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How to quantify and characterize day trippers at the local level: An application to the *comarca* of the Alt Penedès

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Abstract

This article presents a methodology for the operational definition, quantification and characterization of day trippers, for use at the local or regional levels. The methodology stresses the importance of such concepts as 'daily urban systems', 'functional areas', 'travel-to-work areas' and other similar aggregations to define what is one of the main features of tourism: 'usual environment'. Different systems are developed for the quantification of day trippers, based on both primary (fieldwork) and secondary data, and we apply both to the case of a *comarca* in the Province of Barcelona (Catalonia). The results show the relevance of the phenomenon of 'same-day trips' (for tourism) and the interest for defining and characterizing this phenomenon correctly in order to implement tourism policies that address the different profiles presented by day trippers.

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Barcelona Province, daily urban system, day trip, local level, operational definition

Introduction: Relevance and difficulties when measuring same-day trips

The importance of the role played by tourism in the economy, directly as well as indirectly, is widely recognized (Daberlay and Stock, 2012; WTTC/Oxford Economics, 2013). Indeed, as an activity that moves ever growing numbers of people (in addition to generating huge cash flows), the need for detailed, reliable, up-to-date information about visitors has become essential for policymakers.

However, while tourist numbers have been exhaustively analysed for large territories (primarily states and the major regions), it is at the local level (where the impact is arguably most important) where, paradoxically, the largest deficits of quantitative and statistical information are to be found.[1] Following Waldhör et al. (2008):

> for many regions 'day tourism' has become the most important source of revenue in tourism. Its impact is always underestimated compared with overnight tourism. (. . .). But surprisingly no real data is available so far to quantify its economic impact apart from some isolated studies dealing with special events.

Among these shortcomings, one of the least analysed phenomena in both the literature and among national and international organizations is same-day trips or day visits. While it is well documented that day trips represent a very high proportion of visitor trips undertaken today, there is a dearth of information about them. The reasons are, among other factors, the difficulties of delimitation (given that day trippers do not spend overnights at the destination, it is not always easy to identify them), the emphasis typically placed on the analysis of international tourism flows and the uncertainty that remains regarding the basic concept, even in the official and international glossaries. Cluzeau (1988) defines the phenomenon of day trips as 'unrecognized, difficult to define, underevaluated', and Candela and Figini (2012) state that 'it is important to remark the difficulties in measuring day trips'. Moreover, according to The International Recommendations for Tourism Statistics 2008 (also known as IRTS 2008), United Nations, New York 2010:

> There are some statistical limitations in producing regional – sub-national – data, especially in the absence of a national collection framework for tourism statistics: defining survey frames for tourism sample surveys conducted at the subnational level is particularly difficult due to the lack of control at the corresponding administrative borders.

The same publication from the United Nations (UN) (2010) defines same-day trips as 'trips that do not involve an overnight stay irrespectively of the number of hours spent on the trip'. This very relevant document also states that 'household surveys based on a stratified sample using spatial, demographic and socio-economic criteria can be efficient and suitable instruments for measuring domestic tourism activity and related expenditure. They can provide comprehensive information on both same-day and overnight visitors'. Nothing else is settled about this concept; therefore, the general criteria for tourism activity must be applied. In this sense, the most important difficulty emerges when trying to translate the official definitions into methodological and empirical analysis, especially regarding the concept of 'usual environment'.

Indeed, when dealing with 'measuring tourism at subnational levels', even the UN (2010) admits that:

> there are often differences between density of population, transportation accessibility, cultural behaviours, proximity to administrative borders etc. within a country. Consequently, it is crucial that the operational definition of usual environment be reviewed and discussed among regional and national entities. It is recommended that a consensus be forged around a common definition that satisfies previous recommendations and takes into account these regional differences.

That means that it may become rather difficult to establish a single statistical determinant of the 'day tripper' concept that is valid worldwide. Nevertheless, there is a general agreement supported by literature as well as by official recommendations (such as Eurostat (EU) or Organization for Economic Cooperation and Development (OECD) ones) that this definition must be based on the following criteria: (a) frequency of travel, (b) duration of the trip, (c) the act of crossing an administrative or national border and (d) the distance travelled from the place of usual residence.

Table 1 highlights the disparity of criteria associated with the concept of usual environment, and the consequent need for a debate to agree on a common methodology that can be applied more widely. This definition is probably the key issue to define same-day trips within the tourism framework as well as to distinguish them from another kind of trips (such as those carried out by residents within their usual environment).

Therefore, the aim of this article is, first, to propose a definition of the day tripper concept that is compatible with the guidelines of international organizations, and which might be deemed valid for any country, and second, to propose a methodology for quantifying and characterizing day trippers at a local-regional level. Additionally, an application to the *comarca* (or county) of the Alt Penedès, in the Province of Barcelona is presented.

The need to define and quantify day trippers was detected in 1969 by Colenutt, but the lack of reliable data forced him to estimate them using a mathematical (gravity) model. Latter work in the field, like Carter (1971) or Janiskee (1980) relied on surveys to quantify the day trippers. A different strand was started by Greer and Wall (1979) and followed by Ewing and Baxter (1981), Var and Quayson (1985) and Cluzeau (1988) trying to quantify day trippers using secondary data. This approach has been used often to quantify day trippers from abroad, due to the existence of customs records (Chandra and Tappata, 2014; Cluzeau, 1988; Miguelsanz, 1984), but it can also be used to quantify domestic day trippers (Carrillo and Jorge, 2006; Divisekera and Nguyen, 2014; Feliziani and Miarelli, 2012; McKenzie et al, 2007; Ohe, 2008; Russo, 2002; Sardá et al., 2005; Scuttari and Castlunger, 2011; Versace et al., 2011).

Different approaches include the use of 'big data' and retrieving information available in Internet (Girardin et al., 2008; Ratti et al., 2006) or the use of qualitative information (AngSek and ChanNgai, 2010).

The methodology presented in this article improves previous research in several ways: First, we quantify the day trippers using commuting-related data, which are more exhaustive than tourism surveys (which are the most widely used source of secondary data). Second, we develop and test a methodology that allows to differentiate day trippers from commuters. Third, the sampling and surveying process is improved respect to previous work, and finally, the use of alternate

Table 1. Criteria used in different countries to delimit the usual environment (overnight trips).

Country	Distance definition	Frequency definition	Other definition
Australia	40 km in one direction		
Bolivia	Duration: 4 h (one direction)		
Brazil		Regularly	
Canada	80 km in one direction		
Chile	30 km in one direction	Weekly	
China	ATU (province or city)		
Costa Rica			Habitual environment
Czech Republic	ATU (city, village)	Two times per week	
Ecuador	ATU (municipality)	Not defined	
Egypt	ATU (governance)	Not defined	
Finland	30–50 km in one direction	Weekly	
France			Respondent definition
Holland			Vacation purpose and duration
Italy	ATU (municipality)	Weekly	
Malta	ATU (Isle)	Regularly	Purpose
Mexico	ATU (policy administration division)	Not defined	
Morocco	ATU (city)		
New Zealand	40 km in one direction		
Oman	ATU (state)	18 trips per year	
Panama	Not defined		
Philippines			Habitual environment
Portugal		Weekly	
Slovenia	25 km and 24 h away from home	10 times one quarter	Respondent definition
Spain	ATU (municipality)		
Sweden	40 km in one direction		
Switzerland		Weekly	
Thailand	ATU (municipality)		
United Kingdom			All overnight trips
Uruguay	ATU (location)		
Venezuela	ATU (municipality)		

Note: ATU: Administrative Territorial Unit.
Source: The Canadian Tourism Commission and *Instituto de Estudios Turísticos* (2003).

methodologies (using secondary data and a direct survey of visitors) allows us to compare the results of both approaches in the same territory.

