

# The touristification of urban spaces: measurement proposal

Turistificación de espacios urbanos: propuesta de medición

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## Abstract

In the years prior to the outbreak of the COVID-19 pandemic, the rapid growth of tourism and the emergence of online tourist accommodation rental platforms gave rise to a considerable increase in the tourist pressure on urban destinations, leading to processes (and problems) such as *overtourism*, tourism gentrification or touristification. The post-pandemic tourism recovery has placed these processes at the centre of debate once again. This text reflects on the possibilities for measuring the touristification of the urban space. A methodology is proposed that is based on the elaboration of two indicators that are applied on a city block scale in Donostia-San Sebastián: an indicator of the intensity of tourism accommodation and an indicator of the tourism specialisation of the retail and restaurant supply. Then, a spatial cross analysis is made of the values obtained and they are compared with the presence of visitors, enabling us to reflect on the geography of the

touristification of the city on a block scale. Touristification is, above all, a process of the intensification of the tourism activity which is distributed unevenly across the urban space and acts on a pre-existing fabric that determines its scope. From an applied perspective, the study generates useful knowledge for making decisions about the series of urban policies that contemplate the sustainable insertion of tourism into the city.

**Keywords:** urban tourism; indicators; Donostia-San Sebastián.

## Resumen

En los años previos a la eclosión de la COVID-19, el rápido crecimiento del turismo y la irrupción de las plataformas online de alquiler de viviendas turísticas supusieron un incremento muy notable de la presión turística en los destinos urbanos, desencadenando procesos (y problemas) de *overtourism*, gentrificación turística o turistificación. La recuperación turística postpandemia sitúa de nuevo estos procesos en primera línea de debate. Este texto reflexiona sobre las posibilidades de medición de la turistificación del espacio urbano. Se propone una metodología que arranca con la elaboración de dos indicadores que se aplican a escala de manzana en Donostia-San Sebastián: un indicador de intensidad de alojamiento turístico y un indicador de especialización turística de la oferta comercial y hostelera. Seguidamente, se procede al cruce espacial de los valores obtenidos y su contraste con la presencia de visitantes, lo que permite reflejar a escala de manzana la geografía de la turistificación de la ciudad. La turistificación supone ante todo un proceso de intensificación de la actividad turística que se distribuye de forma desigual sobre el espacio urbano y actúa sobre un entramado preexistente que determina su alcance. Desde una perspectiva aplicada el trabajo realizado genera conocimiento útil para la toma de decisiones sobre el conjunto de las políticas urbanas que afrontan la inserción sostenible del turismo en la ciudad.

**Palabras clave:** turismo urbano; indicadores; Donostia-San Sebastián.

## 1 Introduction

Cities are tourist destinations with a long historical trajectory (Calle Vaquero, 2002). The presence of visitors and tourist activities has determined the touristification of different components of urban life within a wider more general process of tertiarization. This phenomenon affects the whole city, but the spatial selectiveness of tourists implies that it particularly impacts the urban centres (Jansen-Verbeke, 1998). In the years prior to the outbreak of the COVID-19 pandemic, the rapid growth

of the affluence of visitors, driven, among other factors, by the emergence of online tourist accommodation platforms, gave rise to a considerable increase in tourist pressure. Within this context, problems arose that have been referred to with terms such as *overtourism*, tourism gentrification or touristification. In addition to the increase in tourism pressure, there has also been an expansion of the tourism footprint towards neighbourhoods that, until recently, were unaffected by tourism, many of which are low-income housing residential spaces in the urban centres. For decades, these neighbourhoods have been subjected to sustained regeneration actions (Estevens et al., 2023) and are currently attracting the “coolest” and/or alternative tourists (Pettas et al., 2022) and investors (Zhang et al., 2021). These processes are fairly well-known and have been widely addressed in the academic literature related to urban studies and the geography of tourism. However, their measurement is still complex and within the current post-pandemic context it is especially necessary. In certain cities, the discontent due to the increase in tourism pressure is rising again and the design of policies to regulate and contain the tourism activity has resumed.

This text reflects on the possibilities for measuring the touristification of the urban space. It presents a methodology that enables us to estimate this phenomenon on a city block level; a scale for which hardly any studies have been published, but which is fundamental for applying urban regulations. The methodology is applied to the case of Donostia-San Sebastián, a traditional destination which has experienced explosive growth in the affluence of visitors and the tourism supply in all its versions and which, since the review of the *Plan Director de Turismo* of 2017, began to study in detail the effects of *overtourism* and the touristification in the city. The measurement proposal is based on two types of supply data: 1) accommodation stock and 2) the retail and hospitality supply. Demand data are also incorporated in order to make comparisons with the presence of visitors. The supply data are crossed with socioeconomic variables in order to establish touristification indicators on a city block level and show the penetration of the tourism activity on a municipal scale, focusing on the spaces with a greater concentration of the tourism activity, namely the Centro and Gros neighbourhoods.

## **2 State of the art**

### **2.1 The touristification process and its embodiment in the urban space**

The term touristification alludes to the process of the transformation of a place into an eminently tourist space (Knafou, 1996). This transformation implies an adaptation of the place to the visitor and the interests of the tourism industry, which are driven, favoured or at least tolerated by the public administrations. Given the spatial selectiveness of the tourism phenomenon, touristification

does not occur homogeneously between tourist destinations or within them. The current wave of touristification is particularly intense in the cities, specifically in the large destinations of southern Europe (Sequera & Nofre, 2018a), and has affected the urban centres intensely.

The literature on touristification includes contributions from different lines of study that overlap. The *spatial analysis* studies constitute one of these lines. They basically address the distribution of the tourism phenomenon in the urban space (Aparicio et al., 2022; Jiao & Bai, 2020; Rabiei-Dastjerdi et al., 2022). They are quantitative studies that profusely use spatial statistics and the possibilities of handling data derived from geographical information systems. The recent use of *big data*, with data obtained through *web scraping* techniques has revitalised this focus, enabling increasingly more sophisticated statistical analyses to be made. Studies on tourism gentrification, framed within the more critical positions, constitute another line of study on touristification. They imply an adaptation of the paradigm of gentrification to the tourist city (Arias, 2018; Cocola-Gant, 2018; Gotham, 2005; Hiernaux & González, 2014). Their focus of attention is not touristification in itself, but its effects on the urban communities, the most vulnerable component. Due to the pressure exercised by tourism, these communities suffer displacement processes, a central concept in this approach (Cocola-Gant, 2022; Salerno, 2022). Touristification is related to change in the socio-economic and age composition of the residents, price increases of residential properties, retail gentrification, the emergence of conflicts and resistance related to the growth of the tourism activity, etc. In the most recent studies, there is a tendency to differentiate between gentrification and touristification as two processes with the same origin but different effects (Hernández Cordero, 2021; Sequera & Nofre, 2018b). Furthermore, phenomena halfway between the two are also identified, such as transnational gentrification (Jover & Díaz-Parra, 2019; Cocola-Gant & López-Gay, 2020). Meanwhile, the studies on *overtourism* connect with previous reflections on carrying capacity and are more rooted in traditional tourism geography studies (Calle-Vaquero et al., 2020). In these cases, a good part of the theoretical effort is focused on the identification of the thresholds, above which tourism is excessive. Therefore, there has been particular interest in elaborating indicators to apply on different scales (Antunes & Ferreira, 2021; Celata & Romano, 2020).

The touristification process of urban centres is complex and multidimensional (Freitag & Bauder, 2018). It is manifested in different ways and in some cases only implies the intensification of long-term phenomena, while in others we can see more recent mutations of the tourism activity, the scope of which is still uncertain (Calle-Vaquero, 2019). On an urban level, the growth of the accommodation stock is one of the most relevant exponents of touristification (Kowalczyk-Anioł, 2020). This growth is based on the extension of the more traditional accommodation supply, such

as hotels. Although the importance of the hotel industry in the shaping of the tourist city has been acknowledged for some time (Gutiérrez, 1984), there are not many studies that reflect on the scope of hotel operations as a transformation vector of urban centres. On the other hand, the academic production on “airbnbization” (Richards, 2017) is enormous (Ardura et al., 2020; Cerdá-Mansilla et al., 2022; Gutiérrez et al., 2017). These studies reflect the disruptive nature of the platform companies that favour the conversion of housing into a tourism good, and, therefore, residential decline, particularly affecting the neighbourhoods close to the *beaten track*, but traditionally unaffected by tourism (Ioannides et al., 2019; Stors & Kagermeier, 2013). The expansion of these studies is directly related to the wide availability of data obtained through *web scraping* techniques and their accessibility through initiatives such as InsideAirbnb.

