictions to the city centre in order to create more pedestrian areas, incentivising the use of public transportation.	9. Raising prices as a deterrent
4. Comprehensive visitor flow systems, coordinating the routes of tour guides and better integrating them with public transportation.	10. Adapt cleaning timetables to the flows of visitors.
5. Higher integration and intermodality of public transportation routes used by tourists.	11. Pass, or when applicable have, operation Local Emergency and Self-Defence Plans (collapses, large events, evacuations, risks induced, etc.)
6. Limitation or prohibition of some means of transport that interrupt traffic (such as segways or food trucks).	12. Redistribute tourists in different areas and times of the year.

2.5. THE ROLE OF TECHNOLOGY IN THE ANALYSIS AND MANAGEMENT OF OVERCROWDED TOURIST CITIES

2.5.1. TRENDS IN THE DIGITAL TRANSFORMATION OF TOURISM

Once the need to apply different **anticipation and containment policies in planning and management of urban tourism** is clarified, it is necessary to now focus on all those tools that pivot around the development of new technologies. It involves tools that are really ever-changing, where **only a few applications gain a foothold in the innovation market**. In fact, we could talk about some methods and objectives regarding city management, which have remained theoretically unchanged for twenty or thirty years. Nonetheless, today we have new work tools which are completely new by changing.

Smart Cities, Smart Tourism Destinations (STD), and ultimately the best control of Big Data in favour of tourism, resonate today in the "jargon" as indispensable elements and components of tourism to come. But it is clear that all these advances are also occurring in each and every one of the known economic sectors, it is the case, for example, of the industry itself, agriculture or public services...

The control and monitoring of the tourism sector have been studied in many cities for some time. New techniques and tools for **technological management** are being experimented with, which try to know and anticipate the tourist's behaviour. Combating, or at least controlling, the flow of tourists at certain points when they generate overcrowding is also the subject of study. This last point is precisely the primary purpose of the present MED project.

Being well into the 21st century, technological advances today allow for the introduction of different techniques, ways and means of operating in the management of tourist destinations, but also around their main resources. In fact, what we have today are many more solutions and alternatives for the analysis and management of tourism, some of them being extremely imaginative for how complex they are. Different issues are the levels and rates of implementation in the territory, as it is accredited in Section 3 of this study

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Source: Fundación Orange (2016), in White Paper for a New Touristic Strategy of the Region of Valencia.

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1. New intermediation models and stakeholders, which have redesigned the value chain thanks to the entry barriers and the combination of different technologies.
2. Cloud Computing is already the axis of any tourism company's computer system. They facilitate the management of seasonal businesses, international management, and international growth strategies.
3. The mobile phone is consolidated as the preferred channel for tourist services, being an opportunity for the creation of new business models. Last minute purchases and m-Commerce have become common.
4. The Internet of Things in Tourism (IoT-T), is called to promote the digital transformation of the sector. The first forays are being made by large hotel chains and science parks.
5. Smart Destinations: The technological commitment of the Public Administrations causes a boost in innovation for the destinations in their entirety.
6. Social Networks are widely applied in the world of tourism, being a prominent means of bi-directional communication with customers.
7. The Online Travel Agencies (OTA'S) and intermediation platforms that have multiplied in recent years suppose a greater competition, complicating the relationship with other stakeholders of the value chain.
8. The collaborative economy is strongly developing in tourism. It has generated a new ecosystem of activity in which reputation is a fundamental asset.
9. Technologies such as augmented reality or geolocation contribute to improving tourism quality and to promote positioned and proximity marketing.
10. Big Data offers many opportunities. The data that reflect the preferences or movements of tourists will allow for solutions to be generated in order to increase the competitiveness of the destination.

2.5.2. USE OF TECHNOLOGY BY TOURISTS

"Due to the magnitude of technological changes in our era, everything seems to indicate that there is a series of notable differences between those who were born in the digital age (millennials, or those who were born between 1985 and 1995), and those who belong to previous generations "(...)

"Trust in the Internet to buy and sell, the use of social networks as a source of truthful information, or the awareness of belonging to a completely globalised world are some of the characteristics of the new group of tourists that, to this day, already represent 23% of international arrivals worldwide (more than 260 million tourists) (...)".

These notes were taken from the **White Paper for a new Tourism Strategy in the Region of Valencia (2017)**, and perfectly indicate how the new profile could be of the digital tourist associated with the **Millennial** population group. However, we must say that, in terms of tourism, this gap is not so significant, since the new technologies associated with the sector are entering, with certain ease, all the population groups.

What does seem clear, is that the new tourist (at the time called tourist 2.0), no longer sits on the other side of the table while the travel agent types our desires into his mysterious search engine, without seeing the computer screen. In Spain today, one in three travelers purchases their trips online. According to data from **Tourspain, more than 95 % of those who currently travel, look online before doing so, and close to 70 % made a reservation.**

The new tourist profile uses technology for a multitude of common endeavors. Sending emails, participating in social networks, carrying out searches in the browser, using geolocation services, making payments and daily transactions... In reality, a new world of virtual profiles has been built, in which each potential tourist leaves behind their own **digital footprint** of who they are, what they do and what they want.

The way to travel today is to first check Google, make the reservation and post our photos on social networks... All these services, and many others, will be exponentially amplified once the 5G technology is implemented in mobile phone services (TCV-Invat·tur 2015 y Trade Association, 2018).

In this entire process the users and tourists are not the only ones at the forefront of an accelerated adaptation. At the other end there are the search engines, public outreach offices, airlines, large hotel chains, small tourism operators...etc. All these are also looking for the way to capture the tourist's attention by digital means. In reality, what has changed are the channels of interaction between the users and professionals, using new technological platforms for these cases.

The digital tourist meets the following characteristics:

1. They are a **hyper-connected client:** They use new technologies and their mobile phone, in particular, in order to resolve all of the issues related to their trip: from the use of search engines, flight reservations, or hotel check-in. They use applications to locate sites of interest or to guide them on the journey, leave their opinion and value the tourist services on their social network's profiles.

2. They are an **informed client:** The digital tourist is informed about everything regarding their destination and, what is most important, they consult forums and social networks specialised in the opinion of other users about hotels, restaurants, points of interest...etc. The online reputation is without a doubt one of the most far-reaching elements for the tourism sector in the digital age.

3. They are an **interacting client:** The digital tourist tries to get a response and personalised treatment with the touristic services they are going to hire. It is increasingly necessary for the customer experience, to be very aware of the necessary response to their queries through the different channels that the service or establishment has.

4. They are a **client looking for new experiences**: One of the biggest advantages in the relationship between tourism and new technologies is the possibility offered to surprise the visitor, to personalise their experience and the services offered to them (working previously on Fam Trips of Blogtrips). Also gameification or augmented reality services may capture the attention of the tourist who is hoping for new experiences.

5. They are a **client suited for and accustomed to taking advantage of and sharing resources**: They may use services such as BlaBlaCar or Airbnb, which have become a clear trend in new forms of tourism, demonstrating the intimate relationship between tourism, mobility and new technologies. The role of the intermediaries loses relevance and they can seek more competitive prices.

The trend scenario of the tourist phenomenon and its management with new technologies opens a field of interest for its application thanks to the increased use of mobile devices and online connectivity of visitors. In Section 4 this reflection is included within the conclusions of the benchmarking study.

2.5.3. SMART CITIES AND REGIONS: BIG DATA IN THE SPOTLIGHT

2.5.3.1. BIG DATA PRINCIPLES

When we talk about **Big Data**, in reality we refer to a set of data or combinations of them whose **size (volume), complexity (variability) and speed of growth (speed)** make it difficult to capture, manage, process or analysis using conventional technologies and tools, such as relational databases and conventional statistics or visualisation packages, all within the necessary time to be useful.

Although the size used to determine whether a given data set is considered **Big Data** is not yet defined and continues to change over time, most analysts and practitioners currently are referring to data sets ranging from 30-50 Terabytes to several Petabytes.

The complex nature of **Big Data** is mainly due to the unstructured nature of a large part of the data generated by modern technologies, such as web logs, radio frequency identification (RFID), sensors incorporated in devices, machinery, vehicles, Internet searches, social networks such as Facebook, laptops, smart phones and other mobile phones, GPS devices and call center records. In most cases and in order to effectively use the data handling, it must be combined with structured data (usually from a relational database) of a more conventional commercial application, such as an **ERP (Enterprise Resource Planning) or a CRM (Customer Relationship Management).**

What makes **Big Data** so useful for many companies and administrations is the fact that it provides answers to many questions that companies didn't even know they had. In other words, it provides a point of reference. With such a large quantity of information, data may be moulded or tested from anything in almost any field. By doing so, **organisations are able to identify the problems in a more understandable way.**

The collection of these, and the search for trends allows companies and management bodies to move much more quickly, efficiently and without problems. It also allows them to correct problems before the problems end their benefits or hurt their reputation.

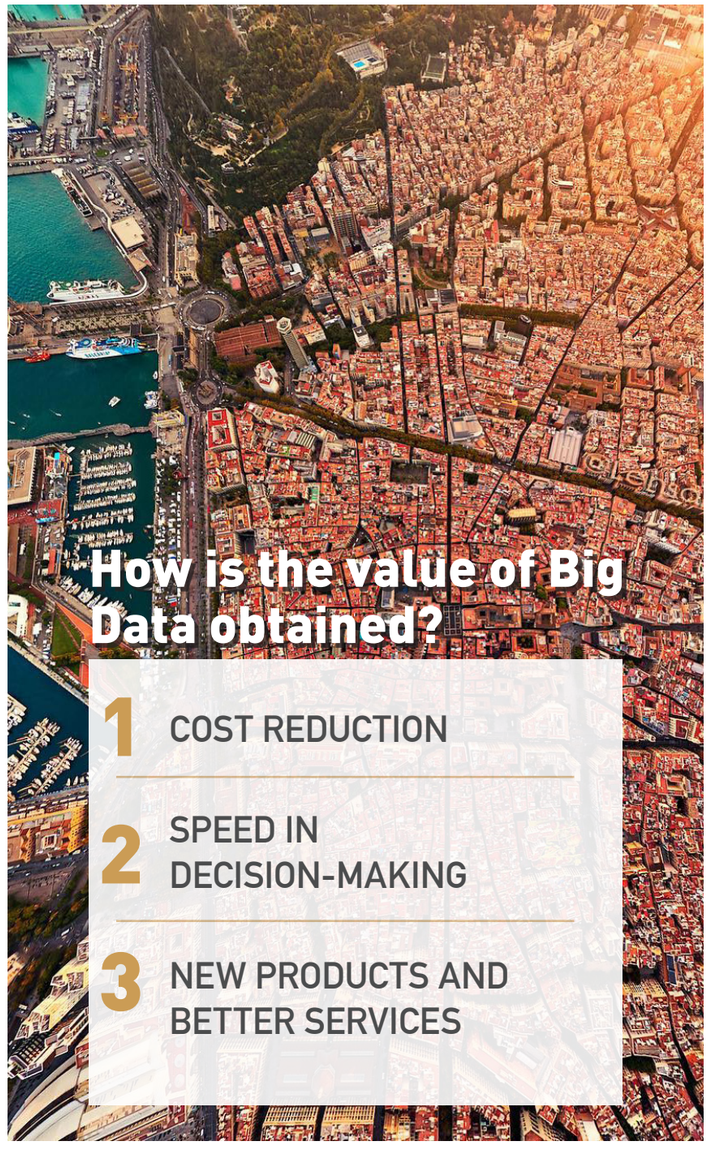
Big Data analysis helps organizations to better use their data and use it to identify new opportunities. This, in turn, leads to smarter business moves, lower-risk operations, higher profits and more satisfied customers.

The most successful companies with Big Data achieve value in the following ways:

1. Cost Reduction: Large data technologies, such as Hadoop and cloud-based analysis, provide important cost advantages when it comes to storing large amounts of data, as well as identifying more efficient ways of doing business.

2. Speed in decision-making: With the speed of Hadoop and in-memory analytics, combined with the ability to analyse new data sources, companies and administrations can analyse information almost in real time and make decisions accordingly.

3. New products and better services: With the ability to measure the needs of customers and their satisfaction through analysis comes the power to give customers what they want. Therefore, companies are creating new products to meet customers' needs.



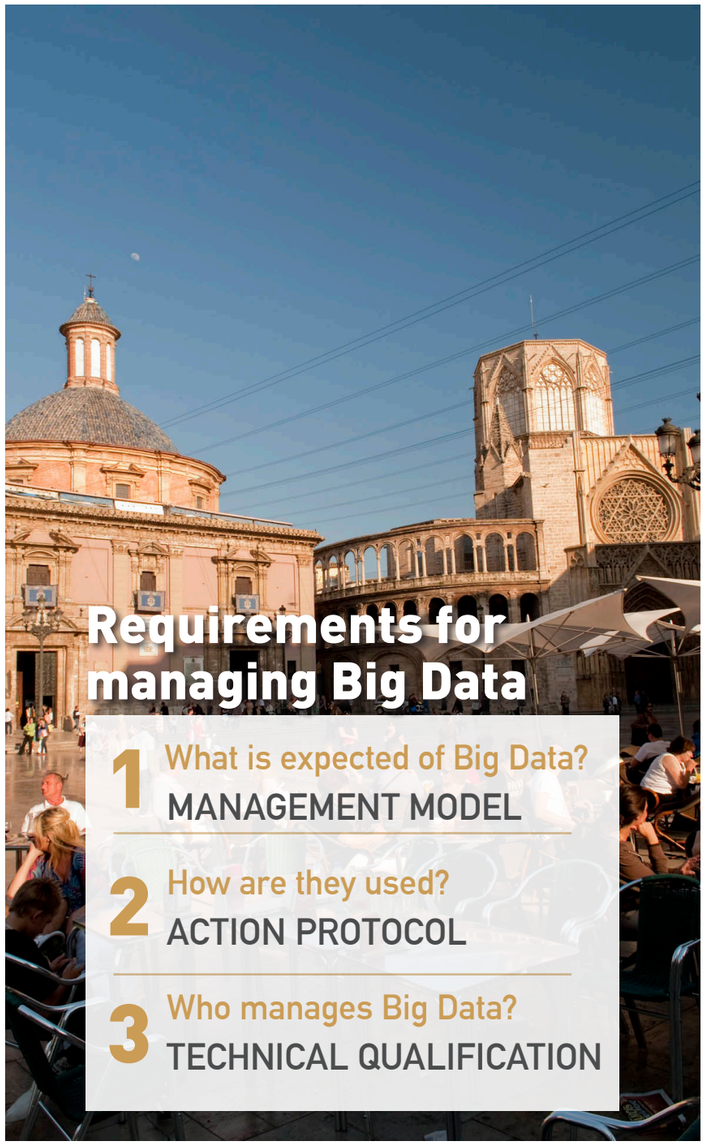
For example , in tourism, you can keep the customer satisfied while this feeling may be difficult to measure. The **Big Data** analysis offers companies and managing bodies the ability to collect data from customers or tourists, apply the analysis, and immediately identify possible problems before it's too late.

It can be introduced in the field of environmental quality, urban mobility or in the area of marketing and advertising. Thanks to the proliferation of smartphones and other GPS devices, advertisers are offered the opportunity to address consumers when they are near a store, a café, a museum or a restaurant. All these examples open an remarkable range of possibilities, especially for the management of tourist flows and the risk of overcrowding that we have been analysing in this work. In fact, all of these applications' development is in full swing, but their potential seems almost infinite.

However, it is interesting what Turisme Comunitat Valenciana and Invat·tur point out as a result of the publication of the White Paper for Tourism for the Region of Valencia (2015), *"even if an organization is not clear if it is able to address a Big Data strategy, it at least must be aware of what the current market trends are and the applications that are taking place"*. Therefore, whenever an opportunity is detected, it will be able to easily be included in the strategic business processes and action plans, considering the adoption of Big Data solutions. According to the same source, the good news is that the analysis and management of massive set of information, it is no longer a privilege of the large supercomputing laboratories. What's not so good is that, probably, leading companies and tourism organizations do not have much margin to choose between an avenue with big data or to continue working without them. It seems to be quite clear that everyone (tourists, administrations and companies) must quickly adopt to the coming changes.

Big Data favours the development of new data collection infrastructures, accompanied by solutions and models that are necessary to extract value from said information. This must be economical, quick and flexible, always ready to make the most convenient decisions. For example, by linking **Big Data techniques with artificial intelligence,** the chances of profitability and loyalty of tourists' behaviors are increased, but in fact it is used on all kinds of phenomena and activities: financial sector, transport, healthcare, sports, energy and tourism itself.

At the time when the data becomes a primordial asset of every managing entity, large multinationals such as IBM (2014), advocate for the incorporation of a **Chief Data Officer (CDO).** It's about introducing new technological techniques that come from various fields, such as statistics, computer science, applied mathematics, cartography, economics and, of course, the emerging development of artificial intelligence. In view of this interdisciplinarity, it is important to note that **Big Data** is not only technology, it also requires adapting business and operational processes, making decisions, adapting knowledge and having qualified people to take advantage of the technology in use. All of those aspects that exceed the technological skills, since it also requires professional management and the political sphere in order to validate and approve decisions on the government of cities. If the decisions are correct, it is because the data collection and filtering system works, generating confidence in the work system in question (IMB 2013).



Regarding technological and digital progress, four major trends are currently taking place, including synergic and interdependent ones:

1. Computation in the cloud

2. Use of smart mobile devices

3. Use of social networks

4. Intelligence applied to Big Data

Regarding Point 4, the primary characteristics of these data sources are dependent upon 3 variables:

1. Volume: In terabytes or petabytes of data...

2. Speed: Intended to transmit data in real time.

3. Diversity of the source: Whether it is structured (data that can be stored in the form of tables), semi-structured (HTML files) or unstructured (texts, photographs, videos) (McAfee, Brynjolfsson, Davenport, Patil, and Barton, 2012; Kitchin, 2013; Sagiroglu and Sinanc, 2013).

The **primary TECHNIQUES** that are allowed to be introduced in the complex world of Big Data are the following (TC- TCV -Invat·tur 2015):

1. Association Rules: Allow for relevant relationships or association rules among data variables to be discovered. It is based on algorithms that verify possible rules. One of its possible applications is the analysis of what products are purchased together frequently, being especially useful in the setting of expenditure by tourist purchasing.

2. Qualifying Techniques: They identify the category to which a new data set belongs, based on prior classifications. They are supervised learning techniques, already based on a set of training data with already classified datasets. For example, they are used in recommendation systems to help the user plan their trip or what they will do in a city. Another case of use may be the prediction of the customer's behavior before a purchase decision

3. Clustering: These are statistical techniques for the classification of objects/subjects, which is based on dividing a group of elements into smaller groups of similar objects, whose similarities are not known in advance. An example of use is in the segmentation of consumers into analogous groups for carrying out specific marketing campaigns, for example in family tourism, sports, etc. (tourism demand segmentation).

4. Fusion and integration of Geolocated data: Data is integrated and analysed from multiple sources in order to establish more efficient, and potentially more accurate, approaches than if they were established through the analysis of a single data source. For example, the geolocation of a device only indicates where it is physically located, but if it is combined with a map and is associated with the resources it visits, it makes it possible to know many tourist preferences and habits (Beltrán G. 2014).

5. Data Mining: Combina métodos estadísticos y de aprendizaje automático para extraer patrones de grandes conjuntos de datos. Estas técnicas incluyen reglas de asociación, clustering, clasificación y regresión. Se aplica por ejemplo para determinar los segmentos del cliente con más probabilidad de responder a un tipo de oferta.

6. Genetic Algorithms: These algorithms are well suited for solving non-linear problems. Applied to tourism, they can help to establish solutions for traveler to find a route that, starting and ending in a specific city, only pass one time through each of the cities and minimise the distance traveled. For example, it combines GIS technology and geolocation.

7. Machine Learning: It is a type of artificial intelligence based in algorithms, which enables computers to apply "intelligence" from empirical data. It's objective is to learn to automatically recognise complex patterns (accumulation of tourists, for example) and report malfunctions.

8. Natural language processing (NLP): A set of artificial intelligence and linguistic techniques in order to analyse human language. One of its most widespread applications are search engines where a word is autocompleted as it is being written, or the next word is recommended, based on previous searches and sequences of words that appear together. Language translators or correctors on devices are a good example. A possible action in matters of tourism could be the elimination of sensory barriers in order to access information.

9. Neural Networks: They are computational models, inspired by the structure and functioning of biological neural networks (cells and connections of the brain) in order to find patterns in the data. They are used for the identification of high-value customers, who are at risk of withdrawing or to detect fraudulent insurance claims. Its touristic examination is still to be determined.

10. Analysis of Networks: Set of techniques used in order to establish and characterise the relationships between nodes in a figure or network. It is used in the analysis of social networks to determine the connections between individuals in a community, how information travels, or who has more influence over who. For example, it would be important when establishing opinion leaders in the touristic areas or in the field of business.

11. Optimisation: They are numerical techniques used to redesign complex systems and processes that improve their tasks, according to one or more objective measures such as cost, speed or reliability. For example, these applications include the improvement of operational processes such as programming, routing or distribution in plants.

12. Predictive and Simulation Models: These are techniques by which a mathematical or statistical model is created or chosen in order to predict the probability of a result to visualise scenarios. An example of the application in the field of tourism is the prediction, in advance, of the entry of foreign tourists or their overnight stays.

13. Sentiment Analysis: Application of natural language processing (NLP) and other analytical techniques, to identify and extract subjective information from comments and texts. The key aspects of these analyses include the identification of characteristics, aspects, or products on which a feeling is being expressed, determining the type of feeling (positive, negative or neutral) and the degree and strength of the feeling. A very widespread example are the monitoring tools of blogs, web pages and social networks to determine how customers and interest groups react to their actions and generate opinion.

14. Geospatial Analysis: It involves models that analyse topological, codified geometric or geographic properties in a data set. These data are generated by means of technology (GIS), providing location information (addresses or latitude/longitude coordinates). It may be used in order to determine the consumer's predisposition to purchase a product depending on their location, environmental impact, mobility, etc. It is completely linked to genetic algorithms and the integration of geolocation data (points 4 and 6).

The **primary TECHNOLOGIES** for the development of Big Data are the following:

1. Big Query: Management system of distributed and proprietary databases, created by Google. Inspiration for HBase

2. Cassandra: Management system of open source databases designed to manage enormous amounts of data in a distributed system. This system was originally developed for Facebook and now is managed by the Apache Software Foundation as a project.

3. Cloud Computing: Technological model in which a service is provided for on-demand access to a set of shared computing resources (networks, servers, storage, applications...) flexibly and instantaneously.

4. Distributed Systems: They are constituted by several computers that communicate in a network and that are used to jointly solve a computational problem. The problem is divided into multiple tasks, which are assigned to one or more computers in order to be resolved at the same time. The benefit of distributed systems is that they offer higher performance at a lower cost (a set of low-end equipment can be less expensive than a single piece of high-end equipment), higher reliability (the system is more tolerant of equipment failures), and more scalability (increasing the power of a distributed system can be achieved by adding more equipment instead of having to completely replace a central computer).

5. Hadoop: Open Source Software for the processing of large data sets in a distributed system. Its development was inspired by the Filing System of Google and Google MapReduce: It was originally developed in Yahoo! and now is managed by the Apache Software Foundation as a project.

6. HBase: Non-relational, distributed and open source database system, based on Google's Big Table system. It was originally developed by Powerset and now is managed as a project by the Apache Software Group as a part of the Hadoop.

7. MapReduce: Programming model used by Google to process huge data sets that are used to solve some algorithms that can be parallelised and processed in distributed systems. Implemented in Hadoop.

8. MongoDB: Open Source database management system designed to work with unstructured data, making the integration of data in certain applications easier and faster.

9. R: Open Source language and programming environment for statistical and graphical analysis. It has become a standard among statisticians for the development of statistical software and is widely used for data analysis

10. Complex events processing: Technology designed to detect and respond to events in real time that indicate situations that impact businesses. Used for detecting fraud, financial systems, and services based in localisation.

Some of these techniques and technologies have been collected within the case studies of Section 3 of the present Benchmarking study.

2.5.3.2.CAPTURING DATA IN THE IMMEDIATE SURROUNDINGS: INTERNET OF THINGS (IOT)

Other technologies that must accompany the development of Big Data are the systems or means for the massive collection of data. Many of these may be done from what is known as **"Internet of Things" (IoT).**

It is a concept referring to the **digital interconnection of everyday objects with the Internet,** although alternatively, it can also be linked not only to objects, but also with people. For this, it will be necessary to previously define the object or person in question, to know what is being sought with this type of connections, if they are going to be simple or relational.

This technological development, occurs in the field of urban and/or tourist management by using radiofrequencies and sensors fixed in urban elements that allow a better control or monitoring "of things" or people. Thus, for example, it can be especially useful for controlling overcrowding and improvement of urban mobility.

Companies such as Cisco or Libelium are providers of data capture sensors, thus generating a kind of "dynamic connection counter" that allows you to estimate the number of "things" connected. The devices are connected to the network, through low power radio signals; it's the most active Internet of things field of study. This fact explains why signals of this type do not need Wi-Fi or Bluetooth. However, different alternatives that are cheaper and require less energy are being researched. They are called the **Cheap Networks.**

The **IoT** can be applied not only to measure the concrete state of things, but also allows for the study of certain habits of people, for example when they act as tourists or consumers. The large quantity of data received through sensorisation is able to segment grouping patterns of common or differential behaviour on a quite a few individuals. Using the profiles built the segmentation process, media producers present the consumer with on-screen advertising aligned with their known habits, in the right place and time, to maximize their effect. Therefore, a large amount of information is collected by tracking how tourists interact with the content. This is done by measuring certain performance indicators such as the abandonment rate, click rate, registration rate or the interaction rate.

The amount of information handled is still a challenge beyond its analysis, in its management. However, the benefits obtained from the information far exceed the complications of handling it. The research firm IT Gartner predicted that if in 2016 there were some 6.4 billion "things" connected, that number would grow to 20.8 billion by the year 2020.

The travel industry is one of the industries that is best taking advantage of the investment in IoT. Thus, a recent study by Tata Consultancy Services revealed that the companies in the travel industry that have led this wager, have already invested an average of 125 million. For example, in the accommodation sector, IoT technology is impacting customer interactions such as backoffice operations. Some hotel groups, such as Virgin Hotels, offer an application that allows customers to interact with their room's thermostat or control the television, and soon the rooms may be accessed without a key. Other chains like Marriott are experimenting with "like buttons" that allow guests to provide information in real time about the property's services, designs and procedures.

For large-scale transport hubs such as airports, theme parks and conference centers, the IoT offers the opportunity to simplify operations, allowing staff to reorient themselves with the customer experience. An example of this would be the company Disney, famous for the launch of its "Magic Band" initiative in Orlando. It is a network of sensors throughout the park that help simplify everything, from transporting guests, to booking restaurants or planning itineraries through a bracelet enabled and used by the customers themselves.
(https://disneyworld.disney.go.com/es-us/faq/bands-cards/understanding-magic-band/)

Even though the possibilities of using IoT technology continue multiplying in the tourism sector, industry observers are aware that this should be done with some caution, especially for issues of security or piracy

Finally, note that the city of Barcelona held the **2nd IoT Solutions World Congress** (https://www.iotsworldcongress.com)in October 2018 in collaboration with the Industrial Internet Consortium as the main association of the sector.

At this type of fair, a multitude of companies meet, showing exhibition areas and a complete congress programme with the participation of numerous speakers who debate some of the sector's challenges. The most interesting applications are based on proposals for smart mobility, energy efficiency and the use of renewable energies. Applications are also developed for the use of intelligent architectural platforms, interesting for counting people in the touristic visits. This type of proposals may also be seen in the International Tourism Trade Fair "Fitur-tech" in Madrid. (http://www.ifema.es/fitur_01/FiturTech/index.htm)

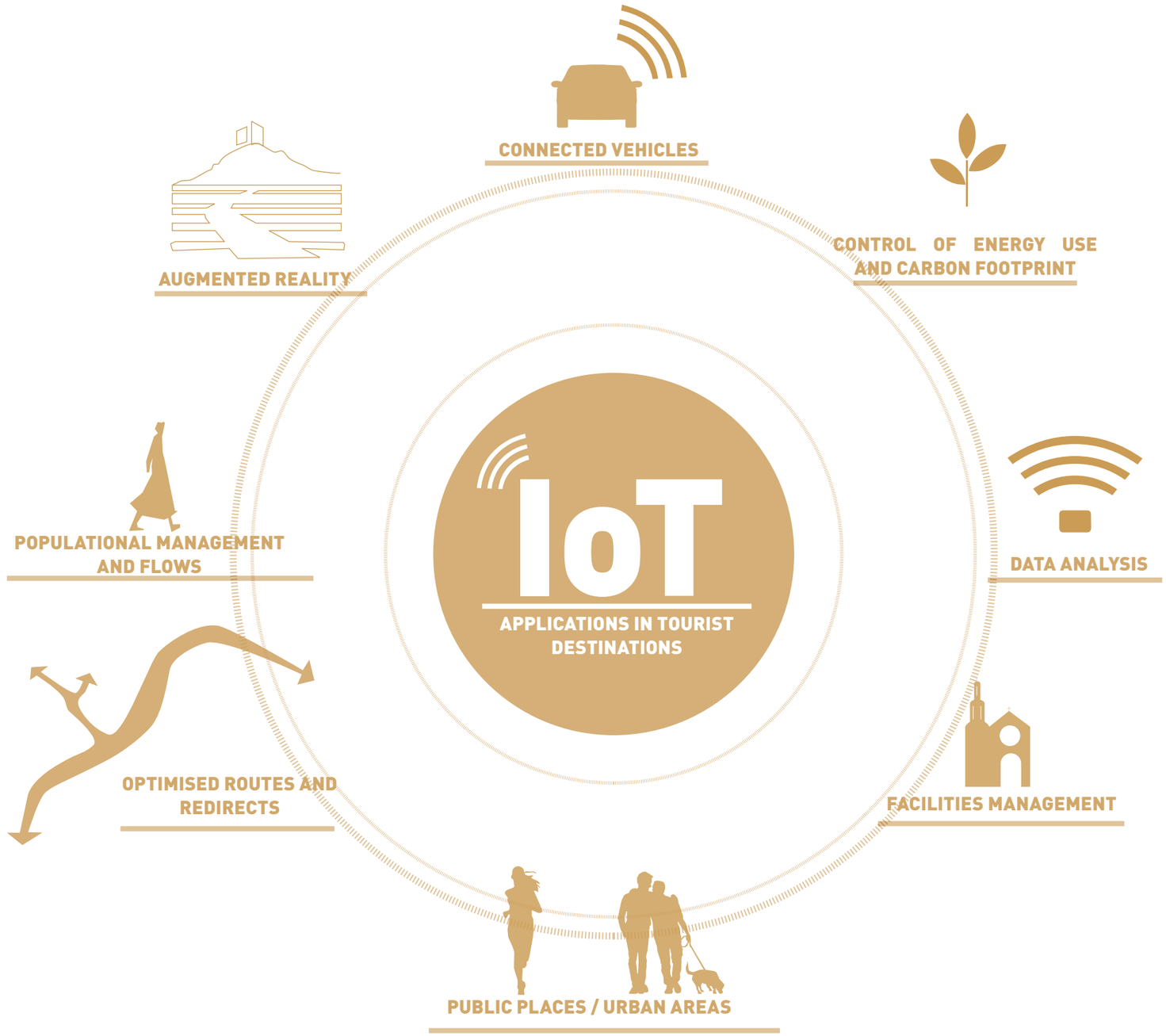
Project co financed by the European Regional Development Fund

Illustrating the question: Internet of Things (IoT)

The challenge is to develop null or low maintenance management systems, with low power consumption and wireless transmissions able to transmit data in real time.

The data is transmitted through these nodes on IoT cloud-based platforms, and, from there, to servers of the different applications.

- Connected vehicles
- Tracking deliveries in real time
- Autonomous vehicles
- Rideshare technologies and new business models by means of mobility
- Optimised routes and redirects
- Smart logistics
- Delivery improvements
- Technologies for risk prevention or emergencies
- Temperature control
- Speed optimisation
- Health monitoring services
- Increased worker productivity
- Control of energy use and carbon footprint
- Control of breakdowns in the urban services (water, waste...).
- Smart Buildings / Accommodations
- Smart Offices
- Smart Infrastructure
- Facilities Management
- Public places / urban areas
- Sales and retail trade
- Augmented Reality
- Data Analysis
- Populational Management and Flows



2.5.3.3. LAS SMART CITIES

The **Smart City** (term coined by the multinational IBM) concept arises from the evolution of the so-called Digital Cities, which in 2004 arrived in Spain after previous work carried out by the **Ministry of Industry** with the elaboration of **1st Digital Cities Programme** that was addressed in the world. Prior to the preparation of this work, the Spanish company ACCEDA brought together more than 30 companies from different sectors (telecommunications, security, construction, audiovisual, consumer electronics, electrical equipment, IT, healthcare, education, etc.), which together with other Spanish governments and cities, they wanted to create a kind of **Digital Ecosystem.**

The result of those multisector meetings, showed how a true smart city could be: homes, banks, hospitals, hotels, tax offices, post offices, government offices, schools, as well as the entire urban fabric: street lighting, traffic lights, urban furniture and everything that would ultimately make up truly smart city model. This Digital community, was presented by companies such as ZTE, Telefonica, Siemens, Gas Natural, Prosegur, Berker, INDRA, RACE, etc.

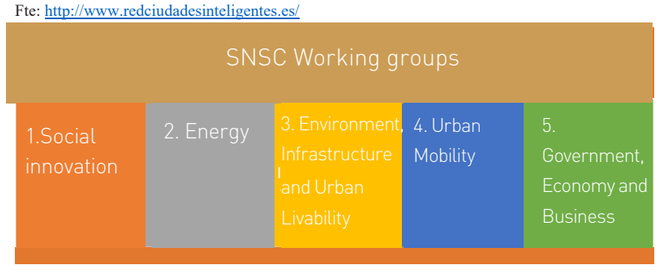
In 2011 the **Spanish Network of Smart Cities (SNSC)** was created, formalised with the signing of the **"Manifiesto for Smart Cities"** One year later, it had the first founding session **"Innovation for progress"**. The commitment of this network was to create an open model of cooperation that favours the economic, social and business progress of cities through innovation and knowledge, supported in any case by Information and Communication Technologies (TIC). http://www.redciudadesinteligentes.es/

In 2018 SNSC constituted 81 cities; each and every one of them developed their own adaptation strategies. Some of them are A Coruña, Albacete, Alcalá de Henares, Alcobendas, Alcorcón, Alicante, Almeria, Alzira, Aranjuez, Arganda del Rey, Avila, Badajoz, Barcelona, Burgos, Cáceres, Castellón, Ciudad Real, Córdoba, Guadalajara, El Puerto of Santa María, Elche, Fuengirola, Getafe, Gijón, Jaén, L'Hospitalet de Llobregat, Huelva, Las Palmas de Gran Canaria, Logroño, Lugo, Huesca, Madrid, Majadahonda, Malaga, Marbella, Mérida, Molina de Segura, Móstoles, Motril, Murcia, Oviedo, Palencia, Palma de Mallorca, Pamplona, Paterna, Ponferrada, Pozuelo de Alarcón, Rivas Vaciamadrid, Sabadell, Salamanca, San Cristobal de La Laguna, Sant Cugat, Santa Cruz de Tenerife, Santander, Santiago de Compostela, Segovia , Seville, Tarragona, Toledo, Torrejón de Ardoz, Torrent, Valencia, Valladolid, Vitoria-Gasteiz or Zaragoza...

The foundation FUNDETEC is its technical office.

SPANISH NETWORK OF SMART CITIES (SNSC)

Fte: http://www.redciudadesinteligentes.es/



2.5.3.4. SMART DESTINATION

We could say that the **"Smart Destination"** is the result of the normal evolution of Smart Cities, especially when cities understand that the tourism sector is their most influential reality.

The State Trading Company for the Management of Innovation and Tourism Technologies, SAMP (SEGITTUR), under the Ministry of Industry, Commerce and Tourism, and attached to the **Secretariat of State of Tourism,** defines **Smart Destinations** as those "consolidated touristic spaces based on a state-of-the-art technological infrastructure, an intelligent system that captures information procedurally, analyses and understands events in real time, to facilitate decision-making and visitor interaction with the tourist environment "

The same **SEGITTUR,** has been working with a selection of destinations to prepare the constitution of the **Smart Destinations Network**. Currently, it has the participation of different Provincial Councils and 12 specific destinations: Arona, Avilés, Benidorm, Calvià, Castelldefels, León, Cádiz, San Bartolomé de Tirajana, Santander, Sanxenxo, Palencia and Pontevedra. This network has all the signs of increasing, fostering collaboration and joint action of the member destinations. The main idea is to find synergies and exchange good practices, to which the coordination of actions is added, the search for a joint promotion framework and contribute to guarantee the leadership of Spain in the field of tourist intelligence. This network hopes to have the support of a working group formed by institutions of reference from the public sector, important stakeholders from the tourism sector, the technology industry, large public service providers and experts in related matters. The Spanish experience in this field is summaries by the existence of a Comprehensive National Tourism Plan (CNTP). 2012-2015, that included the Smart Destinations among its priority measures, establishing a set of actions that have been studied by SEGITTUR.

Not only that, the Region of Valencia also puts forward the creation of its own Smart Destination Network. In April 2018, Turisme Comunitat Valenciana announced the opening of the first

Technical Assistance Office for Smart Destinations in all of Spain, based in Benidorm-Invat•tur, with the intention of making the due technological accompaniment to any initiative that may arise to promote the creation of the Smart Destination in the Region of Valencia.

With this idea, the intention is to technify tourism destinations and drive innovation through the paradigm of smart destinations, also promoting sustainability, improving quality and its international tourist positioning.

The actions associated with the smart destinations are the following:

1. Preparation of a basic document that defines Smart Destination and the requisites to be one.

2. Specific definition of necessary compliance in order to be classified as smart destinations.

3. Development of pilot projects.

4. Funding for the application of new technologies in the State Fund for the Modernisation of Tourist Infrastructure.

5. Definition of a new model of Tourist Information Office: "21st Century Office".

6. Creation of a technological platform to share innovative projects between the Central Administration and the Autonomous Communities.

In direct relation with these measures, there is one known as the **"Tourist Destinations" Subcommittee** belonging to the AENOR Smart Cities Standardisation Committee (AEN/CTN 178). This committee is presided over by SEGITTUR.

The areas for action on which the Smart Destinations are structured are the following:

- **Technology:** Degree of implantation of the ITCs in the tourist processes of the whole spectrum of the trip, idea, planning, reservation, experience and subsequent sharing. It is the fundamental pillar of Smart initiatives, through three main technological flows: Internet of Things (IoT), Internet of Services (IoS) and Internet of People (IoP).
- **Demand:** Thanks to the high degree of visibility that can be achieved through the Internet, there has been a remarkable increase in information processes, booking and acquisition of tourist services in recent years. More information available to users has transformed them in "informed visitors" and active dissemination elements for other users. The Smart Destination should adapt itself to this new touristic situation.
- **Changes in the tourism and services sector companies:** Through ICTs, companies and local entrepreneurs have direct communication channels and an exponential increase in visibility. All this, together with innovation and improvement of competitiveness political strategies, has resulted in tourism sector companies having a higher degree of technology with respect to other sectors, and there are more opportunities to generate new business models.
- **Efficiency:** The introduction of ICTs generally entails a reduction in management costs and a substantial improvement in the quality of tourism services. The ability of small businesses to obtain information from their clients, to be able to analyse it and therefore improve decision-making processes is an important change for companies in the sector, which see their work systems optimised.
- **Competitiveness:** The Smart Destinations also help to improve competitiveness at different levels, not only on the technology front, since they allow administrations to maintain a more exhaustive control of tourism resources, as a way to improve their use, better adapting to different market contexts. At the Destination level, the adoption of Smart strategies strengthens aspects such as the comprehensive management of resources, public-private cooperation, or innovation.
- **Sustainability:** Understood as the transversal factor of all Smart strategies linked to the development of Cities as Smart Destinations. The rational, comprehensive and efficient management of tourism and natural resources is more important, if possible, within a Smart Destination, since environmental quality determines the outcome of the tourism experience, and therefore is a key factor in the assessment and quality of the experience.