The article is organized as follows: In the next section 'Operational definition of day trippers', an operational definition of day trippers is proposed; in the section 'Quantification of day trippers from existing data: The case of the *comarca* of the Alt Penedès', and starting from the previous definition, the number of day trippers in the *comarca* of the Alt Penedès is calculated, by using different approaches (including primary and secondary data). The article also tests the reliability of these results. In the section 'Characterization of day trippers', results associated with the characterization of day trippers are offered, and, finally, in the last section 'Conclusions', the main conclusions and proposals for improving the methodology applied are presented.

Operational definition of day trippers

As discussed, the analysis of day trippers is confronted by a basic obstacle from the outset; namely, the vagueness or lack of specificity in international recommendations with regard to trips that should be considered day trips.

A 'visitor trip' can be defined as one that has a main destination which lies outside the usual environment of the traveller; has a duration of less than a year; and, which is undertaken for any purpose other than that of being a wage earner of an entity resident in the country or place visited. There are, therefore, three conditions: moving outside the habitual environment, staying for less than a year and receiving no salary at the place of destination. Additionally, in relation to the visitor trip, two types of visitor can be identified: 'tourists' (visitors of a destination that stay for one night or more, without reaching a full year) and day trippers (visitors leaving the destination on the same day as they arrived, without staying overnight; United Nations World Tourism Organization (UNWTO), 2010). Other authors have used their own definitions: For example, Cluzeau (1988), in Quebec, considers a minimum trip of 80 km to qualify as a day tripper (and considers that, in the United States, the minimum trip should be 160 km), while Chhabra (2006), when quantifying day trippers in the city of Sacramento, considers visitors from Sacramento County (2200 km^2) commuters, not day trippers.

International recommendations regarding the statistics to be used in the analysis and study of tourism, as drawn up by the UNWTO, the OECD and EU, are contained in three main documents: the *International Recommendations on Tourism Statistics* (IRTS 2008, the *International Recommendations for Tourism Statistics 2008. Draft Compilation Guide* (IRTS: CG, 2011) and the *Tourism Satellite Account: Recommended Methodological Framework* (TSA: RMF 2008). From these documents, it can be deduced that a day tripper is a visitor who does not stay overnight at the destination; who travels to a destination that is outside her usual environment; who travels for any purpose (leisure, business etc.) other than that of receiving any type of payment for work performed at the destination; and, with a frequency of travel that is of less than a week.

To determine whether a visitor is a day tripper or not, therefore, we should prioritize the factors of their not staying overnight at the destination and of their leaving their usual environment, the latter being understood as the geographical area in which the individual conducts her everyday life. But where do we set the limits? We propose relating usual environment with the individual's 'urban system' – from a spatial perspective, we typically define zones (generally, groups of municipalities) that constitute what are known as functional areas, that is, areas of everyday displacement (or 'daily urban systems'), areas of labour mobility ('travel-to-work areas'; see Casado-Díaz and Coombes, 2011), shopping areas and so on.

As such, an urban system constitutes a group of municipalities in which a resident performs all her daily activities. Within this territorial division, which exceeds that of the municipality, all displacements within the urban system would be considered her urban commute, while commuting between two different urban systems would be considered a day trip.

This proposal is valid for defining and identifying day trippers associated with a given municipality. Moreover, it can be generalized for a territory greater than that of the municipality since, as shown in Figure 1, to quantify the day trippers in area C_A (which includes more than one municipality), we first need to define the urban systems associated with each municipality in area C_A. Hence, the displacements in blue (i.e. outside the urban system) can be considered day trips, if they meet the other requisites (i.e. the visitor did not stay overnight, did not receive payment for work done at the destination etc.).