Touristification is also manifested in the retail, hospitality and street level services that target the final demand. On the one hand, the businesses directly aimed at tourists, such as souvenir shops, bicycle hire for visitors, complementary services for tourist property rentals, etc. are growing. On the other hand, bars, cafeterias and other retail establishments are adapting to cater to a growing affluence of visitors, changing their range of products, their aesthetics and the way in which they communicate with their customers. Both of these phenomena contribute to the touristification of the urban space. In comparison with the abundance of studies focused on accommodation, particularly short-term rental (hereafter, STR), the academic production on commercial touristification is not so extensive. Worth noting are the texts focused on the mutations of the commercial landscape, which establish a relationship with commercial gentrification processes (Blázquez-Salom et al., 2019; Guimarães, 2022; Ruiz-Romera et al., 2023) and with situations of *overtourism* (Guimarães, 2021). Overall, these touristification vectors and their manifestations are reflected in the urban landscape (Barrero & Jover, 2020). The urban scene is crowded with visitors who wander leisurely on foot or on different soft mobility aids (bicycles, scooters, etc.). In the areas with more tourism, there is a proliferation of street level establishments targeting foreign demand, from *souvenir* shops to nightlife venues (Zhang et al., 2021), and, depending on the built-up area, different types of accommodation establishments. The pedestrianised spaces are filled with stands and terraces, while the facades display posters and other elements of the tourist imaginary. There is also a proliferation of information points and specific signposts for visitors.

## **2.2 Touristification indicators**

Although the academic literature on touristification is extensive, it does not pay particular attention to measuring or mapping the phenomenon, in the sense of differentiating areas with different

tourism intensities or different levels of touristification within the urban space. Neither has there been much focus on establishing indicators that provide an idea of the global scope of the phenomenon and in the cases where this has been done, it has concentrated on a perspective of sustainability or the social impacts generated (Anguera-Torrel & Cerdan, 2021; Torres-Delgado et al., 2021, 2023). In the most basic terms, an indicator is an element that provides qualitative or quantitative information on a phenomenon and can be formed by one or several data referring to numbers, perceptions, facts, opinions or measurements. In theory, indicators enable us to specify the magnitude, intensity, evolution and prognosis of a phenomenon or process and to assess it (Calle-Vaquero et al., 2020). They should fulfil the fundamental premises of generating information, being methodologically aware, scientifically valid and easy to apply and communicate (López Palomeque et al., 2018). Depending on the information that they provide (level of elaboration and combination of data), there are two basic types of indicators: simple indicators and complex, synthetic indicators or indexes (Sánchez & Pulido, 2008). The former provides information with a low level of processing, drawn from secondary sources or own compilation. Synthetic indicators or indexes arise through the combination of several simple indicators by way of a weighting system that prioritises the components. Some authors differentiate the so-called “indicator systems” as they compile simple indicators whose results are interpreted jointly (Torres-Delgado & Saarinen, 2013). To date, the literature on touristification includes two types of indicators for applying on an intraurban scale. The first type includes geolocalised data of the tourism activity: the presence of visitors based on their digital footprint, accommodation capacity (particularly STR), retail and hospitality establishments directly or indirectly related to tourism, etc. The second type seeks to establish the relationship between these variables, which reflect the magnitude of the tourism activity, and variables that express a certain aspect of the local reality, such as the population, housing, area, etc. This second type of indicator reflects more precisely the scope of touristification with respect to the form of urban specialisation that can reach levels close to monoculture. The feasibility of these indicators is limited due to the availability of the data. Depending on the variable used, official records, field work or *big data* can be consulted using *webs scraping* techniques. If the data have geographical coordinates, they are simply located on the urban space, although, more complex spatial statistical operations are applied. In other cases, data aggregations are made based on different territorial units (administrative neighbourhoods, census areas).

The majority of the studies on touristification only use indicators of intensity and tourism accommodation density relating STR with the population and area. Grisdale (2021) applies these indicators to the census sections in Toronto, Lagonigro et al. (2020) to Barcelona, García-Amaya

et al. (2021) to Valencia, Cerezo-Medina et al. (2022) to Córdoba, Granada, Málaga and Seville. Similarly, Cerdá-Mansilla et al. (2022) and Gil & Sequera (2022) apply them to the districts of Madrid, while Antunes & Ferreira (2021) use the parishes of Lisbon and Celata et al. (2020) contemplate a 50x50 metre mesh in Florence. Castro et al. (2023) consider the proportion of the total number of properties. In addition to these studies, there is a series of contributions that use a more diverse set of indicators that even make up indicator systems, as previously indicated. For example, as well as the indicators based on supply, the *Atlas de la Turistificación de Madrid* (2017) incorporates an indicator of the presence of visitors based on the photographs uploaded to Flickr by visitors. García-Ayllón (2018) adds another indicator of social conflict based on the news reports on discontent related to tourism in each neighbourhood. Chamizo-Nieto et al. (2022) develop the proposal by García-Ayllón, extending the tourism variables to restaurants and restricting the urban variables to the population, which makes standardisation easier. In a subsequent study, Chamizo-Nieto et al. (2023) incorporate other variables such as terraces and nightlife establishments, with an analysis conducted on a census section scale. In general, these indicators are compared with other urban indicators in order to determine the relationships between the dynamics of tourism intensification or touristification with other urban processes, such as residential decline, the increase in the prices of residential housing or, in broader terms, gentrification.

The literature review reveals relevant points for contemplation. First, there is a prominence of studies that measure and map touristification based on “airbanización”. This approach neglects the scope of the impact of other accommodation formulas and does not consider other manifestations of touristification, such as the concentration of visitors in certain parts of the urban space and the growth of street level activities aimed at visitors. Furthermore, little progress has been made in the formation of composed indices that include partial touristification indicators. Second, the spatial units of aggregation are too large to reflect in detail the geography of touristification. In other terms, the embodiment of the data on an administrative neighbourhood or census section level does not reflect with precision the degree of the touristification process, imposing artificial limits that do not respond to the reality of the geographical deployment of tourism across the urban space. These two defects (thematic and spatial) justify the methodological proposal that is developed in this article.

### **3 Case study**

Donostia-San Sebastián is a Spanish city with 187,849 inhabitants, located in the autonomous region of the Basque Country. It has a long tradition as a tourist destination dating back to the nineteenth

century as a spa town visited by the aristocracy and high bourgeoisie (Larrinaga & Pastoriza, 2009; Walton & Smith, 1996). At that time, the city was adapted to the aesthetic criteria of the Belle Époque. Today, it is no longer a summer destination for the elite classes but now has a complex destination profile that is much more than a summer tourism city. Although the beaches and the urban seafront still constitute the principal tourist attractions, other elements such as the gastronomy (pintxos, restaurants and prestigious chefs, etc.), the contemporary culture (Film Festival, Tabakalera, etc.) or sports (surf, Behobia-San Sebastián race, etc.) also make it a popular destination.