After all the above, **smart city, tourist city, technology companies, Big Data and IoT,** circulate in the same direction, creating a whole range of technologies and intervening stakeholders. Complex and varied concepts, all interdependent which may cause some confusion.

It can be said that the tourism sector is managing to link and integrate the management of information and knowledge between cities and companies. The quality and quantity of data that companies and tourist destinations can obtain and process, improving planning and decision making, both in tourism management and in the complex management of the city.

2.5.3.5. SOME COURSES OF ACTION FOR DATA HANDLING AND CONTROL OF MASSIVENESS.

The era of WIFI networks, mobile technology, Big Data or Cloud Computing will change the world as we have known it to date. In recent years, different technologies have been developed and implemented at the service of the inhabitants and tourists in the cities in order to improve the living conditions of the former, or to optimise the experience of the latter. Authors such as Buhalis D. and Amaranggana (2014), argue that due to the greater complexity in the management of cities in an increasingly global world, ICTs are now essential for coordination, accessibility and interaction among inhabitants, companies and the cities themselves.

In order to achieve the desired benefits, they are implementing many resources of all types, to more accurately track the necessary information in order to transform that reality. The way in which we leave a "digital footprint", both citizens and consumers, is reflected in Internet searches, in bank card transactions, in the activity log of mobile phones, in photographs uploaded to the network, in messaging or on social networks, etc...

As we pointed out, another of the fundamental ingredients for this technology to continue on its course is the simultaneous development of devices associated with the "Internet of Things" (IoT). The possibility of linking collection devices and measurement of things in the territory, or with people, is undoubtedly another advancement for which this phenomenon is occurring: Data on water and electricity consumption, meteorological data, tallies with sensors to improve urban mobility or the management of overcrowding, are just some examples.

With all this information, it is possible to collect, connect and study the different patterns of social behaviour, which, as pointed out in other sections , is very useful. However, we must also be aware that the strategic purpose that enables the profit derived from these innovations, and that seek to be also profitable and amortized is not being abandoned, but rather quite the opposite.

The domain of **Big Data** and the use of processing algorithms derived from advances in artificial intelligence, speed up and exploit huge amounts of information with greater speed and precision. All this information is used for different purposes (tourism management, urban marketing, city management, strategic or business decisions, etc.).

In this section, some useful examples or specific experiences of use, which are of interest for the purpose of the present study, are briefly mentioned:

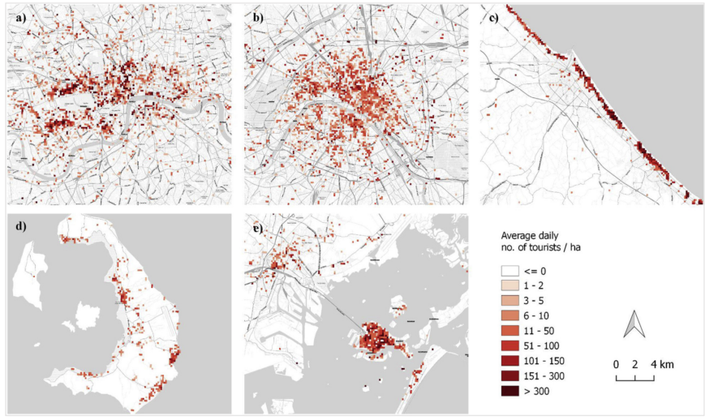
STATISTICAL COMBINATION AND USE OF BIG DATA: LOCATING TOURISTS

The official statistics publish data that are regionally structured on geographical-administrative levels. This information is very limited when it comes to providing non-conventional data that are absolutely emerging. Thus, the non-formalised data are more dynamic, varied and fast, allowing for new research opportunities, including the touristic system in the cities. Additionally, it has already been mentioned that social networks are a source of user generated content (client and user reviews, publications, uploading photos, etc...). With this information, we can assess the large mobility flows specified, estimating the number of visits to specific attractions and identifying the most congested tourist spots in the city (García-Palomares, Gutiérrez, and Mínguez, 2015). Other studies use queries in online search engines, for purposes of predicting the tourism demand in specific destinations. Data from mobile network operators (MNO) is another emerging source for analysis, being particularly promising for the mapping and monitoring of the tourist presence patterns with a higher level of space-time detail. The data derived from the use of mobile phones and geolocations allows researchers to evaluate visit patterns in more touristic places.

Following these principles, some statistic bodies are undertaking "pilot studies" in order to test the use of data that Internet operators offer in the official statistics production (Dattilo and Sabato, 2017). However, the systematic use of this data source is being impeded by the restrictions on operators to access the information in their possession, which remain unwilling to public their data or sell them at excessively high prices (Debusschere, Wirthman and De Meersman, 2017).

In view of the above, the potential of official statistics combined with **Big Data** sources remains limited, especially for applications that require certain levels of resolution. But their combination seems possible, as authors such as Filipe Batista e Silva, Mario Alberto Marín Herrera, Konstantín Rosina, Ricardo Ribeiro Barranco, Sergio Freire, Marcello Schiavina (2017) have proposed. These researchers have made interesting advances in the space-time mapping of the tourist density in Europe, obtaining approximations that are important in order to estimate the number of tourists at a given time or place. The locations that depart from the accommodation establishments, whereas the tourist density covers all types of visitors, regardless of the reason for the visit (for example, business, leisure or personal interests... etc.). Their data also separate by origin and nationality.

Project co financed by the European Regional Development Fund



Tourist density in August 2016 in selected places:
a)London, b) Paris, c) Rimini, d) Santorini, e) Venice. Background map source: Design by Stamen with cartographic base by OpenStreetMap. Source: Batista e Silva F, Marín Herrera MA, Rosina K, Ribeiro Barranco R, Freire S, Schiavina M. 2017.

GEOPOSITIONED PHOTOGRAPHS

The **photo sharing** services provide very useful information in order to identify the presence of tourists while they carry out their activity. There are many communities to share photos on social networks, for example **Flickr or Instagram.**

However, the application value that **Panoramio** had (prior to being closed by Google and becoming a part of the **Google views** project) is worth noting. Its usefulness lies in the possibility it offers to measure the flow or tourists at public access points.

On the **Google Earth** website or its application, photographs are shown that were taken in different places or landscapes, later being published online once the photos were duly geo-referenced, much like the more visited routes such as **wikiloc** (gallery) or **webcam monitoring.**

Photographic records may be used not only to identify more attractive places, but also to analyse special or seasonal patterns of tourist flows in the cities (García- Palomares, Gutiérrez, and Mínguez, 2015). However, a potentially important malfunction was detected: the most photographed areas may offer little information for elements related to accommodation or shopping.

Valencia. Photographic focus by means of Google's Sightmap.
Source: **cercle**

GEOLOCATED SOCIAL NETWORKS

Authors such as Salas Olmedo MH, Moyá-Gómez B, García-Palomares (2017), argue that there is still little known about the spatial behaviour of the tourists in the cities. With the following applications it is possible to geolocate massive amounts of people, helping to, for example, identify and localise the presence of tourists in the cities:

a) **Positioned photographs** themselves. As mentioned above, it is one of the most used platforms as a tourism proxy.

b) **Foursquare check-ins,** Yelp. They are particularly useful as a proxy in order to study and evaluate consumer patterns.

c) Interaction on the social network **Twitter**. It's a valid proxy for being connected to accommodations, for example.

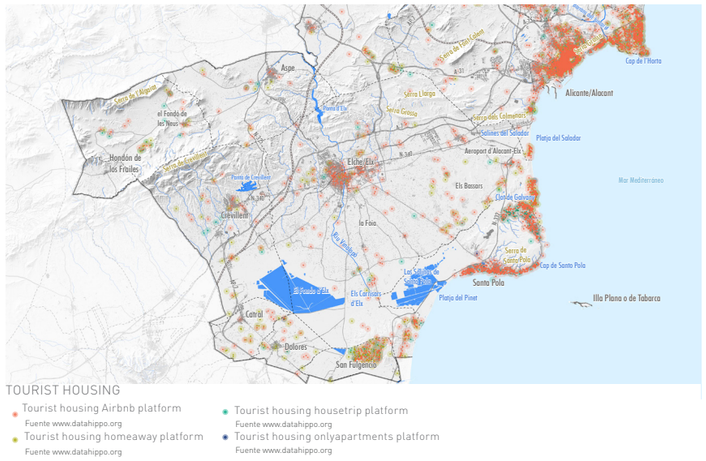
d) **TripAdvisor**, for its ability to generate assessments and specifications, as well as tagging. Its link with Facebook was formalised in 2012.

BOOKING SYSTEM AND THE TRACKING FOR ECONOMIC TRANSACTIONS.

When tourists go shopping or to restaurants and stay in hotels, they leave their **digital footprint** in all of the establishments by paying with a bank card or registering their location on social networks.

Whether through booking centres (that may be small start-ups or e-commerce travel companies such as Booking or Expedia), tour operators (Tui, Thomas Cook, kuoni, Der Touristik...), online travel agencies (OTA), or even using direct sales with the touristic establishment -all of these option use platforms or digital means in their businesses. Another booking system, not without controversy, are P2P intermediary platforms for accommodations, which are currently expanding and without any clear regulation (at least in Spain). It is best evidenced by platforms such as Airbnb, HomeAway, Housetrip, Onlyapartaments.

ALICANTE-ELCHE REGIONAL METROPOLITAN ACTION PLAN. Source:**cercle**



SMART SOLUTIONS IN URBAN MOBILITY

The term **"Smart Mobility"** references a series of actions, policies and initiatives whose primary aim is to favour mobility in cities so that it does not involve a hindrance to the normal functioning of the same. It involves a series of actions that seek to **facilitate the movement of users** - be it on foot, bicycle, public or private transportation - under one common premise: save time and economic and environmental expenses, which is ultimately what gives them the "smart" name.

The city of Dubai is at the cutting edge of working to develop smart mobility systems, making them a global reference. The tourism industry, as well as new technologies, in the city are booming. The city expects to receive about 20 million visitors in 2020 according to data handled by Euromonitor International. With these estimates, the Dubai 2030 transportation strategy has as the goal of making 25% of all the transportation there smart and without drivers. Beyond the leading experience of this city, they are of special reference for this study, the monitoring and evolution that many European cities may have, motivated by the approval of the different **Sustainable Urban Mobility Plans (SUMP).** A document of this nature should have concrete measures and pragmatic proposals linked to "Smart Mobility".

PRE-EMPTING THE TOURIST: FACIAL RECOGNITION AND ANTICIPATING INTERESTS

Its purposes are initially designed to reinforce security between borders and airports, facial and emotion recognition systems may become a new technology with the potential to recognise the interests, and therefore the influx, of tourists to different tourist resources. It is anticipated that this will happen in the near future, given that the emotion recognition software may be able to integrated in the consumers' devices. In this field, one of the main advances is being made by companies like Apple by acquiring Emotient (an emotional intelligence startup).

Other companies such as Affectiva-MIT also offer emotion recognition software by using sensors or webcams. It monitors the facial response, applying machine learning algorithms in order to achieve results. Identify up to seven emotions and more than twenty facial expressions. Regarding these applications, it could be possible to sense or predict what tourist resources are the most satisfactory and estimate their demand.

Another interesting experience is that which the adventure travel agency Explore offers, which was one of the first in testing these technologies in order to help select tourist destinations or activities. This model allows the providers to read the emotional and physical state of consumers, obtaining direct answers without filters, in situations such as shopping, booking a holiday or gauging the arrival time at the reception of a hotel.

Following other similar cases, by using Travelsify the possibility of booking hotels based on mood exists. It involves an online booking platform that classifies each hotel in accordance with 34 attributes, and then allows users to select a hotel based on their emotional state of mind instead of just selecting it based on comfort criteria. Travelsify announced a collaboration with the AccorHotels hotel group, which uses the technology in their search engines. This working method may contribute to a better focus in bridging the gap between prior expectation of the trip and the experience itself. In the same way, companies such as Expedia are examining emotions in order to improve tourist services. Sensors analyse the different tourists and also gather their emotions. This company hopes that this technology may help to improve its platforms, segmenting different clients, seeking to reduce stress and frustration when booking vacations on the same. In the experimental stage, they are working on reading brain activity with applications like headphones connected to the brain that are able to register different emotional states. Some experts argue that portal brain tracking devices will reach deeper levels of interaction between humans and computers.

COMPREHENSIVE TOURISM ANALYSIS: PREDICTION OF TRIPS AND TRAVEL

The prediction of arrivals to a country or city involve making calculations using projection models based in handling primarily socioeconomic data. We're referring to consumer goods, commercial industries, demographic and lifestyle trends of consumers in different countries. It also includes complete analysis and data, tables and figures with projected forecasts several years into the future.

This type of data are processed by leading market research companies, such as **Euromonitor International**. Its **Travel Forecast Model** is totally interactive and uses the company's latest macroeconomic predictions and trip data updated by the UNWTO for purposes of offering the most frequent updates, comparing the characteristics of the cities, using historical patterns and identifying what is its influence in the influx of tourists to said cities.

Its forecast model is able to anticipate the arrival of international tourists, being able to adjust itself to the forecast of the countries and bring forward possible occupation data including at the urban level.

COORDINATION OF ANALYSIS PARAMETERS: THE CASE OF TOURISM OBSERVATORIES

In recent years the creation of many observatories, also of a touristic nature, has been formalised. The dispersion and lack of homogenisation of data has always been a concern for analysts and urban and tourism managers. For this reason, the University of Burgos and the CETT-UB Campus of Barcelona have tried to pool different cost-sharing and joint collaboration initiatives.

They are really looking for co-creation processes in which working groups share initiatives that, individually, each destination has implemented in recent years. Said initiatives are primarily focused on the gathering and use of data on the tourists' activity in the destination and the application of parameters of the smart destinations themselves.

Among the aims of our project is establishing an association of tourism observatories which may centralise shared knowledge and serve as a home base for all involved entities. In this regard, it is worth remembering the big differences that can be seen in the development of **Big Data** techniques between different companies, regions and cities, as well as the need to share knowledge among the different organisations so that they may communicate with each other.

OWNED SOCIAL GOVERNANCE: THE SMARTGOV CASE

We cannot leave out other experiences complementary and similar to **HERIT DATA**, such as the **SMARTGOV** project. A community initiative in which the European Commission set 1,650,000 for the development of smart governments, public participation and subsequent decision making by means of using Big Data in its data harmonisation.

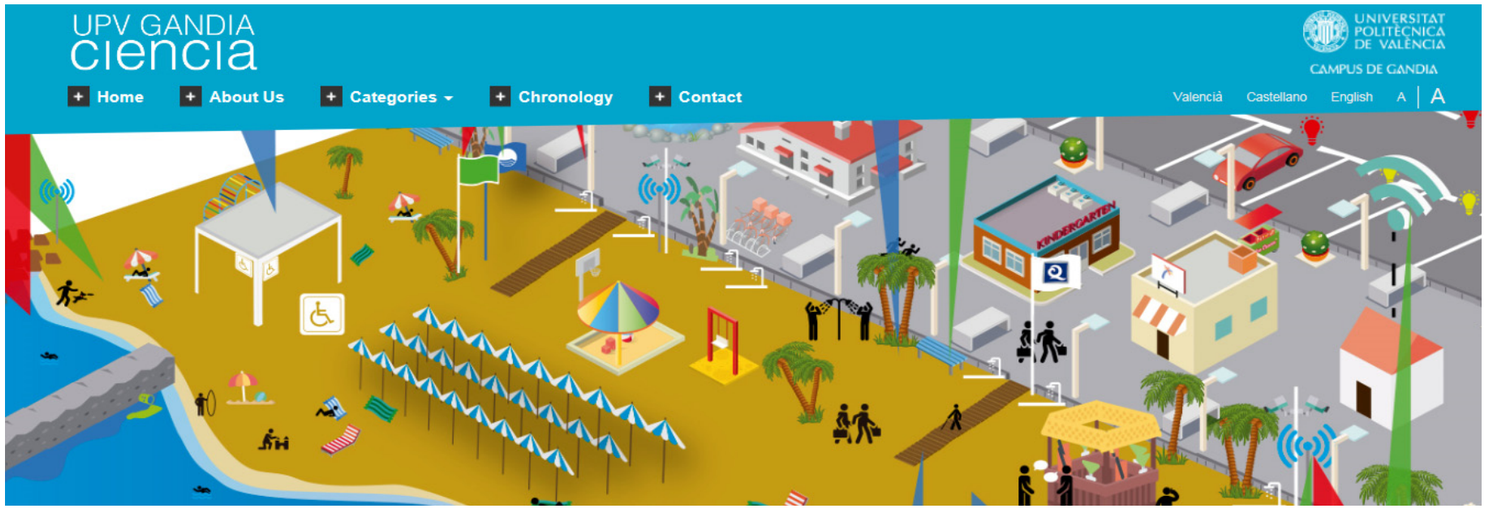
It involves an interdisciplinary and international research project financed by JPI Urban Europe. It is a joint programming initiative that has the goal of creating attractive, sustainable and economically viable urban areas. The SmartGov project will last 3 years and will run from 1 April 2016 through the end of March 2019. In the Region of Valencia, the government of Quart de Poblet is participating with its sights set on including Council of Valencia, in which experiences are shared and transferred between European universities and other public administrations and technology companies from Austria, Cyprus, the Netherlands and Spain (http://www.smartgov-project.eu).

PUBLIC NETWORKS AND WIFI CONNECTION: THE NEED FOR THE INTERNET OF THINGS (IOT)

During their stay in the city, tourists also connect to the Internet in order to confirm details of their visit, check their email, participate in social networks, etc. All of this activity leaves a "digital footprint" in many of the places visited. Tourists frequently use the installations in hotels, hostels, restaurants and certain open spaces in order to connect to the Internet via free **WIFI** networks, therefore their activity may be notably reflected from the public space.

Thanks to these devices, it is possible to improve the management of the large heritage and cultural containers, influence the citizen's own security, in the count of tourists, in their study and characterisation to better research markets, or on the elements of measurement and environmental sustainability (generation of RSU, energy and mobility...). These are only some examples, but in reality there are many more: sociopolitical, technological, climate changes, types of communication and relationships....

Details of the Smart Beaches Project designed by Polytechnic University of Valencia and TCV. Generalitat of Valencia. Fte: http://cienciagandia.webs.upv.es/en/2018/06/campus-gandia-partners-to-develop-smart-beaches/



Overcrowding in cities results model. Visit Benidorm. Source: **cercle** *from Bilbao Leire. Visit Benidorm.*

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CASE STUDIES AND GOOD PRACTICES

3

3 1 Introduction

3 2 Region of Valencia

3 3 Barcelona

3 4 Occitania

3 5 Florence

3 6 Western Greece

3 7 Amsterdam

3.1 INTRODUCTION

The "HERIT-DATA" project, is expected to identify the best techniques and tools for sustainable planning and responsible tourism management in certain MED regions and cities. With this aim, we have selected some cities or regions with mass tourism and that treasure significant cultural heritage. This project seeks to visualise the harnessing of new technologies and innovation, in particular, by using management tools, in the context of the smart cities and the use of Big Data. Furthermore, it includes any other social or urban management policy or measure that helps to improve the general state of the cities, including their touristic and heritage part.

The present section seeks to abridge the results of comparing 6 tourist destinations throughout Europe. The CASE STUDIES are:

- Valencia
- Barcelona
- Occitania
- Florence
- Western Greece - Olympia
- Amsterdam

In the analysis of these 6 tourist destinations we differentiate two types:

1. Heritage city. The analysis of these places is done on an urban scale and focuses on areas with a greater heritage charge, which are those that suffer more congestion due to tourism. The selected cities are Valencia, Barcelona, Florencia and Amsterdam.

2. Touristic resource of heritage interest. In Occitania the Pont du Gard and the Hérault River Valley were selected. In western Greece the enclave of Ancient Olympia was chosen.

Along with the in-depth analysis of these 6 tourist destinations, the present study gathers international experiences at the European level that enables us to get a more complete picture of the "Overtourism" phenomenon and its management through new open technologies/big data.

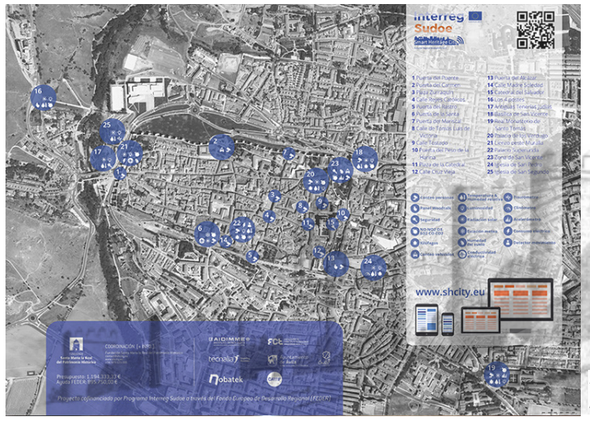
Venice

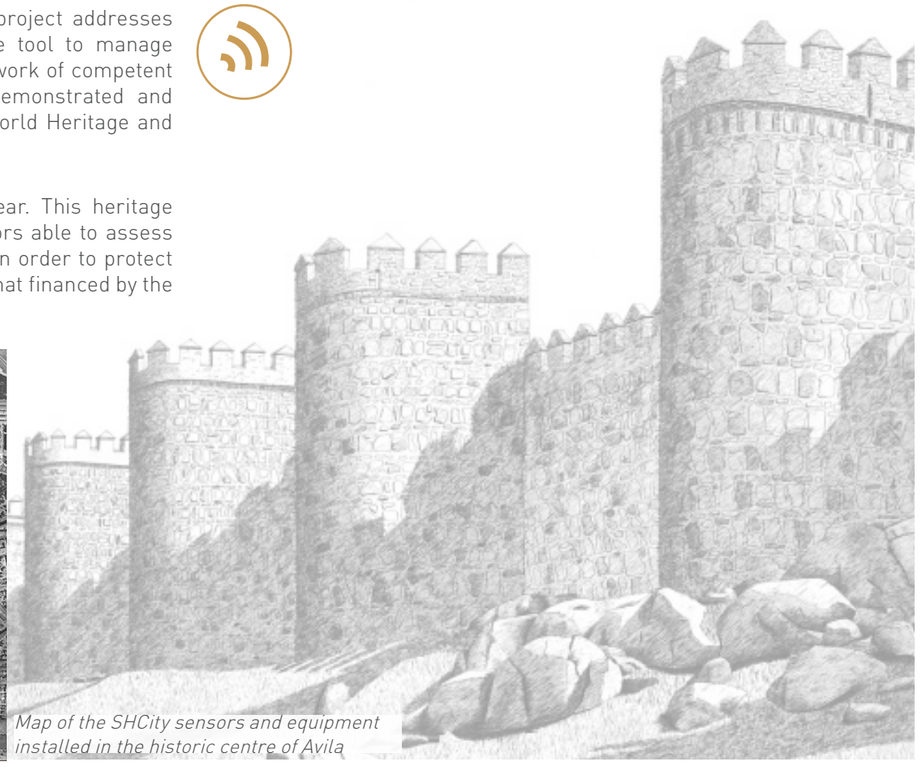
It's calculated that 30 million people visit Venice every year, and a fifth of them spend at least one night in the historic centre of the city, while the local population leaves the city due to either direct or indirect pressure. 58,000 people currently live in Venice, an amount of inhabitants similar to that of the city following the great plague of 1438. The figures show the size of the Venetian diaspora: in 1951 it had 175,000 residents; in 2017, less than 54,000. In other words, around 120,000 people left the city in the past 50 years, following the 'Corriere della Sera'. At present, 2.6 citizens abandon Venice every day, around 1,500 per year. A new budget law passed by the City Council includes a new tax, for which one will have to pay to access this place. The charge for a day trip will depend on the time of year. This tax will cost between 2.50 and 10 euros per person. However, there will be exceptions for students, people who briefly travel to Venice for work or business and regional residents.

Avila

The European INTERREG Smart Heritage City (SHCITY) project addresses the innovative challenge of creating a single open code tool to manage historic urban centres and facilitate the decision-making work of competent authorities. The SHCity management system will be demonstrated and validated in the city of Avila (Spain), for being UNESCO World Heritage and participating in the Smart Heritage initiative.

The city receives some 400,000 tourists visiting each year. This heritage city tourist destination already has more than 226 detectors able to assess 1,000 different parameters in museums and monuments in order to protect them. The project has a budget of 1,194,333 euros, 75% of that financed by the European Regional Development Fund.





Map of the SHCity sensors and equipment installed in the historic centre of Avila

TOURISM & BIG DATA

Hyper-competitiveness, changes in the touristic demand and challenges related with environmental degradation and social and cultural impacts of tourist destinations, require fast information systems that make it possible to detect, and even predict, trends, and that generate more efficient responses in all dimensions of sustainability. A better understanding of tourists will allow for better satisfaction, which is fundamental for the competitiveness of the destination. At the same time, it facilitates a better performance for the local community that may make better decisions. These new resources represent clear progress on the limited preexisting knowledge of the reality of the activity. Granularity, observations of real behaviours, wide samples, diversity of data and ways of presenting the same, potential for real time management and predictive ability are some of the most prominent benefits that enable the creation of knowledge with great potential for disruptive innovations and as a pillar for ***advancing sustainability of the destinations.***
(Calle,2017).

Tourism of Portugal, in collaboration with NOVA SBE (University) and NOS (Telecom Company) designed a pilot project that uses mobile data, Airbnb data, and social network trackers to study the pression of tourism in Lisbon and Porto. The project seeks to measure and monitor the tourist flows and presence in the space and time by means of the use of traffic of telecommunications (CDR data), social networks use (Facebook, Twitter, Instagram), Airbnb data and airport arrivals.

It intends to better understand the touristic phenomenon, its behaviour in the city, in other words, the duration of the stay, the most frequent routes and most popular touristic resources. A second phase of the project is to design recommendations for action and concrete actions to be taken by the authorities in the field of tourism in order to address the identified problems.

Source: Tourism of Portugal (2018).

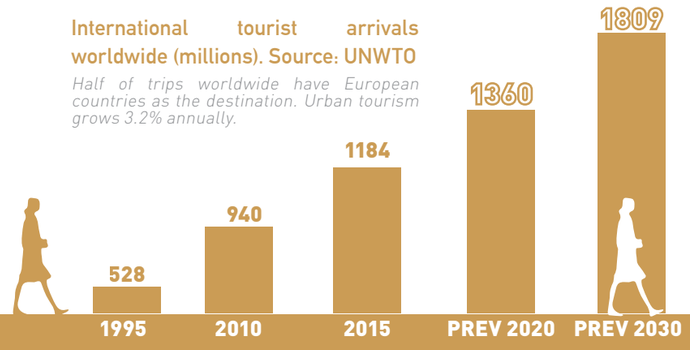
3.1.1. CURRENT AND FUTURE CHALLENGES

Up until recently the ultimate goal of tourism was driven by the idea of "the more the merrier". However, the symptoms shown by certain tourist destinations are calling into question the tourist activity, in other words, the ultimate goal of the phenomenon. The emergence of mass tourism is altering the nature of the places it invades. Social and environmental sustainability are facets that strongly emerge in order to guide a new form of tourism management, and new technologies may help us to lead the process.

In this timeline, data, news, lists of overcrowded tourist destinations are collected that demonstrate the topicality of the problem faced by urban environments of a heritage nature.

International tourist arrivals worldwide (millions). Source: UNWTO

Half of trips worldwide have European countries as the destination. Urban tourism grows 3.2% annually.



2017

Machu Pichu received 1.4 million visitors.

2017

Reikiavik

The number of international air travelers has skyrocketed; between 2016 and 2017 visits grew 25%, to 2.2 million.

July 2017

Anti-tourism protests in **Barcelona.**

3 million passengers arrive to Barcelona annually. They intend to relocate the cruises arrival area.

2017

January 2017

Barcelona presents the law to curb tourism.

The local administration approves the new legislation intended to curb tourism. The law limits the construction of hotels and ceases to issue licences for new tourist accommodation rentals.

30.000.000 visitors
40.000.000 users of Barcelona airport
130.000 spots of regulated accommodation
24% increase of rent prices in 4 years

June 2017

Venice plans to prohibit new hotels.

The urban planning city council of Venice presents a plan that is described as essential "for the protection of the city". It will prevent new vacation accommodations from being opened in the historic centre.

Machu Picchu restricts visitors

Any person that travels to the citadel at the top of the Andean mountain will need a ticket for the morning (6 am to noon) or the afternoon (noon to 5:30 pm). Any person that wishes to stay at the site for more than the allotted time will need to purchase a ticket for both time segments.

August 2017

Tourists and cruises are moving away from Dubrovnik.

Dubrovnik announces a two-year plan to drastically reduce the number of visitors allowed in its old centre, in an effort to prevent overcrowding in ruins.

2017

Cinque Terre Riomaggiore, Manarola, Corniglia, Vernazza and Monterosso inhabitants and receive 2.4 million visitors each year.

Timeline prepared from: https://www.telegraph. co.uk/travel/news/timeline-action-against-overtourism/

2018

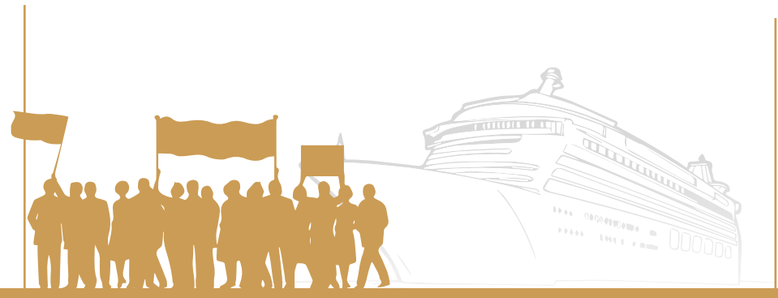
October 2017

Mallorca doubles the tourist tax.

The Balearic Islands announces plans to double its tourist tax during the high season in an effort to combat overcrowding. The archipelago has experienced a huge increase in foreign arrivals, which has led to requesting measures in order to protect the region from uncontrolled growth and environmental damage.

Amsterdam prohibits shops targeted at tourists.

Amsterdam announces the prohibition of any new store targeted at tourists such as bike rental shops, souvenir shops or others.



April 2018

Venice reflects on the visitor load.

The mayor Luigi Brugarno proposes charging visitors who enter the floating city. *"The solution is obvious: those who live, work, or have a place to sleep in the city can enter, the rest should stay away".*

First anti-tourism protest in **Ibiza.**

More than 500 people take to the streets to protest against the impact of urban tourism in Ibiza.

Venice introduces unprecedented crowd control measures without to separate tourists from premises.

Large amount of tourists per resident: some days, the centre of Venice receives 60,000 visitors, while its population is only 55,000.

October 2018

THE TRAVELER LIST
OVERTOURISM
Majorca
AMSTERDAM
Boracay
Angkor Wat
Machu Picchu
Iceland
Santorini
Bali

Dubrovnik
BARCELONA
Venice

"In order to enjoy the visit, you need conditions that make it easier to appreciate. Everything that is accumulating people in one place is unsustainable. Mass tourism only brings about deterioration. In any case, the problem of 21st century museums is not that a lot of people go to museums, I prefer that museums die from success than see them empty." President of the International Council of Monuments and Sites. Source: El Pais. JAN 2019

January 2019

INDEPENDENT LIST
OVERTOURISM
Ubud, Bali
Maya Bay, Thailand
Uluru, Northern Territory
Venice, Italy
BARCELONA, SPAIN
Santorini, Greece
Rome, Italy
Tuscany, Italy
Iceland
The Hamptons, New York

November 2017

Cruises diverted from the centre of **Venice.** Following years of debate amongst Venetians and the tourism industry, the government announces that it will prohibit cruises from going near Piazza San Marcos.

January 2018

LISTA CNN
OVERTOURISM
Venice
BARCELONA
Santorini
Dubrovnik
Cinque Terre
Taj Mahal
Machu Picchu

May 2018

Venice prohibits new fast food establishments. Venice once again attempts to reduce the impacts of mass tourism by prohibiting take-away establishments from opening in the city.

November de 2018

WASHINGTON POST LIST
OVERTOURISM
VENICE
VERONA
MACHU PICCHU
CHOQUEQUIRAO
BARCELONA
REYKJAVIK
BAFFIN ISLAND
CAMINO DE SANTIAGO
ST. CUTHBERT'S WAY
DUBROVNIK
ROVINJ
AMSTERDAM
LJUBLJANA
ROME
TURIN
CINQUE TERRE
PORTO VENERE

3.1.2. STRATEGIES TO MITIGATE THE NEGATIVE EFFECTS OF MASS TOURISM

In November 2018 the report titled **"The integration of sustainability in tourism policies of major European cities"** (González et al., 2018) was published. This document outlines the main strategies to tackle the management problem of mass tourism. New technologies can be a tool to implement these strategies on various fronts such as monitoring, communication, governance or daily management of the tourism phenomenon. The strategies proposed in the report promoted by Eco-Union and the City Council of Barcelona are the following:

MANAGE CONGESTION AND GENTRIFICATION

- Promote comprehensive metropolitan tourism strategies in order to spread out tourists in wider geographical areas.
- Integrate the land use in tourism policies as regulatory instruments to avoid overspecialisation and congestion in specific urban spaces.
- Develop special urban mobility plans for tourist areas to avoid saturation around the main areas of attraction through pedestrianisation and the administration of car parks for cars and coaches.
- Implement regulations for short-term online accommodations and prevent illegal accommodations.
- Promote social housing for low and mid-income people, especially in the central districts of the city.

INCREASE THE EXCHANGE OF KNOWLEDGE, ASSESSMENT AND MONITORING

- Analyse the city's environmental footprint and evaluate the load capacity in order to measure environmental impacts related to carbon emissions, water and energy use, waste generation, among others.
- Implement tourism observatories to collect, monitor and share tourism impacts on a municipal and metropolitan level. Data should be shared on open platforms for researchers, the tourism industry and civil organisations.
- Technical skills training and development of workshops with different types of stakeholders involved to define sustainability strategies.

GUARANTEE SOCIAL RETURN IN THE DESTINATION

- Support sustainable public procurement (SPP) practices by means of introducing green and social criteria upon agreeing to public contracts or obtaining tourism/accommodation licences.
- Implement and use of tourism taxes in order to improve the quality of the destination and maintain ecosystem services instead of reinvesting in touristic promotion.
- Promote green or social certifications at the destination and tourism industry level.
- Publicize sustainable practices, companies and products in the destination.
- Increase the support (financial and technical) for sustainable enterprise and responsible companies

PROMOTE INCLUSIVE GOVERNANCE AND CROSS-SECTOR MANAGEMENT

- Guarantee inclusive participation of stakeholders to collaborate in tourism planning with the civil organisations.
- Improve comprehensive and cross-sectoral touristic management in order to develop more integral policies regarding urban planning.

REDUCE ENVIRONMENTAL IMPACTS AND RESOURCE CONSUMPTION

- Develop sectoral mobility plans for tourists in specific sectors, places and seasons.
- Promote the offerings of suppliers of local goods to reduce the carbon footprint and promote local jobs in food and crafts.
- Ensure prevention and waste recycling plans, prohibit the use of single-use plastics and carry out educational campaigns.

In order for tourism to be accepted by local communities and civil society stakeholders, it should contribute positively to the sustainable development of European cities.

GENERAL RECOMMENDATIONS FOR IMPROVING THE INTEGRATION OF ENVIRONMENTAL AND SOCIAL SUSTAINABILITY WITH URBAN TOURISM POLICIES.

- The comprehensive assessment of sustainability is the first step to understanding the real impact of tourism in the destination. This should be done in collaboration with external experts or scientific institutions in order to guarantee an objective analysis.

- The monitoring and transparency are essential for collecting knowledge, feed public debate and properly inform urban sustainability policy makers. The access to information and its knowledge allows social, environmental and economic stakeholders to get involved.

- There is a need for political coherence and cross-cutting coordination between different urban policies, involving all city departments, reinforcing destination management beyond economic promotion and commercialisation, because sustainable tourism is a crosscutting issue.

- Mitigation and prevention of negative environmental and social impacts by integrating different policies, strategies and practices related to the management of natural resources and social equality objectives.

- Regulating the tourist market and access to urban resources is fundamental in order to reduce the overcrowding of public

spaces and guarantee equal access to (and the preservation of) public property (public spaces, land, housing, water, energy, food, etc.). There is a wide margin for improvement in matters such as urban and environmental taxation.

- The growth aspirations of quantitative tourism must be redefined under a sustainability perspective. Increasing visitor tourism in over-exploited destinations will further increase environmental and social conflicts, jeopardising the quality of destinations and the livability of cities.

- Transport and mobility patterns must be adapted to reduce carbon emissions related to low-cost airlines, cars, and cruises. National and local transportation authorities should take steps to combat climate change, and sustainable mobility strategies are a key issue in order to reduce mass tourism in cities and preserve the environment. The accessibility policy (airlines and cruises) should be redefined in accordance with climate targets.

- The regulation of the housing market and the exchange economy is another key issue where a combination of regulatory and legal policies at local, national and European levels must guarantee access to housing for permanent residents.

3.1.3. SHARED CHALLENGES FOR MITIGATING THE NEGATIVE EFFECTS OF MASS TOURISM IN CITIES OF HERITAGE VALUE

In 2018 the study called "**Overtourism: impact and possible policy responses"** was published. It's a research document requested by the European Parliament's Committee on Transport and Tourism (TRAN) (Peeters et al., 2018). This study addresses the complex phenomenon of "overtourism" in the EU. By focusing on a set of case studies, it provides information on indicators of mass tourism, analyses management approaches implemented in different destinations and evaluates the responses from the policy. However, common indicators cannot be created by the complexity of factors in each situation, this scientific study enables us to qualitatively illustrate the challenges that different cities bear to those selected for this present Benchmarking work.

According to the research undertaken by the European Parliament, the most common impacts are the overcrowding of infrastructure (of transportation) and of touristic areas s, pollution, and problems related to waste. On the other hand, the negative economic impacts of mass tourism were the least reported. The most frequent measures (but not necessarily the most appropriate/effective) are those related to limiting the number of people in access points (by distributing them to other areas), ensuring that visitors respect the rules and regulations and improve the ability of the destination to deal with a greater number of people (by increasing abilities, efficiency of infrastructure, facilities and services). In coastal and island destinations, a wide range of measures are applied that reflect the wide range of impacts these destinations are facing.

LISBON, PORTUGAL

To prevent the negative impacts of "gentrification" more effecting public housing and tourism policies and a better dialogue with urban social movements are required. Innovation is needed in the design of urban regeneration processes and policies to prevent displacement and eviction of residents, as well as taking concrete measures and initiatives to guarantee the "right to housing" instead of "tourism-led gentrification".