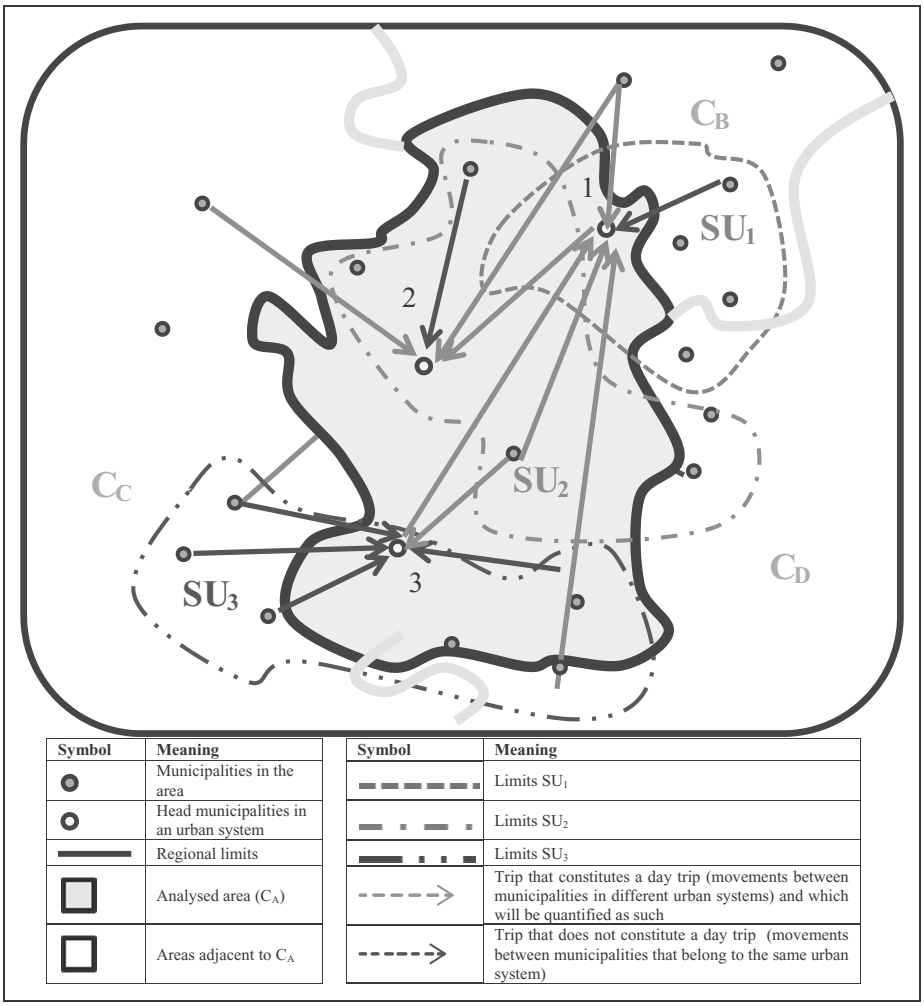
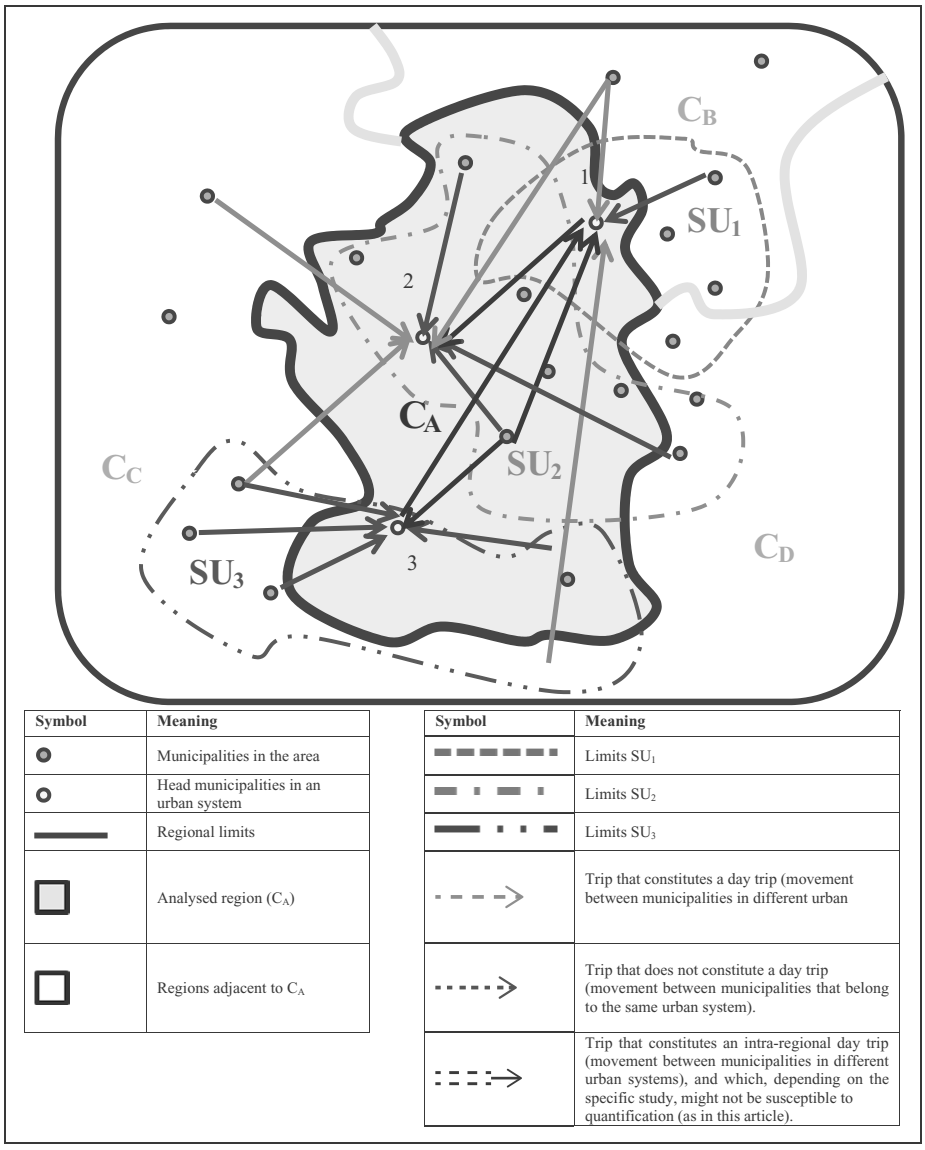


Figure 1. Day trippers considering inter- and intra-regional day trippers.
Source: Own elaboration.

The urban systems associated with each municipality can be determined using the inter-municipal mobility flows of work, education, shopping, entertainment, leisure and so on between other municipalities and the municipality in question.

Likewise, as shown in Figure 1, some visitors from municipalities outside area C_A will not be considered day trippers, since their municipality of origin belongs to the urban system of C_A (see e.g. SU1). As such, the areas of influence spill over the regional limits. In addition, Figure 1 shows that some trips originating in the same municipality (within or outside area C_A) may or may not constitute day trips, depending on whether the destination of the displacement is a municipality within its urban system or not (see e.g. SU3).

At an operational level, while an urban system could be defined for each municipality, given the large number of municipalities that might make up an area C_A, we propose estimating the number



Symbol	Meaning
●	Municipalities in the area
○	Head municipalities in an urban system
———	Regional limits
▭	Analysed region (C_A)
▭	Regions adjacent to C_A

Symbol	Meaning
▬ ▬ ▬	Limits SU_1
▬ ▪ ▬ ▪	Limits SU_2
▬ ▪ ▪	Limits SU_3
- - - →	Trip that constitutes a day trip (movement between municipalities in different urban
····· →	Trip that does not constitute a day trip (movement between municipalities that belong to the same urban system).
⁝⁝⁝ →	Trip that constitutes an intra-regional day trip (movement between municipalities in different urban systems), and which, depending on the specific study, might not be susceptible to quantification (as in this article).

Figure 2. Day trippers not considering intra-regional day trippers.

of day trippers (and therefore their urban systems) only for municipalities with a significant number of such travellers. These 'head' municipalities (municipalities 1, 2 and 3 in Figure 1) are characterized by their tourist, leisure and entertainment attractions, demographic variables and shopping and economic activities.

Finally, a variant of the definition proposed for day trips is determined by the difference between the inter-areas versus the intra-area trips. Thus, while in Figure 1 both are considered, Figure 2 only considers inter-area trips. In order to simplify calculations, in this article, we only

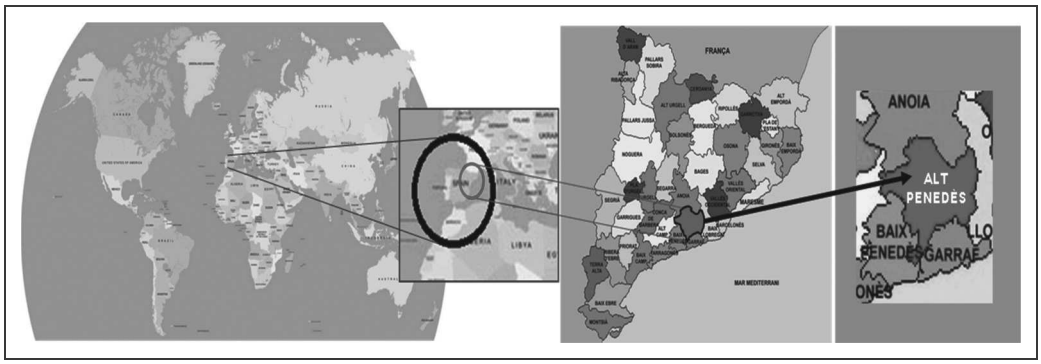


Figure 3. Location of the Alt Penedès.

compute inter-area[2] day trips, without any limitation with regard to the fact that the methodology and application presented would be equally valid for quantifying and characterizing the intra-area day trippers.