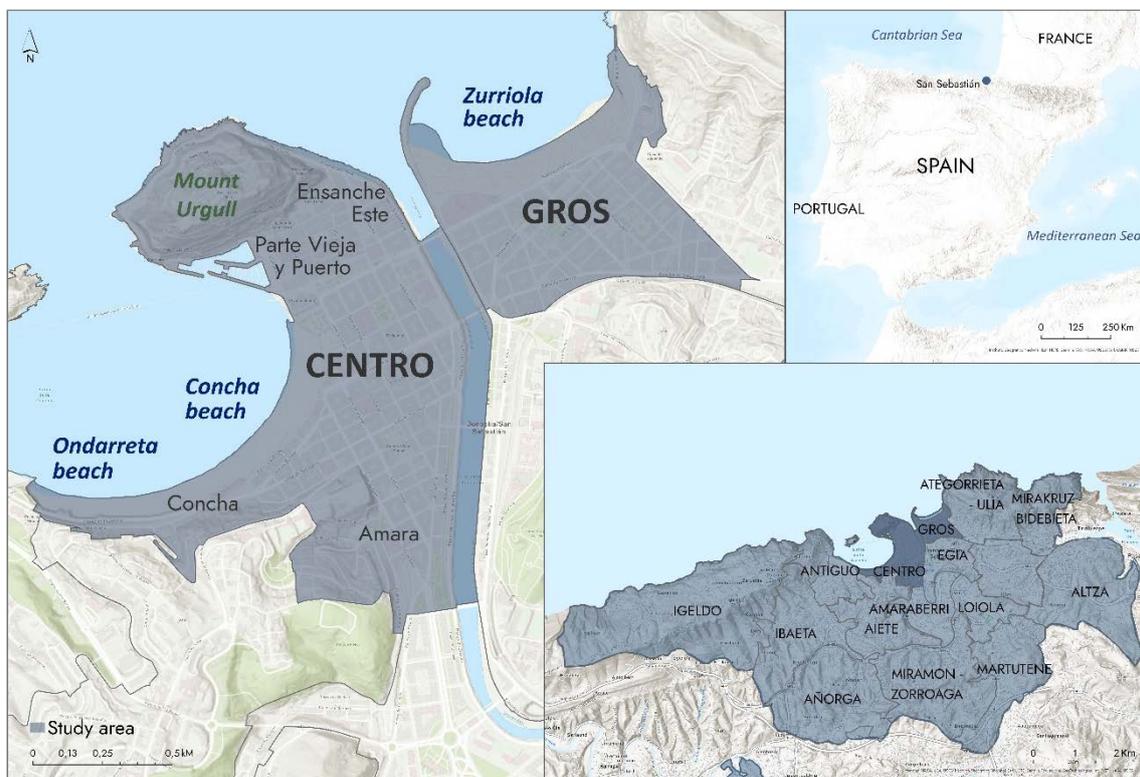
According to the UrbanTUR 2022 report, Donostia-San Sebastián holds the fourth position in the ranking of tourism competitiveness after Barcelona, Madrid and Valencia (Exceltur, 2023). According to the data of the Basque Statistical Institute, during the year 2019, the year before the outbreak of the COVID-19 pandemic, the hotels in the city recorded 740,455 tourists and 1,524,664 overnight stays. With respect to 2010, the growth was 57.18 % and 67.51 %, respectively. These figures reflected the good health of the hotel economy, with very high levels of occupation and *rev-par*. During these years, the STRs and daytrips emerged. After the tourism recession of the pandemic years (2020 and 2021), the growth path has resumed very quickly. During 2022, the record figure of 822,872 tourists accommodated in hotels was recorded, generating 1,747,541 overnight stays.

Within the city, the tourist area covers the urban seafront along two bays separated by Mount Urgull. To the west and in front of the Ondarreta beach, the Antiguo neighbourhood houses many hotels in a predominantly residential and university area. In front of the Concha beach, the Parte Vieja constitutes the historical quarter of the city and a space with a strong retail and hospitality concentration. Together with the southern, residential and commercial enlargement, it forms the Centro neighbourhood. To the east, opposite the Zurriola beach, is the Gros neighbourhood, with a surf ambience and presided by the city's conference centre, the Kursaal (Figure 1).

The rapid growth of the number of visitors to traditional tourism spaces has given rise to a notable increase in tourist pressure (García-Hernández et al., 2017). The conversion of whole buildings into hotels and the proliferation of the STRs adds further vectors of pressure on the property market which is already traditionally stressed. All of this has placed tourism at the centre of the urban debate. There is a certain view that the current pace and forms of tourism growth are threatening the sustainability of the urban model and the long-term success of the tourist destination. These considerations are explicitly mentioned in the revised versions of the Plan Director de Turismo of

2017 and 2022 and are embodied in urban planning instruments, such as the Municipal bylaw regulating the use of tourist housing and the rental of rooms in the habitual residences for tourist use of 2018. The implementation of this type of accommodation requires the zoning of the space. The debate remains open, spurred by the action of certain citizen groups similar to those of other cities and reflected in the recent proliferation of academic studies that address aspects such as the effects of the growth of the accommodation stock (Calle-Vaquero et al., 2017), the relationship between the expansion of STRs and the prices of residential rents (Etxezarreta-Etxarri et al., 2020), the professionalisation of the supply offered by Airbnb (Aguado-Moralejo & Del Campo-Echeverria, 2020) or the dynamics of the retail activity in neighbourhoods experiencing recent processes of touristification, such as Gros (Berra-Sandín, 2022).

Figure 1. Location and administrative division of San Sebastián and the area of study



Source: own elaboration

## 4 Methodology

### 4.1 Information sources

The proposed methodology is based on the following data: the accommodation stock and the retail and hospitality activity related to tourism and the visitors. The supply data is crossed with other urban variables in order to establish touristification indicators on a city block scale in the

administrative neighbourhoods of Centro and Gros. In order to analyse the accommodation supply, a database has been constructed with information on all the accommodation units existing in the municipality. As well as the names, it includes basic information about the type, category, capacity (rooms and places) and location (with coordinates). The reference date of the database is November 2022 and it is based on two municipal management data sources: the conventional accommodation census conducted by the tourism department and the housing and rooms for tourist use census managed by the urban planning department. In both cases the data were cleaned up and compared with those of the *Register of Tourist Establishments and Activities* of the Basque government. With respect to the short-term rental properties and rooms, the data of the municipal census are only slightly lower than those provided by InsideAirbnb, with the advantage that the former includes the exact location and number of beds. Specifically, the census includes 1288 short-term rental properties and 132 short-term rental rooms, while InsideAirbnb records 1824 listings of which 1377 correspond to whole houses or apartments, 419 to private rooms, 4 to shared rooms and 24 to hotel rooms.

The analysis of commercial touristification uses an inventory of street level establishments engaged in economic activity as a data source and constructed through field work. This exercise was carried out in August 2022 and May 2023, coinciding with days of a high presence of visitors in the city. Through direct observation, an estimate of the percentage of business related to the tourism activity was made of all of the establishments, using criteria such as opening hours (uninterrupted or not and bank holidays), the presence of tourist customers, whether they offered the *Tax free* scheme, the existence of signs in English or other languages, the existence of menus translated into other languages, the presence of terraces and gardens related to the business, the prolongation of the sales spaces into the street with elements to attract foreign tourists or the adaptation of the product. In the case of the extensive retail area of the Centro neighbourhood, based on previous surveys of the retailers (Fomento de San Sebastián, 2015), a homogeneous criterion was adopted to assign a low-medium yet constant level of connection to tourism to all the establishments and franchises of Spanish clothes and complements brands with a high penetration in the international market (Zara, Mango, Tous, etc.). The field work allowed a direct observation to be made (at randomly selected days and time) of the presence of a high percentage of tourist customers in these establishments.

Finally, the information provided by Flickr has been used to analyse the demand data. Flickr is a social network that enables the sharing of photos and videos. The geolocalised photographs that users upload to the network enable mappings to be made of the spatial distribution patterns of the visitors in terms of density. It has been used in tourism studies since its creation in 2004, such as

those by Barros et al., (2019 and 2020), due to its easy access API. For this reason, it is the most used data source, although it is not among the most popular networks. Like the rest of social networks, there is bias when using Flickr, essentially because it is not used by the whole population and due to the presence of hyper-productive users who cause overestimations in analyses (Barros, 2019). For this task, the geolabelled photos were downloaded between 1 January 2021 and 1 March 2023 through the application programming interface (API) provided by Flickr, which, through a Python script, offers free access to the photographs for non-commercial use. Following the methodology proposed by Fischer (2010), all those uploaded by the same author over the course of more than one month corresponding to someone who could reside in the city, or its immediate surroundings were eliminated. The final data sample contained 3072 geolocalised photos with coordinates. The information was stored in a geojson file which enabled a layer of points to be created using GIS software (ArcGIS 10.3 and QGIS 2.14).

#### **4.2 Types of analysis conducted**

Two touristification indicators have been calculated in this study: an indicator of the intensity of tourism accommodation and an indicator of the tourism specialisation of the retail and restaurant supply. The values of both indicators are crossed to provide a map using bivariate GIS analysis. The indicator of the intensity of tourist accommodation compares the total accommodation capacity with the resident population on a city block level, in line with the Tourist Function Rate (TFR), proposed in 1967 by Defert. Although the accommodation capacity variable is commonly used in touristification studies, in general, it is limited to the STR supply and, more specifically, to Airbnb listings, without referring to capacity. The resident population in the Municipal Population Register is used as a local variable. With this information, the number of accommodation beds per 1000 inhabitants has been calculated. For the mapping exercise, following Castro et al., (2023), the values have been grouped into four categories reflecting a gradation of the tourist intensity of the accommodation: low level, where the accommodation beds represent less than 10 % of the resident population with intensity values lower than 100 (less than 100 accommodation places per 1,000 residents in a block); medium Level, between 10 % and 25 %; high level, between 25 % and 50 %; and very high level, above 50 % (Table 1).