CINQUE TERRE, ITALY

For the time being, it is unrealistic to predict a decline in the numbers of visitors to Cinque Terre. Therefore, the discussion about tourist overcrowding will likely remain focused on how to most efficiently manage the increase in tourism flows and how to communicate better with visitors. A "no action" scenario in the long-run could lead to irreversible deterioration with social and environmental collapse.

MAJORCA, SPAIN

Tourist overcrowding and subsequent protests are a serious problem for local authorities. The local social movements are protesting and signaling that tourism is destroying the social and economic fabric of Palma de Mallorca. It is likely that these protests will continue and grow stronger in the future. The Pla d'Equilibri Ambiental i Turístic 2017-2020 (Environmental and Touristic Balance Plan) proposes sustainable development measures for the island.

VENECIA, ITALIA

Italy is taking active steps to promote lesser known parts of the country. The city itself has implemented a great deal of actions, including: management of groups, creation of a new platform to acquire the various services of the city, coordination of landings, diversification of the private coach arrival points, changes in public transportation, regulation of tourist facilities, increased roadblocks, smartphone-enabled devices for visitors' personal use, agreements with mobile providers, posters and information totems, etc...

It is expected that arrivals in Malta will exceed 2.5 million in 2018. With tourism contributing approximately 27% of the GDP, the industry will continue being one of the main sources of revenue for the company. As an effect of the actions of the La Valletta 2018 foundation and the intense cooperation between Air Malta and Malta Tourism Authority, it is expected that the number of arrivals will increase even more, which will increase the pressure on La Valletta, the capital.

VALLETTA, MALTA

BUCHAREST, ROMANIA

Overnight stays have grown 50% in the past 4 years and this growth shows no signs of stopping in the short-term. This could make the situation worse in terms of impacts related to tourist overcrowding, further damaging the environmental condition and overcrowding of the city. Local authorities must adopt a more strategic approach to tackle the general problems of tourism, in order to preserve the environment, reduce the overcrowding of the city and efficiently manage the impact of the tourist flow increases.

The lack of tourism governance and strategic cooperation between the local and national authorities could put the future of the destination at risk. The implementation of effective policies aimed at managing and regulating the increase of tourist flows is needed in order to alleviate the negative consequences of tourism in the local community. This is necessary in order to preserve the destination's image, prevent deterioration and safeguard the future tourist attraction of the island.

SANTORINI, GREECE

CONCLUSIONS OF THE STUDY

- There is a serious lack of detailed and reliable information that hinders the effective identification of the state of, or risk of, "overtourism" for a destination.
- It is necessary to generate a system of indicators that makes it possible to monitor the touristic development of a destination.
- Although the number of destinations experiencing "overtourism" is generally low, the effects of it are potentially serious, to a degree that cities may lose their appeal and main functions.
- It is necessary to redefine the 'growth paradigm', where the measure of success is not only focused on the extent of visitors' arrivals, but rather the in the value that said presence contributes to a destination in terms of profitability, local employment or fair pay for the workers involved in it.
- The development of platforms such as Airbnb as entities outside the control of the destinations, as well as the loss of revenue associated with these platforms, deserves more attention.
- Economic policies are needed that improve the socioeconomic benefits for residents, specifically those who do not participate directly in the tourism economy. These may include measures such as charging visitors a tax so that they may support the cost of local infrastructure, public transportation and municipal services such as street lighting.
- Social policies that alleviate the burdens imposed on residents are necessary. These may include policies, such as limiting Airbnb rental periods, limiting the number of beds in specific areas, or efforts to better distribute the tourist pressure.

AYIA NAPA, CYPRUS

The projections show that by 2030, Ayia Napa will reach 1 million tourist arrivals per year, 75% of which are expected to be international tourists. This will entail an increase of approximately 350,000 visitors in comparison with the arrivals in 2017. The impacts of tourist overcrowding is raising the awareness among interested stakeholders in how these problems damage the image of the destination, the environment and the social fabric.

In accordance with the study "Overtourism: impact and possible policy responses", a research document requested by the European Parliament's Committee on Transport and Tourism (TRAN) (Peeters et al., 2018), it is concluded that Florence, Amsterdam and Barcelona are at a level at which they are showing signs of "overtourism" and the Region of Valencia is presenting indications of trending towards "overtourism".

This study provides a series of conclusions that are important for this work. Thus, the primary challenges to be addressed were detected:

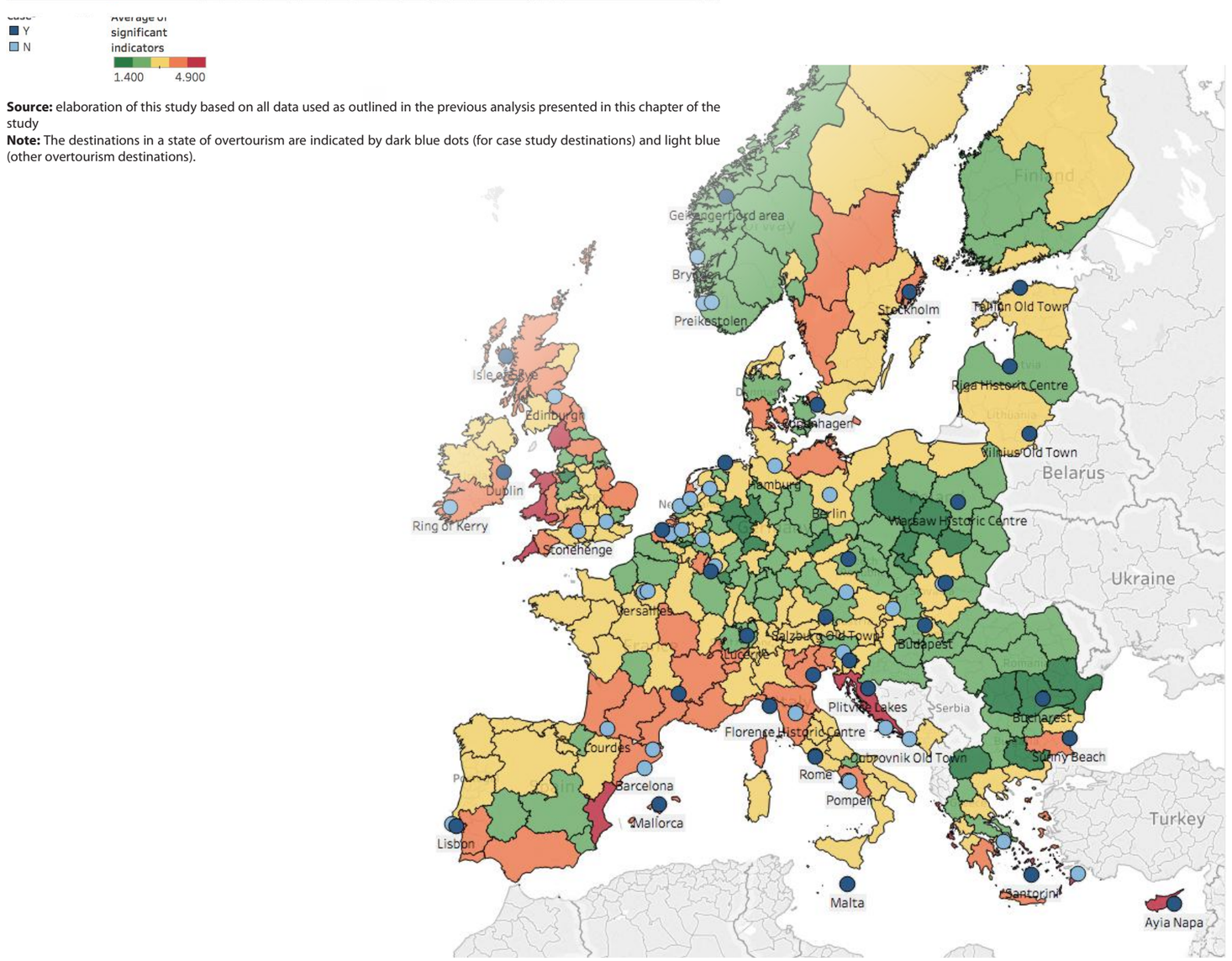
I. There is a serious lack of detailed and reliable information that hinders the effective identification of the state of, or risk of, overtourism for a destination.

II. Although the number of destinations experiencing overtourism is generally low, the effects of it are potentially serious, to a degree that cities may lose their main function as residential space.

III. Many authorities manage their destinations based on a growth paradigm, they value increasing the number of visitors and cannot identify and mitigate the state of overtourism.

IV. The role of ITCs, social networks and peer-to-peer platforms are often identified as one of the primary causes of overtourism, given that they accelerate the seasonal and geographical growth and concentration of the flows and volume of tourists in certain places.

Average of the 5th percentile of the nine significant indicators and location of the destinations in state of overtourism from the initial gross list of destinations



Source: elaboration of this study based on all data used as outlined in the previous analysis presented in this chapter of the study
Note: The destinations in a state of overtourism are indicated by dark blue dots (for case study destinations) and light blue (other overtourism destinations).

Therefore, according to the study carried out, the members of the European Parliament may consider the following recommendations for action:

- **Promote tourism monitoring and identify its evaluation methods and procedures.** Said methods must include not only measures of tourism volume and density / intensity, but also measures related to the collecting of data about the number of one-day tourists and visitors, Airbnb and other new forms of accommodation and transportation systems.

- **Promote the inclusion of additional overtourism statistics in the current Eurostat tourism statistics monitoring system.** It is desirable to increase the level of detail within the economic indicators, such as tourism revenue. Furthermore, the scope of tourism statistics should be widened from overnight stays to daily visitor accounts. The important indicators that must be included are nights of accommodation, visiting days, length of stay, capacity and revenue from all specified visitors not only for conventional tourist accommodation and resources, but also for Airbnb-type accommodation, use of the mode of transportation includes the proportion of air transport arrivals and cruise ship arrivals / flows.

- **Encourage the rebalancing of a 'growth paradigm' with a 'regional development paradigm',** where the measure of success is not only focused on the extent of visitors' arrivals, but rather the on the value? that said presence contributes to a destination.

- **The destinations' touristic management strategies should focus instead on managing the volume (growth) of tourism instead of just on the distribution of visitors in space and time.** The destinations' policies should point to a better monitoring of the commonly agreed upon performance indicators. Destinations should also identify and promote good practices and improve the national and regional legislation in order to address the overtourism phenomena.

- **Encourage the development of a set of EU policies designed to alleviate the vulnerability of "coastal and island" destinations and "heritage resources" in comparison with the general care given to urban areas.** These EU policies should be based on studies that evaluate overtourism in this type of destination, based on the environmental load capacity and how to govern a significant volume of visitors. One problem that causes overtourism is the strong competition between destinations which strengthens the growth paradigm in the majority of destinations. Therefore, some form of cooperation is recommended to help distribute visitors within the load capacity of these destinations.

- **Support a thorough assessment of the role of social networks, digital platforms, etc...to cause overtourism.** There is evidence (also confirmed by this study's analysis) that it leads to the concentration of tourist flows, but more research is needed to better understand these interrelationships. This is necessary in order to better govern the sharing economy, regarding its effects on tourist flows (concentration in certain places; decrease in the length of stay), competition and tax evasion.

- **Stimulate the identification of actions at various levels that go beyond the assumption that overtourism is directly related to seasonality, and that decentralisation, visitor spreading and decongestion policies will provide the solutions.** These measures may relocate the problem to another area, but not fix the underlying problem of an ever-growing number of tourist arrivals, over the load capacity of the destinations.

- **Emphasise the need to develop economic policies,** in the form of taxes or incentives, by improving the economic benefits for residents, specifically those who do not participate directly in the tourism economy.

- **Advocate for the creation of a European working group** on excessive tourism in order to monitor at-risk destinations and to annually report on trends, with specific intervention recommendations at the macro level.

- **Push national governments to implement regulations that restrict the granting of housing licenses for tourist use in congested areas.**

- **Propose the creation of executive boards in Destination Management Organisations** to include resident representatives, neighbourhood entities and grassroots organisations, and allow them to proactively contribute to the policy decision-making forums, particularly focused on the planning and management of tourist destinations.

3.2. REGION OF VALENCIA, VALENCIA AND BENIDORM

The Region of Valencia is one of the autonomous regions that make up Spain. It has a population of almost 5 million inhabitants, and in 2018 welcomed 9.2 million foreign tourists. Valencia, its capital, has a population of more than 798,000 inhabitants. It is a city with a strong relationship with the sea, through the Turia river and the port of Valencia. The physical construction of the urban landscape, which today we call Ciutat Vella, corresponds to the medieval enclosure within the walls that existed from the 14th century until the 19th century, at which time the city expanded outside of them.

3.2.1. VALENCIA

Area, Mobility and Urban Planning

At present Valencia has a **sustainable mobility plan that was prepared in December 2013.** This is currently being implemented by means of actions to pacify road traffic in the most touristically overcrowded spaces of Ciutat Vella.

The municipality is reviewing its municipal planning by means of a neighbourhood-by-neighbourhood urban recycling strategy. Specifically, for the Ciutat Vella environment, in the pipeline is the **CIUTAT VELLA SPECIAL PROTECTION PLAN** (hereinafter, SPP) in which a set of measures are collected in order to control the tertiarisation of the old quarter's residential areas.

Following a thorough public participation process, a set of measures were defined that seek to protect the heritage and the residential character, re-characterising the urban landscape by means of a green infrastructure that likes the public space within the old enclosure within the walls.

Among the directives introduced by the Ciutat Vella SPP, in order to improve the conditions of the resident population, a new regulation of uses and activities is established for the entire area that will enter into force following the approval of the Special Plan. This is probably one of the most important measures to favour the implementation of residential versus tertiary use.

The management of degraded areas is reviewed, those areas that contain the largest number of sites and buildings in poor condition that are mainly concentrated in the areas pending development, which coincide with the implementation units provided for by the current planning.

A balance is established of public appropriations; the SPP establishes a significant review of the existing general provisions. It is intended to supplement with public facilities capable of meeting the needs of the resident population. The proposal involves an increase in public services, striving to increase those needed by the resident population.

Cartography of Valencia. Century XVIII.

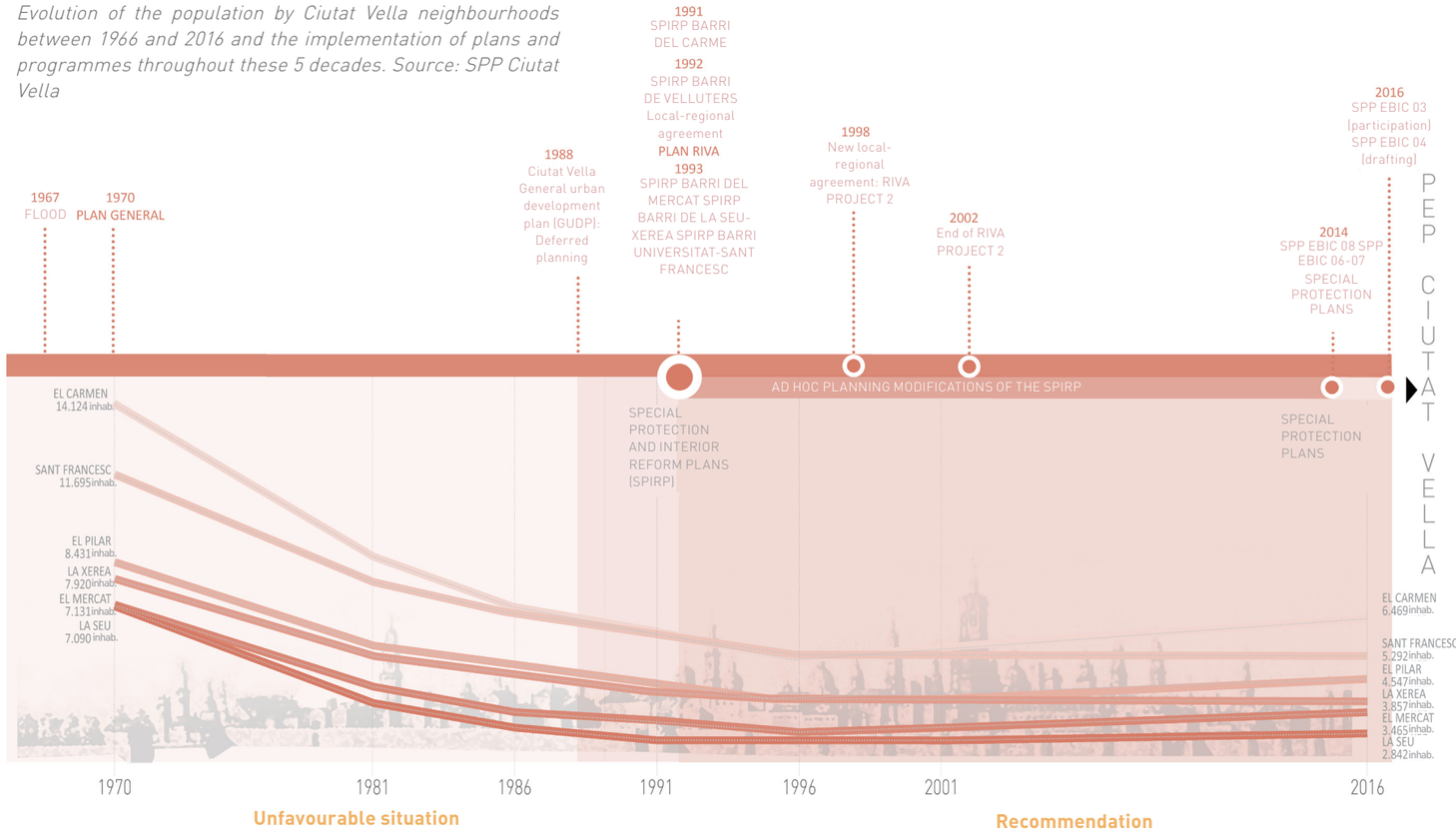
Urban quality improvements by means of improving the quality of free spaces and improving the urban landscape.

Regarding touristic use. There is a significant difference between what the SPP proposes and what the current planning proposed given that the latter permitted the implementation of hotel establishments across the spectrum, in both protected and unprotected buildings. A hotel establishment may currently be located in a building for exclusive use, that is, one in which all the floors of a building are intended for hotel use, or mixed-use buildings, that also have residential use, with the only condition that it be below the floors used for housing.

The SPP, with the proposed changes regarding the regulation of uses, establishes a large predominantly residential area. It involves the Carmen neighbourhood and the majority of Velluters, Mercat and Seu Xerea. In this area, commercial, office and tertiary use is permitted on the ground and first floor of buildings where there are also residences on the upper floors. Hotels are not permitted in this case.

Professional tourist housing may only be located in the most outsourced part of the area - the area of la Ronda, the Universitat Sant Francesc neighbourhood and the Avenida del Oeste. It is only permitted if it is located in an exclusive-use building, in other words in buildings only meant for that use. They may not set up in residential buildings, nor can they share a building with residential uses. Furthermore, a minimum distance of at least 150 metres between them is required for new installations.

Evolution of the population by Ciutat Vella neighbourhoods between 1966 and 2016 and the implementation of plans and programmes throughout these 5 decades. Source: SPP Ciutat Vella



Visual integration guide of the LANDSCAPE STUDY of the CIUTAT VELLA SPECIAL PLAN of Valencia. Source: PEP Ciutat Vella.

Turismo

Valencia has a **Strategic Tourism Plan** (City Council of Valencia. 2016) which evolves in 4 strategic axes, 11 plans and 32 programmes. In accordance with the document called **Touristic Valencia, towards 2020** the strategies are defined in the following manner:

STRATEGY I. CREATE VALUE FOR THE VISITOR . The first of these four strategies must make Valencia a destination with a better-defined value proposition and more tourist-oriented based on the coordination of the products, with more specialised management and marketing, able to adequately meet the requirements of the different target segments. Similarly, the information and service that tourists receive in the city itself must be improved so that they can have an unbeatable experience.

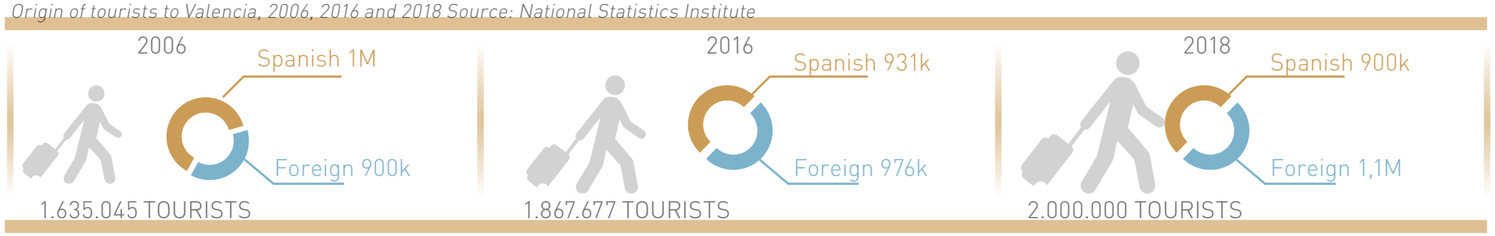
STRATEGY II. UPDATE THE VALENCIA BRAND. MORE SEGMENTED AND TECHNOLOGICAL PROMOTION. The second strategy seeks to boost the growth of the demand, strengthen the visibility and positioning of the brand. Valencia must grow both in already consolidated markets, attracting segments with greater purchasing power, as well as to expand its goals into growing markets throughout Europe. Additionally, it must streamline the activities that have already been carried out, from a more comprehensive, innovative, segmented marketing approach, that also optimises the use of ITCs.

STRATEGY III. A SMART AND SUSTAINABLE DESTINATION. Thirdly, it is committed to knowledge as a competitive advantage and in the construction of a smart, sustainable tourist destination, where tourism enriches, not compromises, the quality of life.

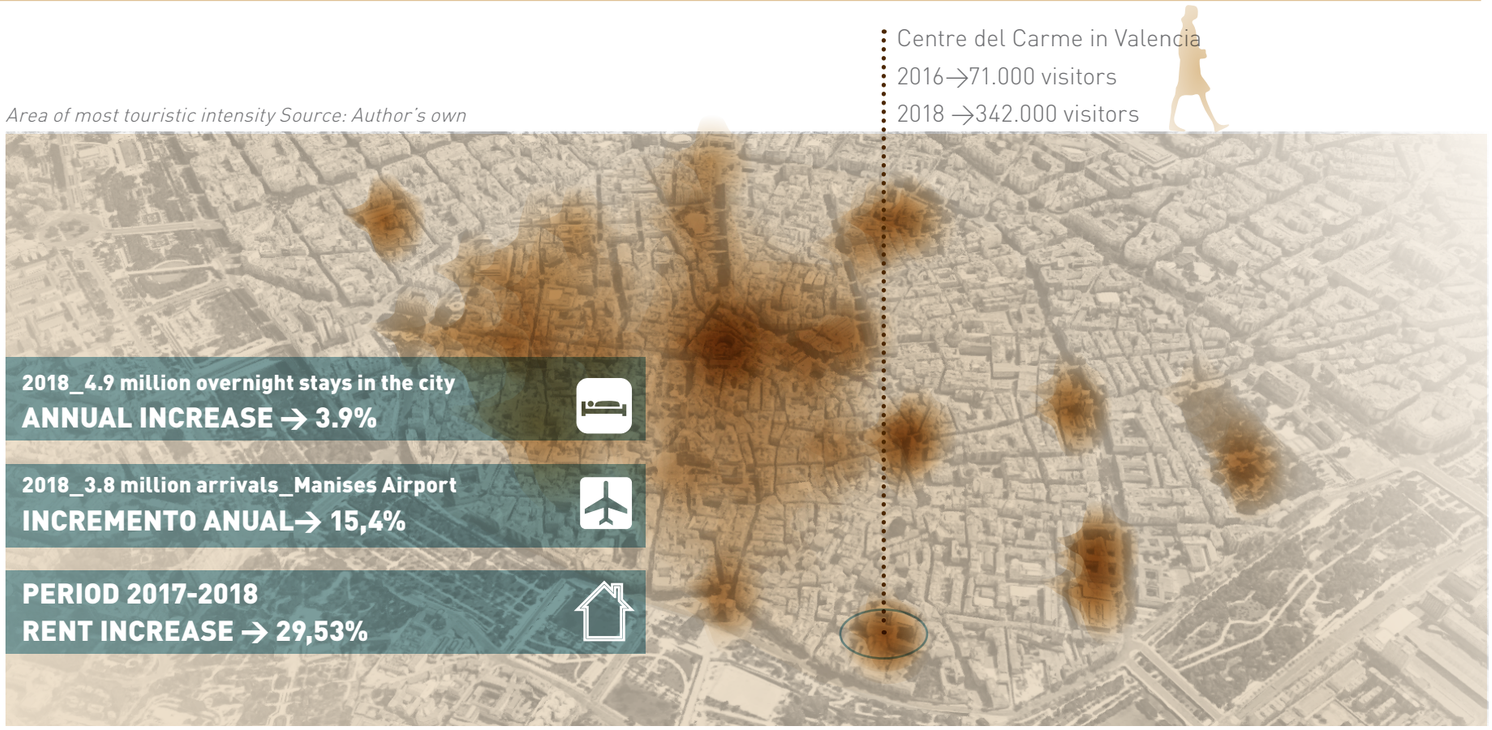
This strategy is related to the **Herit-Data** project and in this context, Valencia begins to test new technologies for controlling tourist overcrowding through initiatives such as the participation in the European project **ALTER-ECO**, in which alternative touristic strategies are sought in order to improve the sustainable local development of tourism by means of promoting the Mediterranean identity.

STRATEGY IV. COLLABORATIVE, EFFICIENT AND TRANSPARENT GOVERNANCE. Finally, none of this would make sense without encouraging the tourism sector to participate in the destination's tourism management, through open and collaborative governance; Valencia Tourism Foundation must evolve, and improve daily in order to be more useful for the whole city.

Origin of tourists to Valencia, 2006, 2016 and 2018 Source: National Statistics Institute



Area of most touristic intensity Source: Author's own

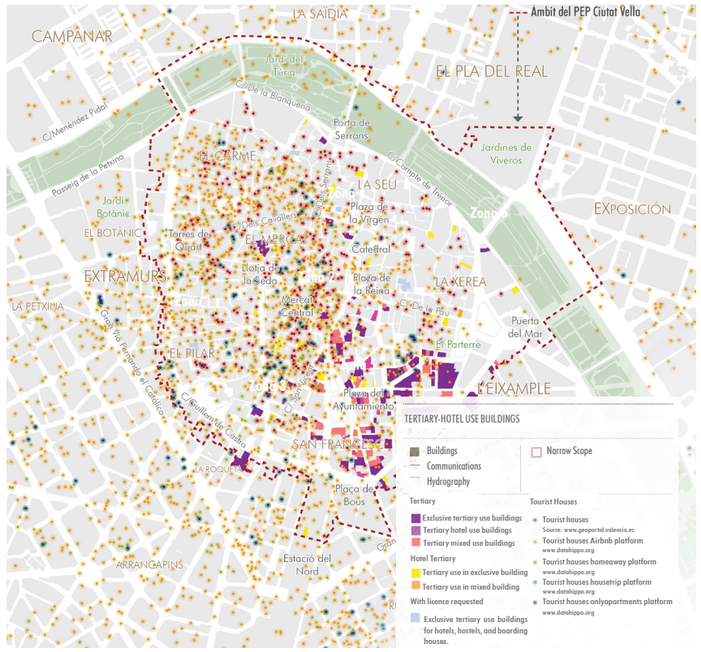


Mass tourism

How to tackle tourist overcrowding in Valencia is debated in different forums. This is concentrated in places such as Ciutat Vella, where it coexists with predominantly residential areas in which the first warnings surface when faced with the increase of urban tourism.

The emergence of online rental platforms, the rental price increases of homes (only between 2017 and 2018 the increase in Ciutat Vella is 29.53%, according to ASICVAL), the management of mobility and the public space, are factors that demand an urgent response in the control and governance of tourist spaces, in particular of the Ciutat Vella area.

In the same way saturation points are produced in specific moments, such as cruise arrivals at the Port of Valencia



Tertiary activities in Ciutat Vella Source: SPP Ciutat Vella of Valencia

Mass tourism management

According to the Sustainable City Council of Valencia's Sustainable Mobility Plan, the Centre area is a priority area for the implementing pedestrian zones, the pacification of traffic, creating 30 km/h zones and implementing measures within the concept of Smartcity. The pacification of traffic in Ciutat Vella is a given and the commitment to non-motorised mobility with the Anell Ciclista (circuit of bike lanes). Its implementation is having a strong responsiveness in certain sectors.

Furthermore, the Ciutat Vella SPP proposes restricting tertiary uses in order to avoid the gentrification of residential areas. Similarly, it proposes a set of paths and hubs to improve both the tourist destination experience and the public space.

They created the **Municipal Tourism Council**, for example, or the Municipal Coordination Committee for improving governance.

Priority pathways and hubs. Source: SPP Ciutat Vella of Valencia

New technologies in mass tourism management

The **Region of Valencia and the city of Valencia** specifically have started on the path of implementing new technologies for governing the touristic phenomenon.

The **NETWORK OF SMART TOURIST DESTINATIONS OF THE REGION OF VALENCIA** (DTI network) is bearing fruits with relevant experiences, as is the case with works being undertaken in the Valencian regions' different municipalities, like **Benidorm** in which the areas of greatest influx are being monitored and the information is being shared among public and private stakeholders.

Valencia is boosting the governance of the destination under the **Smart City premise, through the Smart City Office**. This initiative was honoured with the EnerTIC2016 award as the Best Project 2016, Best Smartcities and Smart e-government Project.

Within the Valencia Smart City project **AppValencia** was developed, an application that has various functions in order to improve the tourist destination experience and functioning of the city.

Currently in the **Port of Valencia**, a very interesting experience is being carried out, based on the "placemaking" philosophy in which the influx of people to the port area is monitored in order to then implement management mechanisms.

In 2019, the **City Council of Valencia** in collaboration with a mobile phone company intends to carry out a monitoring experiment in order to know the flows within the municipality of Valencia of residents and non-residents during February and March. This time period coincides with the local festival of the Fallas, declared Intangible Cultural Heritage of Humanity by UNESCO in 2016 and recognised as a festival of international touristic interest. The results will be available in the third quarter of 2019.

GOOD PRACTICES

3.2.2. VALENCIA_SMART CITY

The City Council of Valencia created the Smart City Office in February 2018. The goal of the Office is to make Valencia **'smart'** by helping the socioeconomic services and actors to use technology to resolve public problems and achieve a better quality of life for the citizens.

*"A **Smart and Sustainable** City is an innovative one that takes advantage of Information and Communication Technologies (ICT) and other means **to improve the quality of life, competitiveness, efficiency of operation and urban services, while ensuring that it responds to the economic, social, environmental and cultural needs of present and future generations**".*
UNE 178201:2016_ Smart cities. Definition, attributes and requirements.

The Office has a set of projects in which the application of new technologies with open/big data is a key factor. In this respect, tourism, as a phenomenon that is gaining prominence in the city, is being addressed from various projects. Some projects are addressed below:

The City Council of Valencia has the **AppValència** available. Ésta permite encontrar todos los servicios próximos, consultar el itinerario de las líneas de bus o metro y mantenerse al tanto de todas las alertas y notificaciones.

VALENCIA AL MINUT
real time data

The Valencia al Minut project provides the public with an information portal to known the status of the city in real time.

It shows the rate of passage of urban buses, traffic conditions, capacity of public car parks, levels of air pollution, temperature, Valenbisi service terminals and bikes available, employment evolution, municipal cultural programme and social networks.

The portal operates as a message and interactive information board where, at a glance, both the citizens and the workers of the City can consult data in real time on the areas of greatest interest, such as sustainable mobility, social welfare, environmental sustainability and the own governance of the municipality.

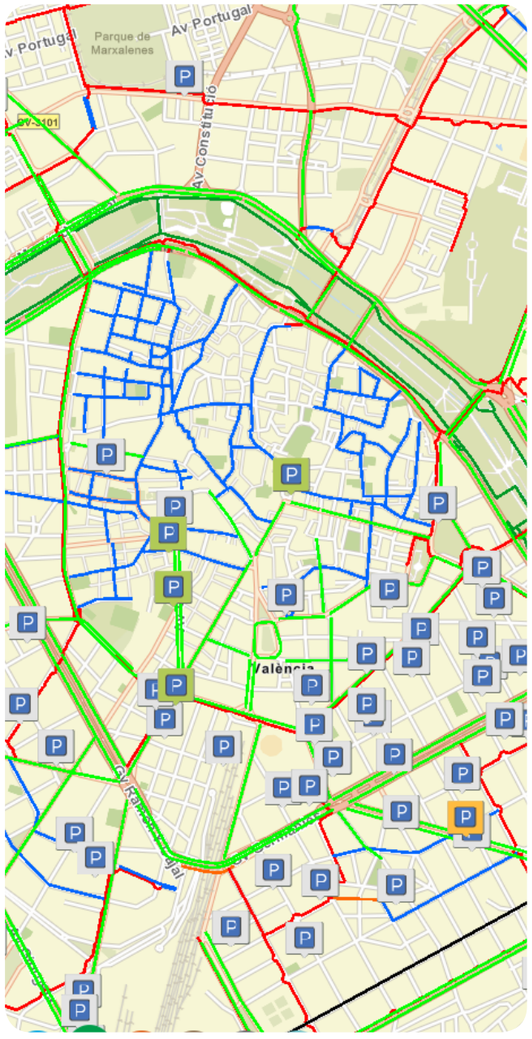
GEOPORTAL

Urban space information

The Geoportal Project allows for a wide variety of existing City Council of Valencia resources to be made available to the public.

The Geoportal offers information provided across a view of maps through different municipal areas such as mobility, economics, social services, festive culture, etc. in which the user may select the information that interests them through a map and choose what they want to see.

Geoportal includes a section of open plans for the use of citizens: street maps, Fallas, mobility map, urban planning, tax areas, open data, historical maps of Valencia, gardening, markets, social networks, and social services. In addition to the plan tools for administrative use: Property tax, tables and chairs, tourist apartments, public incidents, business tax, lighting inventory, infrastructure works, etc.



PLATAFORMA VLCi

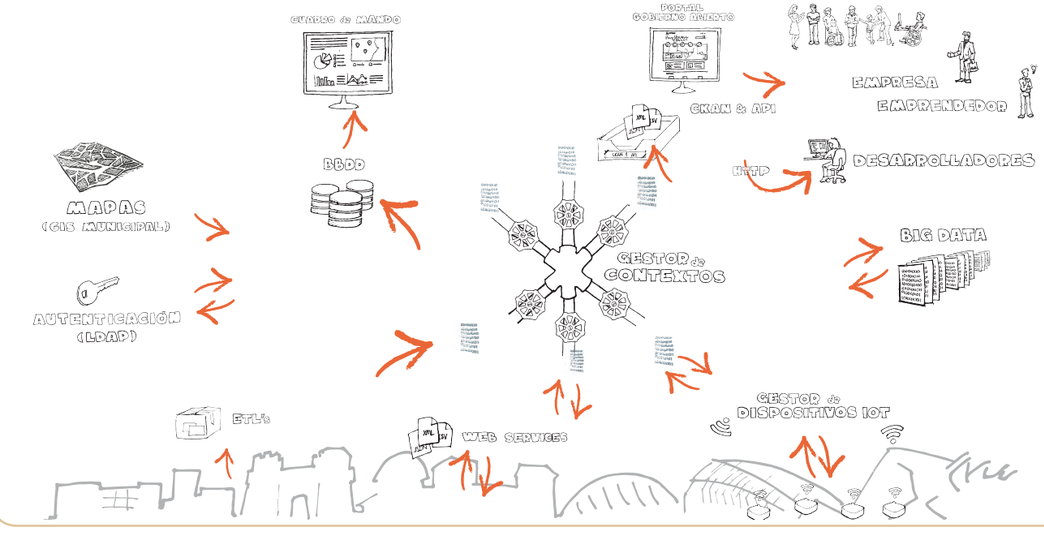
Smart management

The VLCi platform project, strategically planned in 2013, and whose implementation began in July 2014, is an advanced storage and computing system that allows municipal managers to collect a large amount of information in a single repository, analyse it using advanced Big Data tools and draw conclusions through dashboards that help municipal managers to make decisions.

The VLCi platform, the first smart city platform rolled out in Spain that complies with the FIWARE European standard, collects all types of information from the City Council of Valencia systems and the systems and devices deployed in the city.

MAIN FUNCTIONS

- Information acquisition. Collection of data from sensors and from the information systems from different City Council of Valencia Services.
- Information distribution. Managing large volumes of information from multiple sources.
- Storage and analysis of information. Predictive and statistic analysis. Big Data Analysis.
- Presentation of information Generating reports Control Panels. Open data management.



GOOD PRACTICES

3.2.3. LA MARINA. VALENCIA

Through the ALTER-ECO project, an interesting pilot experiment is being developed in the Valencia Marina. This represents more than 1,000,000 m^2 in the city and by the sea. The Alter-Eco project has the goal of improving the balance between the tourist attraction, as a source of economic growth, and the conservation of the classic Mediterranean city model as an example of sustainability. The objectives of this project are as follows:

- Reduce the concentration of tourists in hot spots where the load capacity is exceeded, by means of diversifying the offerings.
- Highlight the distinguishing value of the destination, reinforcing the identity and visibility of the Mediterranean and promoting local traditions and common cultural heritage.
- Improve the coordination of actions among public and private actors towards the implementation of the strategies in order to create new business opportunities.

TIMELINE →→

S.XXI

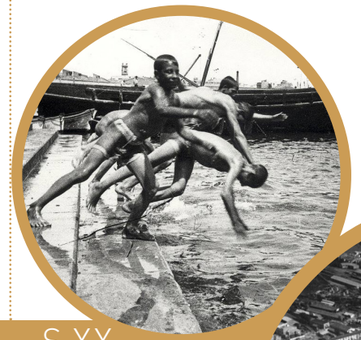
URBAN TRANSFORMATION

During the 19th and 20th centuries the Port represented one of the areas of greatest urban transformation in the city of Valencia. This dynamism is reflected in the nearby neighbourhoods and therefore the Coastal Towns gain greater importance in the metropolitan context.

S.XX

CITY-PORT RELATIONS

During the second half of the 20th century the Port generated significant growth towards the south. Its operation leaves the interior dock outside the centrality area of the port space.



2004

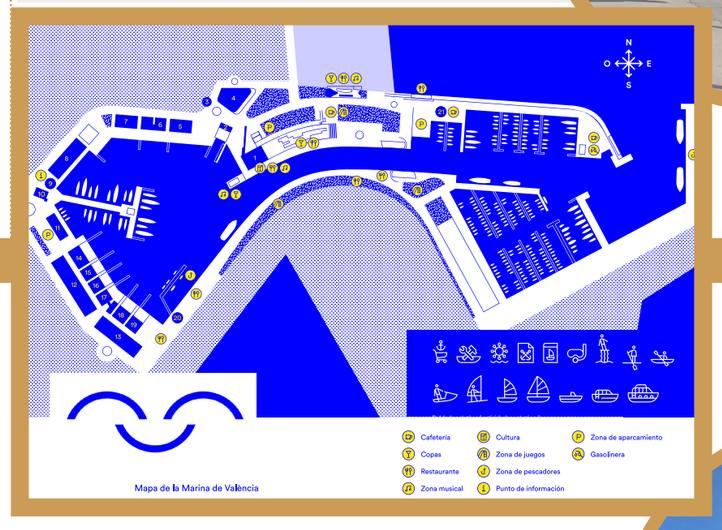
CONSORCI VALÈNCIA 2007

From 2004 on, there was a boost for the governance of this area with the creation of the Valencia Consortium 2007, which will manage the first major transformations of the Inland Basin and the arrival of major events such as the America's Cup and Formula 1.