Thus, in applying our methodology, a trip is considered a day trip for a certain area when it fulfils two requirements: First, it has originated outside the area being studied; and, second, it has not been generated from a municipality (outside the area) that is part of the area of influence of the head municipality.[3]

Quantification of day trippers from existing data: The case of the *comarca* of the Alt Penedès

Our objective is to quantify the number of interregional day trippers in the *comarca* of the Alt Penedès, 1 of the 11 administrative entities (comprising several municipalities) making up the Province of Barcelona, in the Autonomous Community of Catalonia (Spain). The Alt Penedès has 106,262 inhabitants, occupies an area of 592.7 km^2 and comprises 27 municipalities (Figure 3).

Following suggestions of the Draft Compilation Guide (IRTS: CG, 2011) and the Tourism Satellite Account (TSA: RMF 2008), our starting point is to consider the *comarca's* day trips, that is, journeys outside the usual environment, lasting less than 24 h, without an overnight stay, with a frequency of less than once a week and conducted for a purpose other than to undertake a paid activity at the destination. Eurostat (2013) states that this should be less than once per week. A trip that is repeated once a week is considered to be performed in the usual environment and therefore not considered tourism. Note, we consider habitual trips (not day trips) to be those made between the *comarca's* municipalities and, as stated in Figure 2, those originating from municipalities that make up a common urban system.

Head municipalities and urban systems of the Alt Penedès

Our first step is to determine the *comarca's* head municipalities and its urban systems.

The head municipalities are defined as those with the greatest commercial, leisure (including restaurants) and tourism potential, and which serve as centres of attraction for day trippers. To identify them we used the *Economic Yearbook of Spain* (La Caixa and LR Klein Institute, 2013) and the *Yearbook of Distribution* (Indisa, 2013). Table 2 summarizes this information.[4]

Table 2. Variables used to define head municipalities.

Market share of the municipality in 2012	Retail sales index
Number of bank offices in 2013	Index of restaurants and bars
Number of business premises in industry and construction	Tourist index
Number of commercial wholesale premises	Economic activity index
Number of commercial retail premises 2012	Number of Cash & Carry establishments
Surface (m^2) of commercial retail premises	Total surface Cash & Carry (m^2)
Shopping malls	Number of hypermarkets
Surface (m^2) of shopping malls, 2012	Total surface of hypermarkets (m^2)
Number of restaurants and bars	Number of hypermarkets of more than 1000 m^2
Wholesale trade index	Total surface of hypermarkets of more than 1000 m^2

Source: Economic Yearbook of Spain and Yearbook of Distribution in Spain.

Table 3. Classifications of head municipalities of the Alt Penedès.

Region	Municipality	Socio-economic criteria	Tourist products	Weekday	Holiday/weekend
Alt Penedès	Vilafranca del Penedès	X (20)	X (41)	X	X
	Sant Sadurní d'Anoia	X (13)	X (32)	X	X
	Olèrdola	X (8)	X (15)	X	X
	Santa Margarida i els Monjos	X (2)	X (6)	X	X
	Subirats	2	X (29)		X
	Avinyonet del Penedès	1	X (9)		X
	Castellet i la Gornal	1	X (6)		X
	Font-rubí	1	X (11)		X
	Gelida	X (1)	X (4)	X	X
	Sant Martí Sarroca	1	X (6)		X
	Torrelavit	1	X (7)		X
	Vilobí del Penedès	1	X (10)		X

Source: Own elaboration.

Additionally, the *Marketing Plan and the Inventory of Tourism Products of the Province of Barcelona* (Diputació de Barcelona-Barcelona Provincial Council, 2012) was consulted for information on the major tourist attractions of the municipalities, so that we could select the municipalities most likely to attract day trippers.

Table 3 lists the head municipalities identified both for weekdays and for holidays/weekends.

The urban systems are defined using commuting flow data both for work and studies as recorded in the 2011 Census of Population, as well as various mobility surveys conducted in the Province of Barcelona: the Metropolitan Transportation Authority (EMT) conducts annually the *Mobility Survey on a Weekday*,[5] but this does not cover all the municipalities of the province. In 2006, the Daily Mobility Survey, which is more exhaustive and based on a larger sample, was also conducted. Similarly, the Metropolitan Area of Barcelona (AMB)[6] carries out a complementary mobility survey for the municipalities of the first metropolitan ring.[7] These two surveys, although

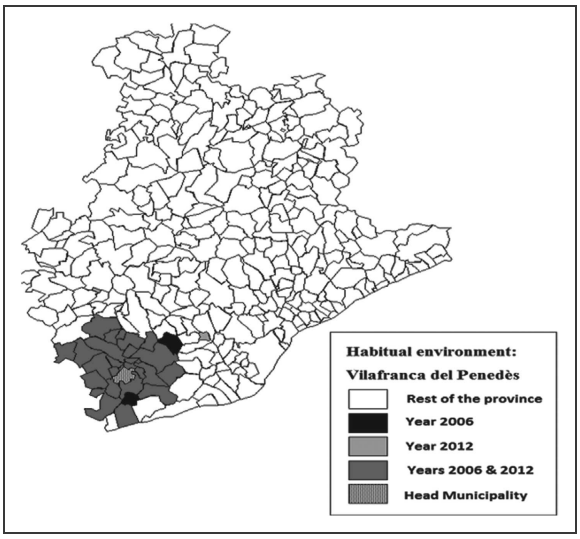


Figure 4. Urban System of Vilafranca del Penedès.
Source: Own elaboration.

not as exhaustive as the Census of Population, have the advantage of considering a greater number of motives for mobility than the Census.[8]

Therefore, to define the urban system in municipality A, we use inter-municipality mobility flows exclusively. The mobility surveys outlined above provide mobility flows between A and the other Catalan municipalities (municipalities B, C, D etc.) but considering all type of day trips (e.g. including biking).

These flows are bidirectional, that is, in the case of municipalities A and B, there are two flows: A → B and B → A; however, as we are only interested in the visitors to municipality A, only the second of these flows is of interest to us. Indeed, the data of interest for constructing the *usual environment* of municipality A are flows B → A, C → A, D → A, E → A and so on. Yet, of these flows, we use only those that are large enough to indicate, unequivocally, a strong relationship between the two municipalities. As a threshold, we choose a flow that represents at least 4.5% of the total displacements originating from municipality B or at least 4.5% of the total flows received by municipality A.[9] Therefore, all municipalities with a flow of mobility *towards municipality A* that fulfils one of these two conditions are considered part of municipality A's usual environment. Thus, our methodology does not explicitly require the geographical contiguity of all municipalities that make up the usual environment of a head municipality.

Figures 4 and 5, by way of examples, show the urban systems for the two most populous head municipalities.

Quantification of day trippers from existing data

Our first approach to quantifying the number of day trippers to the Alt Penedès uses previously existing statistical sources, which does not entail any fieldwork.

The three statistical sources that provide information on daily movements of people in Catalonia are the 2011 Census of Population, the Mobility Survey on a Weekday (EMEF) and the

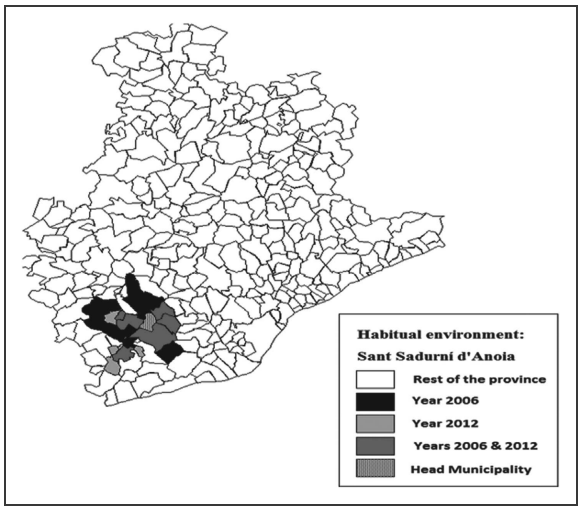


Figure 5. Urban System of Sant Sadurní d'Anoia.
Source: Own elaboration.