Meanwhile, the tourism specialisation indicator of the retail and hospitality supply examines the relationship between the estimate of the percentage of the tourism business of the street-level establishments and the total number of establishments in the city block where they are located. To do this, the values given to all the establishments in the inventory have been added. These values

oscillate between 0 (establishment unrelated to tourism) and 1 (establishment completely oriented towards tourists). The sum of the values obtained is divided between the total number of establishments in the inventory. For the map, the results of this indicator have also been grouped into four categories reflecting a gradation of the commercial touristification, understood as the level of connection/dependence of the establishments of the block with foreign consumption. The thresholds of the categories have been set analogously to the indicator of the intensity of accommodation supply to facilitate the comparative mapping analysis: low level of touristification, with values lower than 10 %; medium level, between 10 % and 25 %, high level, between 25 % and 50 %; and very high level, above 50 % (Table 1).

Table 1. Indicators of touristification

		INDICATOR OF LEVEL OF TOURISM SPECIALISATION OF RETAIL AND HOSPITALITY SUPPLY			
		Low (>10 %)	Medium (10-25 %)	High (25-50 %)	Very high (> 50 %)
INDICATOR OF TOURIST ACCOMMODATION INTENSITY	Very high (> 50 %)				
	High (25-50 %)				
	Medium (10-25 %)				
	Low (>10 %)				

Source: own elaboration

The results of both indicators are cartographically represented separately on intensity and specialisation maps and jointly on a summarised touristification map. This map is based on the grouping of the values obtained in each of the indicators and their representation through bivariate colours symbology. This type of representation, elaborated with ArcGIS Pro, shows the quantitative relationship between two comparable and equivalent variables (in this case the indicators), which are simultaneously represented in a layer. To do this, the data have been manually classified, assigning four classes corresponding to each of the categories of each indicator, enabling correlations to be established between them.

Finally, the data corresponding to the location of the visitors based on the georeferenced photos in Flickr have been analysed. Each geolabelled photo is represented as a *spatial-temporal event* defined by the location, moment and user. A heat map has been elaborated with the dispersed

photos, showing the density of the photos. Furthermore, based on their exact location, they have been related to the closest street sections and the number of photos per street section has been mapped, normalised by the total number of photos of the city. Therefore, the streets have been ranked, providing information that complements, from the demand side, the results of the touristification indicators based on the supply.

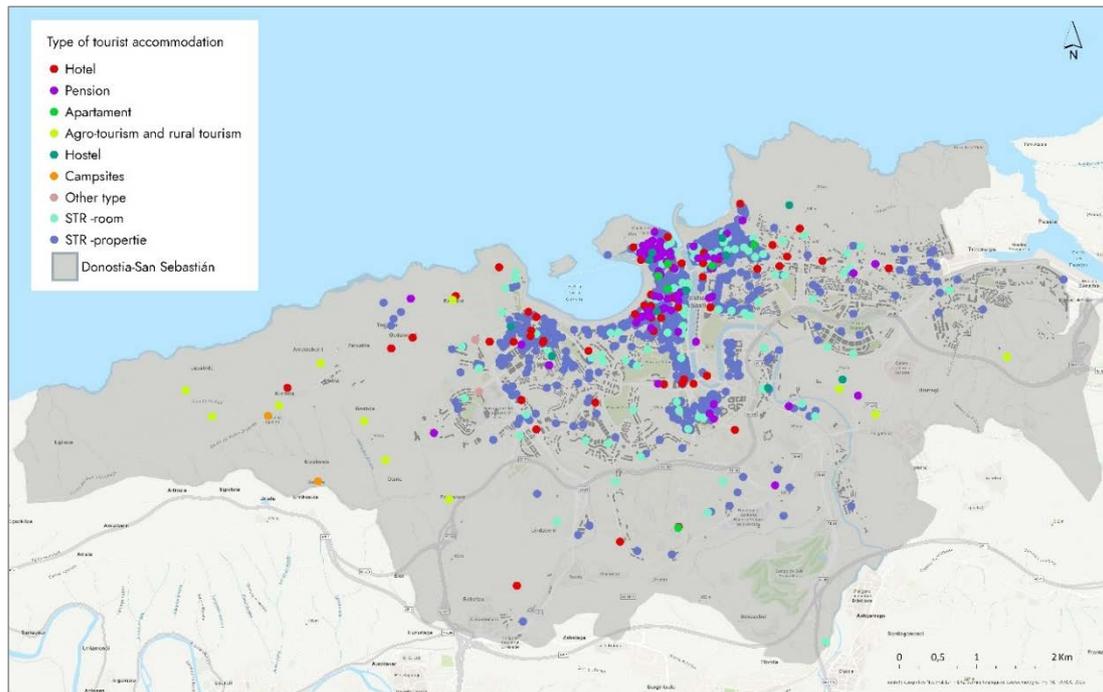
## **5 Results**

### **5.1 Indicator of accommodation intensity**

The accommodation supply in Donostia-San Sebastián is made up of 1607 establishments with a capacity of 17,438 beds. The conventional supply, formed by hotels, pensions, hostels, apartments, campsites, agro-tourism and rural tourism establishments and university residences for intermittent tourist use, represents 11.63 % of the establishments and 64.41 % of the beds. The short-term rental properties and rooms amount to 1,420 units and represent 35.58 % of beds. As in other Spanish cities, the growth of the accommodation stock has accelerated over the last two decades and constitutes a central vector of the real estate dynamics of the city. This growth has two components. First, the increase the number of high category hotels and hostels, either in new buildings or pre-existing buildings that have changed use. Second, the expansion of the STRs. This accommodation formula has a long tradition in the city, related to summer holidaymakers, but has increased exponentially due to the actions of online platform companies.

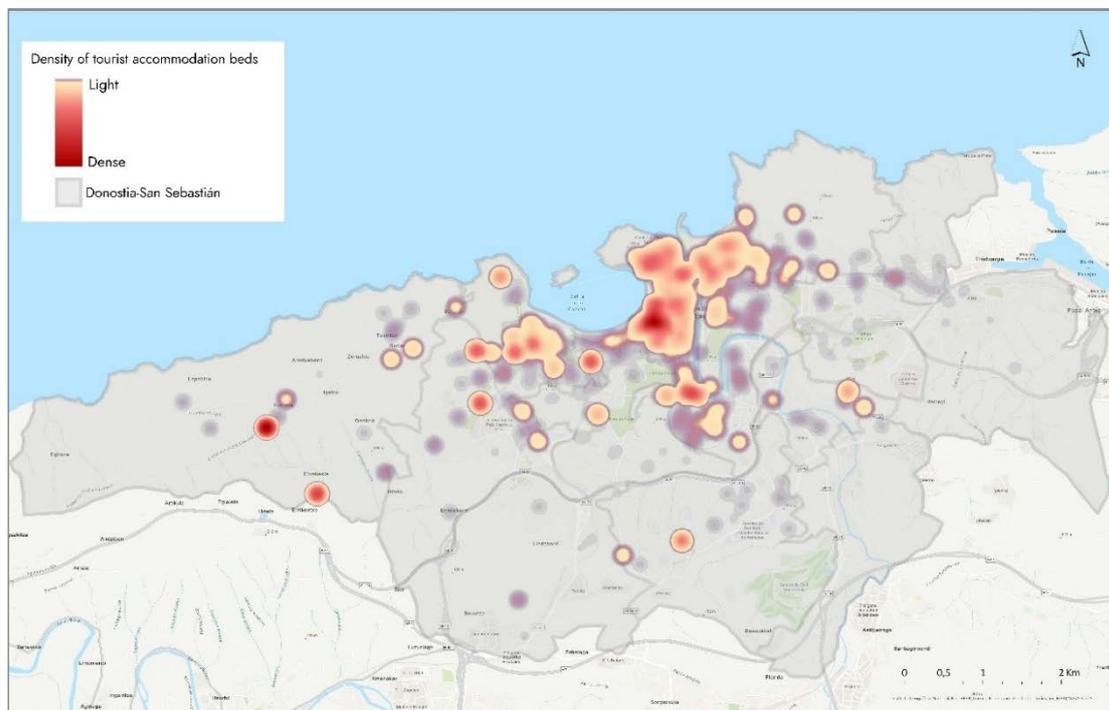
The distribution of the accommodation capacity is highly uneven (Figures 2 and 3). 71.15 % of the beds are concentrated in the four neighbourhoods on the seafront: Igeldo, Antiguo, Centro and Gros. The accommodation formulas of Igeldo are typical of that of the rural hinterland, such as campsites, agro-tourism and rural tourism establishments and villas that are wholly or partially rented for holiday use; Antiguo stands out for its hotel specialisation, mainly large buildings of a high category; Centro is the tourism nucleus of the city (41.6 % of the municipality's hotel beds and 44.9 % of beds on short-term rental properties and rooms); and Gros is specialised in STRs. The intensity of the tourist accommodation in the city as a whole is 95.99 accommodation beds for every 1000 inhabitants. Within the purely urban neighbourhoods, the highest intensity corresponds to Centro (296.04), Antiguo (167.37) and Gros (112.22).