VALENCIA MARINA STRATEGIC PLAN 2017-2022

PLACEMAKING

"The Valencia Marina will be open, inclusive, green and dynamic. It will need to be redesigned in order to be accessible and connect to the city (which will be facing the sea), strengthening the Coastal Towns such as a new Valencian centrality. In order to achieve it we need to listen, collaborate, generate knowledge and coordinate the task with steady progress and adding cooperation".

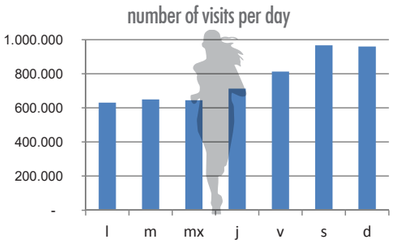


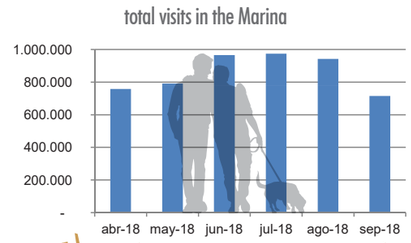
Following the big events, a revitalisation programme of the Marina is being promoted in which PLACEMAKING is being emphasised as a transformational direction. This task seeks to bring citizens closer to the Marina, attract companies, innovation and activities linked to the sea, as well as convert it into a cultural space within the city.

From April 2018 the number of visitors received by the Marina can be quantified thanks to the monitoring of the enclosure at seven points. If the level of displacement in the Marina and its location could be sensed by the activity carried out, with the data collected by the sensors, the influx level has been determined more precisely, namely:

- number of people that pass through the Marina
- rush hours of visits
- breakdown by days of the week
- areas of greater influx
- journeys carried out between the seven points of reference

ALTERECO PROJECT →MONITORING





2018

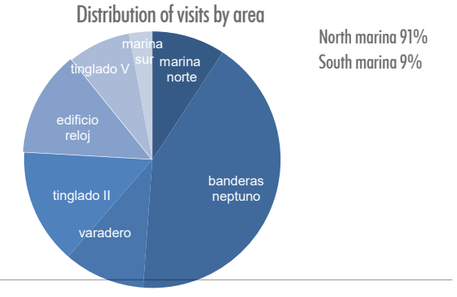
Images from the visit in December 2018.

Specifically, the study of these data offers very high monthly visit figures, between 757,645 in April and a maximum of 974,168 in July. It increases while the week progresses and there is a remarkable rise on weekends. The weekend of 15 June, between 49,789 and 56,932 people came to congregate in one day.

The Marina is a large area that may become overcrowded with the celebration of large-scale events. Hence the importance of measuring the influx of people to improve management in relation to events, especially in the summer season when there is more demand.

The information provided by the monitoring as it is currently configured would be , without a doubt, very useful, however, it would be desirable to incorporate key data such as:

- The breakdown of the visits received according to
- the time of day.
- Rush hours
- Rate of the movements
- Perhaps the most important is the duration of each visitor's stay.



GOOD PRACTICES

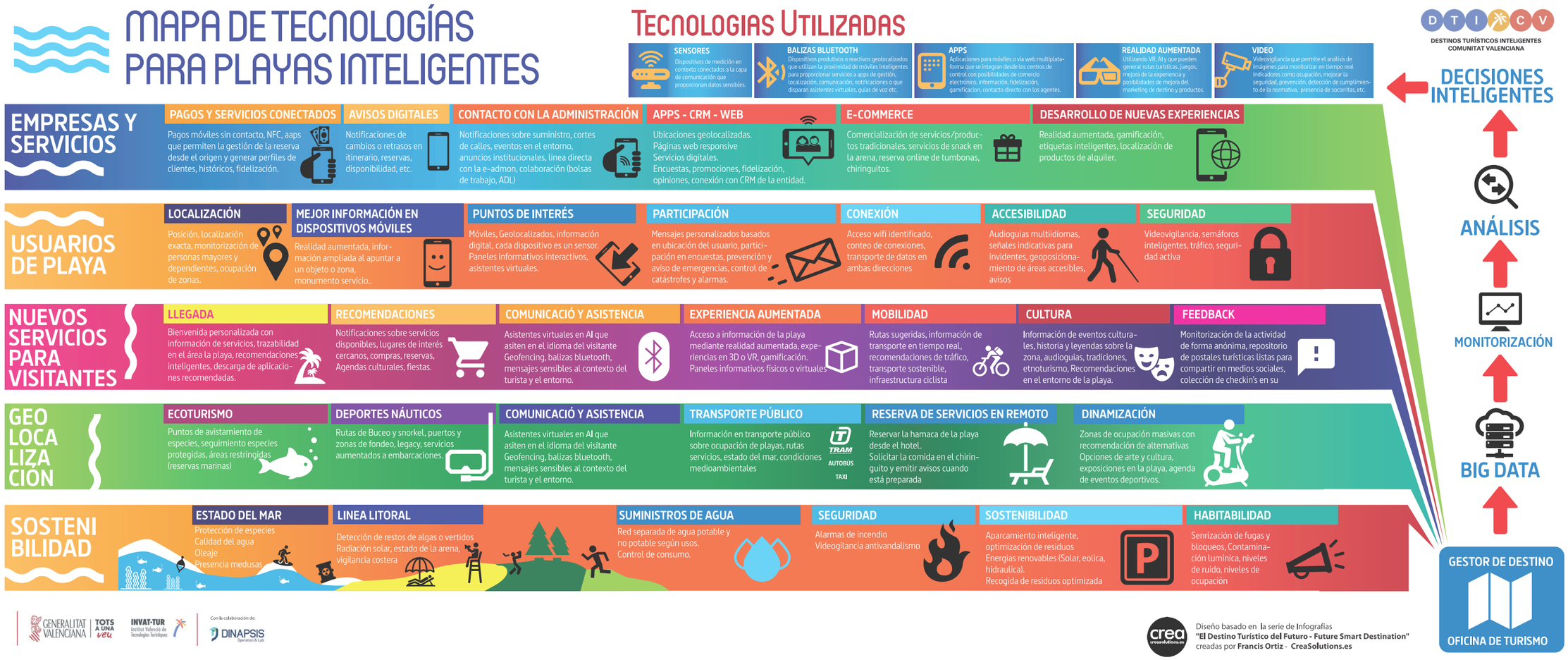
3.2.4. BENIDORM. ALICANTE

The body known as the Institute for Spanish Tourism Quality (ISTQ) has granted Benidorm the UNE 178.501 certificate that recongises it as **the first smart tourist destination in Spain**. The factors evaluated focus on five axes: sustainability, accessibility, new technologies, innovation and governance. Furthermore, Turisme Comunitat Valenciana has implemented the **network of Smart Tourist Destinations of the Region of Valencia (DTI CV network)** through the Valencian Institute of Tourism Technologies (Invat.tur), that will allow destinations to advance in the digital transformation of tourism management.

The DTI CV network wants to group all the municipalities and entities that prove to be tourist destinations and actively work in the digital transformation of their tourism management.

In the case of Benidorm, the congestion of the beaches is very important. In this respect, by means of a Wi-Fi network they were able to "monitor" the population that visits the beaches. This belongs to a private company, and has the city's beaches 'online' with 30 Wi-Fi points, providing 20,000 people with Internet service at the same time.

Another project that may be interesting is the Beacons project linked to the Visit Benidorm APP. In this case, by means of the strategic placing of Bluetooth beacons and without Geofences connection, the application becomes integrated with the surroundings. Both indoors and outdoors, the receipt of strategic messages in real time, sends users the most important information related with their most immediate context.



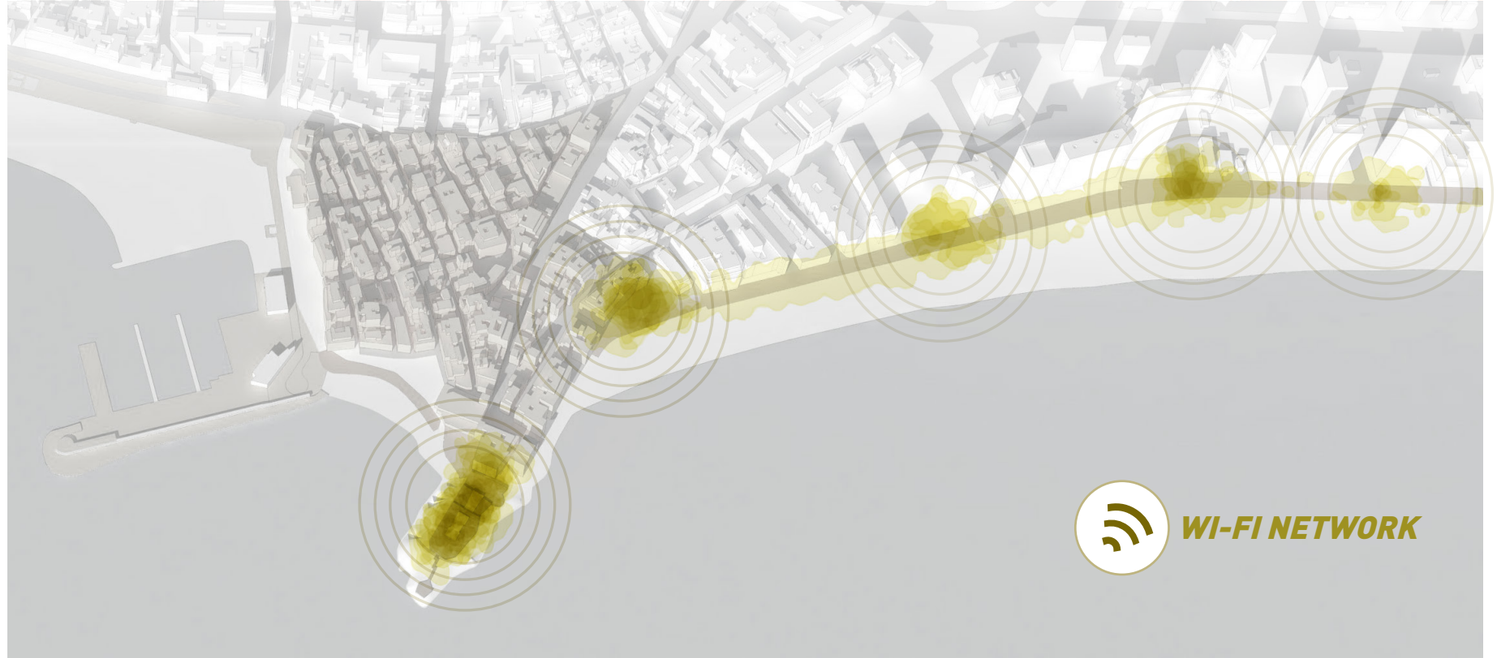
GENERALITAT VALENCIANA | TOTS A UNA veu | INVAT·TUR Institut Valencià de Tecnologies Turístiques | Con la colaboración de: DINAPSIS Operation & Lab

Diseño basado en la serie de Infografías **"El Destino Turístico del Futuro - Future Smart Destination"** creadas por **Francis Ortiz - CreaSolutions.es**

The Wi-Fi network is a tool that has enabled us to have a lot of information during the 9 months that it has been underway.

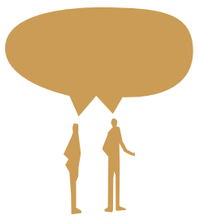
- Total unique users connected (different wi-fi devices): 574,090
- Total users detected (daily sum total wi-fi devices detected by the network) during the entire 2018 season: 21,913,696
- Total users tracked (users that remained in our wi-fi network's coverage for more than 5 minutes with sufficient signal strength to take their susceptible device data to be incorporated into the Municipal BigData): 9,231,385

Levante Beach in Benidorm. Area of most tourist activity. Photograph: Bruno Almela



Model of tourist overcrowding in Benidorm by Visit Benidorm. Bilbao Leire. Computer graphics: Author's own from Visit Benidorm artwork.

INTERVIEWS



"We are working on the tourists' knowledge and their behaviour in the city through different tools, which allows us to share the knowledge of the tourist profile with the city's private sector."

Leire Bilbao. Visit Benidorm

3.3 BARCELONA

3.3.1. THE CITY OF BARCELONA

Barcelona has 1,620,000 inhabitants and is the centre of a metropolitan area exceeding 4,000,000 people. In its urban layout, three areas have been identified in which tourism has had a big impact: Ciutat Vella, El Eixample and La Barceloneta.

Barcelona has become a touristic city in a few short years. There are an estimated thirty million visitors each year, close to 50,000,000 users in the Barcelona-El Prat airport, more than 145,000 regulated places of tourist accommodation, etc...

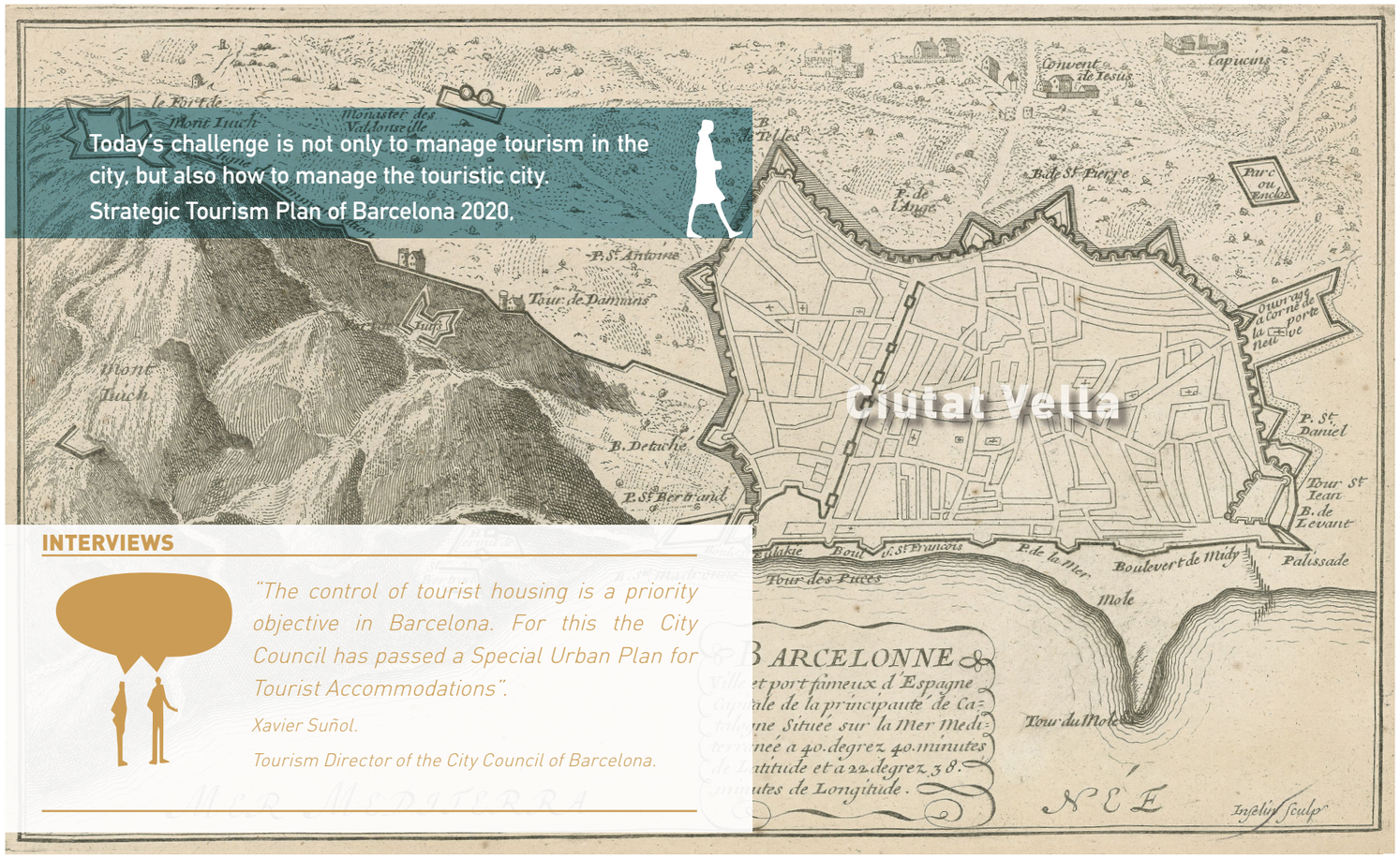
Barcelona occupies a leading position in various European rankings (please see the timeline at the beginning of Chapter 3 of the present document) of cities that suffer tourist overcrowding and the forecasts indicate that this will continue in the coming years.

According to the **Strategic Tourism Plan of Barcelona 2020** (Tourism Authority. City Council of Barcelona. 2017), tourism management challenges are the city's challenges, from the promotion to the externalities of the activities. It is inconceivable to think about interfering in the city without taking into account the tourist activities and their effects, central elements in a large part of the city.

In the same way, it's considered to be completely inappropriate to think that one could "mould" tourism without keeping in mind the "non-tourism" elements of the city. The touristic city, that which is configured through diverse images, practices and tourist activities, shares and forms, at the same time, a part of a much more complex, multifaceted and heterogenous city.

Today's challenge is not only to manage tourism in the city, but also how to manage the touristic city. In other words, the challenge lies in how to make the touristic city coexist with the rest of the multifaceted city that is Barcelona's needs. This change in perspective is crucial when it comes time to think about instruments in order to manage the effects of tourist practices and tourists' use of the city, which are increasingly more integrated in the daily dynamics.

If we consider that tourism and the city are inseparable, one may not act without the other being affected. Accepting this will help, also, to stop treating tourism in an essentialist and aprioristic manner: tourism is neither good nor bad, it depends on the context, the structuring elements and their effects.



INTERVIEWS

"The control of tourist housing is a priority objective in Barcelona. For this the City Council has passed a Special Urban Plan for Tourist Accommodations".

Xavier Suñol.

Tourism Director of the City Council of Barcelona.

Barcelona. 18th Century.

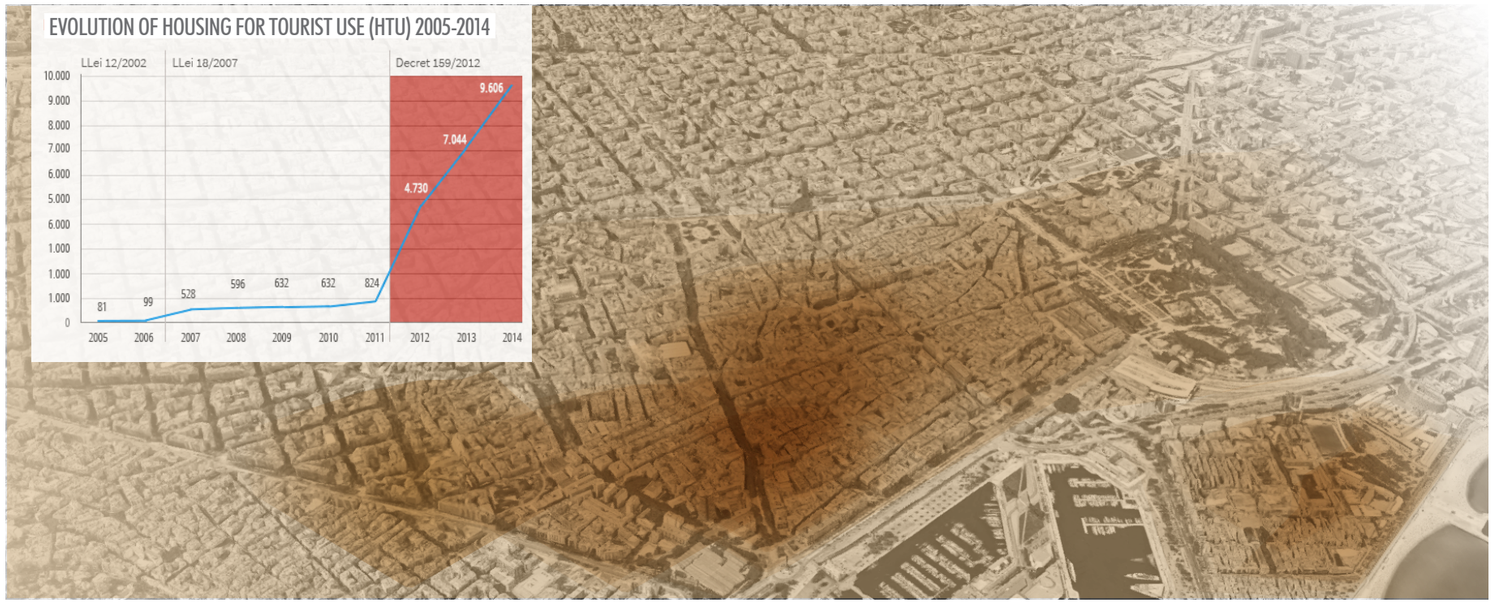
Area, Mobility and Urban Planning

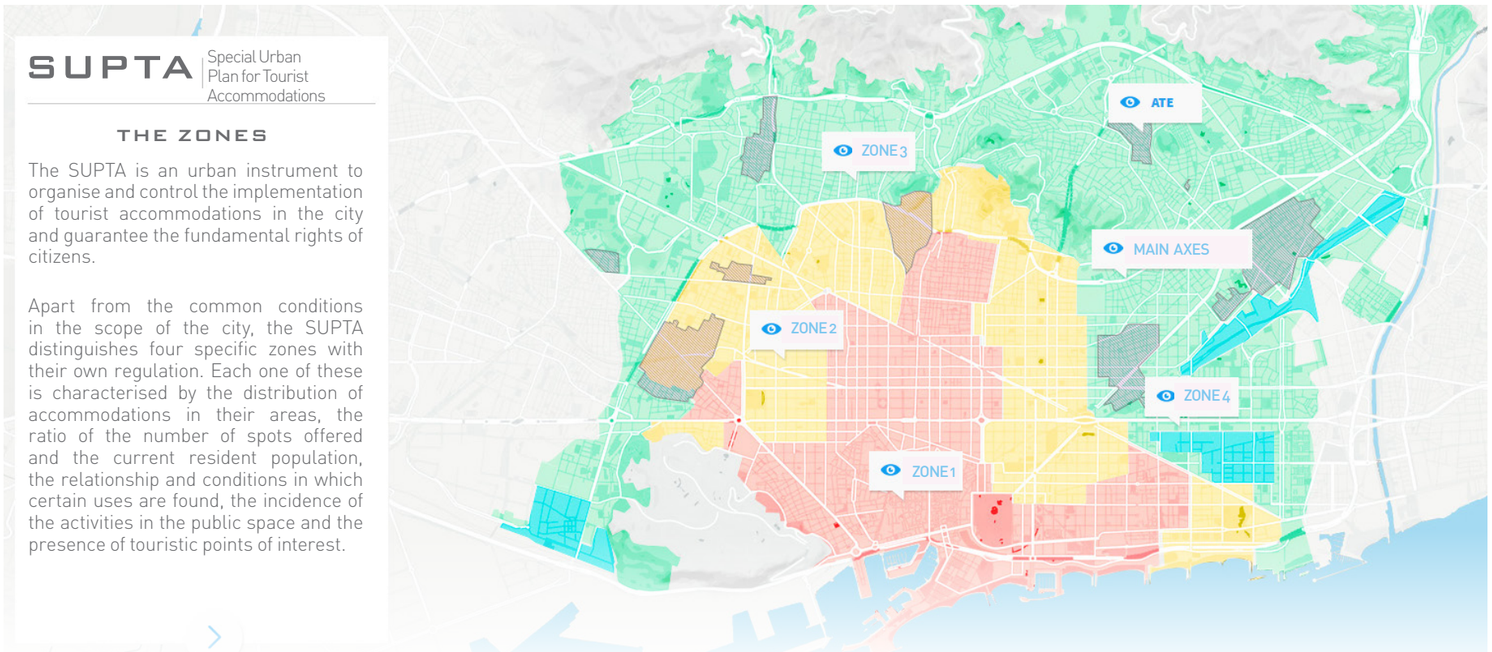
The urban planning of the region is regulated by the 1976 General Metropolitan Plan and by occasional modifications of the same in those areas that have required updating. At present the **URBAN MASTER PLAN** of Barcelona is being processed, which encompasses the metropolitan area.

The **Special Tourist Accommodation Plan** (PEUAT) regulates the installation of tourist accommodation establishments, as well as youth hostels, temporary accommodation collective residences and housing for tourist use. The regulation is a response to the need to reconcile the city's tourist accommodations, with a sustainable urban model based on the guarantee of fundamental rights and improving the residents' quality of life.

The limitation is proposed of tourist houses with respect to zoning in order to control its density. The search and detection tool for tourist apartments ads, ARAÑA WEB, has also been considerably improved on the different web platforms in order to detect illegal advertisements (without RTC), as well as to fine-tune the visualisation and physical implementation (address, floor and door) to be able to move from the announcements (without an exact address) to the opening of a disciplinary file, to the operator of the housing for tourist use (hereinafter, HTU). The task of the visual displays will also make it possible this year to search and see other possible frauds on the web that cannot be attributed to platforms, such as licence number falsification or the use of a licence registration number corresponding to another home.

Awareness-raising measures: With the aim of raising awareness for both the population of Barcelona was well as its visitors about the importance of maintaining attitudes that promote a peaceful co-existence, safety and sustainability, a specific co-existence campaign was developed that addresses different problems, among them the rental of illegal HTUs.





Tourism

Barcelona prepared a **Strategic Tourism Plan 2020 of the city of Barcelona (approved in 2017)** that came about with the intention to be the road map of tourism policies that the City Council plans to promote for the next 4 years. This framework document is the fruit of months of work and debates with experts, entities and stakeholders of the sector in order to diagnose the strategic challenges and objectives to which a response is needed. In fact, since January 2017 it has b¬¬¬een being implemented and now, several of its lines of action have either begun or even been finalised.

The Plan is structured in 10 programmes that split into 30 lines of action, each of which is achieved in a number of measures. The Plan is based on 3 main objectives: [The Plan is structured in 10 programmes that split into 30 lines of action, each of which is achieved in a number of measures. The Plan is based on 3 main objectives:

01. GOVERNING TOURISM

The public administration should focus its efforts in management, strengthening public leadership on tourism governance, and deploying all of the instruments within the reach of the Municipality to manage it. It involves changing the rules of the game and having the most powerful tools, from the municipal government, that makes it possible to find a balance, promoting certain practices and limiting others.

02. SUSTAINABILITY AS A VITAL OBJECTIVE

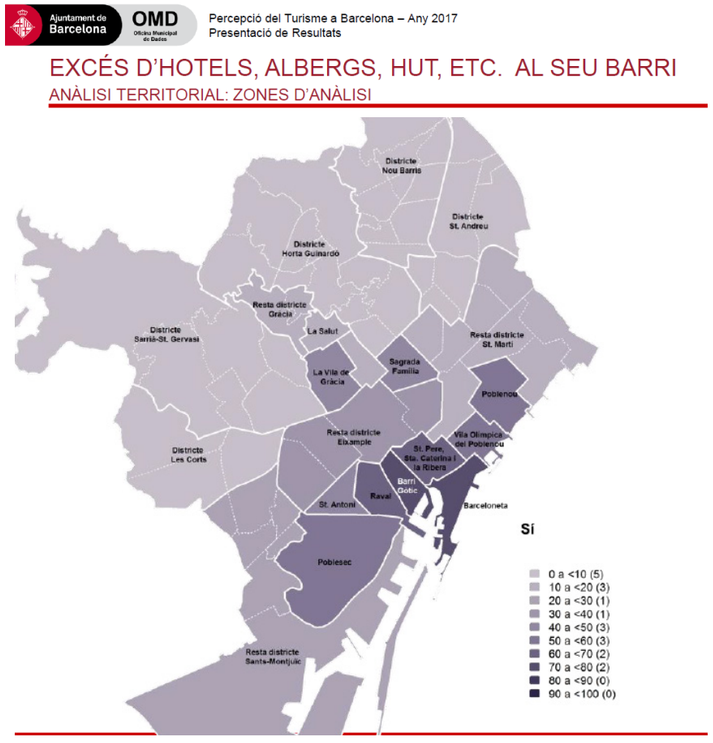
The Strategic Plan considers the launch of the Biosphere-Barcelona certificate, which would firstly make it possible to continue promoting sustainability as a goal of the tourism city's unwavering future, and guarantee the greatest possible social return of activities without jeopardising the future survival of the city. Secondly, the certificate would enable the recognition of sustainable tourism criteria as an attribute of the destination, positioning Barcelona as a pioneer urban destination in this area.

03. TAKE ADVANTAGE OF TOURISM TO ACTIVATE NEW ECONOMIC AREAS

The plan addresses the need to involve tourism activity in the economic development plans of the districts that are being promoted, such as Ciutat Vella, and to favour business cooperation so that the productive fabric of the city also benefits from the influx of visitors and companies that visit Barcelona every year.

Barcelona also has the **Touristic Mobility Strategy, passed in November 2017.** Among its goals it seeks efficiency of the modal split so that it may be more sustainable, compatibility of the tourist flows with the normal flows of the city and monitoring of the tourist flows through a systematic collection of data. .

Report: Percepció del Turisme a Barcelona. City Council of Barcelona. 2017

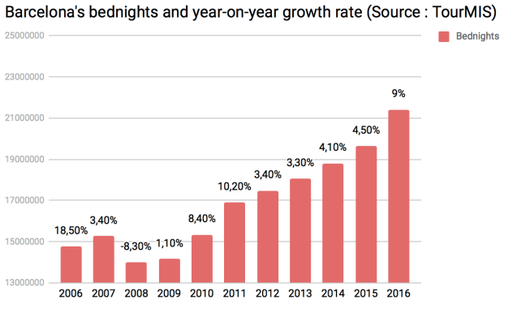


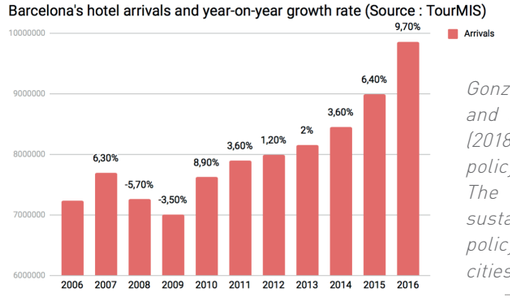
Source: "Analysis of the tourist incidence in the public space from indicators in three areas in the city of Barcelona", carried out by Urbaning by order of the City Council of Barcelona. January 2016. Touristic Mobility Plan.

Mass tourism

Barcelona is one of the most visited European urban tourist destinations. The past two decades have seen an increase in tourist visits and the floating population. It is the first tourist destination of Euro-Mediterranean cruises. Access to housing is becoming a topic of priority in municipal polities and 30% of new promotions are being set aside for public housing. In the last 4 years the rent prices have increased 24%, a situation exacerbated by, among other factors, the upward pressure of the demand for tourist apartments.

According to the 2017 Perception of Tourism in Barcelona survey, 83.1% of Barcelonians considered that tourism was mainly a good thing for the city, compared to 14.4% that thought the opposite. 59% of the population considers that the ability to provide service to tourists is reaching its limit, whereas 35.2% believe they should continue attracting tourists.





González A., Fosse, J. and Santos-Lacueva, R. (2018) Urban tourism policy and sustainability. The integration of sustainability in tourism policy of major european cities. Barcelona.

Mass tourism management

The **Strategic Tourism Plan 2020 of the city of Barcelona** provides for the boost of measures to generate a new stable management model surrounding the **HIGH INFLUX AREAS (HIA),** which makes it possible to design specific measures that are agreed upon with all stakeholders involved, governed by the region itself and that generate distributed, fair and sustainable wealth.

In Barcelona, priority areas appear such as the Sagrada Familia, Park Güell or the Fuentes of Montjuïc; hubs such as the Rambla or the seafront; or entire neighbourhoods such as the Barcelonete, the Gothic Quarter or Born, which experience overcrowding that needs to be specifically managed.

In this respect they intend to draft **management plans with measures for HIAs** that will make it possible to, once the needs are detected, deploy an array of actions and instruments to be implemented in order to reduce the impact of the excess of visitors and the functional specialisation focused on the floating population, bearing in mind the developmental needs of daily life, but also the active appropriation of spaces not used for tourism. The management and design of these plans must be coordinated among the districts and different areas, also incorporating the say of external stakeholders in the City Council of Barcelona. The factors to be taken into account for managing the space, among others, are:

- Mobility: modes of access, means of transportation and relation to the region, visitors' route, car parks, etc.
- Flow management: signage, anchors, transportation stops, queue management, etc.
- Public space: design of the urban space, furnishings, outdoor terraces, business licences, safety, etc.
- Communications: online tools, background information for visitors, civic actors, Tourist Information Offices, etc.

New technologies in mass tourism management

Monitoring elements are being regularly tested in High Influx Areas (HIAs) in order to know visitor flows and diverse metrics in order to improve the management of these areas.

In Ciutat Vella regular tallies have been carried out and at the beaches, drones were used for visual examination. The Rambla is a critical area and seeks to comprehensively tackle improving the urban spaces as well.

The City Council of Barcelona has a tech team that, through open-data and big-data, is dedicated to inspecting the irregularities in tourist accommodation. In the same way there are experiments in the use of credit card usage data to define commercial areas.

In the **Sagrada Familia** a pilot project was carried out. A successful experiment in which the effects of the European Directive on data protection were evaluated. Traceability in order to understand behaviours is of interest, but it is necessary to know the limits.

There is an agreement with the telephone provider in order to supply the mobile phone data. An analysis is being done of the important data by the Supercomputation Centre of Catalonia, however, it is in the preliminary stages.

Turó de Rovira Experiment. There are devices for counting people using 3D cameras that analyse volumes without reference images to better distinguish individuals at the top-down level. Privacy is maintained. It has arrival and exit controls and makes it possible to have "real time data". Once the maximum occupancy is exceeded, it is controlled and services such as cleaning and security can be managed. In any case, the load capacity has not yet been calculated.

GOOD PRACTICES

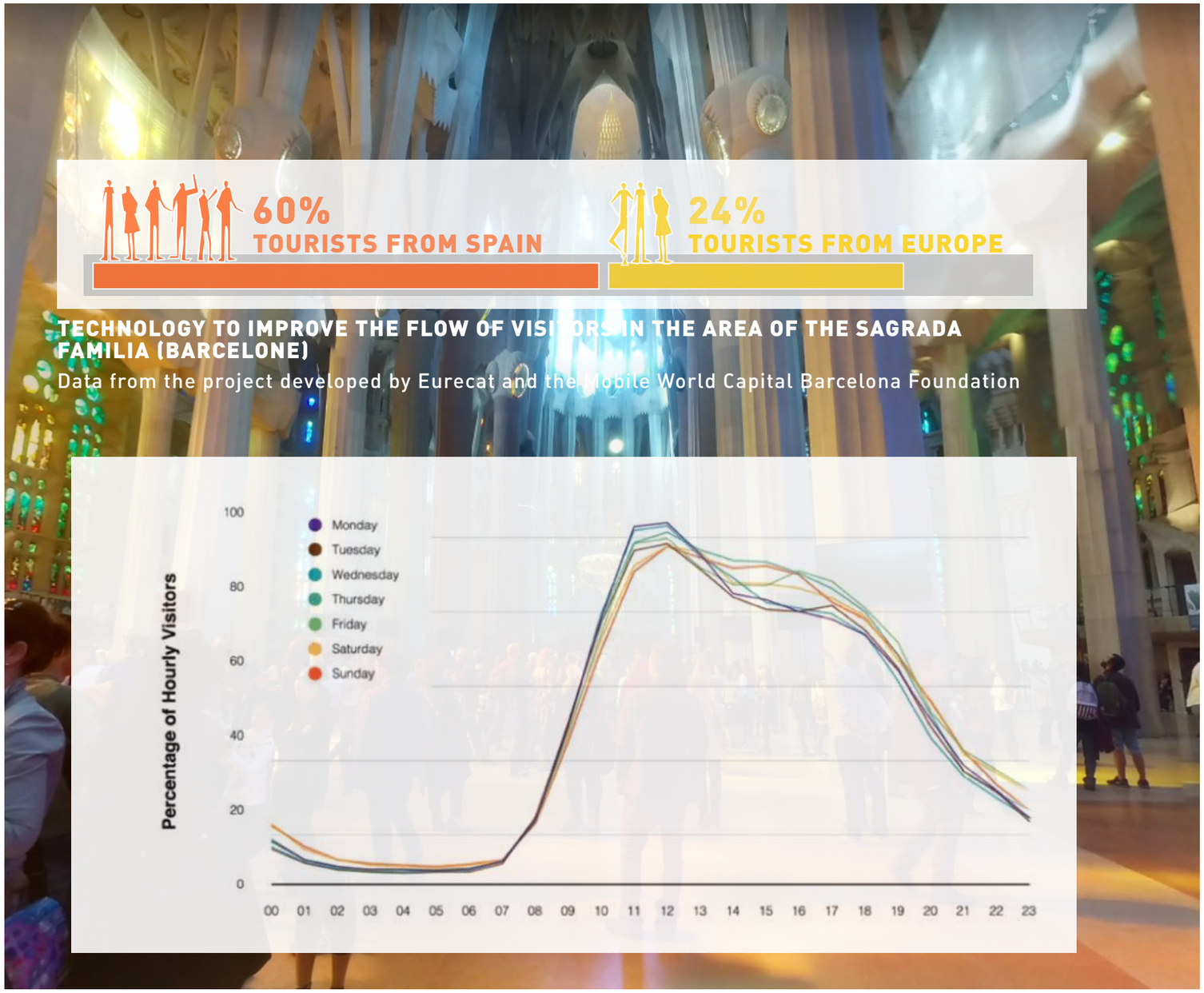
3.3.2. LA SAGRADA FAMILIA

By means of installing sensors, 3-D cameras and the global system for mobile communications (GSM), the movements of pedestrians were monitored over the course of four weeks in order to understand the profile and behavioural pattern of those who visit the church and its surroundings, and thus be able to better plan the area's services.

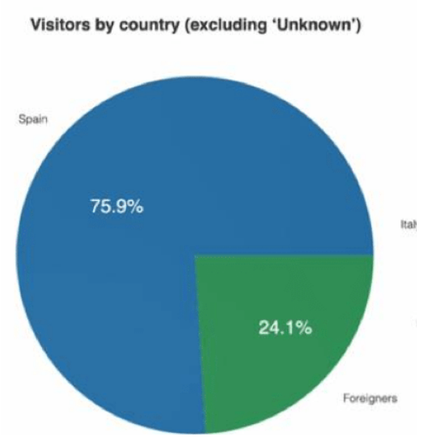
The project was developed together with Eurecat and the foundation Mobile World Capital Barcelona, providing very useful information regarding mobility, signage, civic actors or, for example, the launch of specific campaigns. The tool also has to allow for the improvement of tourist offerings in matters of route management, timetables, more personalised offers depending on where they come from, the visitor's profile, etc.