Everyday Mobility Survey (EMQ).[10] For various reasons, the Census data are not very useful for our purpose here.[11] For this reason, the EMEF and EMQ were used for the estimation of day trippers on weekdays and weekends, respectively.

For a trip to be considered a day trip into the *comarca* (or an inter-*comarcal* day trip), this trip must meet two requirements: (a) it must have originated outside the *comarca* under study and (b) it cannot have originated in a municipality that forms part of the area of influence of the head municipality.

If both conditions are simultaneously met, the trip is considered one of the day trips made to the *comarca* from other *comarcas*. If it only meets one (or neither) of the criteria, the trip is discarded from our study.[12]

Two methods have been used to estimate the number of day trippers: one based on mobility surveys (this subsection), and another, based on our own fieldwork and primary data collection (next subsection).[13] The first approach, like the one presented in next subsection based on new fieldwork, can be applied to other regions in the world. For example, there are mobility surveys in Ottawa (Canada), Seattle, San Francisco, Madison and the Sonoma county (USA) and others done by different institutions over their employees (MIT, Queen Mary University – London, University of North Carolina, among others).

In both cases, the study involved territorial agents, consulted via *focus groups*, both to assess the head municipalities selected and to determine a range of other specific aspects concerning the fieldwork.

Estimation of weekday day trippers. Given that the EMEF[14] for 2012 provides information on the reasons for which a trip was undertaken, once the areas of influence of the municipalities are delimited, this survey can be used to calculate the number of day trippers that a territory receives daily.

The survey assigns each interviewee a weighting factor, that is, a value that indicates how many inhabitants of the Metropolitan Region of Barcelona (RMB) he or she represents. This allows us to

Table 4. Estimation of weekday day trippers in the Alt Penedès (2012) from the Metropolitan Region of Barcelona.

Main reason for trip	Survey of number of trips (1)	Total trips (2)	Weighting coefficient (3)	Trips made by day trippers (4)	Number of day trippers (5)	Equivalent full time day trippers (6)
Work	18	7024	0.175	1229	1082	185
Study	1	249	0.07	17	17	6
Daily shopping	1	119	0.1	12	12	2
Health trips or similar	1	170	1	170	170	34
Visiting relatives or friends	2	1372	1	1372	1372	480
To accompany others	6	1696	1	1696	1696	332
Working formalities	2	615	1	615	615	154
Personal issues	5	2486	1	2486	1528	386
Leisure, entertainment, shows, movies etc.	2	863	0.925	798	798	150
Total	38	14593		8396	7291	1729

estimate, on the basis of the values obtained in the survey, the total number of displacements in the RMB.

Using the EMEF data, we calculated the number of day trippers that visited the *comarca* of the Alt Penedès on a weekday. The procedure was as follows:

1. Elimination of return trips to usual home environment.
2. Identification of all trips with the Alt Penedès as their destination (Villafranca del Penedès, Sant Sadurní, Olèrdola, Santa Margarita i els Monjos, Avinyonet del Penedès, Castellet i Gornal, Gelida and Sant Martí Sarroca) and which started in another *comarca*.
3. Of the trips identified in (2), elimination of those originating in a town that belongs to one of the Alt Penedès' urban systems or the same urban system (column 1 of Table 4).
4. Weighting of each observation, each trip has been multiplied by the survey's weighting factor. In this way, we obtain an estimation of the total number of trips to the *comarca* of the Alt Penedès on a weekday (column 2 of Table 4)
5. However, not all the trips considered within the previous section can be considered day trips, as many are undertaken in order to return to the usual home environment. For this reason, each trip motivation is given a weighting coefficient: If this coefficient is low, then a high proportion of trips of this type are 'usual' trips, not day trips (column 3 of Table 4). These coefficients are calculated taking into consideration the motivation for the trip and are based on the information provided by representatives from the local authorities and tourist offices in several municipalities of the Alt Penedès.
6. The proposed multiplier in step 5 multiplies the total number of trips obtained in step 4. By so doing, we obtain the number of daily incoming day trippers for the Alt Penedès, broken down according to the motivation of the trip (column 4 of Table 4).
7. To determine the number of individuals undertaking these trips (given that one person can make more than one trip to the Alt Penedès on the same day), those who travel to the Alt Penedès more than once on the same day have been identified. We then eliminated all the additional trips with the exception of the first. Column 5 shows the total number of people making one trip to the Alt Penedès.

8. As many people undertake several daily trips, and not all the trips have the same *comarca* as their destination, the value obtained in (4) has been weighted in line with the following function:

$$\frac{\text{Number of trips of person } i \text{ with Alt Penedès as final destination}}{\text{Total number of trips made by person } i}.$$

   By so doing, we can obtain the equivalent number of full-time day trippers who visit the Alt Penedès on a weekday (column 6 of Table 4).
9. We reviewed the original data (EMEF 2012) to analyse the possibility that significant movements towards municipalities not chosen as a head municipality have been chosen, but this was not the case – the trips within the *comarca* with destination to one of these municipalities were not relevant.

Our results are shown in Table 4. Overall, each day of the year, the *comarca* of the Alt Penedès receives 14,593 trips, but of these only 8396 can be considered day trips. These 8396 trips are generated by 7291 day trippers, but considering that many of these people visit other regions too, the number of 'full-time'[15] day trippers in the Alt Penedès is 1729 people on a weekday. We should stress that this estimation of weekday day trippers only takes into account those that start their journey from the RMB, so that the actual number of day trippers would be higher (when including movements of other municipalities of the Province of Barcelona and for example, of other provinces of Catalonia).

Estimation of the number of day trippers on holidays and at weekends. This estimation is based on the EMQ data, for the whole of Catalonia (and not just the RMB, as above) and for all the days of the week (with a total of 44,084 respondents on weekdays and 8629 at weekends). The 8629 weekend respondents reported making a total of 25,371 trips. One drawback of this data source is its relative age, not having been updated since 2006.

The methodology used was the same as that described above for weekdays. The only change was we considered the trips from outside the *comarca* to the municipalities of Alt Penedès that are not considered heads of any urban system. Although these municipalities do not have the capacity to attract visitors, for reasons of shopping or work, they are attractive for weekend day trippers.

In this sample, day trippers making more than one-day trip to the Alt Penedès on Saturdays or Sundays were not found.

The 'reason for trip' section list specific motives, for which weighting coefficients (obtained as in (5) above) are suggested. The results are presented in Table 5. Thus, it is estimated that every weekend, on average, the Alt Penedès is visited by 21,772 people, corresponding to 8922 day trippers visiting this *comarca* exclusively (equivalent full-time day trippers). In this case, and unlike the estimation of weekday day trippers, we count day trippers to the Alt Penedès from all the other *comarcas* of Catalonia.