Figure 2. Type of tourist accommodation



Source: own elaboration

Figure 3. Density of tourist accommodation beds



Source: own elaboration

The intensity of tourist accommodation in the area of study (Centro and Gros neighbourhoods) is 207.31, that is, the accommodation beds are equivalent to 20.7 % of the resident population. The data on a city block level enable the penetration of touristification associated to accommodation to be estimated in more detail (Table 2). In 38 of the 305 blocks of the area, very high values of accommodation intensity are recorded. In many these blocks, the number of beds exceeds the inhabitants in the censuses. These places generally house large hotels and have marginal residential spaces, which are gradually being occupied by STRs. In another 40 blocks, high values are recorded (between 25 % and 50 %), in 75 average values are recorded (between 10 % and 25 %) and in 57, low values are recorded (between 1 % and 10 %). On the contrary, there are no accommodation beds in 95 blocks. In some of these cases, the blocks house facilities, but the majority correspond to peripheral residential areas, particularly Centro (flat areas with a predominance of gardened and low-density buildings). In terms of surface area, these 95 blocks represent just 17.44 % of the built-up area. Therefore, accommodation touristification affects 82.56 % of the surface of this area with high or very high impact on almost 25 % of this space.

**Table 2. Number of blocks and area in accordance with the tourist accommodation intensity indicator**

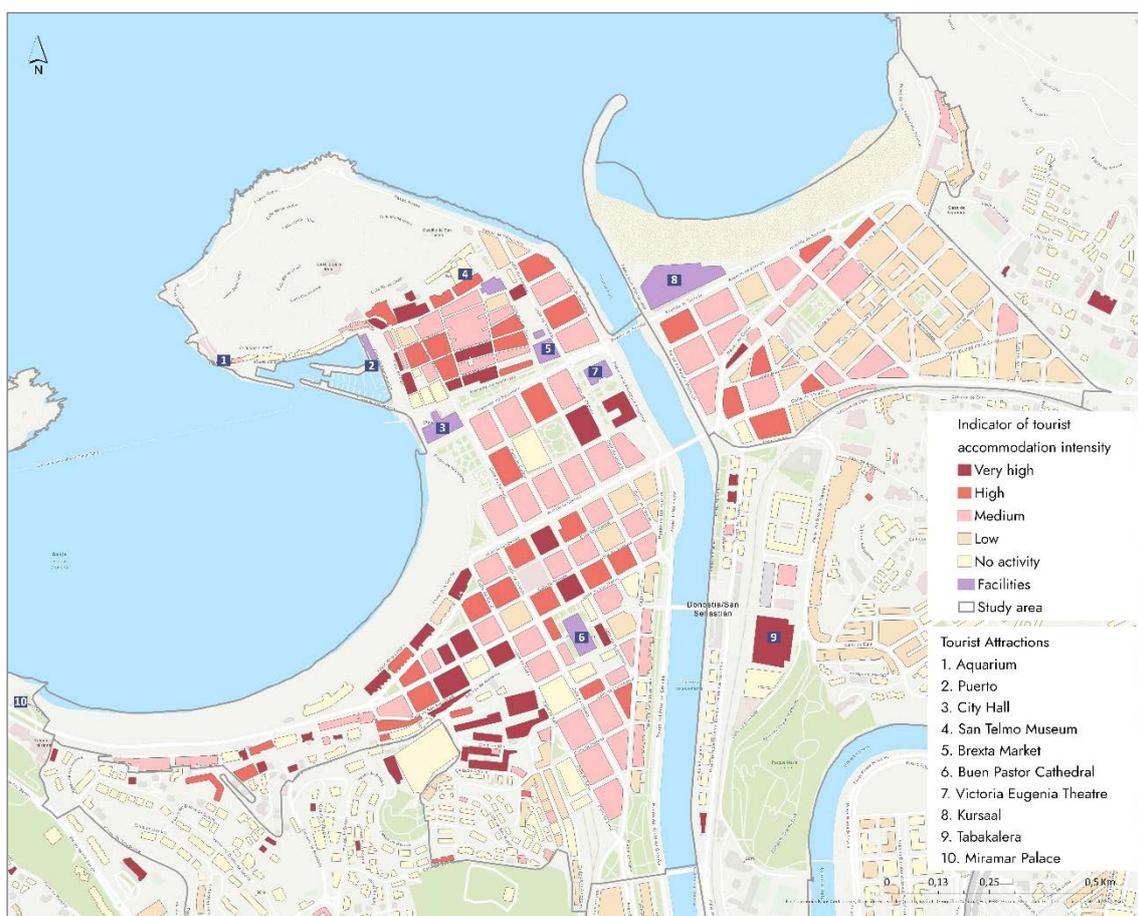
TOURISTIFICATION INDICATOR		NUMBER OF BLOCKS	% BLOCKS	AREA M <sup>2</sup>	% AREA
Very high	>50 %	38	12.46	56,899.13	9.20
High	25-50 %	40	13.11	96,808.03	15.65
Medium	10-25 %	75	24.59	213,893.32	34.58
Low	1-10 %	57	18.69	143,049.33	23.13
No activity	0	95	31.15	107,876.32	17.44
<b>TOTAL</b>		<b>305</b>	<b>100.00</b>	<b>618,526.13</b>	<b>100.00</b>

Source: own elaboration

Within the area, the spatial distribution of the intensity is far from homogeneous (Figure 4). The values vary depending on the characteristics of the urban fabric and the distance from the beach. Within the Centro neighbourhood, the highest intensities are recorded in Parte Vieja. The morphology of the historical quarter makes it difficult to build hotels, therefore, on the whole they occupy one or two floors of residential buildings. More recently, some of these buildings have been transformed into boutique hotels and there has been a proliferation of STRs and there are many blocks in which these types of properties are more numerous than those for residential use. The urban fabric of the rest of the Centro neighbourhood, typical of the nineteenth-century extensions, does not have these limitations for the establishment of large hotels, which is an

accommodation formula that continues to grow in this area. In parallel, there has also been a proliferation of short-term rental properties and rooms across the whole area, whether apartments in purely residential buildings or villas located in the higher parts of the city. There is a lower level of tourist intensification in Gros, which particularly affects the beach front and the banks of the River Urumea. Although some hotels have been established, the principal formula is properties and rooms for tourist use, with a gradual touristification of the residential spaces, property by property, within each plot.

Figure 4. Indicator of tourist accommodation intensity



Source: own elaboration

## 5.2 Tourism specialisation indicator of the retail and hospitality supply

Tourism has been a powerful vector for the transformation of both retail trade and street-level services, such as restaurants, for many years in San Sebastián. The snapshot of the field work shows different levels of intensity of touristification of the retail and hospitality supply, which vary depending on the neighbourhood and district. In the inventory conducted in the Gros and Centro neighbourhoods (including Parte Vieja, Puerto and Ensanche Este), 3334 street-level establishments

were counted. 13 % of these had a very high percentage of connection with foreign customers (+50 %). 5.3 % had a very high level of tourist orientation (25-50 %), 6.7 % a medium level of tourist orientation (10-25 %), 8.9 % a low level of tourist orientation and 64 % have no tourist orientation. On a spatial level, these figures vary between the different neighbourhoods and their internal divisions. In Parte Vieja, Ensanche Este and Puerto, 63 % of the establishments were related to tourism and this was high or very high for more than half of them (53 %). In Gros, these figures are 24 % and 11 %, respectively and in the rest of the Centro neighbourhood 27 % and 7 % (Table 3 and Figure 5).