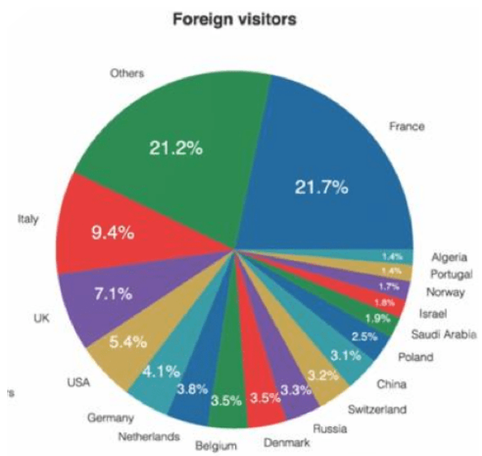
The first results obtained show the primary access and exit points of the visitors and indicate that the intersection of Calle Mallorca and Calle Marina is the point at which there is the greatest concentration of people. It is also shown that 80% of the people detected in the monitored area are there for less than 100 minutes while the remainder were there for a longer visit, presumably because they also visited the inside of the basilica. The peak hours are between 10 am and 12 pm.

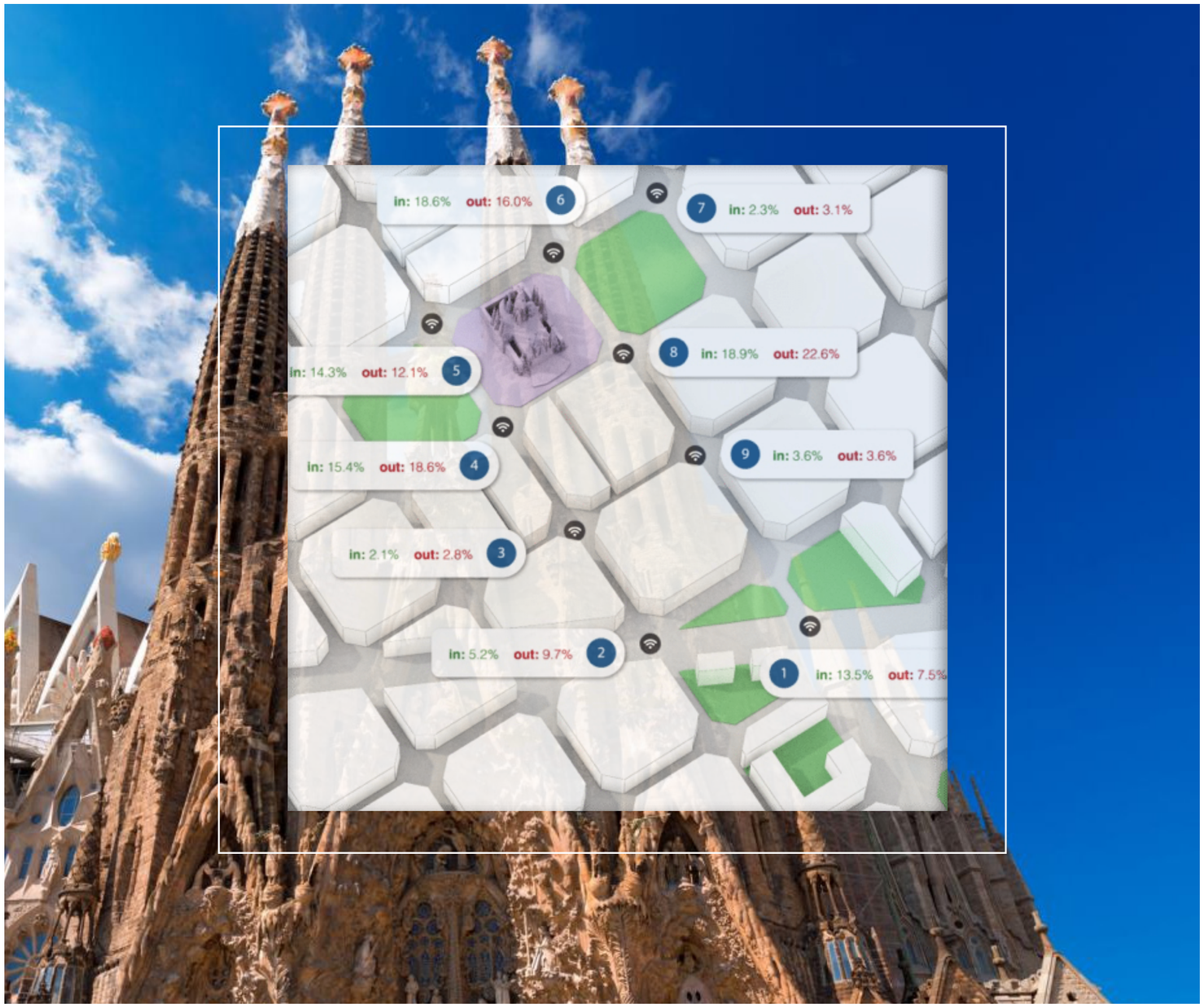
Regarding the profile of the total volume of people detected in the area, 24% are foreign, primarily from France, Italy and the United Kingdom. Regarding domestic visitors, excluding the province of Barcelona, Madrid leads the number of visitors with 36.7%, followed by Tarragona (10%), Gerona (7.7%) and Valencia (5.4%).



An algorithm makes it possible to filter which of these people are tourists, excluding those who passed through the area in under ten minutes or those who did so repeatedly during a period of more than 7 days.







GOOD PRACTICES

3.3.3. TURÓ DE LA ROVIRA
from the sidelines to a tourist area

The Turó de la Rovira in Barcelona is serving as an experiment in order to understand how new technologies may help with the management of tourist areas. In this enclave of heritage, cultural and scenic value, following a series of conflicts, a set of measures have been implemented among which is the use of new technologies.

TURÓ DE LA ROVIRA AS A PART OF THE ACTIVE DEFENCE STRATEGY OF THE CITY.

The air defence of Barcelona consisted in surrounding the city with batteries that enabled them to make a fan of fire with the intention of repelling, or at least hindering, attacks from German and Italian aircraft allied with the Francoist army.

The small number of batteries were deployed in two areas: on the sea front, where three to four were located, spread throughout Montjuïc and Poblenou, and the Turó de la Rovira, where there was another.

Between the 25 and 26 of January 1939, at the time of the retreat, the Republican army disabled the pieces of artillery, which following the end of the war remained for some time at the top of the hill.

MARGINALISATION

From the beginning of the 20th century, Barcelona grew quickly. The lack of housing was constant and brought about the uncontrolled expansion of shanty towns. At the end of the 1950s the shanty towns reached their peak, with some 20,000 shacks that housed some 100,000 people, close to 6% of Barcelona's population.

In the Turó de la Rovira, all of the air defence batteries no longer in use were quick to be reused, and they became a new nucleus of informal housing. The popular name of The Guns, in no uncertain terms, referred to the military use of the location during the Civil War.

The neighbourhood, charactarised by strong organisational ties of collective struggle, came to have close to 110 shacks and 600 inhabitants.

PATRIMONIAL ASSESSMENT LANDSCAPE RE-QUALIFICATION

2011

RECOVERY

In 2011, a project developed by the Museum of History of Barcelona (MUHBA) was carried out. It was an operation to improve the environment. The proposal is based on the conservation of all the remains of the batteries and those corresponding to the subsequent occupation by the illegal buildings, provided they are compatible with the remains of the military defense structures. The MUHBA wanted to value this historic and heritage space by installing five information panels on site that facilitate the self-guided visit, the edition of two urban history guides and the programming of guided tours.

OVERCROWDING OF TOURIST SPACE

"What until before the Olympic Games was surrounded by humble barracks and was a forgotten space, is now one of the favorite places of the instagramers and is" dying of success. " The increasing popularity of Turó de la Rovira, the old bunkers of the Carmel neighborhood, is leading to an increase in incivism. "

LA VANGUARDIA JOSE POLO, BARCELONA 06/08/2018.

La presión turística sube hasta el Turó de la Rovira

Todas las noches centenares de jóvenes se reúnen en los viejos búnkeres del Carmel

2017-2018 →

COEXISTENCE

The irruption of this space in tourist circuits has surpassed the load capacity of the environment and problems of coexistence with neighbors have surfaced. Especially in summer, there is a large influx of people looking for a panoramic image of the city of Barcelona. This conflict is aggravated by the urban situation in which there are many houses that are outside of urban planning.

CONTROL OVERCROWDING

Visit to Turó de Rovira in December 2018.

2019→

OVERCROWDING MANAGEMENT

Along with the increase in surveillance, the improvement of accessibility with public transport, the improvement of access roads and streets in the surroundings, a follow-up action of the flows with video surveillance has been initiated.

There are devices for counting people using 3D cameras that analyze volumes without image reference to better distinguish individuals at the zenith level. The privacy is maintained. It has arrival and departure control and allows to have "real time data". Once the maximum capacity is passed, it is controlled and services such as cleaning or security can be managed. One of the most important tasks would be to study its load capacity.

GOOD PRACTICES

3.3.4. BARCELONA MORPHOLOGIES OF TOURISM

The Morphologies of Tourism experiment outlines the impact of tourism in Barcelona by means of analysing soft data with the goal of creating a public monitoring infrastructure and a series of documents to understand the complexity of the phenomenon and make new decisions. The 19 mappings that make up the project, prepared within the framework of the Festival of Arts and Design of Barcelona FADfest'17, are grouped into 4 chapters that describe the tourist attractions and the city's visitors, hotel offerings, available services and finally, addresses the possible population displacement by tourism action.

The project poses a set of questions and proposes a visuality of the phenomenon by means of mappings:

The urban identity and tourist attractions

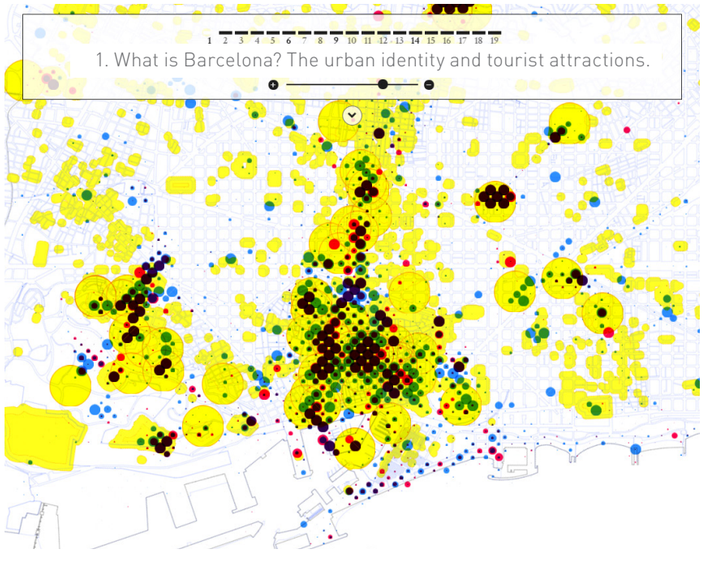
What builds the touristic identity of Barcelona? Is it its main monuments, its cultural offering or its anonymous urban fabric? One of the key issues in the development of the touristic identity is knowing what visitors appreciate, and even more, if the places that are symbolic for tourists also are for the Barcelonians. At present, the tourist attractions are concentrated in the city centre, with some exceptions such as Parc Güell or the hill at Montjuïc. This Barcelona, that focuses the visitors' attention, is simultaneously the Barcelona of many of its residents, as shown by the overlap of the most photographed areas by the two

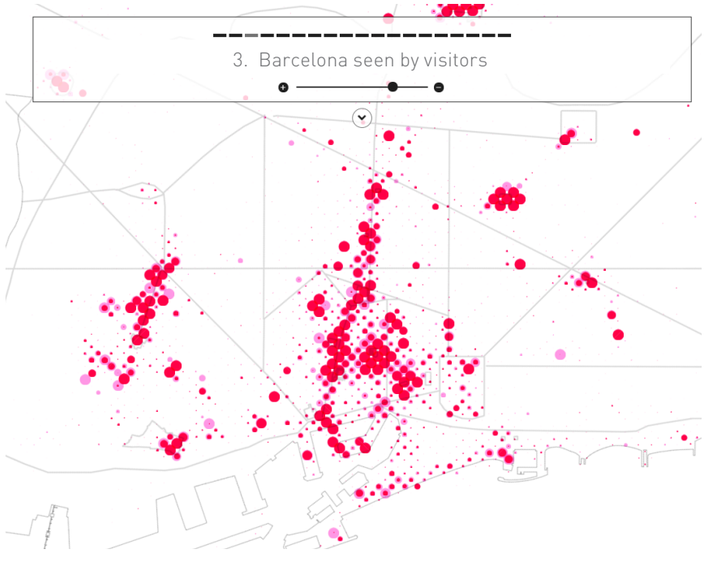
Barcelona seen by visitors

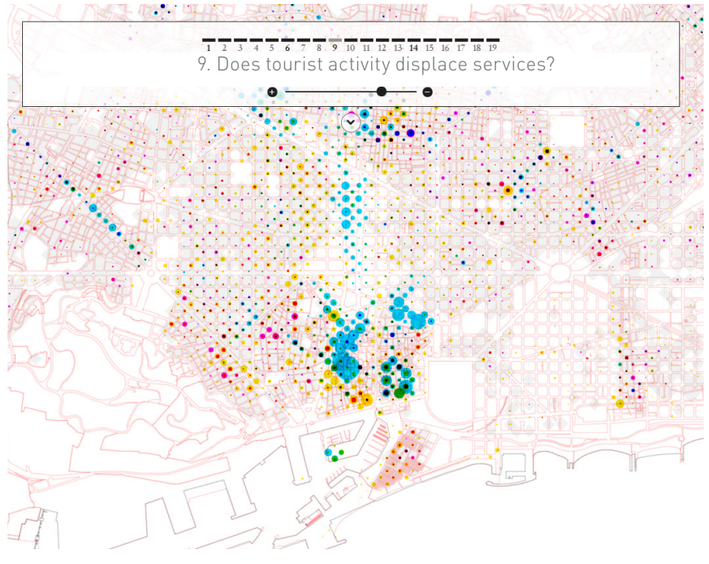
The image of the city that visitors take with them is recorded through the photographs taken during their stays. The main monuments (Sagrada Familia, Parque Güell, the Magic Fountain), the historic centre and some civic axes such as the Rambla or Passeig de Gràcia are the most photographed places, and therefore, are emblematic for visitors.

Does tourist activity displace services?

In a diverse and mixed city such as Barcelona, where the ground floor is made for businesses, it is understood as a service targeting its residents. Everyday commerce (a mix of food, fashion and accessories, home, etc.) forms the main commercial axes, despite there being specialised areas such as Passeig de Gràcia or Portal del Ángel whose offerings go beyond the city itself. Nonetheless, in recent years new restaurant and leisure establishments have multiplied, especially in certain neighbourhoods, as well as shops aimed at visitors around the most touristic areas. However, the mix of businesses remains a feature in many areas, there is a general perception that gradually, and in part as a result of the visitors' habits, that services are being displaced.







Is there a relationship between the tourist activity and the displacement of residents?

In Barcelona there are currently 9,657 officially identified tourist apartments apart from those offered on platforms, Airbnb being the most significant. This pool of housing for holiday usage (both official ones and those from the so-called sharing economy) takes flats out of the primary residence rental market. However it cannot be stated that the tourist apartments are the sole direct cause of the rise in rental prices, in Barcelona it has skyrocketed exponentially over the past three years. This new economic activity undeniably creates pressure on residential land. In contrast with other cities, the impact of tourist housing has extended beyond the city centre and affects a majority of Barcelona neighbourhoods, impeding many residents' access to housing and causing displacement of the population to other municipalities.

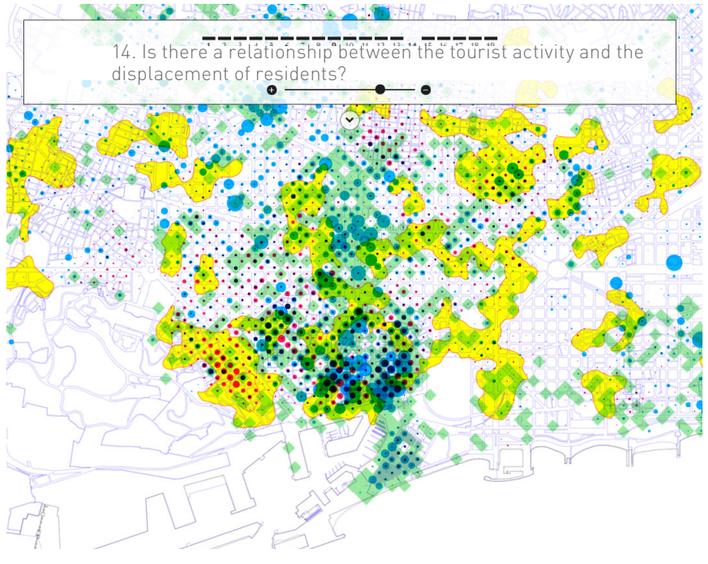
Where are there tourist apartments and which are busiest?

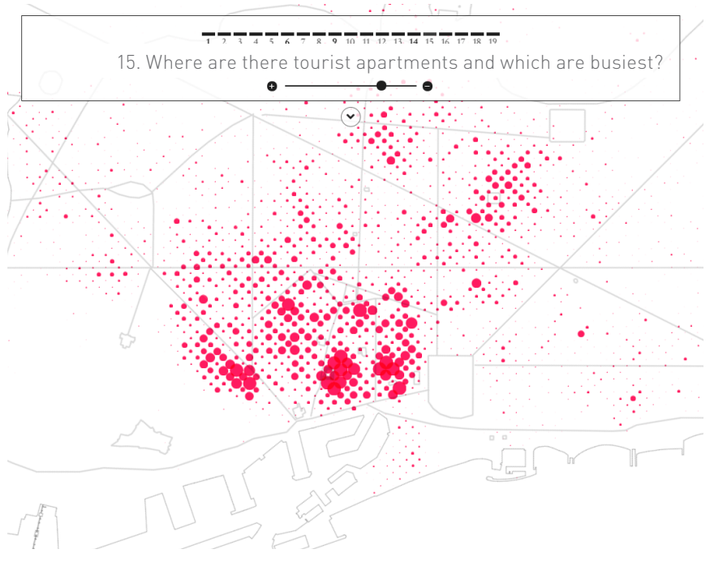
Despite there being Airbnb tourist apartments throughout the city, the most visited are those located in the historic centre of Barcelona and the immediate vicinity; specifically, in the district of Ciutat Vella and in the Poble Sec, Sagrada Familia and Gràcia neighbourhoods. These areas withstand great pressure from visitors staying there, which in many cases is added to the influx of people generated by the tourist attractions.

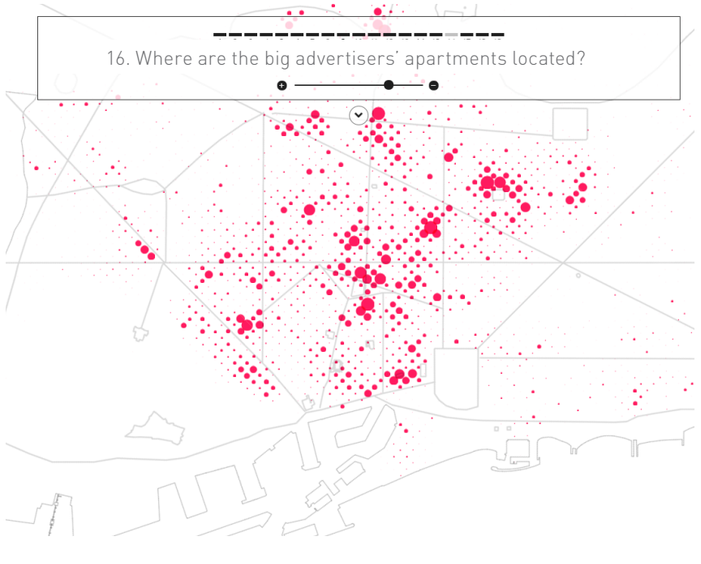
Where are the big advertisers' apartments located?

Peer to peer apartment renting, promoted by the Airbnb platform, has gradually led to this service being used to manage properties and obtain economic benefits. In Barcelona, the offering of apartments advertised by a sole manager is found in the areas close to the main tourist attractions, very central or well connected.

Source: http://turismebcn.300000kms.net





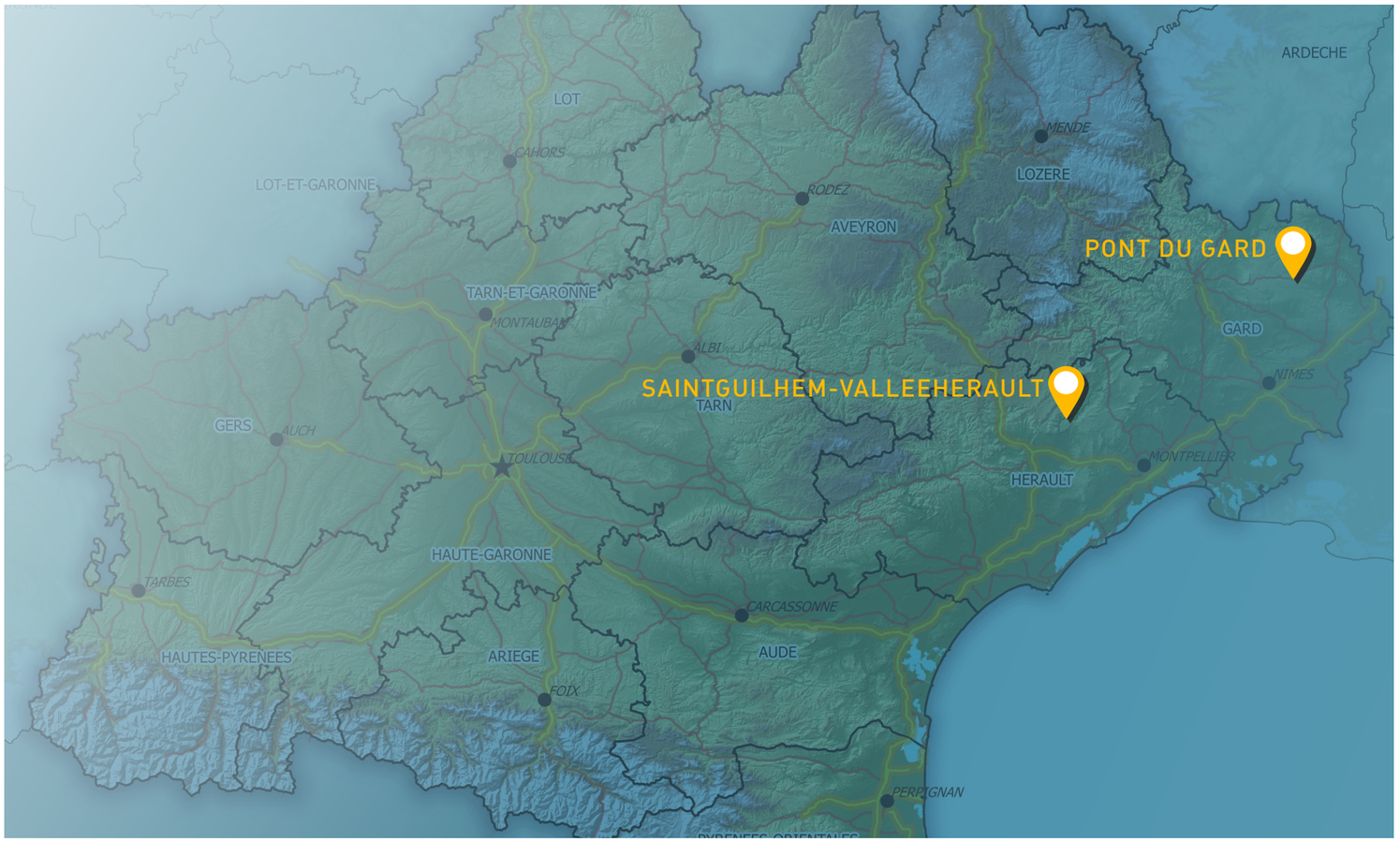


3.4 OCCITANIA

Occitania is one of thirteen regions in France and is located in the south, bordering the Mediterranean and Spain. However, at the touristic level it has countless destinations, among them urban ones such as Toulouse, Montpellier, Nîmes or Narbonne, for the present work the tourist resources of Pont du Gard and Saint Guilhem-Vallee Hérault are analysed.

3.4.1. PONT DU GARD

In the year 29 B.C., in the Roman age, an aqueduct was constructed in order to supply the city of Nemausus (now, Nîmes) which should have housed 60,000 inhabitants. The water was brought from the Uzès well 21 km from Nîmes, to clear the canyon of the mighty Gard River 5 km away from the city. For this, they used 13 arches among which is the Pont du Gard, which today forms a part of one of the most visited monuments in France. This series of arches is as tall as a 16-story building.



Area

The Pont du Gard is found within the Biosphere Reserve of the Gardon River gorges and covers more than 45,000 acres, surrounded by villages of more than 250,000 inhabitants. The Gorges du Gardon is a point of interest for its biodiversity and therefore the public authorities wanted to guarantee its conservation by means of introducing numerous protective measures beginning in the 1980s.

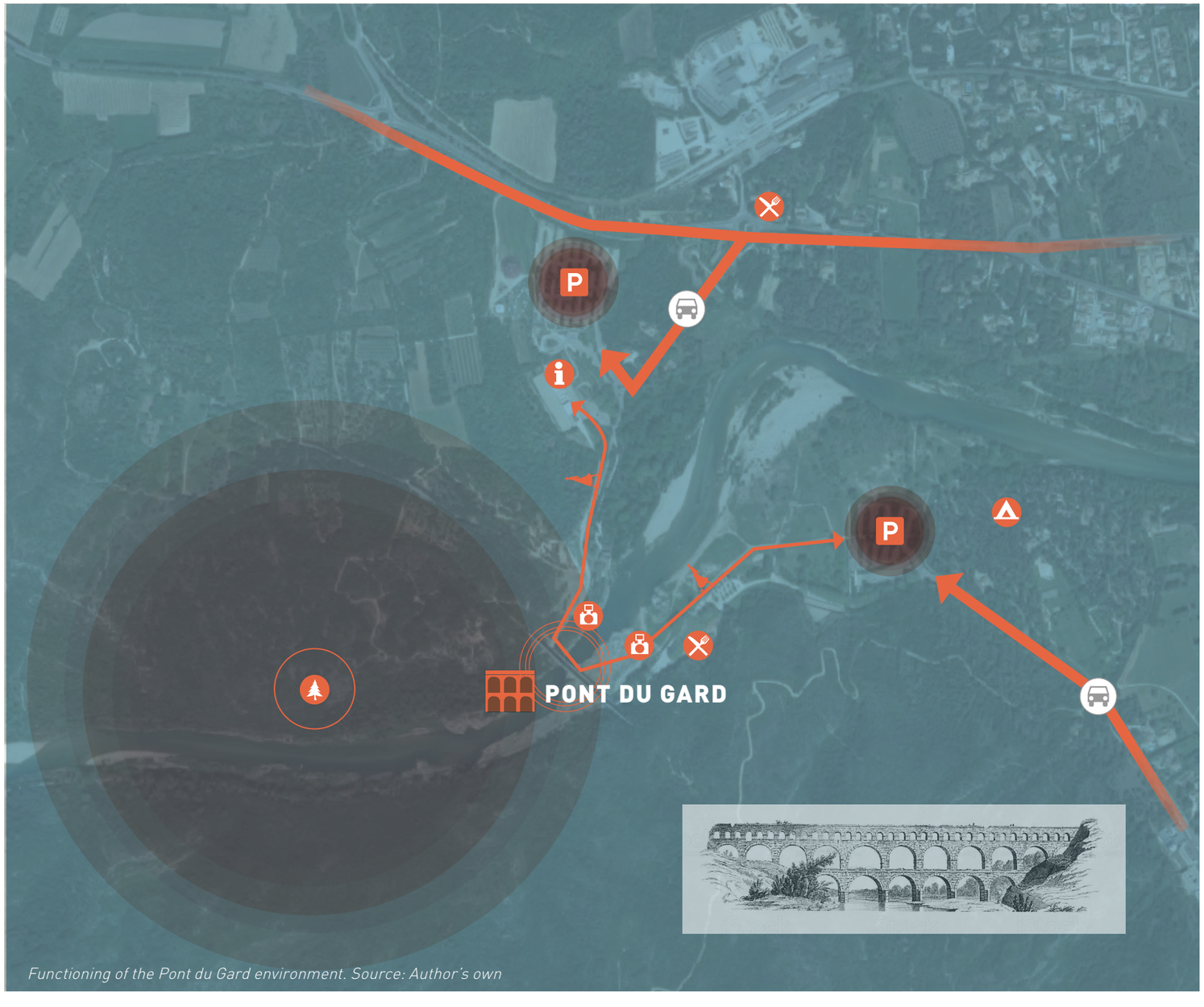
In 2015 the figure of the UNESCO Biosphere Reserve and the structure of the protected area, is the Syndicat Mixte of Gorges du Gardon (SMGG) was created in coordination with the 26 municipalities through which the reserve extends. The arches are found within the central zone of the protected area.

Tourism and overcrowding

The Pont du Gard already surpassed a million and a half visitors annually in 2014, at a growth rate of 8% per year. According to the local newspaper Midi Libre, in 2018 the Pont du Gard received 900,000 visitors, similar to in 2017.

Visitors typically arrive in private cars or coaches, and at the reception point there are two car parks located on each side of the river. The left bank to the north, the right bank to the south. From there, visitors access the river and aqueduct on foot via adapted pathways.

Officials in matters of tourism point out that it would be interesting to monitor these arrival points using new technologies in order to regulate tourist overcrowding. Today no measures of this type are being carried out in the area of study.



Functioning of the Pont du Gard environment. Source: Author's own

INTERVIEWS

"New technologies allow us to understand the touristic phenomenon and control mass tourism in heritage resources such as the Pont du Gard".

Magali Ferrand.

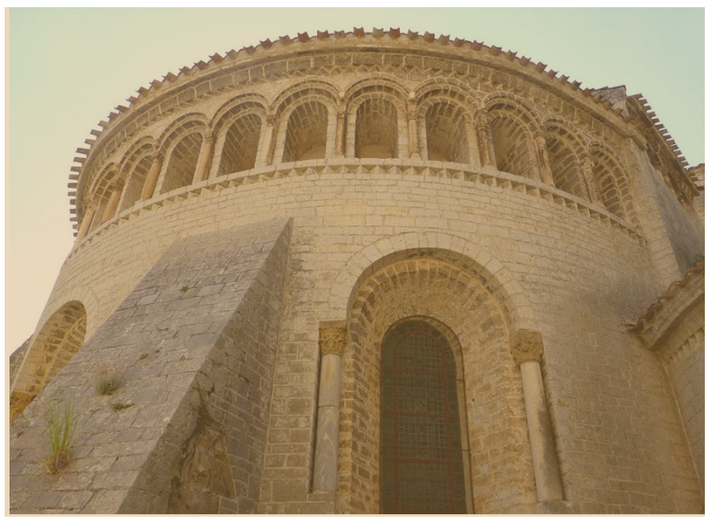
Directrice Déléguée. Direction du Tourisme et du Thermalisme/ Site de Montpellier

3.4.2. SAINT GUILHEM-VALLEE HERAULT

The "Gorges of the Hérault" are located in the Hérault River valley, approximately 40 km west of Montpellier. It consists of 5 municipalities located within its perimeter, which are: St Guilhem le désert, Aniane, St Jean de Fos, Montpeyroux and Puéchabon. Attractions like the Gellone Abbey and Devil's Bridge are highlights.

Saint-Guilhem-le-Désert is a Benedictine abbey founded in 804. It's an essential stage of the Way of Saint James branch that crosses Arles. The present building corresponds to the 11th century and is in the Romanesque style, all of this surrounded by a picturesque medieval village.

The Devil's Bridge is a structure built in the Romanesque style. Its construction was achieved thanks to an agreement between the Aniane Abbey and the Saint-Guilhem-le-Désert Abbey in the 11th century, as it is clear from the cartulary of Gellone (or Saint-Guilhem-le-Désert).



Area

Along the Hérault River a natural and cultural site of high value is located, highlighting tourist resources such as the medieval villa of Saint-Guilhem-le-Désert built around the Gallone Abbey, also recognised as a UNESCO Heritage site. In the same way, others such as the Pont du Diable (Devil's Bridge) in Hérault and the Clamouse caves are highlighted.

The Devil's Bridge is considered World Heritage by UNESCO. The bridge's construction began between 1028 and 1031 by the Aniane and Gellone Abbeys, whereby during 1000 years it has endured torrential flooding of the Hérault River and set the pace between the hills and the plain. Among the oldest existing French medieval bridges, it incorporates early techniques of Romanesque art in the region, including two main arches and two secondary arches (gills, that stood up to the rush during floods), demonstrating the strength and solidity of its construction.

Tourism and overcrowding

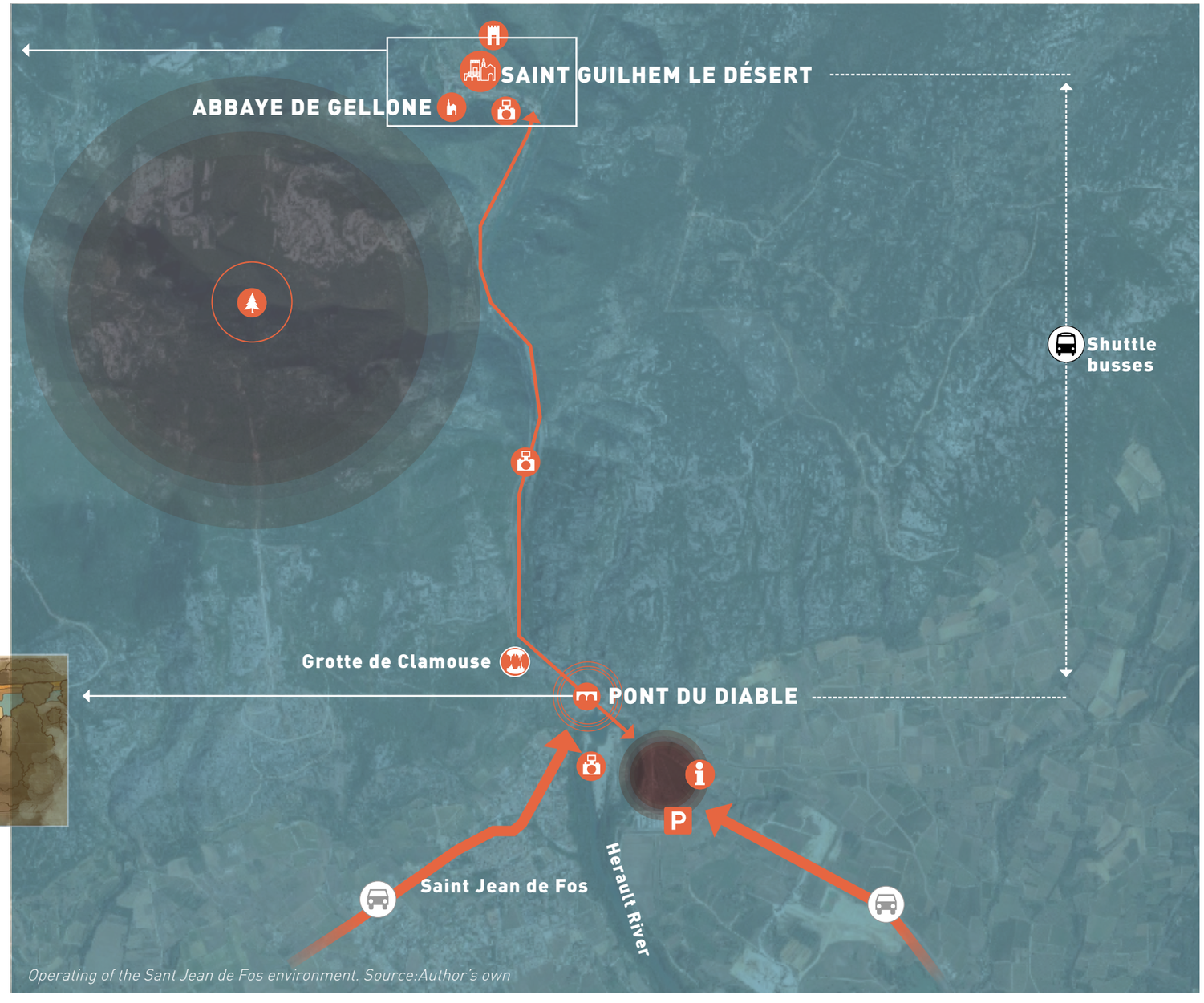
By being a popular tourist destination frequented each year by 650,000-700,000 visitors, the local authorities decided to establish a 'CLASSIFIED SPACE PLAN' twenty years ago in order to limit the impact of a high number of visitors and to improve the facilities.

Hence, each year the organisation has implemented improvements such as a welcome centre in Pont du Diable, which consists of a transportation system that connects the bridge with the town of Saint-Guilhem-le-Désert in summer, and restoration works in the streets and squares, following guidelines for the management of outdoor activities and looking after the countryside.

In 2010 the municipality of Hérault Valley, with the status of administrators of the enclave from 2002, received the "Grande site de France" (classified site) accreditation from the government. A long-term management plan was put in place in order to guarantee that "Saint-Guilhem-le-Désert - Gorges of Hérault" is a site managed with sensitivity, that it is welcoming for visitors and that it protects its heritage.

The surroundings have two tourism offices, one located in the vicinity of Pont du Diable and the other in Saint-Guilhem-le-Désert.

New technologies are currently not used for controlling tourist overcrowding but officials in matters of tourism point out that monitoring the capacity would be of interest.



Operating of the Sant Jean de Fos environment. Source:Author's own

3.5 FLORENCE

3.5.1. CITY OF FLORENCE

Florence is found in the centre of Italy and has a population of 378,000 inhabitants. The Cradle of the Renaissance experienced its era of greatest splendour following the establishment of the Grand-Ducal of Tuscany, under the rule of the Medici dynasty. Its historic centre was declared World Heritage by UNESCO in 1982.

The centre of Florence is, in fact, the main destination for many tourists that make their way to Tuscany and the Florence Metropolitan Area. Within that area, without a doubt, the main targets are the largest and most famous museums, palaces and others...specifically: the Uffizzi Museum, the Vecchio Palace, the Pitti Palace, the Opera del Duomo Museum and Academy.

However, Florence is not just the city of Michelangelo's David and the Uffizi. Florence is not just the "cradle of the Renaissance", it has a long history and many faces. The Middle Ages (especially the 13th and 14th centuries), but also the 19th and 20th centuries, had a profound impact on the art, architecture and urban planning of Florence.