If we analyse Saturdays and Sundays separately, a number of differences emerge: Around 41% of all weekend trips are made on Saturdays (Table 6), the rest on Sundays (Table 7). Significant differences are found here in terms of the motivation for the trip, with work trips, shopping and personal issues being concentrated on Saturdays, and visiting family and friends and other leisure activities being concentrated mostly on Sundays.

Given that 2012 comprised 250 weekdays, 52 Saturdays, 53 Sundays and 11 holidays falling on a weekday (the latter being treated as Sundays for the purposes of this study), we can estimate the total number of day trippers that the Alt Penedès receives in a year (Table 8).

Table 5. Estimation of day trippers at weekends in the Alt Penedès (2006).

Main reason for trip	Survey of number of trips (1)	Total trips (2)	Weighting coefficient (3)	Trips made by day trippers (4)	Number of day trippers (5)	Equivalent full-time day trippers (6)
Work	6	2134	0.1	213.5	213.5	86
Daily shopping	5	813	0.175	142.1	142.1	65
Non daily or occasional shopping	2	999	1	999	999	375
Visiting family or friends	24	8229	1	8229	8229	3528
Accompany others	1	693	1	693	693	173
Personal issues	3	1161	1	1161	1161	428
Business lunch etc.	3	1028	1	1028	1028	368
Sports activities	6	1165	1	1165	1165	537
Cultural activity (museums, lectures, movies, theatre etc.)	1	146	1	146	146	73
Other leisure activities (restaurants, entertaining etc.)	12	4341	1	4340	4340	1915
Walking	8	3654	1	3655	3655	1374
Total	71	24,363		21,772	21,772	8922

Table 6. Estimation of day trippers on Saturdays in the Alt Penedès (2006).

Main reason for trip	Survey of number of trips (1)	Total trips (2)	Weighting coefficient (3)	Trips made by day trippers (4)	Number of day trippers (5)	Equivalent full-time day trippers (6)
Work						
Daily shopping	5	1623	0.1	162	162	60
Non daily or occasional shopping	2	422	0.175	74	74	31
Visit family or friends	2	999	1	999	999	375
Accompany others	8	2950	1	2950	2950	1180
Personal issues	1	693	1	693	693	173
Business lunch etc.	2	653	1	653	653	327
Sports activities	1	410	1	410	410	137
Cultural activity (museums, lectures, movies, theatre etc.)	3	705	1	705	705	353
Other leisure activities (restaurants, entertaining etc.)	0	0	1	0	0	0
Walking	2	522	1	522	522	261
Total	29	10,982		9173	9173	3664

Quantification of day trippers from fieldwork. To estimate the number of day trippers, we first need to establish whether it is in fact better to conduct fieldwork at source. Such a survey has the advantage of providing a more reliable estimation of day trippers because it can be conducted with all

Table 7. Estimation of day trippers on Sundays in the Alt Penedès (2006).

Main reason for trip	Survey of number of trips (1)	Total trips (2)	Weighting coefficient (3)	Trips made by day trippers (4)	Number of day trippers (5)	Equivalent full-time day trippers (6)
Work	1	512	0.1	51	51	26
Daily shopping	3	390	0.175	68	68	34
Non daily or occasional shopping	0	0	1	0	0	0
Visit family or friends	16	5279	1	5279	5279	2348
Accompany others	0	0	1	0	0	0
Personal issues	1	508	1	508	508	102
Business lunch etc.	2	618	1	618	618	232
Sports activities	3	460	1	460	460	184
Cultural activity (museums, lectures, movies, theatre etc.)	1	146	1	146	146	73
Other leisure activities (restaurants, entertaining etc.)	10	3818	1	3818	3818	1654
Walking	5	1650	1	1650	1650	605
Total	42	13,381		12,598		5258

potential day trippers and it can be carried out at all potential visitor sites. However, it is not problem free, given the difficulties associated with analysing a local area, such as the delimitation of the population to be surveyed and the need to work with extremely large sample sizes in order to draw conclusions and introduce relevant weightings for small municipalities.

Figure 6 shows the isochrones connecting each point of the territory where a survey should be conducted and where it is necessary to define the number of surveys conducted at each point of origin and along every isochrone to estimate the day trippers in the Alt Penedès. This illustrates the high costs associated with this procedure especially if the territory to be analysed is particularly large.

The existing literature, based on the analysis of case studies, favours surveys conducted at the destination, that is, a specific analysis of a given location.[16] Two such studies are those conducted in Bruges (Vanhove, 1995), Venice (Van der Borg, 1995), the Australian state of Victoria (West and Gamage, 1997, 2001) or Sacramento, California (Chhabra, 2006), respectively (other interesting studies have been undertaken in Paris and the Ile de France region, New York, and the large parks of the United States). In Spain, this approach has been used at regional level by Esteban et al. (2011) and, in small municipalities by Royo and Serarols (2005) and Royo (2005), whose problems were similar to ours (see below). These studies report surveys of destinations (or several points within them) of both tourists and day trippers, as is subsequently revealed in the classifications they propose.

Conducting the survey within the destination would appear to be the most appropriate methodology here. It is a tried and tested method and one that is widely accepted at the academic level; however, it does give rise to a problem when transferring it to the present study. Most of the cases studied in the literature focus on a clearly delimited place (a city, a nature reserve etc.). However, here our focus is on movements between points and on tourist resources and products that do not lie within an urban area or enclosed space but rather in a *comarca* made up of a set of municipalities and tourist spots.

Table 8. Estimated annual number of day trippers in the Alt Penedès.

Main reason of trip	Survey of number of trips (1)	Total trips (2)	Weighting coefficient (3)	Trips made by day trippers (4)	Number of day trippers (5)	Equivalent full-time day trippers (6)
Accompany others	1552	460,036	1	460,036	460,036	92,009
Cultural activity (museums, lectures, movies, theatre etc.)	64	9344	1	9344	9344	4,672
Other leisure activities (restaurants, entertaining etc.)	1244	487,246	1	471,064.8	471,064.8	156,958
Business lunch etc.	180	60,872	1	60,872	60,872	21,939
Non daily or occasional Shopping	104	51,948	1	51,948	51,948	19,481
Daily shopping	546	76,654	0.1	11,183.2	11,183.2	4,284
Study	250	62,250	0.07	4357.5	4357.5	1,500
Work	4824	187,3164	0.175	319,016.4	282,245.5	51,030
Working formalities	500	153,750	1	153,750	153,750	38,500
Personal issues	1418	687,968	1	687,968	448,468	119,980
Health trips or similar	250	42,500	1	42,500	42,500	8,500
Walking	476	209,860	1	209,860	209,860	78,686
Sports activities	348	66,100	1	66,100	66,100	30,106
Visiting relatives or friends	1940	834,256	1	834,256	834,256	331,636
Total	13,696	5,075,948		3,382,256	3,105,985	959,280

Note: RMB: Metropolitan Region of Barcelona. This estimate considers day trippers on weekdays from RMB and weekend day trippers from the whole of Catalonia. It does not therefore consider weekday day trippers from outside the RMB.