**Table 3. Street-level establishments in accordance with their connection to tourism**

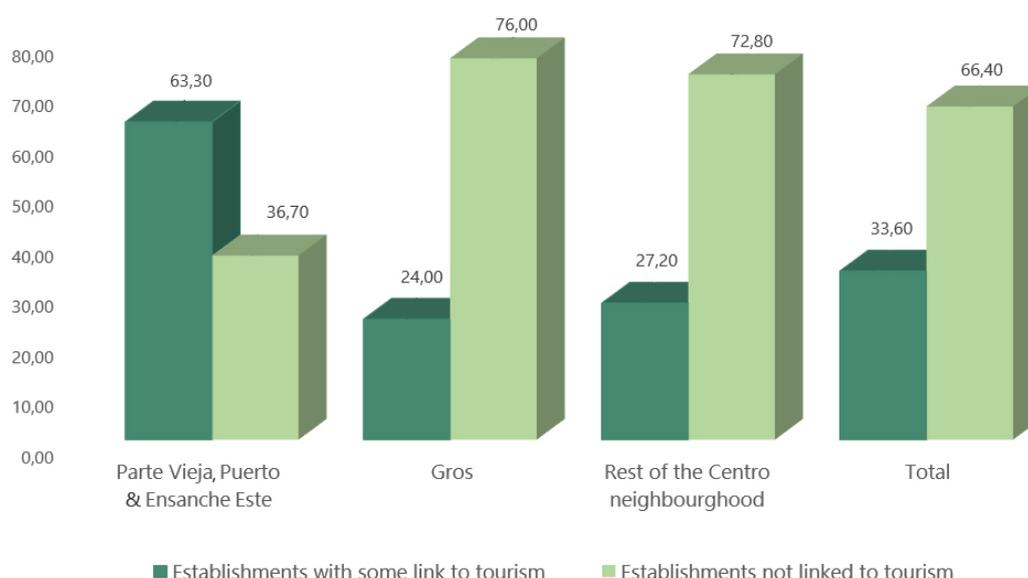
	PARTE VIEJA ENSANCHE ESTE PUERTO		GROS		REST OF CENTRO NEIGHBOURHOOD		TOTAL	
	Total	%	Total	%	Total	%	Total	%
Very high tourist orientation (> 50 %)	290	41.4	89	7.1	47	3.4	426	12.7
High tourist orientation (25 -50 %)	79	11.3	52	4.1	46	3.3	177	5.3
Medium tourist orientation (10-25 %)	46	6.6	80	6.4	98	7.1	224	6.7
Low tourist orientation (> 10 %)	28	4.0	81	6.4	187	13.5	296	8.9
No tourist orientation (= 0 %)	257	36.7	954	76.0	1,010	72.8	2,221	66.4
<b>Total</b>	<b>700</b>	<b>100.0</b>	<b>1,256</b>	<b>100.0</b>	<b>1,388</b>	<b>100.0</b>	<b>3,344</b>	<b>100.0</b>

Source: inventory of street-level establishments, August 2022 and May 2023.

Own elaboration based on field work.

Grouping the data of the inventory of establishments by block, the calculation of the indicator of the retail and hospitality tourism specialisation generates the following figures (Table 4). Overall, the street-level establishments of 49 % of the blocks in the area of study are in some way related to the tourism activity. However, there is a total of 155 blocks (51 %) that have no retail or hospitality establishments engaged in tourism activity. Overall, 24.3 % of the blocks with tourist activity have a high (8.52 %) or very high level of retail and hospitality touristification (3.61 %) (37 blocks in total). There are 36 blocks with a medium value (24 %). The rest have a low value (82; 54.7 %).

Figure 5. Percentage of street-level establishments oriented towards the tourism activity



Source: own elaboration, inventory of street-level establishments, August 2022 and May 2023

Table 4. Number of blocks and area in accordance with the tourism specialisation indicator of the retail and restaurant supply

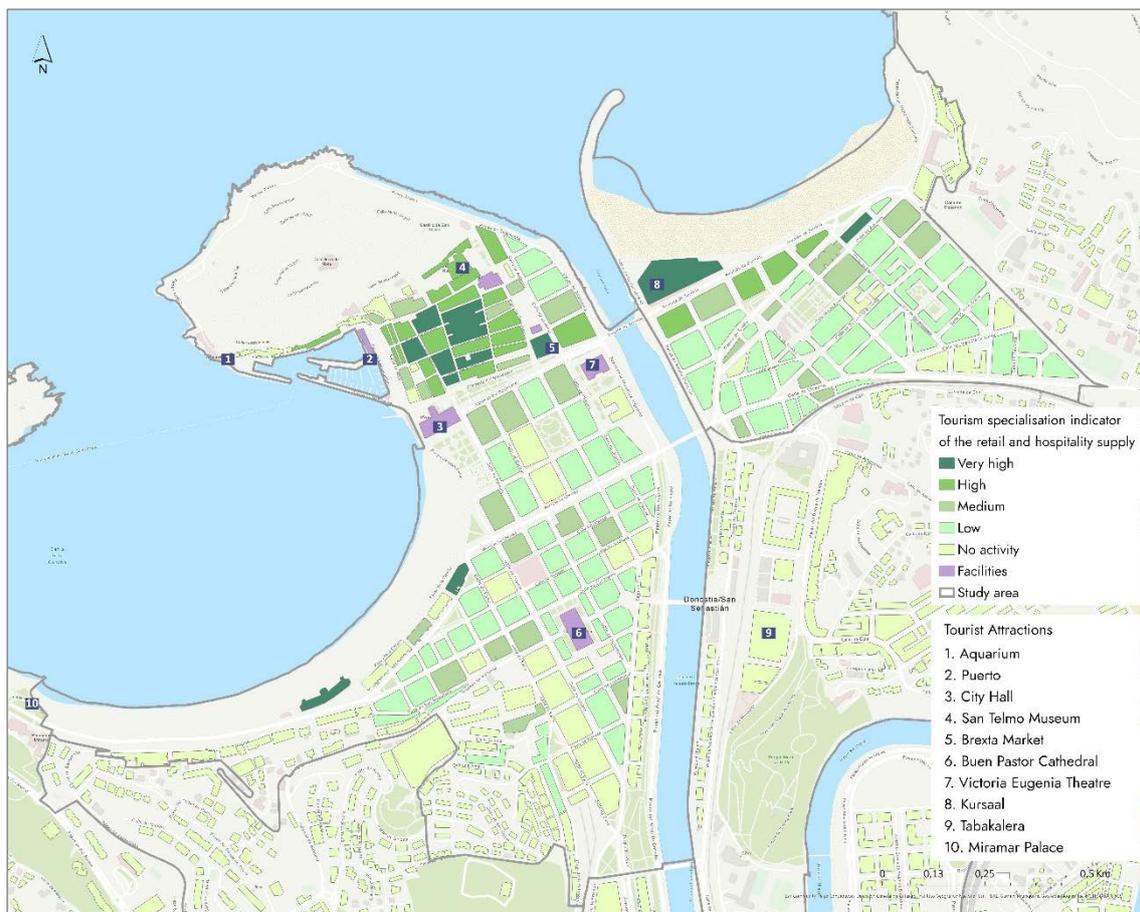
TOURISTIFICATION INDICATOR		NUMBER OF BLOCKS	% BLOCKS	AREA M <sup>2</sup>	% AREA
Very high	>50 %	11	3.61	41,812.30	6.76
High	25-50 %	26	8.52	58,011.16	9.38
Medium	10-25 %	36	11.80	93,013.61	15.04
Low	1-10 %	82	26.89	243,313.14	39.34
No activity	0	150	49.18	182,375.92	29.48
<b>TOTAL</b>		<b>305</b>	<b>100.00</b>	<b>618,526.13</b>	<b>100.00</b>

Source: own elaboration

Figure 6 shows the spatial distribution map of the blocks in accordance with their retail and hospitality touristification indicator. The blocks with high and very high values are concentrated in Parte Vieja, Ensanche Este and Puerto. This is also the case opposite the Zurriola beach (Gros neighbourhood), on the southern side of Alameda, in front of La Concha beach and some blocks of Calle San Martín (Centro neighbourhood). All of the blocks in both Parte Vieja and Puerto have high and medium levels of retail and hospitality touristification and only in Ensanche Este are there two blocks with a low level. Meanwhile, the Gros neighbourhood is a new retail touristification area. The Zurriola beachfront has blocks with high and medium levels of touristification and the rest of the neighbourhood has low levels, although some presence in almost all of the blocks. The

central part of this neighbourhood is another of the spaces of touristification with the highest values in the blocks closest to the Alamea, the Concha beachfront and the surroundings of Avenida de la Libertad and Calle San Martín, where traditional retail supply coexists with global fashion and complement brands. However, there is a large group of blocks (155) in the higher part of the neighbourhood that have no tourism activity, corresponding to residential areas with apartment blocks or houses built on the hill.