FLORENCE 1731. Source: Harvard University. Oldmaps.com

Project co financed by the European Regional Development Fund

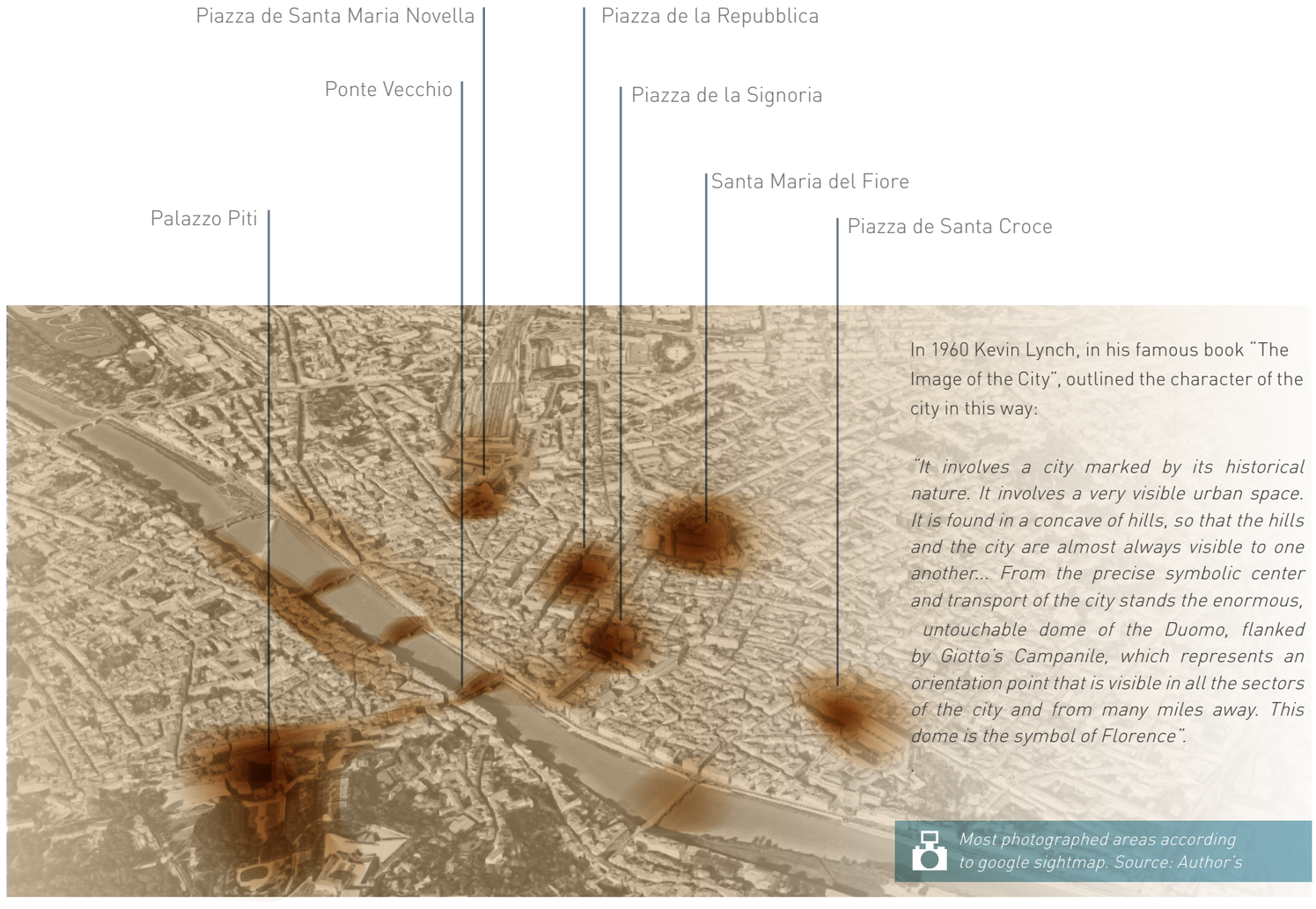
Territorio, Urbanismo y Movilidad

The city of Florence has a general sustainable urban mobility plan. With the goal of reducing pollution, alternative modes of transportation are being promoted, such as a new tram, bike-sharing, car-sharing (electric) and of course, they are committing to pedestrian mobility. With regards to the latter, a specific campaign called Firenze Walking has the goal of conveying that everything in the city is nearby; this campaign (which includes an application, traffic signs, paper materials) also includes alternative routes in the city and its surroundings, trying to reduce the congestion of mass tourism. Florence has a pedestrian area of 12 acres and a network of bike lanes of 95 km.

The city of Florence has a restricted traffic area (Zona a traffico limitato ZTL) corresponding to the UNESCO area, within the bypass of the boulevards (among which the pedestrian area has a total area of 12 acres). Tourists may drive within the ZTL only to arrive to their hotel during a limited amount of time; Florence has many car parks on the border of the ZTL, well connected to the city centre by bus. Additionally, there are 2 Park & Ride areas for private cars: one is in Viale Giannotti (eastern Florence, connected by bus), the other is in Scandicci (west of Florence, connected by tram).

The tourist busses must pay a fee to enter in the Florence municipal area (the rate changes in accordance with many characteristics such as the emissions pollution), where they must follow predetermined routes. It is undeniable that in some frequent pick-up areas there are problems with congestion. The tram system, if improved, would pose a valid alternative in this regard: groups of tourists could be left outside the city centre and transferred, by tram, to the heritage areas and vice versa. Preferably through alternative routes through the city centre.

The app Firenze Walking shows 18 routes with almost 97 km to cover.



In 1960 Kevin Lynch, in his famous book "The Image of the City", outlined the character of the city in this way:

"It involves a city marked by its historical nature. It involves a very visible urban space. It is found in a concave of hills, so that the hills and the city are almost always visible to one another... From the precise symbolic center and transport of the city stands the enormous, untouchable dome of the Duomo, flanked by Giotto's Campanile, which represents an orientation point that is visible in all the sectors of the city and from many miles away. This dome is the symbol of Florence".

Most photographed areas according to google sightmap. Source: Author's

Tourism

The metropolitan area of Florence and Tuscany have information resources to measure and quantify the tourist phenomenon. For example, in 2017 around 23 million tourists visited the Florence Metropolitan Area and 13 million to Florence specifically. There is also a profile for country origins, what is more complicated to assess is how they move through the city.

In accordance with current legislation, the Florence Metropolitan Area maintains records of the tourist flows in Florence, both in terms of arrivals and overnight stays. The data are also registered according to nationality, time of year, type of the accommodation facilities (hotels, country houses, campings, B&Bs, etc.), the distribution in Florence and other cities in the metropolitan area.

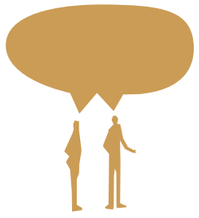
To effectively apply the Convention Concerning the Protection of the World Cultural and Natural Heritage, in 2002 the World Heritage Centre established that the inclusion of new sites on the World Heritage List should be necessarily subject to the preparation of a **MANAGEMENT PLAN.** Therefore in 2004, the Centre extended this obligation to sites that were already included on the List, thus providing local governments and administrators with a valid tool to protect, improve and monitor the heritage and increase public consciousness. Article 108 of the Operational Guidelines for the implementation of the World Heritage Convention established that each candidate must have an appropriate Management Plan or another management system able to specify the methods through which the Outstanding Universal Value is preserved, as well as the instruments to encourage participation of the local community and interested stakeholders. The Management Plan analyses, through the participation of various actors, the forces of change and the changes that take place in cultural, environmental and socioeconomic terms; it promotes protection and improvement projects coordinated and shared with the different actors that operate in the area.

Through the development of a clear and integrated Management Plan, it's possible to:

- Provide management tools intended to coordinate the different interests of the different parties, both public and private, involved.
- Identify strengths and weaknesses, opportunities and possible threats;
- Identify short, medium and long-term objectives related with conservation and development, as well as the innovative actions and strategies to achieve them.

Within the management of the tourism management system there are 5 projects underway: tourist destination monitoring centre; Florence green way; historic centre load capacity centre; way of the prince; Firenzecard and Firenzecard +.

INTERVIEWS



"Florence is creating a new system that will inform tourists, in real time via Wi-Fi on their smartphones, of the overcrowding of areas of the city, and soon we will be successful".

Carlotta Viviani.
Responsabile P.O. Promozione Economica Turistica e Lavoro
Direzione Attività Economiche e Turismo

COORDINATION

Tourism being one of the main driving forces of the Florentine economy, it is inevitably connected with a wide range of other areas (culture, business activities, mobility, etc.); therefore, the City of Florence Tourism Department cooperates with other municipal departments. The City of Florence UNESCO Department also plays an important role, involving a series of local departments and other interested parties with respect to their Management Plan.

In accordance with the Regional Law 86/2016, the city of Florence has a leadership role in the promotion of the generalised area of its surroundings ("tourist area *), cooperating in this way with the other 17 municipalities in the Florentine area.

13.000.000 TOURISTS

378.000 INHABITANTS

Mass tourism

The Uffizzi Museum, the Vecchio Palace, the Pitti Palace, the Opera del Duomo Museum and Academy are spaces where the city's congestion is concentrated, in terms of queues outside of the same, which may last until the closing time, causing distress for the tourists and residents due to the "invasion" of the public space, the noise, and the traffic problems created.

There are also particularly overcrowded streets and areas, such as Via Calzaioli (between the Duomo and Piazza Signoria) and the areas around Ponte Vecchio (the old bridge) and Piazza Signoria. It is important to note that all of these points of interest belong to the central heart of the city, crucial points in the Core Area, as it was identified and included in the UNESCO World Heritage List of 17 December 1982. The Core Area corresponds to the part of the city surrounded by the medieval wall, which means less than 5 km^2, where the majority of the over 13 million tourists per year are concentrated.

The overcrowding of this urban area is considered one of the main problems for this monumental city.

LOAD CAPACITY STUDIES

There are many reports and studies in this field, both public and private. The role of OTD (Osservatorio Turistico di Destinazione - Tourism Observatory of the Destination) is also very important in this field. The OTD is an operational instrument of the "Sustainable and Competitive Tuscany" project which created a regional network of tourist destinations, following the NECSTouR management system.*

* NECSTouR (Network of European Regions for a Sustainable and Competitive Tourism) is a network of European regions, created in Plymouth (United Kingdom) in 2009, for the implementation of the European Agenda for a sustainable and competitive tourism. More than 30 European regions are participating to date.

The guidelines of this project are:

- Cooperation and synergy between the interest groups of the Destinations.
- Constant control of the tourist phenomenon.
- Evaluation of the sustainability of the Destinations.

The first objective of OTD is monitoring the Region of Florence and its area, involving all interested parties (public and private) in order to define concrete actions for improving sustainable and competitive tourism. The interested parties represent various areas: administrative, cultural, sports, religious institutions, as well as accommodation companies.

According to the "Florence Charter" (2007), the policies and objectives for a sustainable tourism (supported by the OTD instrument) are the following:

- Standard of living of the residents.
- Labour standards.
- Seasonal adjustment.
- Protection of cultural heritage.
- Protection of environmental heritage.
- Protection of the destinations' identity.
- Optimisation and reduction of natural resources (specifically: water).
- Optimisation and reduction of energy consumption.
- Reduction of waste and optimisation of waste elimination.

The regional project (including 50 destinations in addition to Florence) also has the goal of creating a European quality mark for the best sustainable destinations.

Mass tourism management

To control the number of tourists in Florence, different measures are being implemented. For example, all busses that enter the city of Florence must pay a tax, based on many parameters, among which is the number of tourists on board.

The Region of Tuscany, the Florence Metropolitan Area (which includes 42 municipalities, one of them Florence) and the city of Florence itself work in coordination to manage tourism. Nonetheless, there are no thorough studies that determine the load capacity of the tourist destination.

Some measures that could be incorporated in the future would be:

- Shuttle busses synchronised with the museums, so that tourists enter the museum when the time comes, avoiding queues and congestion in the public space.
- Improvement of the availability of data for tourists, so they are aware of congestion and queues, and can then avoid contributing to this type of phenomena and have a bad tourism experience.
- New technologies in mass tourism management.

Redirect the visit. Seasonality is, in fact, a problem for being able to redirect tourists in real time. In the same way Florence has practically 2 months of off-season: January and November. From Florence different destinations are constantly trying to be proposed with respect to the best-known area, but the measure only affects those who go to Florence for a third or fourth time.

Communication plays a key role in managing overcrowding. Tourists should be informed about less crowded times of year and less crowded areas of the city through a series of communication channels (tourism website, applications, social networks). This type of information may provide a general prognosis (according to experience, the high seasons, peak days of the year, and special events are known ahead of time). Nowadays it can be more refined thanks to new technologies.

To improve tourism in the off-season a possible rate-reduction strategy will be implemented. Manu Hotels in Florence apply lower prices during this period. Museums are also implementing this policy. For example, Uffizi Gallery considerably reduces its entry prices from November to February, in addition it allowed free access with the same entry to a "lesser known" point of interest, such as the Archaeological Museum.

Regarding relocation, the Municipality of Florence has introduced a campaign of discounts for a series of civic museums. Having paid the tourist tax, tourists receive entries to not crowded or lesser known museums.

Regarding the seasonal adjustment of the offer, big events are promoted in the off-season (October-February). At this time of year big events are organised in Florence, such as F-light (Florence Light Festival), Firenze Marathon and many others.

Furthermore, in this respect, there are contributions from the Florence Chamber of Commerce: micro, small and medium companies, professionals, organisations, public and private organisations may make a non-refundable contribution to the co-financing initiatives for seasonal adjustment and the relocation of tourist flows, with the aim of contributing to sustainable tourism in the entire Florence Metropolitan Area.

New technologies in mass tourism management

Florence uses open big data, but there are not yet results at the city level to resolve the overcrowding problem. The Internet of Things (IoT) is a reality in Florence and soon they will have interesting results according to the experts consulted.

Florence, as it regards to decongesting tourist flows, is creating a new system that will inform tourists about the level of overcrowding the areas of the city, through Wi-Fi on their smart phones in real time. Universal signage (traffic lights: green/yellow/red) will orient them during their stay, also proposing alternative routes, with invitations to visit lesser known or less crowded museums and exhibitions at that time.

This will all be possible thanks to the installation of sensors, throughout a series of strategic points of the city, which will make it possible to track attendance; but also, thanks to the collaboration of telephone companies able to analyse data anonymously.

GOOD PRACTICES The new Uffizi system, by means of which the tourist obtains the entry on a touch screen in which the exact entry time is shown based on an algorithm's calculation. In this way the waiting time is used visiting other places in the city.

From 2011 a new instrument has decisively contributed to managing the tourist flows: the Firenze Card. With this card, tourists may visit all of the places of interest in Florence with priority access during a period of 72 hours (with the possibility to extend another 48 hours). According to recent studies we know that, thanks to this instrument, visits to "less relevant" museums is constantly increasing, as well as the duration of the average stay in Florence.

GOOD PRACTICES

3.5.2. UFFIZI GALLERY

The Florentine museum, with 3.4 million visitors per year, is developing a system based on Big Data in order to avoid waits and generate a "sustainable tourism". On peak days, more than 10,000 visitors pass through the Uffizi, counting an average of 6,000 to 7,000 visitors per day.

In October 2018 a system was tested for the first time that is based in an algorithm that collects scientific - such as average visit time, capacity of the rooms, time of year, comparative history, etc. - and social data. This section is what makes the system live, since it bases its prediction of waiting on issues such as weather, the impact of certain temporary exhibitions or the profile of visitors.

Each visitor receives upon arrival an hourly appointment, with a 15-minute margin of error, which allows them to take advantage of that time in other matters. In fact, the gallery already saw a 22% increase in visitors in the first week of functioning.

The behaviour of the visitors outside, and also within the tourist resource, was analysed. They have seen what are their strategies when they visit the museum, how they are grouped. Each day groups are identified that spend 40 minutes or less in the museum. That is to day that they enter, take a photo and leave. Then, 3% of visitors spend more than four hours there, arriving in the morning and leaving in the afternoon. However, the majority are there between two and three hours. This contradicts the assumption that mass tourism is thought to be superficial, when it is not. Mass tourism in cultural spaces does not seek a shallow experience as it may be prejudged.

The system was designed by a team from the L'Aquila University directed by Henry Muccini, President of the Computer Studies Programme.

"Queue management is an exact science, based in statistics, the management structure, information technology...
But it is also a social science, that has nothing to do with molecules, but rather groups of people that behave differently depending on the surroundings. We were able to work on it to have a very precise predictive statistic model, but there will be cases in that we haven't thought of yet"
Eike Schmidt (director del museo).

GOOD PRACTICES

3.5.3. DATA-BASED PLANNING FOR A SUSTAINABLE TOURISM IN TUSCANY

http://dssg-eu.org/florence/

FIRENZECARD

The Firenzecard is an electronic card in order to facilitate visits to cultural heritage sites in the city of Florence. The card holders automatically receive general entries, entries for exhibitions and priority access to all of the museums of the Firenzecard circuit without needing to make a reservation. The card enables users to visit 72 key tourist attractions and museums in Florence, and is active for 72 hours from its first use. Those under 18 years of age from the EU have free admission with the card of an accompanying adult family member.

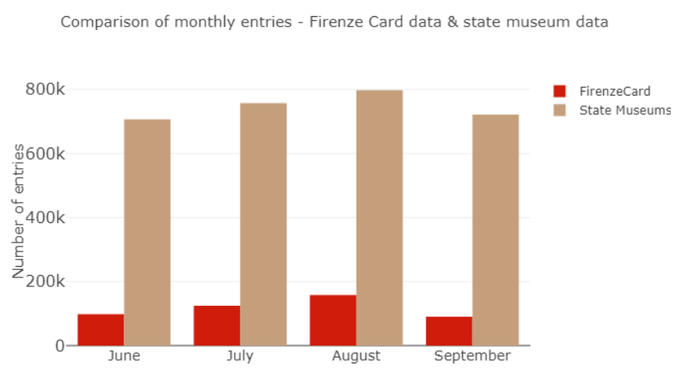
The Firenzecard data set used for this study consisted of attraction entry information of Firenzecard users during the period from 1 June 2016 to 30 September 2016. This represents a total of 51,031 cards. Given that minors can enter together with the adults on a Firenzecard, the number of cards and card holders is not the same as the total number of people that enter on the card. A total of 58,411 people entered museums with Firenzecards during the summer.

A data entry log is created each time a person uses their Firenzecard to enter a museum or tourist attraction on the circuit of 72 tourist attractions on the card. Each entry contains: an anonymous user identification number, the date and time of entry, a field that specifies if the entry was the first entry made with the card, the name of the tourist attraction visited and the number of minors that are included on a card. The time of entry for all minors that are included on a single card is identical (in other words, the scanning of a card does not separately register each minor that enters).

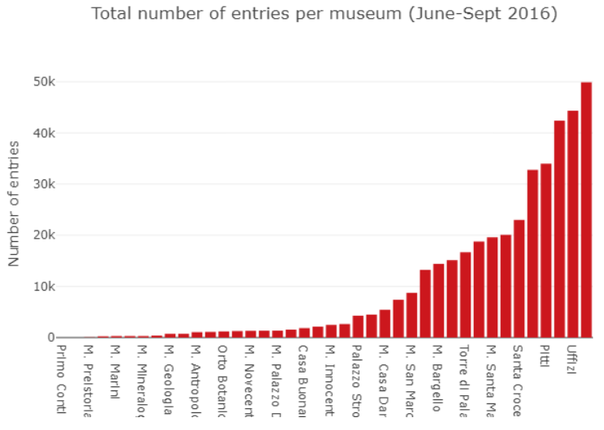
The Firenzecard data set analysed reveals the behavioural patterns of use of the 51,031 Firenzecard holders during the period from 1 June 2016 to 30 September 2016. The analysis is structured around the main key questions related with this subpopulation of museum visitors.

TOTAL MUSEUM ENTRIES AND FIRENZECARD ENTRIES.

The data set provided by the museum entries is a monthly aggregate of the number of visitor entries in the national State Museums, which allows for more comprehensive estimates of the total number of tourists visiting the attractions during the period of 1 June - 30 September 2016. There is a large amount of data that does not completely overlap between the Firenzecard sites and the State Museum sites. The majority of museum and tourist attraction visitors purchase normal museum entries without the card, however, approximately 10% of all recorded museum visitors in summer 2016 entered with Firenzecard. The following figure shows us the total number of museum entries for the museums data set and the Firenzecard data set, during the period from 1 June to 30 September 2016.

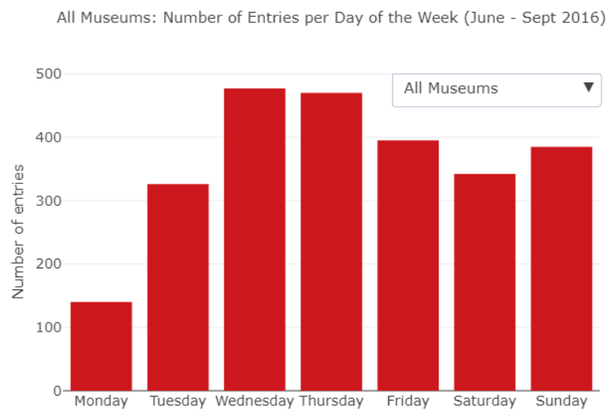


ENTRIES FOR MUSEUMS This figure shows the number of entries for museums with the Firenzecard, during the period from 1 June to 30 September 2016. We observe that the majority of Firenzecard users visit 6 museums.

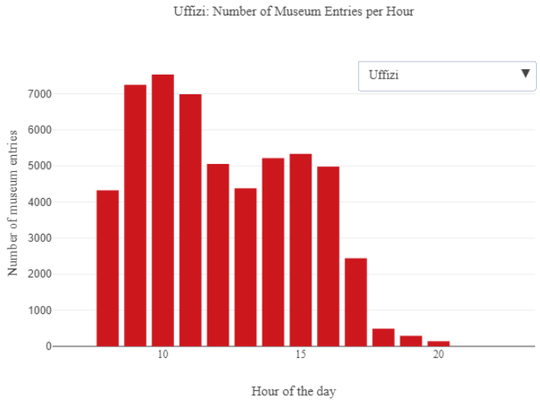


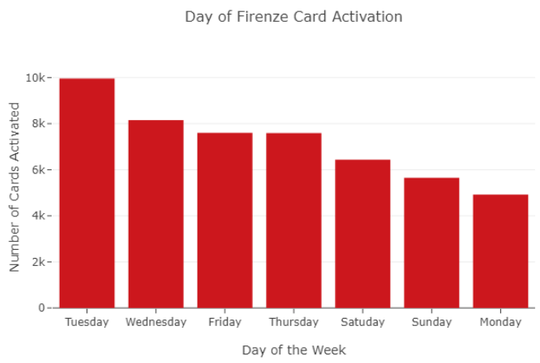
NUMBER OF MUSEUMS VISITED This figure shows the number of museums visited per card during the period from 1 June to 30 September 2016. We observe that the majority of Firenzecard users visit 6 museums.

MUSEUM ENTRIES BY DAY OF THE WEEK The following figure shows us the total number of museum entries in different Firenzecard attractions each day of the week, during the period from 1 June to 30 September 2016.

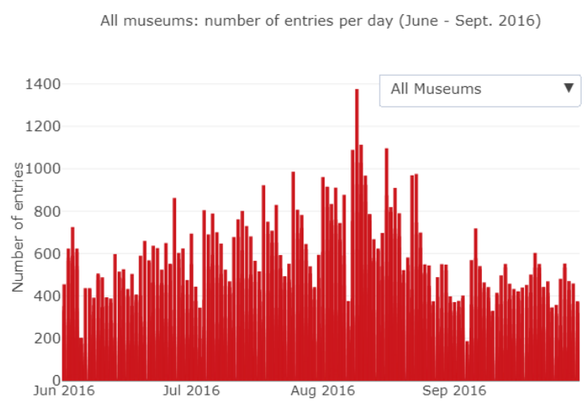


ENTRIES FOR MUSEUMS PER HOUR This figure shows the number of museum entries per hour with the Firenzecard, during the period from 1 June to 30 September 2016. From 8:00 AM, a large number of tourists are already visiting tourist resources. On the other hand, it is less common to visit museums in the late afternoon or at night. This is in part due to the fact that there are fewer museums open at these times. It could be assumed that visitors prefer to not rush to enter the museums close to closing time.





ENTRIES FOR MUSEUMS PER DAY IN SUMMER Ehis figure shows the number of museum entries with the Firenzecard, during the period from 1 June to 30 September 2016. The maximum number of entries with the Firenzecard occurred in August.



CARD ACTIVATION This figure shows us the most common days of Firenzecard activation during the period from 1 June to 30 September 2016. Two of the most popular museums in which to use a card for the first time are Uffizi and Accademia. Given that both museums are closed on Mondays, we see a wave of activations on Tuesdays. This has wider implications for all types of people that purchase Firenzecards; given that many users want to use their card to obtain priority entry in the most important museums, it is less likely that the people would want to use a Firenzecard if their trip to Florence includes a Monday. Furthermore, this large wave of activations on Tuesdays, may explain in part the reduced rates of entry with the Firenzecard seen Friday to Monday in many museums.

DATA DERIVED FROM THE USE OF TELECOMMUNICATIONS IN FLORENCE

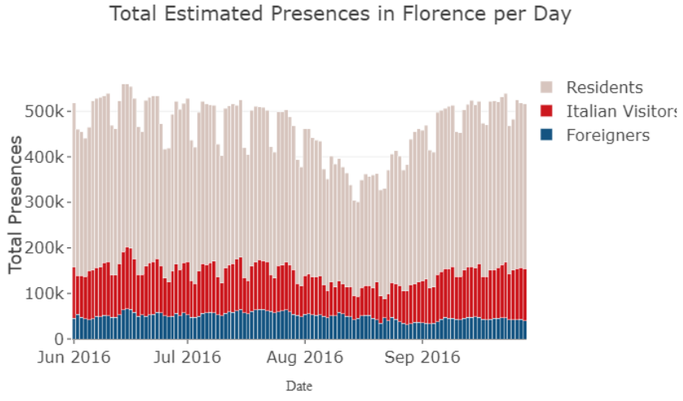
Each time a phone call is placed or received from a phone on a certain provider's network, a record of the call details is created. These records are also referred to as circuit switching data, since, within telecommunications engineering, placing or receiving a call involves activating a switch of an electronic circuit. These records contain:

- the anonymous user identifier code for the client
- the nationality or region of origin in Italy of the user's SIM card
- the date and time of the event
- the coordinates of the tower that handled the call

The data analysed were from the period between 1 June and 30 September 2016. The data contained records for foreign or Italian tourists, that covered the period of their visit in the province of Florence, as well as 3 days before and after their visit. The collective detection organisation proceeded to eliminate Florentine residents from the data set prior to data analysis, by filtering the people who consistently appeared in Florence at night for a certain period of time. This process was carried out in order to protect the anonymity of the residents, given that call records are confidential information. Despite call records being anonymous, the ability to see users' nighttime travel patterns at night and during the day could, in theory, partially allow individuals to be identified. The analyses show the amount of presences in summer in Florence of three categories of people: Italian visitors, foreigners and residents.

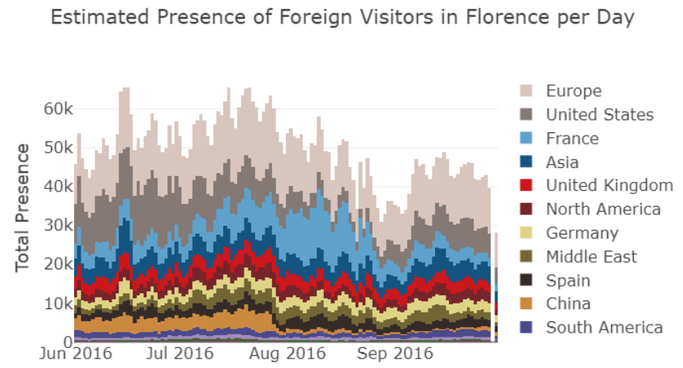
TOTAL ESTIMATED DAILY PRESENCES

Another of the interesting variables of analysis is the total presences per day for all types of people in the city of Florence in summer. We can see in an average day, a third of the people in the city are tourists. This proportion increases in August, given that foreign tourism remains somewhat constant, while the resident population shows a decline. We can also observe a cyclical activity that probably is due to the reduction of calls during the weekends.



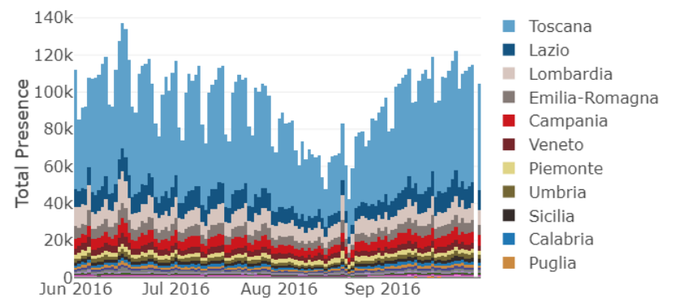
DAILY ESTIMATE PRESENCE OF FOREIGN VISITORS BY DAY

Bearing in mind the estimates for foreign presence, the breaks are made by region of the world, with the most common tourist countries (United States, France, Germany, Spain and China) separately charted instead of aggregated in their region. This shows that peak visiting months or not the same for all the countries.



DAILY ESTIMATE PRESENCE OF ITALIAN VISITORS

Regarding the estimates for italian visitors, most of the italian visitors to Florence come from other places in la Toscana.



THE FLOWS

An on-line application makes it possible to visualise the flows and obtain how the visitors move in Florence.

GALLERIA DEGLI UFFIZI

How many people visit?
The Firenzecard visits are the total number of people that entered using Firenzecard from the four-month period from June to September 2016.

The total of visits is the amount of people that entered museums in any way during the same period.

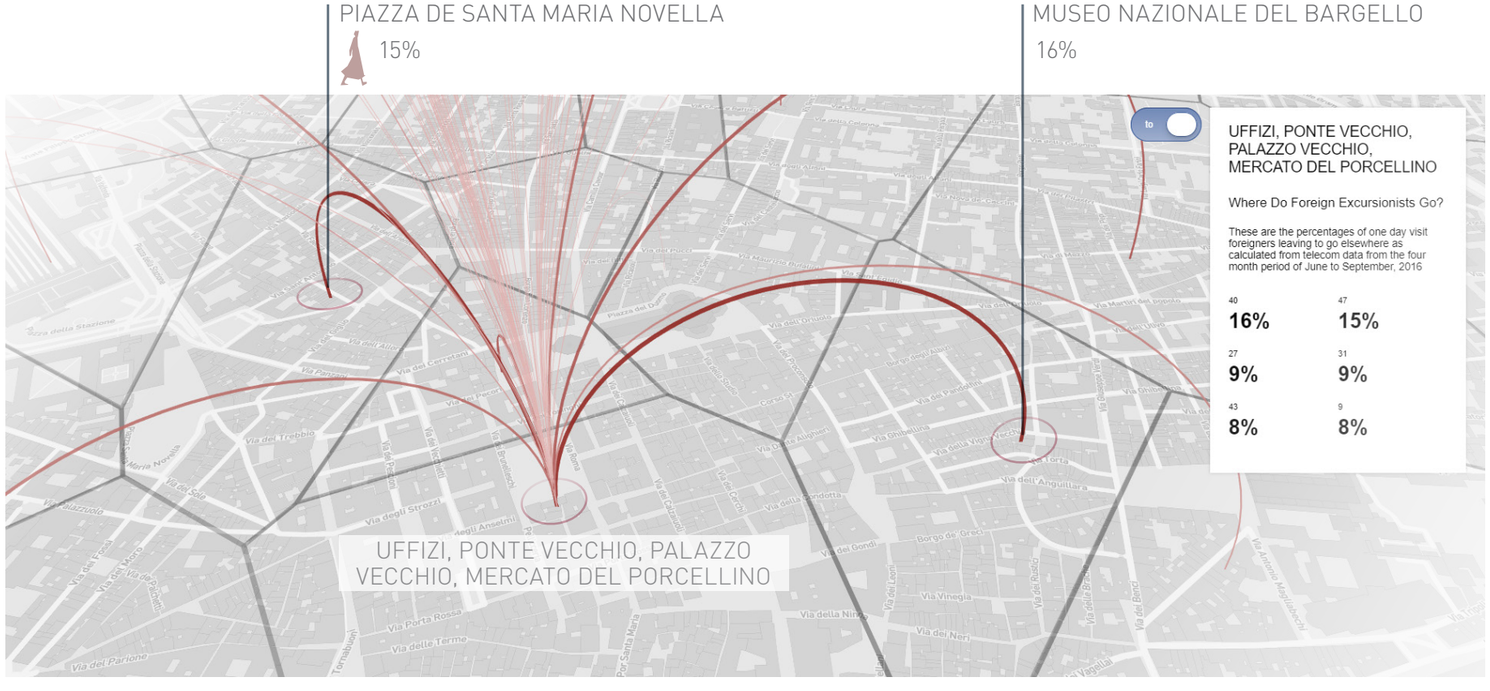
FIRENZECARD VISITS	TOTAL VISITS
44.339	**804.657**

Where to people come from?

These are the percentages of people that arrived to this destination from each one of the following destinations using the Firenzecard

BEGINNING	DUOMO
56%	**9%**
ACADEMIA	TORRE DI PALAZZO VECCHIO
7%	**4%**
M. PALAZZO VECCHIO	PITTI
4%	**3%**

By means of an online map open to the public, we can see the flows in 3-D



3.6 WESTERN GREECE

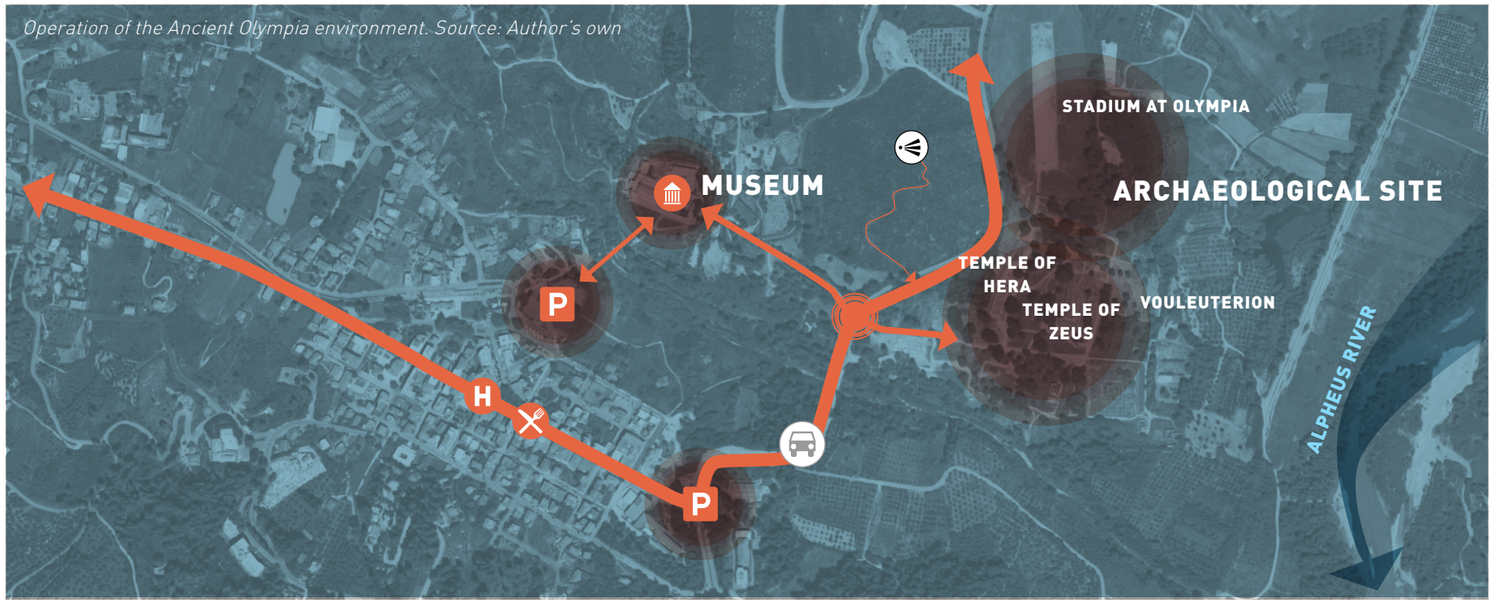
3.6.1. OLYMPIA

Olympia is one of the most influential Ancient Greek sanctuaries, located in Elis, in western Peloponnese. It is located in a valley, where the Alpheios and Kladeos Rivers merge. In ancient times, it was famous beyond continental Greece's borders for hosting the Olympic Games every four years, beginning in the year 776 BC.

The archaeological site is found a short walking distance from the modern town called Ancient Olympia, and includes ruins from the Bronze Age to the Byzantine era. The site covers a wide area of ruins scattered among trees, as well as the ancient stadium where the Olympic Games took place. An impressive variety of elements that were uncovered during the excavations are on display in the nearby Olympia Museum.

The Olympia archaeological site includes the shrine of Zeus and the numerous buildings erected around it, such as the sports facilities used for the preparation and celebration of the Olympic Games, the administrative buildings and other secular buildings and monuments. The Altis, the sacred enclosure and heart of the sanctuary, with its temples, places of worship and treasures, occupies the centre of the archaeological space. It's surrounded by a peribolos, or enclosing wall, which at the end of the 4th century BC had three gates on its west side and two on the south, and borders the Echo Stoa on the east, separating the sacred enclosure from the stadium. The enclosure's wall was extended in the Roman Era and two monumental entries were created on its western side.

Operation of the Ancient Olympia environment. Source: Author's own



Heritage

Olympia is considered World Heritage by UNESCO. The protection and management requisites included in this are the following:

The site is legally protected and has a sufficient buffer zone and effective protective agreements that prevent any potential threat for the future development of the small settlement of modern Olympia.

The site is under the jurisdiction of the Ministry of Culture, Education and Religious Affairs, through the Ephorate of Antiquities of Eleia, its competent Regional Service, which systematically supervises the area for any act of illegal excavation. This body supervises all of the necessary conservation works. The financial resources for the site are derived from the State budget and from European Union funds.

The archaeological area of Olympia is protected at all times. The fire prevention infrastructure is verified and preserved annually so that it's effective, as well as those of the flood instances of the river.

From 2007, during a yearly open event, the competent Ephorate presents its work and activities in the area of the Eleia Regional Unit. Through this open dialogue with the local community and authorities, they are trying to improve and promote the monumental wealth of the region. Furthermore, the presentation of the Web Service activities is expected to be created, for an Open Forum on the history and culture of the Eleia area.

In the archaeological site, they have carried out many interventions, such as the new ticket office, ramps for people with disabilities and replacing the old information signs. Furthermore, close to the site, the creation of the "Olympic Botanical Garden", which has flora native to the area that has been growing since ancient times according to the description of the ancient traveller Pausanias, giving visitors the opportunity to explore and enrich their touristic experience.

Mass tourism management

Mass tourism is one of the main problems generated by the visitors to the archaeological site. The primary means of access is with a private car and parking in the car park.

The centre of Ancient Olympia suffers from car overcrowding and traffic. Therefore, the measures to address these two problems must be planned and implemented.

New technologies in mass tourism management

At present no new open-smart/data technologies are being used to address the touristic overcrowding of the site. In the future it could be one of the routes for improving the management of the archaeological site, its access points and the connection to the main resources of the tourist destination (museums).