Our objective here, therefore, is to obtain a representative sample of the reality of the destination from which we can establish a ratio or set of ratios of day trippers based on known criteria. To obtain this representative sample, we need to take into consideration all locations that attract visitors and assign each an appropriate weighting based on their contribution to the whole. Below, we outline various applications of this methodology.

a. Estimation of day trippers from the destination's day tripper–tourist ratio

This is especially useful in the case of the existence of a wide range of regulated accommodation at the destination (especially hotels), as this ensures a reliable and plentiful source of data. If a survey is well designed and is based on appropriate sampling methods, we can estimate the day tripper–tourist ratio for the municipality. The ratio is calculated as follows:

$$\mathrm{TD} = \frac{\mathrm{DDO}}{\mathrm{OT}} \times \mathrm{TOTD},$$

where,

TD: total number of day trippers;

DDO: number of day trippers visiting destination (as obtained in the survey);

OT: number of overnight tourists using hotel accommodation (as obtained in the survey) and

TOTD: total number of overnight tourists using hotel accommodation at the destination.

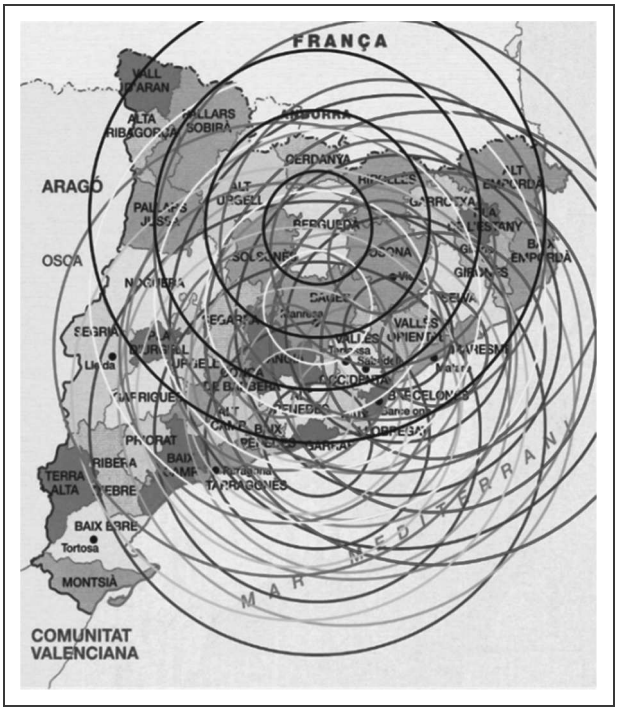


Figure 6. Isochrones associated to each point where a survey is done.
Source: Own elaboration based on Google map.

It should be borne in mind that if we are dealing with an area in which there are several important tourist destinations an 'exchange effect' might exist, that is, people who spend the night at one destination but visit another destination. A further problem is that tourists, especially foreigners travelling with tour operators, often do not really know in which town they are staying. To overcome this problem, it might be better to work with a larger destination, including several municipalities.

b. Estimation of day trippers from the destination's day tripper-registered population ratio

This methodology involves conducting a survey in the destination's main attractions[17] and calculating the ratio between residents and day trippers. The number of residents is a known number (via register/census) which makes this estimation relatively easy to perform.

However, as not all the residents will visit the destination's attractions, we need prior information about the volume of residents who normally visit these places. This group of residents is the reference used for our estimations and the figure is a readily obtained, objective value. However, the application requires a supplementary survey, which involves an additional cost.

Another option that can be used to make the estimation is to use expert evaluations of the municipalities in order to establish the volume of people who visit such attractions as markets or town squares. If using this method, appropriate sampling points must be chosen, as the residents must be correctly weighted in the resident–visitor ratio.

Table 9. Distribution of contacts by typology.

Summer	657 (100%)	432 (65.8%)	213 (32,4%)	12 (1.8%)
Autumn	759 (100%)	557 (73.4%)	186 (24.5%)	16 (2.1%)
	1416 (100%)	989 (69.8%)	399 (28.2%)	28 (2.0%)

Source: own elaboration.

c. Estimation of day trippers from visitor data obtained at one specific site

This method can be applied when there is one site – be it a museum or tourist centre – that keeps a record of the number of visitors, a record, moreover, that differentiates between residents and non-residents. If the number of people who visit this site is high enough to obtain good estimations, a survey can be conducted at other sites of the destination to estimate the ratio between tourists and day trippers visiting the site and those that stay away. By applying the ratios obtained from the survey to the absolute value of visitors who have visited the site, we can estimate the total number of day trippers visiting the destination.

Given the obvious absence in the *comarca* of one specific site with the characteristics outlined above, we opted to implement methodologies (a) and (b).

Prior to undertaking the fieldwork, a focus group meeting made up of representatives from the *comarca's* main tour operators was conducted. These actors provided relevant information regarding specific sites to survey, the best times of year to collect the data, as well as confirming the main municipalities to include in the survey.

The fieldwork was undertaken in the *comarca* of the Alt Penedès. We implemented a quota sampling stratified by municipality, tourist site attraction and day (Saturday and Sunday) and selected the final units (i.e. individuals) by simple random sampling. The fieldwork was conducted in two waves, first in summer (August 2014) and second in autumn (October 2014), to sample two different tourism scenarios during the year. The periods analysed were those suggested by the *comarca's* tourist experts. The current sample comprises 399 day trippers and when disaggregated by season, the summer and autumn subsamples are made up of 213 and 186 day trippers, respectively.

To obtain 399 face-to-face surveys, we contacted 1416 people (Table 9). Residents of the *comarca* made up 69.8% of this group, but they were not the focus of the survey. However, as discussed above, data concerning the number of residents contacted is useful when seeking to quantify the number of day trippers in the *comarca*. Based on the size of the real sample obtained ($n = 399$ day trippers), and working with a level of confidence ($1 - \alpha$) of 95.5% and assuming maximum uncertainty ($P = Q = 0.5$), the estimation error is 5%. However, taking into consideration the large size of the two subsamples, this error is 6.9% for summer and 7.3% for autumn.

We designed a questionnaire to be administered at weekends and to identify and characterize day trippers. In addition to questions about the respondent's age, gender and level of education, a further 14 items were included. These items were elicited in a face-to-face interview following the sequence outlined in Figure 7.

Based on our fieldwork, we obtained three estimations of the number of day trippers in the *comarca* (the differences that appear reflect the differently weighted coefficient applied):

1. Ratio between day trippers/tourists staying only in hotel accommodation.
2. Ratio between day trippers/tourists staying overnight in any type of establishment (hotels, hostels, guesthouses and apart-hotels).
3. Ratio between day trippers/residents.