Figure 6. Tourism specialisation indicator of the retail and hospitality supply



Source: own elaboration

### 5.3 Spatial analysis of the touristification indicators

The results of the bivariate analysis are shown in Table 5 and Figure 7. By combining the accommodation and retail-hospitality touristification indicators, 16 groups are obtained that reflect both the intensity of the phenomenon and its predominant nature. In order to obtain a simpler estimate, a description of the results grouped into four categories has been made:

- Group 1. Made up of the 16 blocks with the high and very high levels of accommodation and retail-hospitality touristification. They represent 5.28 % of the blocks and a practically equivalent surface area, 5.58 %.
- Group 2. This includes 62 blocks with a primarily accommodation touristification, as they have high and very high levels (values over 25 %) and medium and low levels of retail and hospitality touristification (values lower than 25 %). They represent 20.46 % of the blocks and 19.27 % of the surface area.
- Group 3. This group includes 21 blocks with a predominance of retail-hospitality touristification, with high and very high values (over 25 %) and medium and low values of tourist accommodation. Quantitatively, it is less important group than Group 2, as it only represents 6.93 % of the blocks and 10.56 % of the surface area.
- Group 4. This is made up of 13 blocks without touristification or very low levels in both components, below 10 %. It represents 44.55 % of the blocks and 32.29 % of the surface area. It should be noted that no accommodation or retail-hospitality touristification is detected in only 42 blocks, that is 9.58 % of the total built-up area. In other words, less than 10 % of the total surface area of the area of study is unaffected by touristification.

Figure 7. Spatial analysis of the touristification indicators



Source: own elaboration

The spatial analysis of the touristification indicators reflects that the highest values are recorded in the blocks of the Parte Vieja, with buildings where retail and hospitality with a strong tourist orientation coexist with hostels and STRs on the higher floors. High values are also recorded in a series of purely residential blocks with little retail activity, where the establishment of STRs and hotels is a fairly new phenomenon in these neighbourhoods. On the other hand, beyond Parte Vieja there is a predominance of retail-hospitality touristification in the blocks adjacent to the Boulevard (Centro) - Puente de Zurriola – Avenida Zurriola (Gros) crossroads. Meanwhile, accommodation touristification is much more widespread, extending to the south of this crossroads to the residential developments of nineteenth-century extension of the city.

**Table 5. Number of blocks and area in accordance with the combination of the indicators of accommodation intensity and the retail and hospitality tourism specialisation**

		TOURISM SPECIALISATION INDICATOR OF THE RETAIL AND HOSPITALITY SUPPLY				
		Low (>10 %)	Medium (10-25 %)	High (25-50 %)	Very high (> 50 %)	
INDICATOR OF TOURIST ACCOMMODATION INTENSITY	Very high (> 50 %)	Blocks	23	9	4	2
		m <sup>2</sup>	35,153.99	12,038.11	6,721.22	2,985.82
	High (25-50 %)	Blocks	23	7	7	3
		m <sup>2</sup>	53,249.46	18,738.69	18,029.66	6,790.22
	Medium (10-25 %)	Blocks	51	14	7	3
		m <sup>2</sup>	137,532.98	47,287.71	15,754.13	13,318.49
	Low (>10 %)	Blocks	135	6	8	3
		m <sup>2</sup>	199,752.63	14,949.10	17,506.14	18,717.77

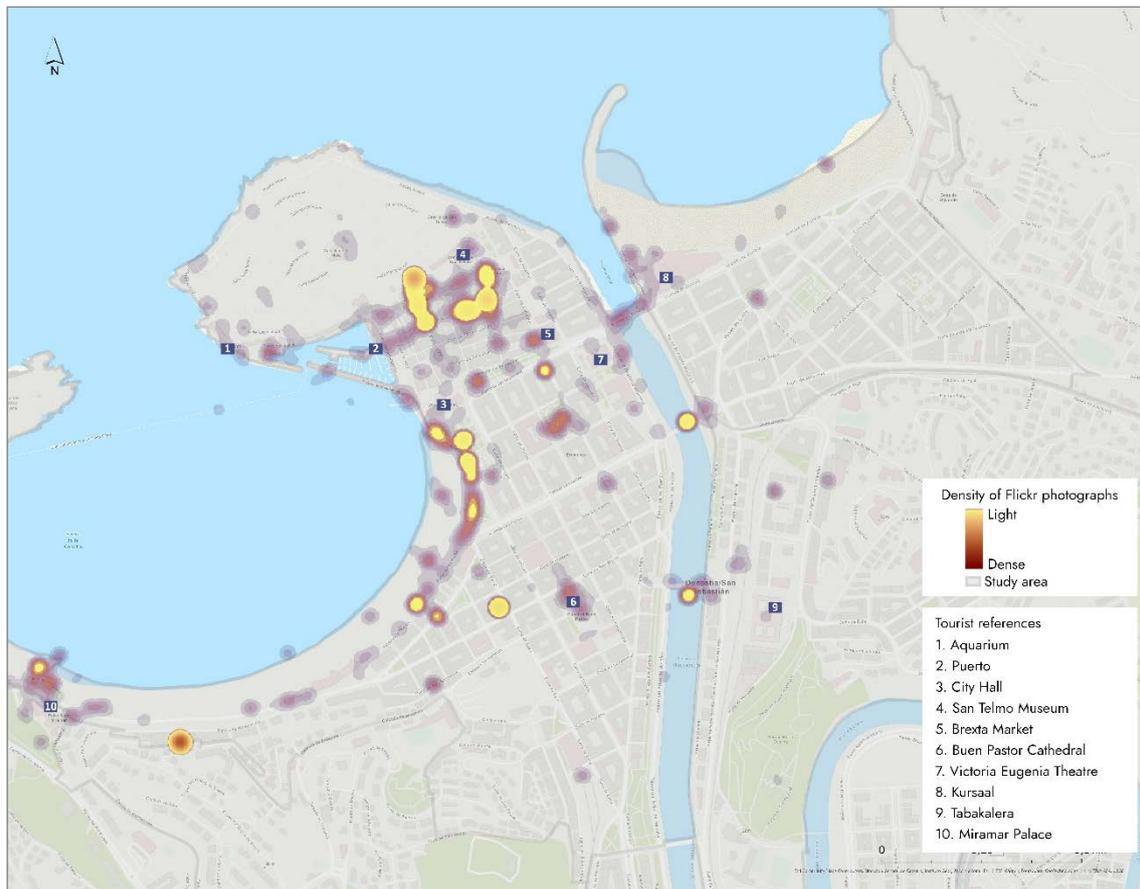
Source: own elaboration

#### 5.4 The presence of visitors

The distribution of the photos uploaded onto Flickr reflects the concentration of tourists and day-trippers in the areas where there is a predominance of blocks with very high values in both indicators. Of the 3072 photos, 27.77 % correspond to the Parte Vieja, where the streets are pedestrianised and where the highest concentration of STRs and tourism-related retail and hospitality establishments can be found. In the rest of the Centro and Gros neighbourhoods, there is a more

dispersed distribution of the photos, associated with the principal tourist attractions: seafront promenades, the monumental City Hall area, the María Cristina hotel and the Victoria Eugenia theatre, the Kursaal and the Cathedral (Figure 8).