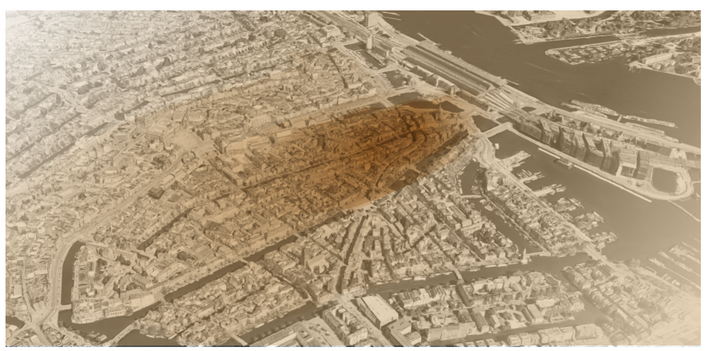
3.7 AMSTERDAM

3.7.1. CITY OF AMSTERDAM

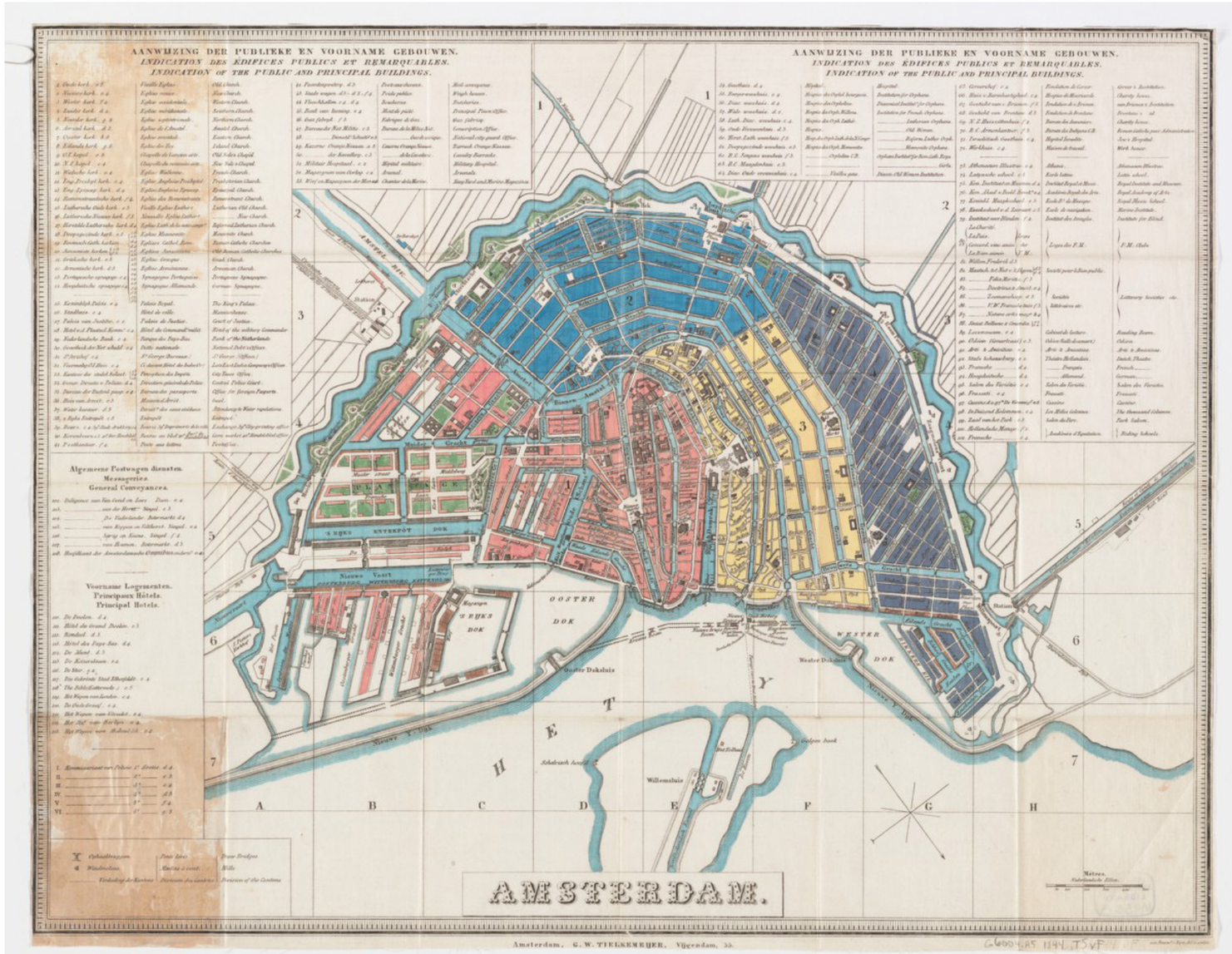
The traces of the current Randstad conurbation were already visible in 1500, with Amsterdam as the undisputed centre, sheltered from the North Sea but with easy access from the ocean through the Bay of Zuiderzee. Amsterdam was built on the highest land of Aemestelle, which divided the peatlands of Waterland and Kennemerland. Amsterdam has 810,000 and its metropolitan area has approximately 1,500,000 inhabitants respectively.

It's most important characteristic, which is part of its tourist attraction, is the configuration of the urban structure in concentric rings that intercut streets and canals. The buildings keep a homogeneous appearance in the central area, without reaching great heights and in this way an average density of the urban fabric is observed.

The presence of water (the canals are recognised as World Heritage by UNESCO), the scene built, the vegetation (there are green passageways that connect the city with the rural areas of Het Gooi, Waterland, and Het Groene Hart) and the public spaces, configure an environment with high imageability (imageability by Kevin Lynch in The Image of the City, 1960). Therefore, Amsterdam presents a visibility highly capable of being replicated, with images that are seized by mass tourism that floods the city.



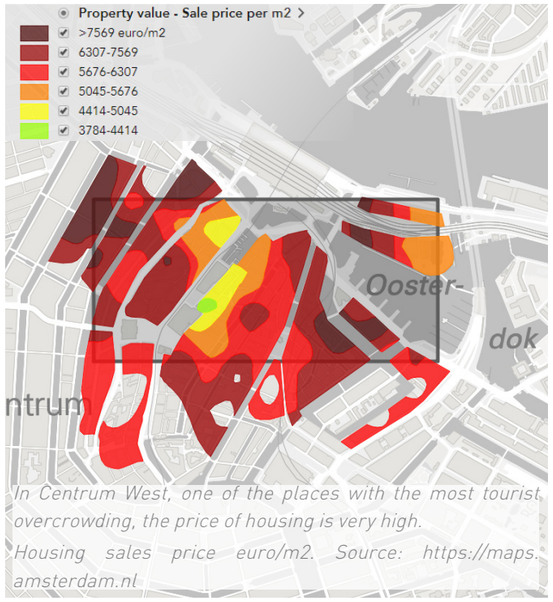
Amsterdam, 1844. Source: Harvard University. Oldmaps.com



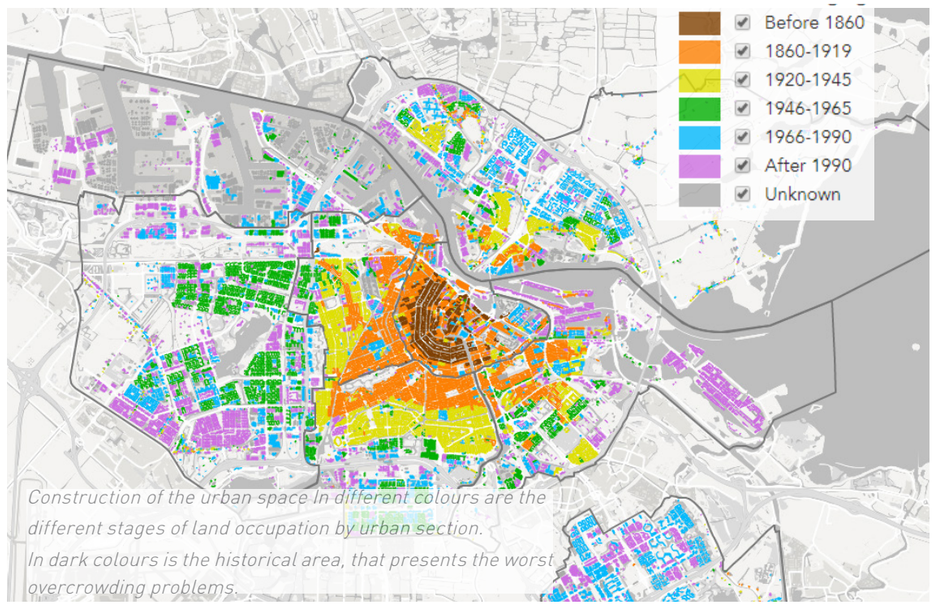
Area, Mobility and Urban Planning

Amsterdam forms the centre of the Ranstad metropolitan area and remains a relatively small city for its competitiveness with Rotterdam, The Hague and Utrecht. According to the government agreement called A NEW SPRING AND A NEW VOICE, the guidelines for urban planning for Amsterdam are defined. One of the challenges is achieving affordable housing, according to the blueprint documents: "The real estate market in Amsterdam is under a lot of pressure. As a result, the prices increase and more and more people are waiting to achieve affordable homes... especially those with lower or middle incomes. The growing housing shortage requires better regulation".

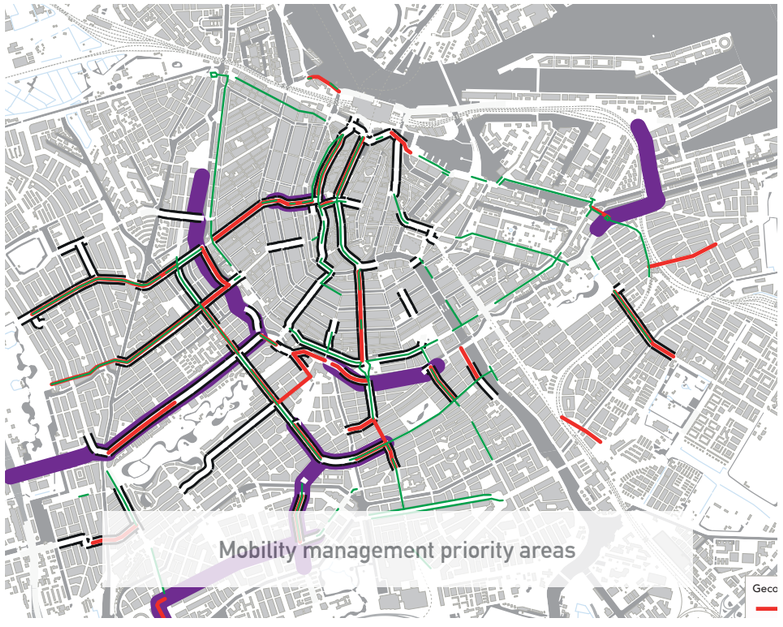
In 2015 the local government approved the road map in order to manage mobility, in which **it commits to sustainable transport in the whole pedestrian-cyclist centre area, well connected with public transport.**

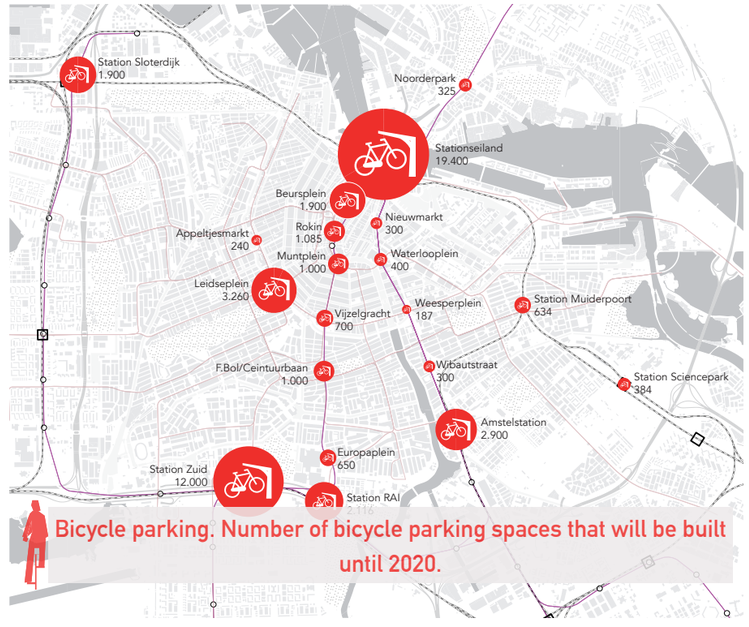


In Centrum West, one of the places with the most tourist overcrowding, the price of housing is very high.
Housing sales price euro/m2. Source: https://maps.amsterdam.nl



Construction of the urban space In different colours are the different stages of land occupation by urban section.
In dark colours is the historical area, that presents the worst overcrowding problems.

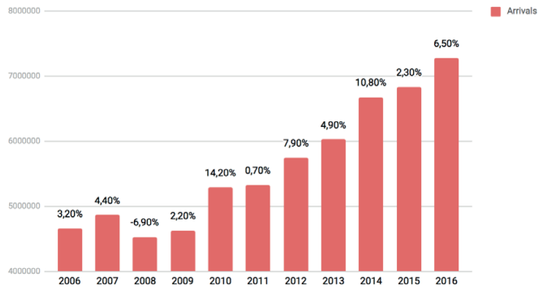




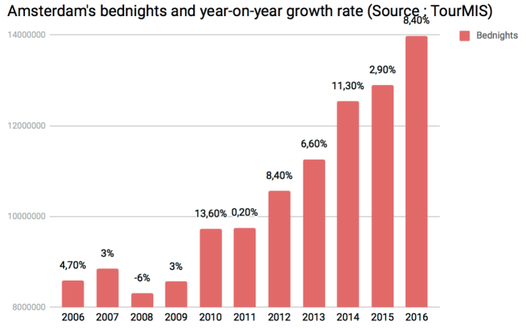
Tourism

Amsterdam's tourism popularity has increased considerably since 2014 thanks to the city's ambitious marketing strategy. Attract international visitors, companies and temporary residents. The measures to improve sustainability are notorious and have been carried out creatively, but the challenge for the coming years is to reconcile tourism growth with urban sustainability.

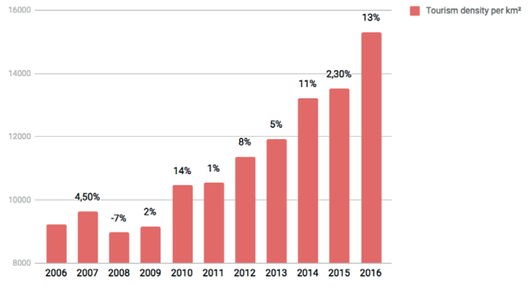
Amsterdam's hotel arrivals and year-on-year growth rate (Source : TourMIS)



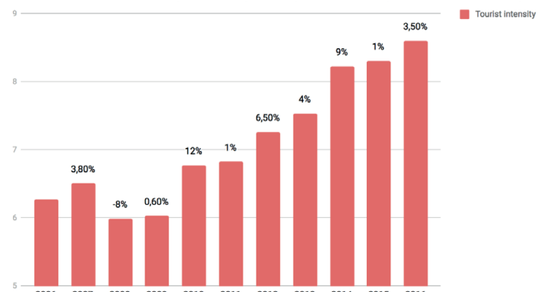
Amsterdam's bednights and year-on-year growth rate (Source : TourMIS)



Amsterdam's tourism density ratio and growth rate (Source: TourMIS)

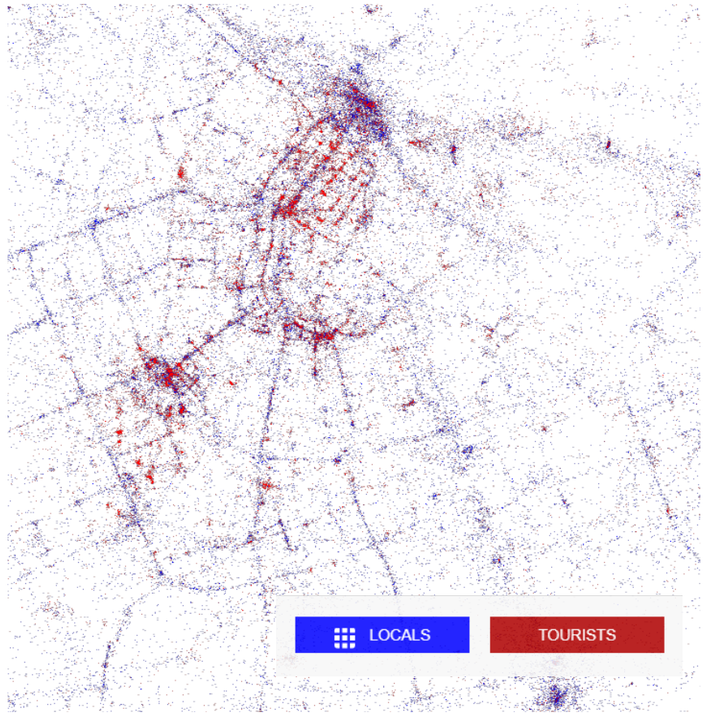


Amsterdam's tourist intensity ratio and year-on-year evolution (Source : TourMIS, UN)



González A., Fosse, J. and Santos-Lacueva, R. (2018) Urban tourism policy and sustainability. The integration of sustainability in tourism policy of major european cities. Barcelona.

By means of MapBox resources and Twitter data from Gnip, the author Eric Fisher worked with the Gnip team to create this map. The blue points on the map are tweets published by "locals": people that tweeted in a city during at least a one month period. The red points are tweets published by "Tourists": people that seem to be locals in a different city and that tweeted in that city during less than one month.

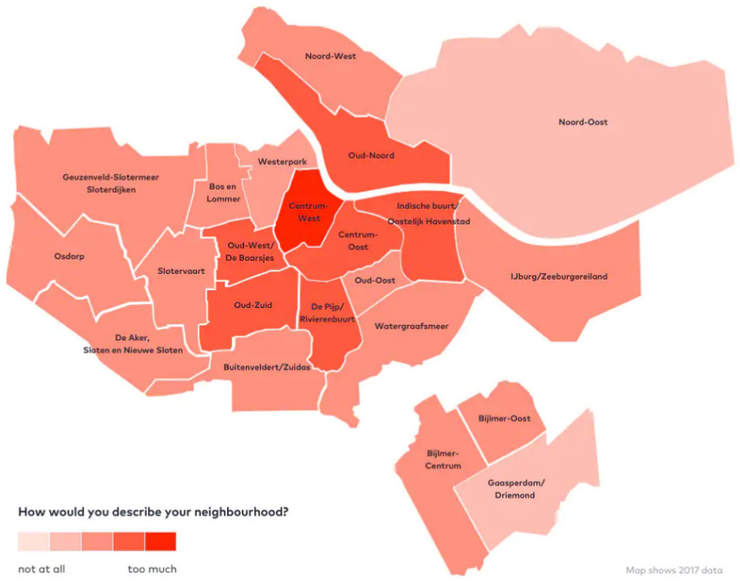


Mass tourism

November 2018 the 'Washington Post' prepared a list of ten of the most overcrowded destinations in the world, and Amsterdam is one of them. According to the American newspaper, the number of tourists exceeds that of residents (See also the World Travel and Tourism Council rankings. Mckinsey. 2016 in State of the Art of the present document).

Amsterdam has seen a strong increase of tourists in the past decade. The overnight stays increased up to 18 million visitors in 2016, more than 8 tourists per resident and 15,000 tourists per km2 of tourist density in the city.

A heat map published by Travelbird with perception surveys data from the citizens about agglomeration, summarises the yearly perception of tourism among the residents of Amsterdam. In red are the areas where there is a greater sense of agglomeration.



Mass tourism management

The framework of the Amsterdam tourist policy is composed by different policies led by the municipal and metropolitan administration. Tourism is incorporated as an urban issue that generates imbalances between visitors and residents. The main tourist policy, the **Strategic Agenda for 2025**, developed for Amsterdam metropolitan area is geared towards "controlled" growth in the metropolitan area.

This metropolitan vision of tourism seeks to deconcentrate the city centre by means of increasing the tourism tax there, increasing the hotel capacity and diversifying the touristic offerings in the metropolitan area with an improved public transportation infrastructure.

Other actions that also form a part of this tourist strategy: **Amsterdam in Balance Program** points to a better balance among different parts of the city and the region. The Amsterdam hotel policy for example involves heavily limiting the creation of new hotels in certain areas.

In order to improve the governance of the tourist phenomenon in the Dutch capital, the government is implementing measures such as doubling the hotel room tax and forbidding short-term Airbnb rentals and souvenir shops in the historical centre. It is also considering the relocation of the cruise wharf and passenger terminal, an action that will affect more than 2,000 cruises and river boats. In the Red-Light District, the law enforcement has begun reporting bad behaviour, such as drinking and littering in public spaces.

A new color-coded system will control crowds; a red light could result in street closures, for example. In order to attract visitors to the suffocated centre, the tourism organisation in charge of the City Card expanded benefits to include day-trips outside the city, such as Haarlem, Zaanse Schans and Keukenhof, where they may visit the tulip fields.

New technologies in mass tourism management

Amsterdam has an **overcrowding in the public space monitoring system (Crowd MONITORING System Amsterdam_CMSA)** operating in two critical points: Redlight District and Kalverstraat (main shopping street). This is a system of Wi-Fi sensors and smart counting cameras. The data are used in order to have an idea of the amount and the density of the crowds. From this view of the data, operational scenarios are created in order to manage crowds. The traffic department and the public space of the department of Amsterdam are responsible for the overcrowding management of the public space in coordination with the police as those responsible for street checkpoints on foot.

The CMSA systems only verify public space areas. The CMSA is a pilot program and at present is evolving towards a generalised use in the rest of the city. They want to combine data from the department of traffic and the public space with other data related to overcrowding. This will provide a comprehensive view of the phenomenon. An important fact is the respect for privacy norms, which means that data are protected, therefore individuals may not be traced.

GOOD PRACTICES

3.7.2. SCHIPHOL AIRPORT

The Veovo BlipTrack Guest Predictability has been installed in the **Amsterdam Airport.** This infrastructure serves as a transit centre for more than 300 destinations, the number of passengers skyrocketing from 50 million in 2011 to almost 70 million in 2017. It's a base for 107 airlines and has six runways. The challenges of managing passengers in Schipol are undoubtedly very important.

The recent developed hybrid camera/Wi-Fi technology helps the airport to mitigate overcrowding, while measuring the passenger flows provides a perfect picture of the movement and behaviour of the passengers throughout the airport. With this information, the airport gains an understanding of how interruptions affect behaviour in order to improve contingency planning. It also helps the airport to add value to existing facilities and to make investments that open new business opportunities.

CONCLUSIONS AND RECOMMENDED ACTIONS

4

4 1 General conclusions

4 2 Guidelines

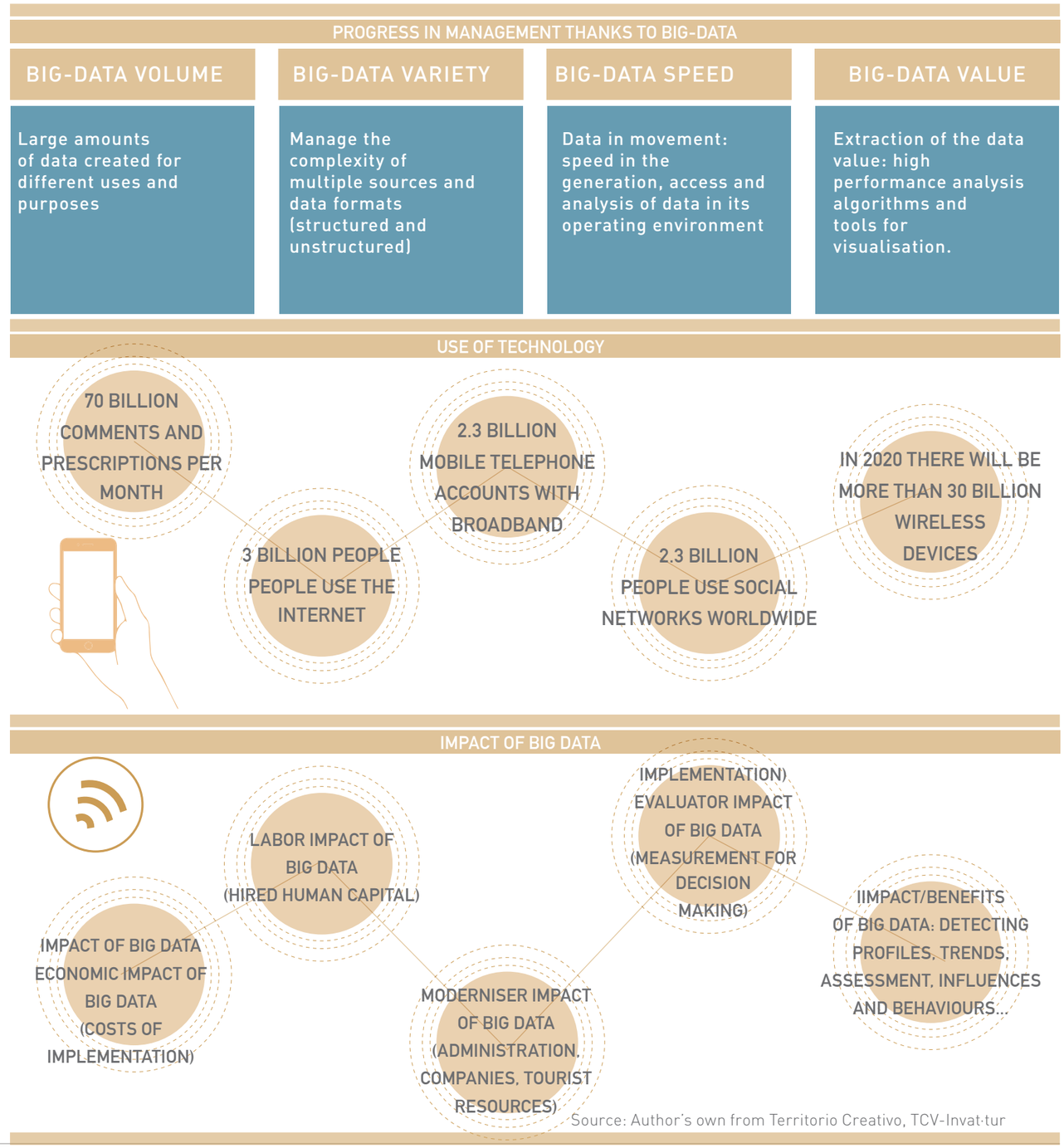
4 3 Recommended actions

4.1 GENERAL CONCLUSIONS

The effects of the "**overtourism**" process in the city may be observed from the analysis carried out. In recent years **changes in business, housing or the public space show us the effects of the touristification process that change the place.** Therefore, traditional or neighbourhood business is being sidelined by activities linked to leisure and tourism. Furthermore, the massive eruption of commercialised tourist housing by means of online portals, creates problems of coexistence and causes an upward trend of rental prices for housing (more than 25% in the past year for the case of Ciutat Vella in Valencia). The tertiarisation of the urban landscape exerts a heavy pressure on the public space that loses quality, entity and social functionality.

This **global process** transforms the city and the observed trends for the majority of European tourist destinations are those of **visitor growth** (except in those cases that have temporarily broken this trend due to unexpected events). This circumstance poses a significant dilemma, that of imposing a limit. The process of touristification has a social impact on the local level that may be important and is subject to significant fluctuations over time. In this respect, **the introduction of the sustainability of the model, the correction of vulnerabilities and the restoration of balance become priority objectives.**

The advantages offered by using open/big data for managing tourist destinations are a given thanks to the volume and variety of information handled, the speed with which it may be managed and the value that may be taken from their handling. Faced with a scenario of increased tourist pressure on destinations that make up historic cities, **an increase in the visitors' interaction with new technologies** is observed. This fact opens a field for the better knowledge of the process that will necessarily have an **impact that it is necessary to evaluate and consider**. The safety in the cities or the privacy of people are issues that must be kept in mind in the handling of big-data for managing "overtourism" in cities of a heritage nature.



Source: Author's own from Territorio Creativo, TCV-Invat·tur

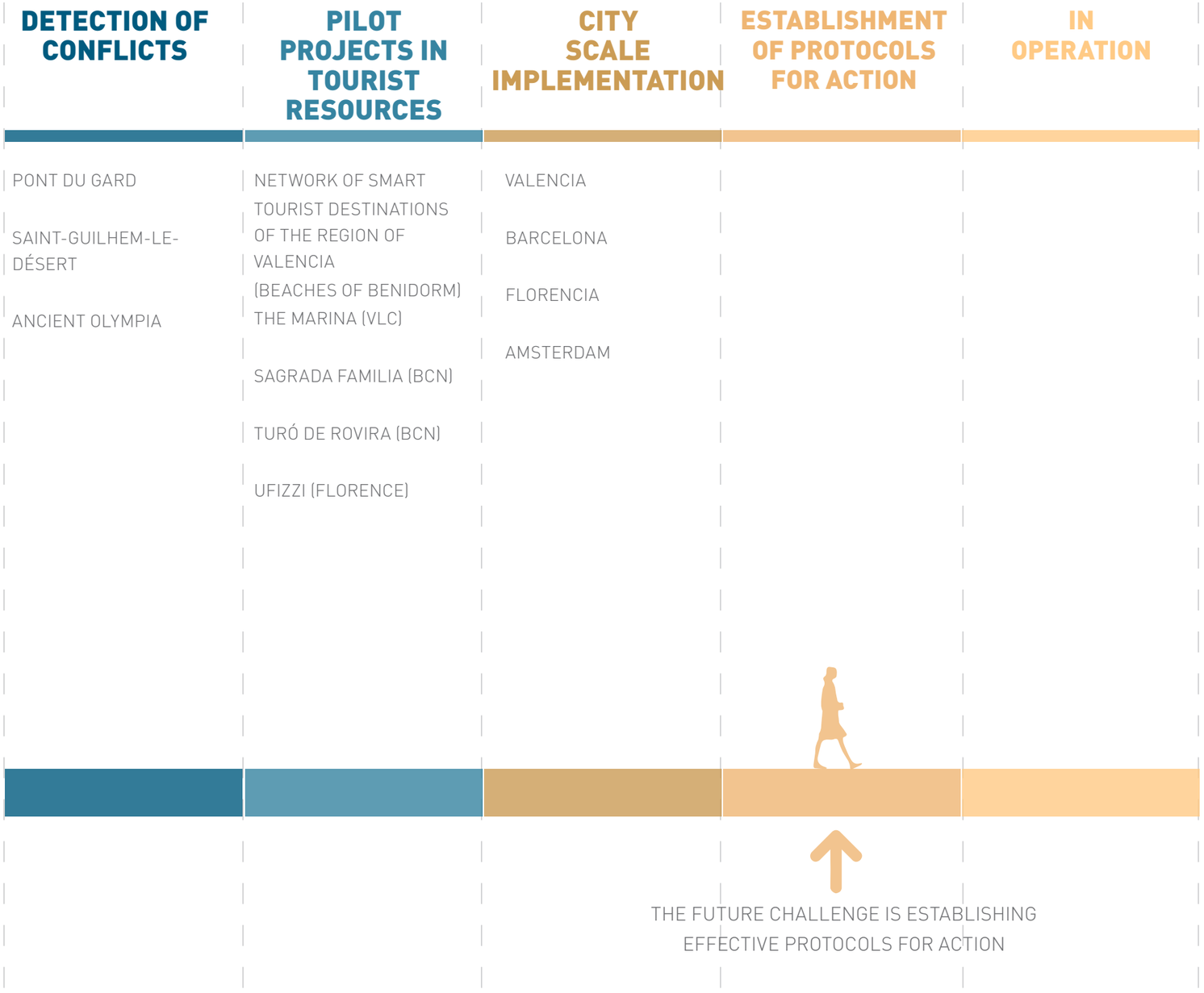
From the analysis carried out in the present study we can see the unequal state of development of the tourist destinations in the implementation of new technologies for managing the phenomenon known as "overtourism".

At the first level we could note destinations that **understand the weaknesses in the management of tourist overcrowding and they address it with conventional methods.** Therefore the need to apply new technologies is highlighted, but for the time being it is not being undertaken, as is the case of Saint-Guilhem-le-Désert, Pont du Gard and Ancient Olympia.

In the case of touristic cities we observe a greater development of the studied cases. On the one hand, the **implementation of small-scale pilot projects** prior to tackling the city scale, it is enabling us to understand the application of new technologies and the limitations of its management. This is the case of the Sagrada Familia in Barcelona or the Marina in Valencia. The testing of these spaces makes it possible to verify the proper functioning and climb towards more complex levels of management.

Furthermore, cities such as Valencia, Barcelona, Amsterdam and Florence are preparing to take the leap for the **monitoring and management of tourist spaces by means of new technologies**. Florence, as it regards to decongesting tourist flows, is creating a new system that will inform tourists about the level of overcrowding the areas of the city, through Wi-Fi on their smart phones in real time. Universal signage (traffic lights: green/yellow/red) will orient them during their stay, also proposing alternative routes, with invitations to visit lesser known or less crowded museums and exhibitions at that time.

At a more advanced level of management would be the **establishment of protocols for action** tied to new technologies. We still don't see this level for the studied cases; however, we are talking about a very near future where conventional systems are nurtured by open/big data in order to improve the experience in tourist destinations with overcrowding problems.



4.2 GUIDELINES

4.2.1. UTILITIES OF NEW TECHNOLOGIES IN MASS TOURISM MANAGEMENT IN HERITAGE SURROUNDINGS

According to the study from the World Tourism Organisation (UNWTO) titled: **"'Overtourism'? Understanding and Managing Urban Tourism Growth beyond Perceptions"** (Koens et al, 2018) 11 strategies to mitigate the negative effects of mass tourism in urban environments are defined.

Any successful urban tourism management strategy must specifically address the short-term challenges derived from the growth of tourism, while simultaneously they must tackle the long-term challenges. This demands a greater planning of the destination and its management and an approach that gathers the aspirations of the many interested stakeholders. It involves deploying a coherent and effective strategy in order to ensure the sustainable development of tourism and to generate benefits beyond the tourism industry operators.

From the measures proposed by UNWTO in the following table, **we detail those in which new technologies may help us make managing mass tourism in urban spaces more efficient** of heritage value in accordance with the Benchmarking work carried out. However, strategy 11 defines the conceptual framework of the present work.

STRATEGY 01
PROMOTE THE DISPERSION OF VISITORS IN THE CITY AND IN THE AREA

- Organise events in the lesser-visited parts of the city and its surroundings.
- Develop and promote tourist resources in the lesser-visited parts of the city and its surroundings.
- Improve the capacity and time that is used in visiting tourist resources.
- Create an joint identity of the city and its surroundings.
- Implement a trip card for unlimited local trips.
- Define the entire city as city centre in order to encourage visits to lesser-visited parts

STRATEGY 02
PROMOTE THE DISPERSION OF TOURISM OVER TIME

- Promote experiences in months with less activity.
- Promote dynamic prices.
- Promote events in months with less activity.
- Establish time intervals for tourist resources and/or popular events attended by real-time monitoring
- Use new technologies (applications or others) to promote the dynamic dispersion depending on the time.

STRATEGY 03
ENCOURAGE NEW ROUTES AND TOURIST RESOURCES

- Promote new routes in the city's points of entry and through the visitor's trip, including in information centres.
- Offer combined discounts for new routes and tourist resources.
- Produce guides and books of the city, highlighting "hidden treasures".
- Create dynamic experiences and routes for different visitor niches.
- Stimulate the undertaking of guided visits in lesser-visited parts of the city
- Develop virtual reality applications in the famous sites and tourist resources to complement on-site visits.

STRATEGY 04
REVIEW AND ADAPT THE LEGAL FRAMEWORK TO THE PHENOMENON

- Review the timetables offered by the tourist resources.
- Review the regulations on groups accessing the most important tourist resources.
- Review traffic regulations in busy areas of the city.
- Ensure that visitors use the parking installations on the edges of the city.
- Create specific drop-off areas for cars and groups in appropriate places.
- Create pedestrian-only areas.
- Review regulations and taxation of new tourist services platforms.
- Review regulations and taxation in hotels and other accommodations.
- Define the load capacity of the city, critical areas, tourist resources, etc.
- Consider a licensing system operator to monitor all the operators, etc.
- Review regulations on the access to certain areas of the city for tourism-related activities.

STRATEGY 05
IMPROVE THE SEGMENTATION OF VISITORS

- Identify and select segments of visitors with less impact according to the context.
- Target of repeat visitors.
- Discourage certain segments of visitors from visiting the city.

STRATEGY 06
ENSURE THE RETURNS OF TOURISM ON THE LOCAL COMMUNITY

- Increase the quality of employment linked to tourism.
- Promote positive impacts of tourism, create awareness and knowledge of the sector among local communities.
- Involve local communities in the development of new touristic
- products.
- Carry out an analysis of the supply and demand potential of the local communities and promote their integration in the tourism value chain.
- Improve the quality of the infrastructure and amenities considering residents and visitors.

STRATEGY 07
CREATE EXPERIENCES IN WHICH RESIDENTS AND VISITORS BENEFIT

- Evolve the city to adapt to the needs and desires of residents and consider tourists to be temporary residents.
- Develop touristic experiences and products that promote the participation of residents and visitors.
- Integrate visitors into the local festivities and activities.
- Create and promote local ambassadors of the city.
- Promote cultural and artistic initiatives such as urban art in order to offer new perspectives on the city and expand visits to new areas.
- Extend the opening hours of visitors' tourist resources.

STRATEGY 08
IMPROVE INFRASTRUCTURE AND AMENITIES

- Develop sustainable mobility plans.
- Create a grid of hierarchical pathways.
- Improve the urban cultural infrastructure
- Improve directional signage, interpreting equipment and warnings
- Make public transportation more suitable for visitors.
- Establish specific transport installations for visitors during peak periods and appropriate public facilities.
- Create safe cycling routes and promote bike rentals and safe, attractive and specific walking routes. They must be appropriate for people with physical disabilities or advanced age.
- Safeguard the quality of cultural heritage.
- Ensure the cleaning times are adjusted to tourist resources and their "peak" hours.

STRATEGY 09
COMMUNICATION AND PARTICIPATION. INVOLVE LOCAL STAKEHOLDERS

- Ensure that a tourism management group, where all interested stakeholders are included, is established and is regularly convened.
- Organise professional development programs for members, etc.
- Organise local discussions for residents.
- Carry out periodical investigations between residents and other local interested stakeholders.
- Encourage residents to share interesting content about their city on social networks.
- Communicate with residents about their own behaviour.
- Construct social subjects in communities in which there is no cohesive social fabric.

STRATEGY 10
COMMUNICATION AND PARTICIPATION. INVOLVE

- Raise awareness among visitors on the impact of tourism.
- Educate visitors on local values, traditions and regulations.
- Provide suitable information about traffic regulations, parking, rates, shuttle bus services, etc.

STRATEGY 11
ESTABLISH MONITORING AND ACTION MEASURES

- Monitor key indicators such as seasonal fluctuation in the demand, arrivals and spending, visit patterns to places of interest, segments of visitors, etc.
- Promote the use of big data and new technologies to monitor and evaluate the development of the tourist phenomenon and its impacts.
- Create contingency plans for peak periods and emergency

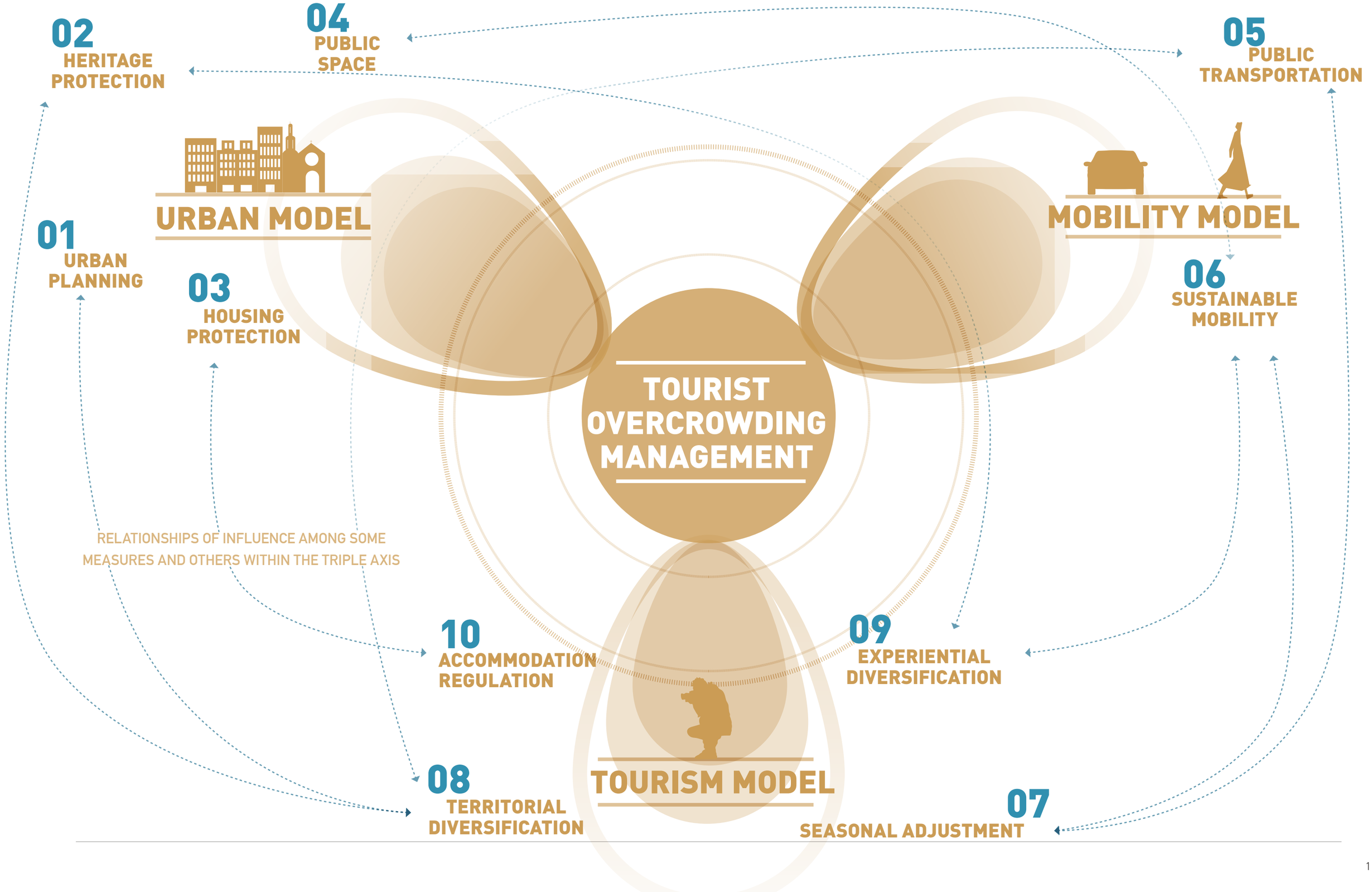
4.2.2. TOWARDS A COMPREHENSIVE TRIPLE AXIS MODEL: TOURISM, URBAN PLANNING AND MOBILITY

In accordance with the study carried out in the context of the Herit-Data project, these are the preferential areas of action in order to correct the trends that may devalue tourist destinations due to the "overtourism" phenomenon. The following table shows the lines of work that have been observed of interest when performing the "benchmarking" of the 6 chosen destinations.

These lines of action are organised around a triple axis model with interactions among them.

1. URBAN PLANNING
2. HERITAGE PROTECTION
3. HOUSING PROTECTION
4. PUBLIC SPACE
5. PUBLIC TRANSPORTATION
6. SUSTAINABLE MOBILITY
7. SEASONAL ADJUSTMENT
8. EXPERIENTIAL DIVERSIFICATION
9. TERRITORIAL DIVERSIFICATION
10. ACCOMMODATION REGULATION

	MECHANISMS FOR CORRECTING NEGATIVE IMPACTS	USE OF NEW TECHNOLOGIES TO IMPROVE THE CORRECTION MECHANISMS
01 URBAN PLANNING	ZONING strategies in the city. Define the areas of focus	Implementation of monitoring systems as a matter of priority according to the ZONING criteria
02 HERITAGE PROTECTION	Strategies for managing the historical legacy, preventing the negative impacts of "overtourism"	Implementation of critical spaces-resources
03 HOUSING PROTECTION	Defence of the city's character as a residential space.	Surveillance and supervision of the trends in the urban area according to the ZONING.
04 RE-QUALIFICATION OF THE PUBLIC	Urban re-qualification strategies based on ecosystem services. Green urban infrastructure	Monitoring critical areas and information to users of alternative spaces.
05 PUBLIC TRANSPORTATION	Intermodal coordination strategies in order to prevent overcrowding of the tourist destination.	Contribute to the time-space diversification strategies and attention to the critical areas. Fast information and systems for the user
06 SUSTAINABLE MOBILITY	Promotion strategies for pedestrian-cyclist mobility in overcrowded areas.	Communication with the user for the experiential improvement of the destination by offering alternative
07 SEASONAL ADJUSTMENT	Promote the decongestion of the critical periods for the tourist destination.	Promote alternatives for peak periods that exceed the destination's load capacity.
08 EXPERIENTIAL DIVERSIFICATION	Promotion of lesser-known resources that complement the destination's archetypal offering.	Coordination of the offering in the destination. Exchange of information.
09 TERRITORIAL DIVERSIFICATION	Partnership-building at the regional level to decongest the heart of the experience, the historic centre	Coordination of the offerings with the region. Exchange of information
10 ACCOMMODATION REGULATION	Control and regulation of the accommodation offerings.	Information and awareness towards the user Monitoring the offerings.


02
HERITAGE PROTECTION
04
PUBLIC SPACE
05
PUBLIC TRANSPORTATION
URBAN MODEL
MOBILITY MODEL
01
URBAN PLANNING
03
HOUSING PROTECTION
06
SUSTAINABLE MOBILITY
TOURIST OVERCROWDING MANAGEMENT
RELATIONSHIPS OF INFLUENCE AMONG SOME MEASURES AND OTHERS WITHIN THE TRIPLE AXIS
10
ACCOMMODATION REGULATION
09
EXPERIENTIAL DIVERSIFICATION
TOURISM MODEL
08
TERRITORIAL DIVERSIFICATION
07
SEASONAL ADJUSTMENT

4.2.3.OVERTOURISM AS A PROCESS
COMPLEXITY OF THE LIMIT AND TREND SCENARIO

As it was previously expressed, mass tourism requires monitoring and therefore the destination must be evaluated in terms of load or reception capacity. In recent years a significant gap has been opened between official figures and real figures of a destination's visitors. It is necessary to correct this information "gap" and parameterise the flows of people in urban destinations. In this respect lines of action of control are pointed out that may be implemented with new open/big data technologies.

- **Control of accommodations.** Supervision of online platforms that enables real time management of a destination's offerings.
- **Control of public transportation.** The cooperation with public or private metropolitan transportation companies (bus, train, taxi, CTV, bike rental, scooters, motorbike) may make it possible to provide relevant information on the tourist flows in the city.
- **Control of "entrance doors".** Urban hubs, ports, airports, stations, etc...become key spaces that make it possible to predict the tourist overcrowding that the urban spaces will later suffer. In cities that receive cruise passengers this is a key aspect.
- **Supervision of the public space.** The implementation of "in situ" monitoring systems (3-D cameras, Wi-Fi networks...), as well as cooperation with mobile telephone companies will allow us to undertake a phenomenological approximation of the overtourism phenomenon .

On this analytical basis, regulation thresholds can be established according to space and time. Depending on the urban space, three approximation scales are proposed:

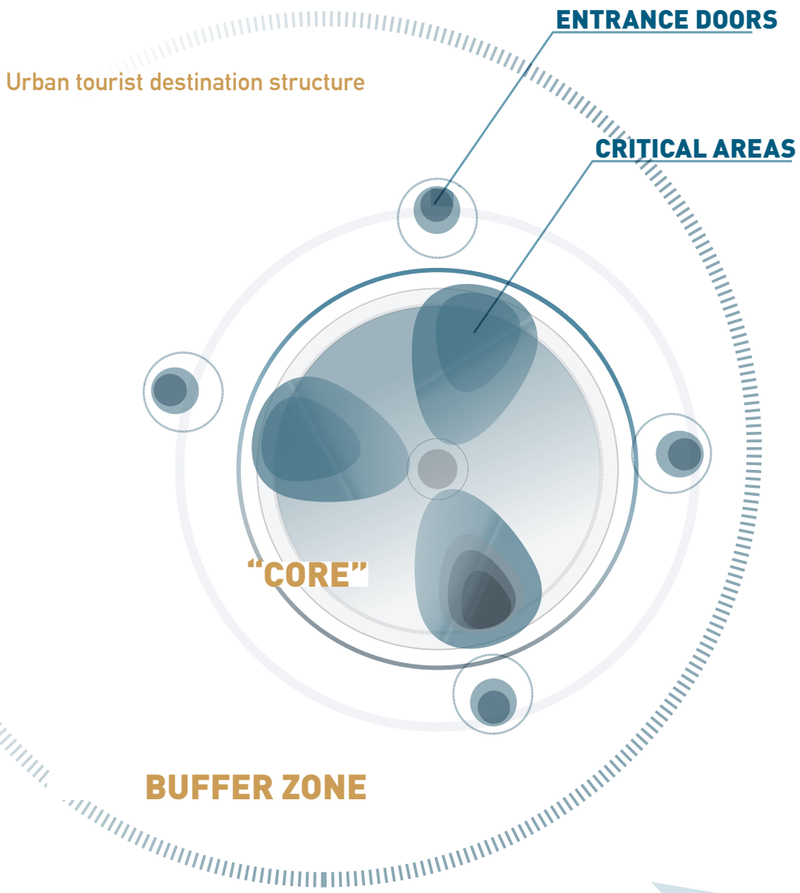
- **Areas of greatest overcrowding.** These are the areas that withstand the greatest overcrowding of visitors. They tend to be arranged around hubs of urban activity such as main squares or tourist resources. Examples of this are Piazza della Signoria in Florence, Town Hall Square in Valencia, around the Cathedral of Barcelona and Royal Palace Square in Amsterdam.
- **Core o centre.** They represent the centre of the tourist experience, encompassing the site with the most heritage value, as are the areas within the walls prior to the 19th century. At times, the core presents a star structure encompassing resources outside the historic centre, as is the case of the Sagrada Familia in Barcelona or the surroundings of the Van Gogh Museum in Amsterdam.
- **Buffer zones** (See regional model). They tend to be areas of urban expansion carried out from the 19th century that respond to a residential nature.

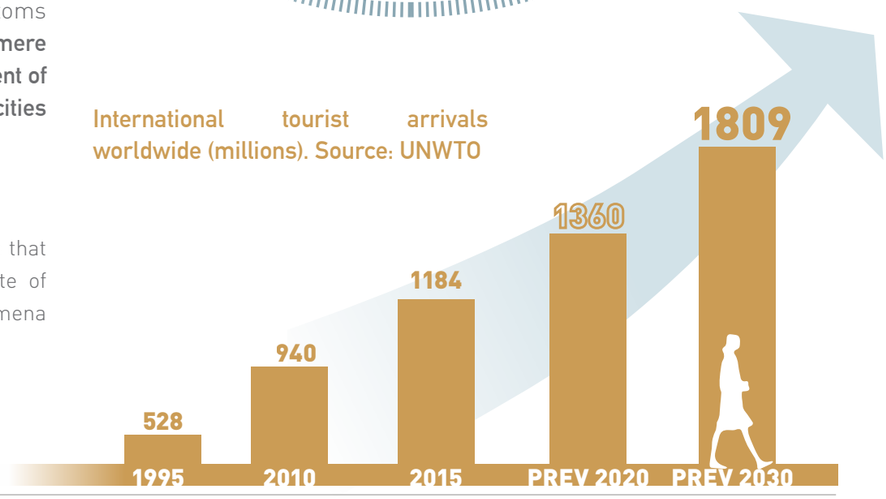
On these three basic levels, regulatory measures may be refined according to their specific reality. Depending on the time, the measures may be adjusted to the stages of tourist influx, fine-tuning if it's a peak or valley period within the seasonality of a destination.

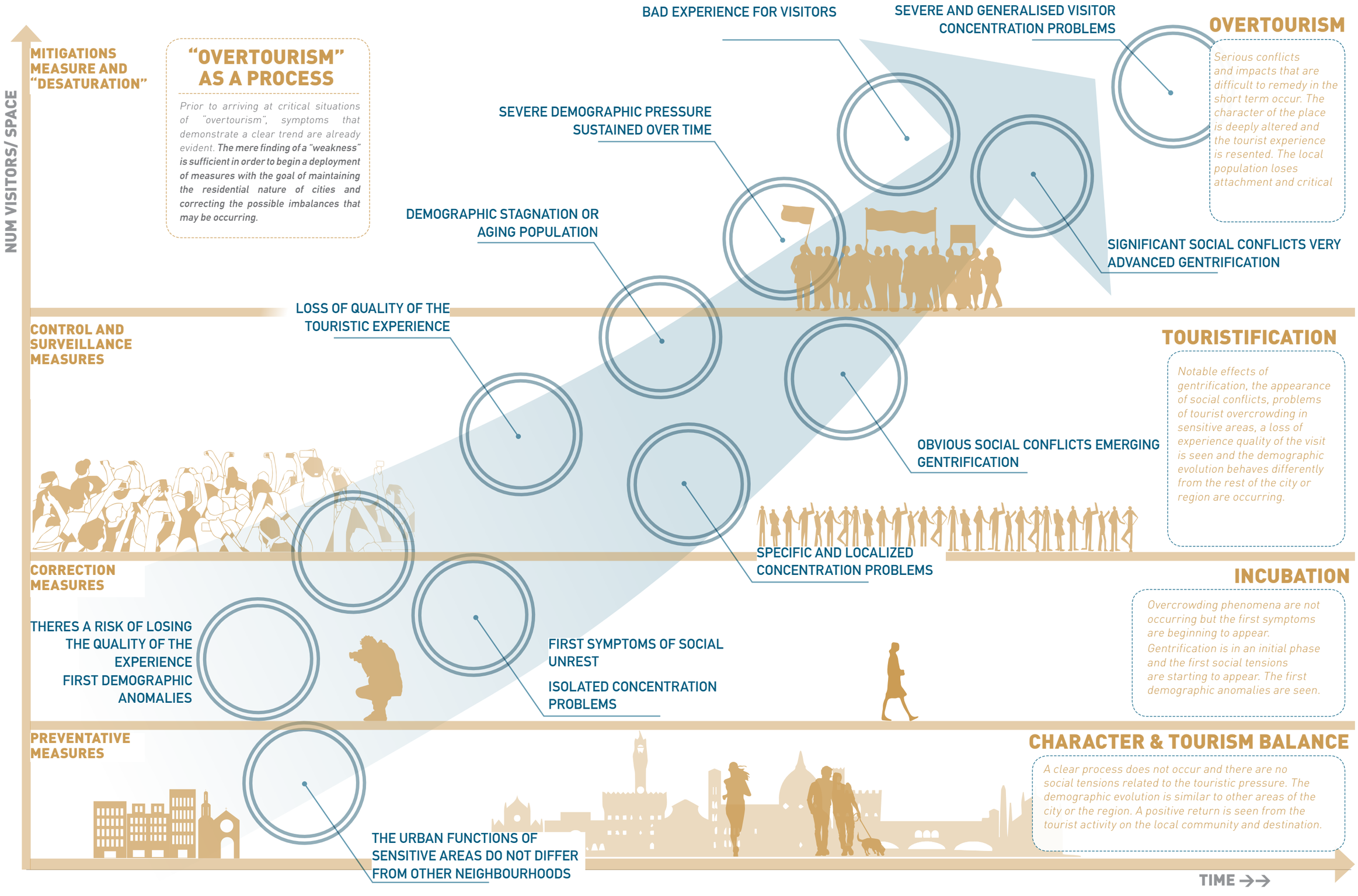
Together with this basic scheme of measures adapted to the space and time, the importance of **evaluating the model of the desired city and its relationship with tourism** should be emphasised. From the present study and in tune with other benchmarking studies that address the same phenomenon, the idea emerges that **"overtourism" is the culmination of an unrelenting process that all urban destinations of heritage value follow in an international context of an increased number of trips and the visitors' selection of urban tourism.**

Prior to arriving at critical situations of "overtourism", symptoms that demonstrate a clear trend are already evident. **The mere finding of a "weakness" is sufficient in order to begin a deployment of measures with the goal of maintaining the residential nature of cities and correcting the possible imbalances that may be occurring.**

In the figure on the page to the right we can see the main stages that urban tourist destinations experience prior to reaching the state of "overtourism". This upward escalation is based on global phenomena that have a clear and significant local impact.






NUM VISITORS/ SPACE
MITIGATIONS MEASURE AND "DESATURATION"
"OVERTOURISM" AS A PROCESS
Prior to arriving at critical situations of "overtourism", symptoms that demonstrate a clear trend are already evident. The mere finding of a "weakness" is sufficient in order to begin a deployment of measures with the goal of maintaining the residential nature of cities and correcting the possible imbalances that may be occurring.
BAD EXPERIENCE FOR VISITORS
SEVERE AND GENERALISED VISITOR CONCENTRATION PROBLEMS
OVERTOURISM
Serious conflicts and impacts that are difficult to remedy in the short term occur. The character of the place is deeply altered and the tourist experience is resented. The local population loses attachment and critical
SEVERE DEMOGRAPHIC PRESSURE SUSTAINED OVER TIME
DEMOGRAPHIC STAGNATION OR AGING POPULATION
SIGNIFICANT SOCIAL CONFLICTS VERY ADVANCED GENTRIFICATION
LOSS OF QUALITY OF THE TOURISTIC EXPERIENCE
CONTROL AND SURVEILLANCE MEASURES
TOURISTIFICATION
Notable effects of gentrification, the appearance of social conflicts, problems of tourist overcrowding in sensitive areas, a loss of experience quality of the visit is seen and the demographic evolution behaves differently from the rest of the city or region are occurring.
OBVIOUS SOCIAL CONFLICTS EMERGING GENTRIFICATION
SPECIFIC AND LOCALIZED CONCENTRATION PROBLEMS
CORRECTION MEASURES
INCUBATION
Overcrowding phenomena are not occurring but the first symptoms are beginning to appear. Gentrification is in an initial phase and the first social tensions are starting to appear. The first demographic anomalies are seen.
THERES A RISK OF LOSING THE QUALITY OF THE EXPERIENCE
FIRST DEMOGRAPHIC ANOMALIES
FIRST SYMPTOMS OF SOCIAL UNREST
ISOLATED CONCENTRATION PROBLEMS
PREVENTATIVE MEASURES
CHARACTER & TOURISM BALANCE
A clear process does not occur and there are no social tensions related to the touristic pressure. The demographic evolution is similar to other areas of the city or the region. A positive return is seen from the tourist activity on the local community and destination.
THE URBAN FUNCTIONS OF SENSITIVE AREAS DO NOT DIFFER FROM OTHER NEIGHBOURHOODS
TIME →→

4.2.4.TOWARDS A REGIONAL MODEL THE TOURIST DESTINATION AS CONSTELLATION OF PLACES-EXPERIENCES

New technologies allow us to optimise criteria that previously were defined in urban, mobility or tourism policies. Tending to the heritage city as a complex entity, in the 4 cities studied (Valencia, Barcelona, Florence and Amsterdam) a pattern has been observed that places value on this study and what we call the **space-time model.** This model is based on improving the interrelationship of the three types of spaces that comprise an urban destination.

1. "Core". Historical Nucleus In this space the most notable effects of the "overtourism" phenomenon are deployed. Increased housing prices, substitution of local or traditional business, pressure on the public space, tertiarisation of the urban landscape, social conflict, etc... The functions of monitoring and action of tourist overcrowding by means of new technologies in these areas are critical.

2. "Buffer". Buffer zone. It involves an urban fabric that accompanies the heritage value space and tends to be configured like a compact and homogeneous urban grid. In this space the indirect effects of accessing areas that tend to get overcrowded are concentrated. They represent a fabric that may complement the "core" as long as it does not become a dispersal of the negative effects that then colonise the entire city.

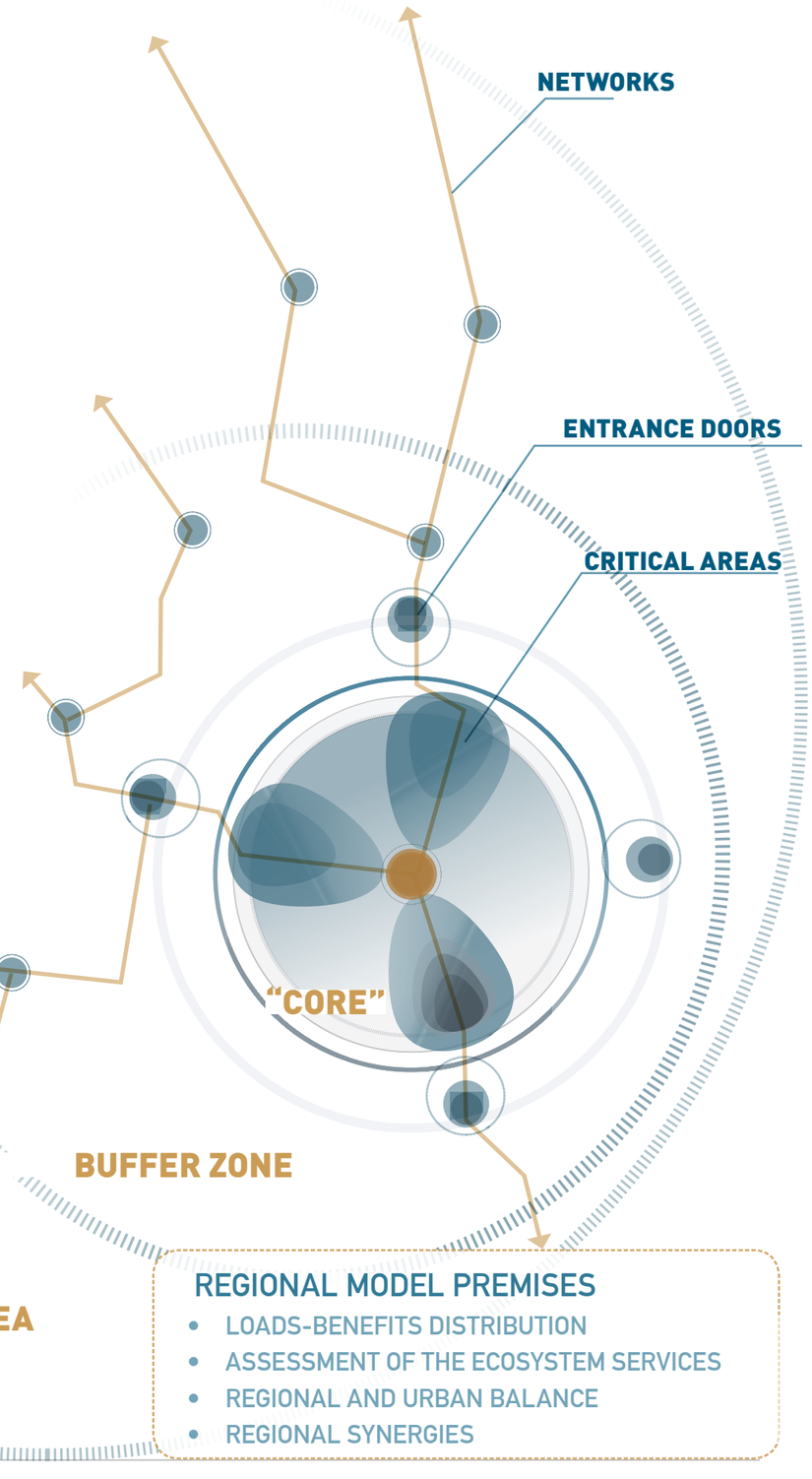
3. "Area". The Metropolitan Area is home to a larger, more diverse area that may be linked to the "core". Regional diversity may favour an experiential diversification and seasonal adjustment of the touristic phenomenon.

New technologies may help to coordinate and manage the areas that are home to urban tourist destinations of a heritage nature. Subsequently relationships are noted between areas that may culminate in concrete measures directed by open/big data. .

- **Critical areas.** Thanks to "zoning" strategies, areas that suffer most from congestion are defined and complementary strategies can be deployed with the other critical areas or with the buffer zone. Once again the monitoring of overcrowding and information for users may improve the experience in the destination.

- **Entrance doors** "Core"-"buffer" contact areas in which more intense modal interchanges take place and are key regulation points to critical areas. Its monitoring and communication with users is key in these areas

- **Networks.** The necessary decongestion of the "core" opens the possibility to weave a net of sustainable transportation that provides the backbone for the region and mitigates the impacts on mobility caused by tourist activity in the city. Once again offering the information on the possibilities of this network and monitoring its functioning may make this type of strategies successful.



The spatial-time diversification cannot be an escape route when faced with the effects of over tourism. It involves complementary measures to the review of a comprehensive model for the city and its area.

4.3 RECOMMENDED ACTIONS

As a summary of the work, as a final reflection, 8 lines of action are collected that should guide a proper implementation of the new open/big data technologies within the management of urban tourist destinations of a historical nature. These are:

1. UNDERSTANDING OVERCROWDING
2. OVERCROWDING PLANNING
3. ZONING OVERCROWDING
4. GOVERNING OVERCROWDING
5. TECHNOLOGY AT THE SERVICE OF PEOPLE
6. FROM MEASUREMENT TO ACTION
7. URBAN LANDSCAPE AND OVERCROWDING
8. EXPERIENCE AND OVERCROWDING

01 UNDERSTANDING OVERCROWDING

02 OVERCROWDING PLANNING

03 ZONING OVERCROWDING

04 GOVERNING OVERCROWDING

05 TECHNOLOGY AT THE SERVICE OF PEOPLE

06 FROM MEASUREMENT TO ACTION

07 URBAN LANDSCAPE AND OVERCROWDING

08 EXPERIENCE AND OVERCROWDING

01 UNDERSTANDING OVERCROWDING

The first step is to develop tools to parameterise overcrowding. Understanding overcrowding entails a process beyond obtaining data. In this respect, Real Time Data monitoring involves a practice that enables stakeholders involved in decision making, local operators and inhabitants to decide how to address overcrowding at that time.

The application of technology may involve administrations taking management steps, for operators to adjust their resources and for residents to adapt their experience. The capacity measures in Turó de la Rovira are enabling the City Council of Barcelona to adjust the cleaning and security services to the influx points of the area.

HOW DO NEW TECHNOLOGIES HELP US?

New technologies represent an efficient tool for visualising overcrowding, either in real time or by means of measurements that enable us to see trends. In Florence, the DATA SCIENCE FOR SOCIAL GOOD EUROPE 2017 project offers us an original way of visualising the movement of people between different tourist resources.

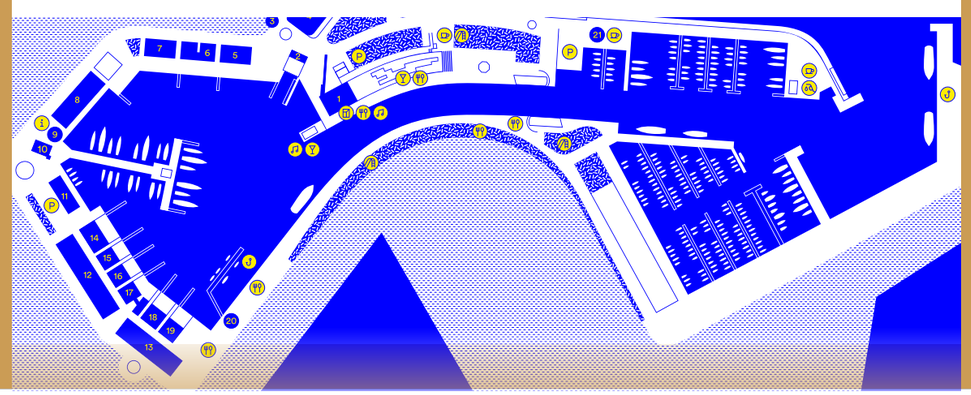
02 OVERCROWDING PLANNING

Planning for overcrowding is deployed on two fronts: time and space. In this respect, it is interesting to understand the patterns of when overcrowding happens and where problems arise from the overcrowding of a tourist destination. This planning requires evaluating the load capacity of tourist destinations as a key stage. The present study shows how places of international interest and those suffering from overcrowding do not yet have an assessment that defines the manageable limits for residents, the urban space, operators and the administration. .

As it has been defined in the present study, planning transcends the field of tourism management and requires an comprehensive approach from areas such as urban planning, mobility and heritage management.

HOW DO NEW TECHNOLOGIES HELP US?

New technologies may produce quantitative data on a complex phenomenon such as that of overcrowding. In the case of the Marina of Valencia, they are carrying out an interesting process of reinterpreting the port area so that the population may take ownership of the place from a functional and symbolic point of view. Regarding qualitative on-site assessments, public turnout parameterisations are added in order to improve the experience and the functioning of the space.



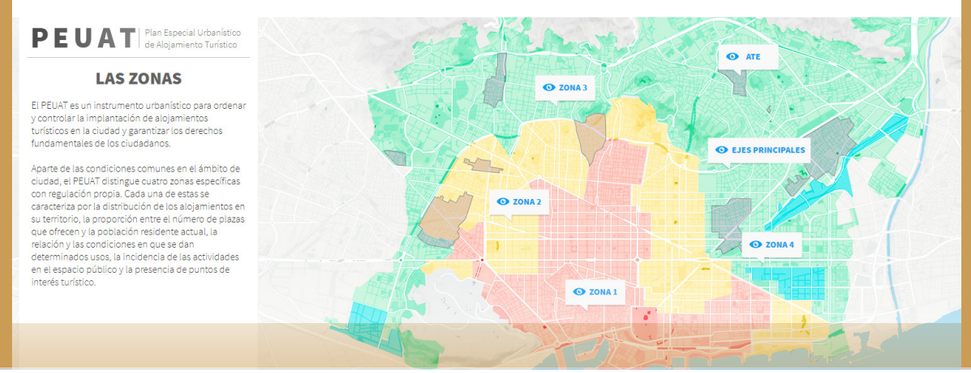
03 ZONING OVERCROWDING

Tourism is deployed in the area with different intensities. The present study demonstrates that the visitors' experience is often concentrated in very specific places. This tourist overcrowding in certain places is an opportunity to improve the overcrowding planning by means of "zoning" strategies that enable specific measures to be defined for each field and to define the different load capacities. This regional differentiation makes it possible to prioritise urban areas to focus the use of new technologies and make public investments more efficient.

Often times, overcrowding draws a kind of "neural network" in the area with greater or less connectivity among nuclei from different entities. This diagnosis can make it possible to design alternative scenarios to improve the tourist experience.

HOW DO NEW TECHNOLOGIES HELP US?

In Barcelona the Special Tourist Accommodation Plan (PEUAT) regulates the installation of tourist accommodation establishments, as well as youth hostels, temporary accommodation collective residences and housing for tourist use. There is a tech team that, helped by new technologies, is carrying out surveillance work on housing for tourist use (HTU). By means of Big Data handling and technical inspection this challenged is addressed in Barcelona.



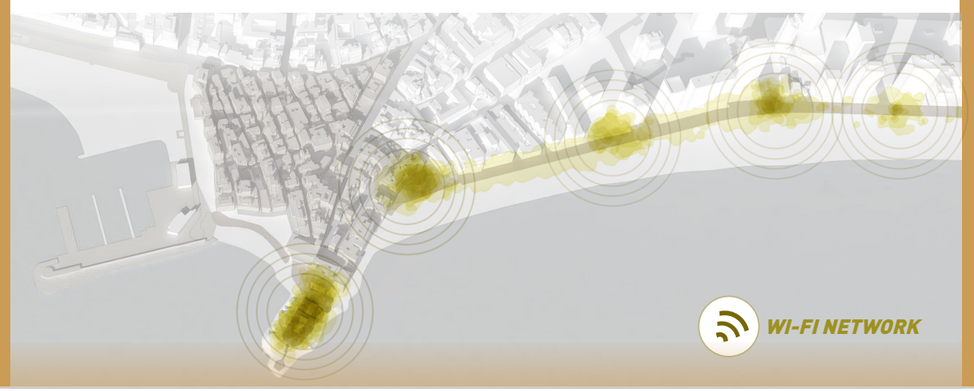
04 GOVERNING OVERCROWDING

One of the challenges for governments of tourist destinations is the overlap of joint policies of urban planning, mobility and tourist management as it regards to the social and business fabric. The implementation of actions that have emerged from the diagnosis of the situation, from the planning and zoning of the overcrowding require a road map.

As in the case of Florence, The Region of Tuscany, the Florence Metropolitan Area (which includes 42 municipalities, one of them Florence) and the city of Florence itself work in coordination to develop policies that improve tourism management.

HOW DO NEW TECHNOLOGIES HELP US?

In Benidorm (Alicante) in 2010 the body Benidorm Tourism Foundation of the Region of Valencia was founded, known by its commercial name "Visit Benidorm", consisting of a mixed public-private entity. In it, private stakeholders and administrations are represented. As a Smart Tourist Destination, they are sharing monitoring information by Wi-Fi networks as an example of good practices of public-private coordination.

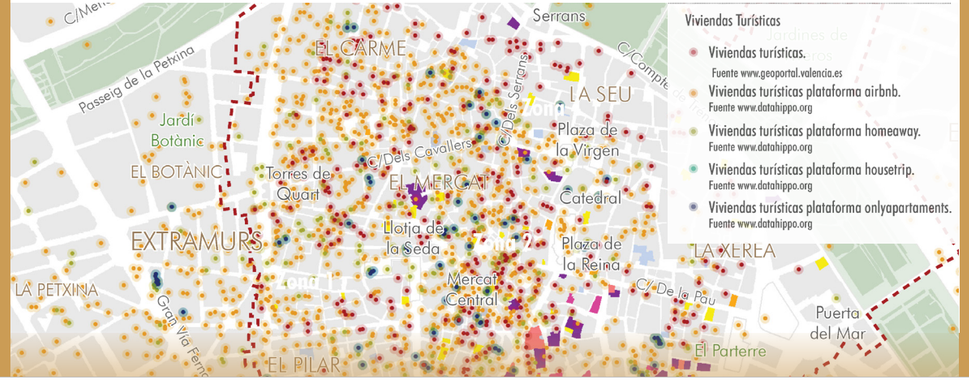


05 TECHNOLOGY AT THE SERVICE OF PEOPLE

Unlike other types of tourist destinations, heritage cities are first and foremost neighbourhoods where people live. Tourist overcrowding poses an exacerbation of the effects of tertiarisation of the neighbourhoods of the heritage city. This phenomenon is causing a series of effects that transform the place. Traditional or neighbourhood business is being sidelined by activities linked to leisure and tourism. The massive emergence of tourist housing commercialised via online portals may create coexistence problems, greater competition for occupying the public space is caused and the housing market is affected by increasing prices. The use of technology in management should complement a social approach to the problem. We see how cities such as Venice lose residents while places such as the Ciutat Vella neighbourhoods have stagnated. In the same way, the application of new technologies poses regulatory challenges such as the preservation of privacy

HOW DO NEW TECHNOLOGIES HELP US?

In the Ciutat Vella de Valencia Special Plan perception surveys and workshops with residents were carried out. The detection of existing imbalances in the processes of transforming the urban landscapes is enough reason to correct this vulnerability from urban planning. By means of Open-Data applications and regional analysis, the process of tertiarisation was shown.



06 FROM MEASUREMENT TO ACTION

The present study shows that the application of new technologies for managing the overcrowding of urban heritage tourist destinations are in the developmental stage and under consideration the in the majority of cases. This occurs in first-rate destinations such as Amsterdam, Florence or Barcelona.

The definition of protocols for action requires an implementation phase that makes it possible to obtain the phenomenological patterns (of behaviour).

Of the experiments currently underway, we can see how increasingly accurate data are needed to define the guidelines for action in the framework of the governance of the tourist destination. The visitor segmentation or duration of the stay are data of great interest in order to understand the tourist experience.

HOW DO NEW TECHNOLOGIES HELP US?

Florence, as it regards to decongesting tourist flows, is creating a new system that will inform tourists about the level of overcrowding the areas of the city, through Wi-Fi on their smart phones in real time. Universal signage (traffic lights: green/yellow/red) will orient them during their stay, also proposing alternative routes, with invitations to visit lesser known or less crowded museums and exhibitions at that time.

This will all be possible thanks to the installation of sensors, throughout a series of strategic points of the city, which will make it possible to track attendance; but also thanks to the collaboration of telephone companies able to analyse data anonymously.

07 URBAN LANDSCAPE AND OVERCROWDING

Overcrowding due to tourism in urban environments deeply transforms the landscape. The continent of the city doesn't substantially change, but the contents do, the ways of inhabiting the urban space, its function and therefore its significance, the character of the place is altered.

In October 2017 Amsterdam prohibited shops targeted at tourists. Amsterdam announced the prohibition of any new store targeted at tourists such as bike rental shops, souvenir shops or others. This measure involves a business categorisation that may be applied in more places in order to prevent overcrowding and the alteration of the urban landscape's character.

HOW DO NEW TECHNOLOGIES HELP US?

Smart Heritage City (SHCITY) is a project from the Interreg Sudoe programme that will address the innovative challenge of creating a single open code tool to manage historic urban centres and facilitate the decision making work of competent authorities. In Avila, as a pilot experiment, 230 sensors and equipment to monitor the heritage and the tourist flows in the historic centre have been installed. By means of the data obtained by the sensors and equipment, the flow of tourists is quantified in real time and the visit times are optimised indicating routes in order to avoid places with a greater influx of tourists and the normal entry queues for monuments and museums. Additionally, the system provides tourists with information about more uncommon circuits and places that are frequented less.

08 EXPERIENCE AND OVERCROWDING

The sense of requalification of a tourist destination, in other words, the ultimate aim of its renovation or improvement, is in many cases to create a memorable visitor experience, a visit that can be remembered and transmitted. In this sense, understanding the phenomenon helps us to visualised the quality perceived by the visitor in order to preserve those aspects that contribute to an interesting interrelation between the urban space and the visitor.

The qualitative and quantitative analysis of the experience in the destination is an approach that allows us to refine the diagnosis. Therefore, new technologies should go hand in hand with on-site studies of observation and consultation with those people that are experiencing the destination.

HOW DO NEW TECHNOLOGIES HELP US?

The Uffizi Gallery in Florence, with 3.4 million annual visitors, is developing a system based in Big Data in order to prevent waiting and generate "sustainable tourism". By means of an algorithm that collects scientific information, the experience of the tourist resource and city in general has improved.

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COMUNITAT VALENCIANA
Jaume Mata. Turisme i Ciutat. valencia Convention Bureau.
Carole Duserre. Técnico en la Marina de Valencia.
Leire Bilbao. Gerente Fundación Visit Benidorm.

BARCELONA
Xavier Suñol. Director Turismo del Ayuntamiento de Barcelona.

OCCITANIA
Magali FERRAND. Directrice Déléguée. Direction du Tourisme et du Thermalisme/ Site de Montpellier

FLORENCE
Alessandro Monti. Senior Project Manager. EU Project ManagerFondazione per la Ricerca e l'Innovazione promossa da Università di Firenze.

Andrea Giordani y Carlotta Viviani. Tourist and Economic Promotion Office - City of Florence.

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Daniel van Motman
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FACING THE OVERTOURISM CHALLENGE IN CULTURAL AND NATURAL HERITAGE SITES USING OPEN/BIG DATA

GENERALITAT VALENCIANA

TURISME COMUNITAT VALENCIANA

Interreg Mediterranean HERIT-DATA

Project co financed by the European Regional Development Fund