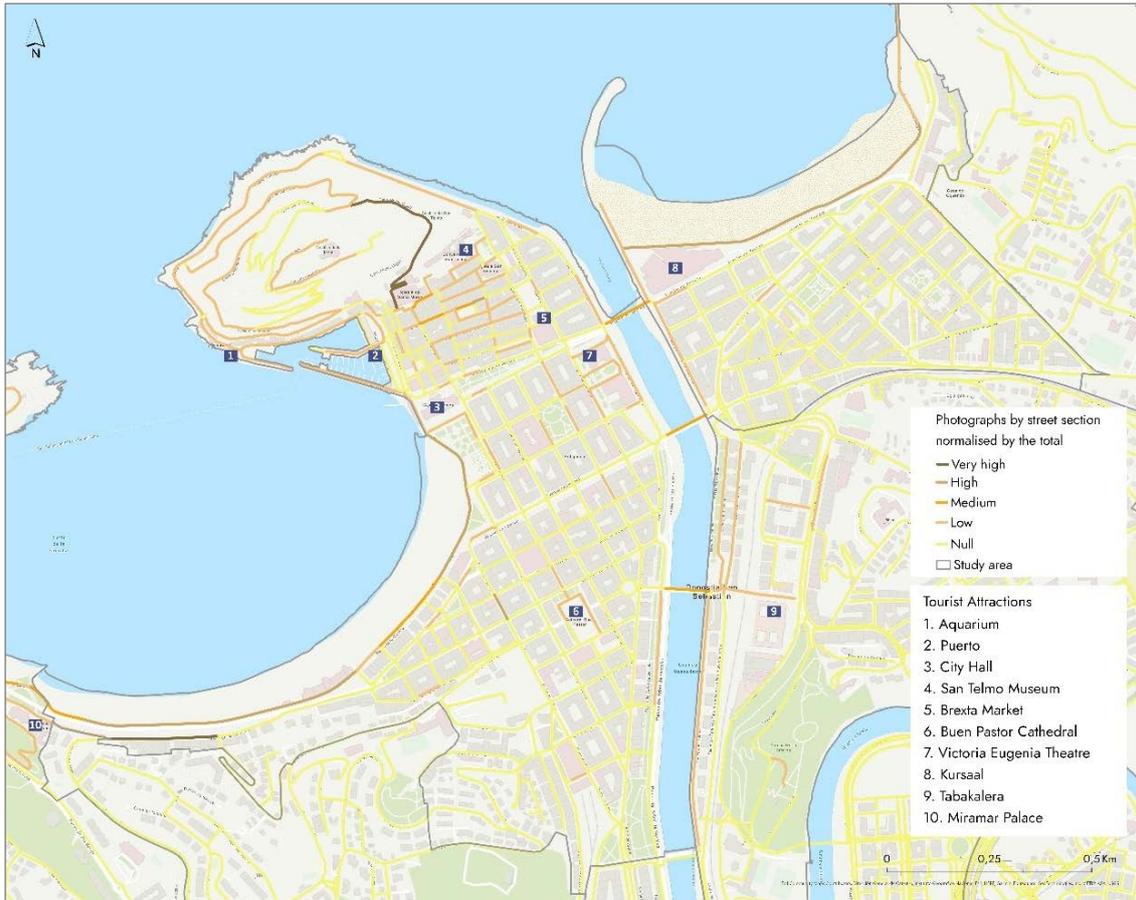
Figure 8. Density of Flickr photographs



Source: own elaboration

In order to better understand the phenomenon, the images have been linked to the closest street sections. This allows the presence of tourists in the particular street to be measured, determining a hierarchy of streets in accordance with this intensity (Figure 9). The streets with a higher presence of images are the spaces where there are perspectives, such as the seafronts (Concha, Ondarreta and Zurriola beaches), the bridges of the River Urumea and the streets accessing to Mount Urgull. In Parte Vieja the principal roads around the Plaza de la Constitución are noteworthy, where many traditional pintxo bars are concentrated.

Figure 9. Photographs by street section normalised by the total



Source: own elaboration

## 6 Discussion and conclusions

The objective of this study is to test several indicators with which to measure urban touristification. First, a simple accommodation (intensity) touristification indicator has been analysed, which takes into account the total number of accommodation beds and not only those corresponding to the STRs (to which the majority of studies on touristification and/or tourism gentrification limit themselves). The second indicator focuses on the tourism specialisation of the retail and hospitality sector and is constructed based on the data collected directly in the neighbourhoods of the city with the greatest tourism activity. One novelty is the identification of the levels of tourism specialisation, which contrasts with other studies published on an urban scale based on traditional statistical records or *big data* and associate the whole of a sector or subsector (all retail and restaurant businesses) with the tourism activity. Using these two indicators, a bivariate analysis is made, which reflects both the intensity of the phenomenon and the tourism specialisation of the subsectors analysed (accommodation and the retail/hospitality supply). The scale of the analysis

(city block) also constitutes an innovative aspect as the majority of existing studies use administrative delimitations (districts, census sections) or regular meshes. The joint use of the indicators coherently reflects the geography of the touristification of Donostia-San Sebastián. Touristification is, above all, a process of the intensification of the tourism activity which is distributed unevenly across the urban space and acts on a pre-existing fabric that determines its scope. This aspect is ignored in many studies, leading to excessively general texts with territorially decontextualised discourses (Jansen-Verbeke, 1998).

The results of the study allow us to differentiate four concentric arcs of different types of touristification. The arc shape is due to the characteristics of the location of the city with a sea front where the beaches constitute the traditional tourist attraction. The nucleus of the first arc corresponds to the historical quarter (Parte Vieja). The blocks of this area record the highest values of the two synthetic touristification indicators (Group 1). The neighbourhood has a dense urban section of narrow and pedestrian streets. Traditionally, it was a popular residential space with a strong presence of retail and hospitality establishments. Currently, it is an area with a strong tourism specialisation in retail and hospitality. The conditions of the urban layout limited accommodation to the format of hostels and guesthouses. However, recently its accommodation capacity has increased significantly due to the proliferation of short-term rental properties and rooms and the transformation of residential buildings into boutique hotels, particularly in the area closest to the port. It is an area that concentrates a large number of visitors and tourism paraphernalia has overtaken the urban scene. In fact, it has a *beaten track* landscape similar to that which can be observed in many other tourist cities (Matoga & Pawłowska, 2018) and is experiencing phenomena such as residential and retail displacement and the emergence of anti-tourism positioning by certain social groups. As in many other historical cities, in this area, touristification threatens the safeguarding of its heritage values, such as its historical urban landscape.

The second arc spans from the Concha beachfront along the Alameda to the Zurriola beachfront. These blocks record high values of retail and hospitality touristification, although that of accommodation intensity is low (Group 2). These are the blocks of the bourgeois extension closest to the Parte Vieja with an orthogonal layout of wider streets and avenues of which the Boulevard de la Alameda is particularly noteworthy. This area has traditionally been one with a high retail and hospitality density with establishments located on the ground floor of buildings that also house homes and offices. In this area, as the tourist flow grows (particularly day trippers), the traditional and specialised retailers that supply the city and a good part of the historical territory of Guipúzcoa are redirecting their business towards foreign visitors. The restaurants specialise in “pintxos” and

there are many ice-cream parlours and take-away establishments in different formats. In addition, the traditional retailers are gradually being replaced by global brands, some with a broad international scope and a noteworthy percentage of tourist customers.

The third arc takes up the majority of the surface area of the area of study. It spans the southern part of the Gros and Centro neighbourhoods in parts that are further away from the seafront. Similarly, to the second arc, it is an area defined by an orthogonal layout and large blocks of residential housing with retail activity at street level. These blocks record high levels of accommodation touristification but lower values with respect to the retail and hospitality tourism specialisation (Group 3). Although there are some hotels in this area, the most significant phenomenon is the proliferation of short-term rental properties and rooms. According to the approaches of the literature on the expansion of the tourist footprint beyond the *beaten track* (Condevaux et al., 2016), in this area, we can observe how the proliferation of online platform accommodation is the principal vector of touristification in these residential neighbourhoods, traditionally unrelated to the tourism activity. In Donostia-San Sebastián, the growth of this accommodation formula has arisen partly due to the fact that the urban planning conditions in these areas are much less strict than in Parte Vieja. In this case, the touristification process represents a pressure factor on the resident population of high-income neighbourhoods. Therefore, as reflected in the recent literature that differentiates between touristification and gentrification (Hernández Cordero, 2021; Sequera & Nofre, 2018b), the growth of the STRs would be a potential vector of demographic emptying rather than social replacement. Within this arc, a unique feature of the Gros area is the surfing ambience, which constitutes a local manifestation of the “new urban tourism” that is identified in other cities (Nientied, 2021). Finally, the fourth arc includes the blocks located on the most peripheral strip of the area of study (Group 4). Here, the levels of both accommodation intensity and retail and hospitality touristification are very low.

The indicators developed can be applied in other destinations. However, their replication could be hindered by the absence of statistical data on the capacity of short-term rental properties and rooms and, particularly, the cost associated with field work, on which the elaboration of retail and hospitality touristification indicators are based. Moreover, the assigning of values for elaborating the indicator implies a certain subjective component inherent in qualitative studies. These replication difficulties constitute a limitation for conducting comparative studies for other destinations and longitudinal analyses that reveal the temporal evolution of the process. However, the use of these indicators enables us to reflect on the scope of touristification. From an applied perspective, the

study generates useful knowledge for making decisions regarding the series of urban policies that contemplate the sustainable insertion of tourism into the city.

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