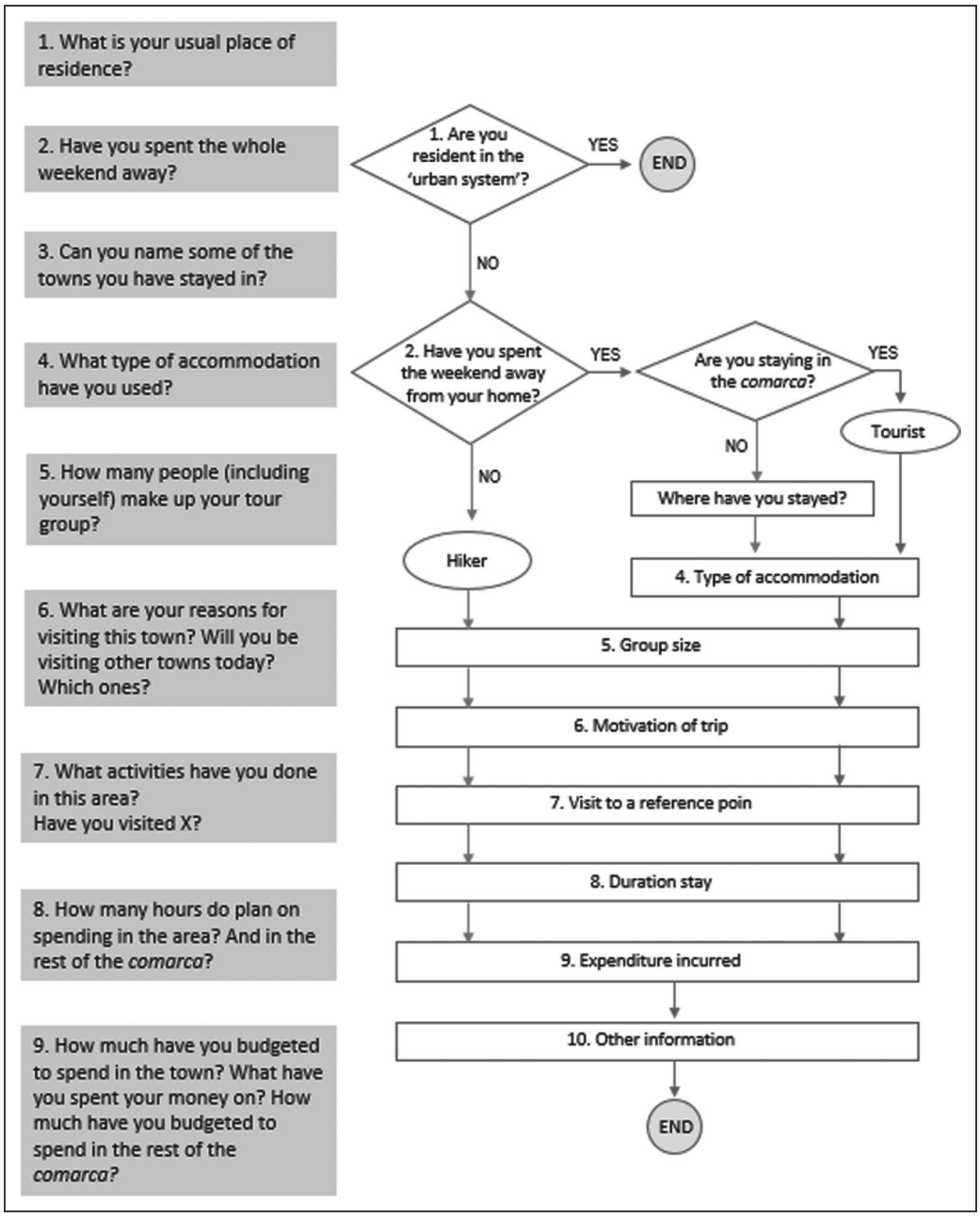


Figure 7. Sequence followed in the questionnaire.
Source: Own elaboration.

Table 10. Estimated number of day trippers (nonworking days) based on raw data in the Alt Penedès.

Scenario	Daily number of day trippers at weekends	Number of day trippers over whole weekend	Total annual number of day trippers* (nonworking days)
1	8856	17,713	1,027,341
2	9084	18,168	1,053,766
3	8266	16,532	958,910

*2012 comprised 250 weekdays, 52 Saturdays, 53 Sundays and 11 holidays falling on a weekday (the latter being treated as Sundays for the purposes of this study).

Estimations 1 and 2 are based on the accommodation available in the Alt Penedès. This information is strictly limited to the *comarca*, where the number of hotels is small. Thus, we opted to undertake a third estimation based on the ratio between day trippers/local residents. This was computed as follows:

$$\frac{\sum sD_i/sR_i}{n} \times \%Pi,$$

where,

sDi: survey conducted with day trippers;

sRi: survey conducted with residents;

$\%Pi$: local population of municipality i as a percentage of the total population of the municipalities making up the sample and

n: number of municipalities.

The ratio was calculated for each municipality and weighted according to the size of the municipality. Ideally, this estimation should take into account the fieldwork so that we might to estimate the local population at these survey point. However, for reasons of budget, we did not conduct a specific survey; rather, we conducted an estimate based on the focus group of experts from the *comarca*. Specifically, we estimated that the percentage of local population making up the surveyed areas is about 90%.

The estimations obtained for three different scenarios when employing the first strategy are shown in Table 10.

4. The fourth estimation strategy employs the secondary data from the Survey of Daily Mobility (section 'Quantification of day trippers from existing data'). The results are shown in Table 11.

The results in Table 10 show the accuracy of the estimations obtained, with just a 10% discrepancy. This result is quite satisfactory considering the sample size used ($n = 200$ wave) and, as such, we can conclude that the methodology is appropriate. This means, however, that to obtain reliable estimations, the methodology should be applied to a larger sample size.

Moreover, if we compare the results in Tables 10 and 11, we see a mean difference of 20%. This difference can be attributed to various factors, including the margin of error associated with any sampling procedure; the fact that the daily mobility survey was conducted during a whole year, while, for financial limitations, the fieldwork performed had a limited timeframe; and, the consequent need to use estimated coefficients to approximate the number of day trippers to each

Table 11. Estimated number of day trippers (nonworking days) based on secondary data from the Survey of Daily Mobility (EMQ) in the Alt Penedès.

Scenario	Daily number of day trippers on Saturdays	Daily number of day trippers on Sundays	Number of day trippers over whole weekend	Total annual number of day trippers* (nonworking days)
EMQ	9,173	12,598	21,771	1,283,268

*2012 comprised 250 weekdays, 52 Saturdays, 53 Sundays and 11 holidays falling on a weekday (the latter being treated as Sundays for the purposes of this study).

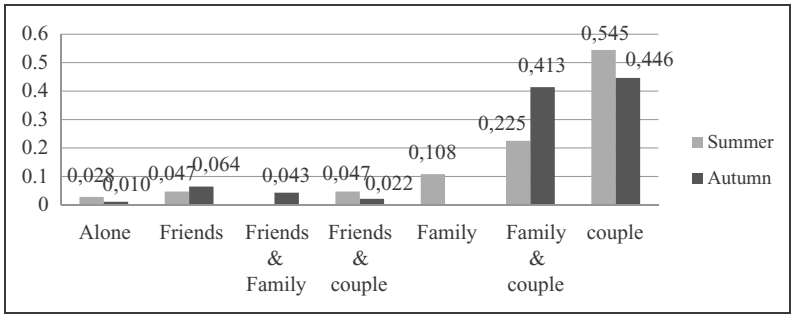


Figure 8. Example of day tripper characterization. Travel group.

category in the Daily Mobility Survey. The difference also highlights a further basic factor, namely, the reference year used with each methodology. Thus, while Table 10 provides results for fieldwork conducted in 2014, the methodology used in Table 11 is based on data for 2006. It should be noted moreover that these 8 years have been characterized by major economic and social changes.

Characterization of day trippers

A final step involves a day tripper characterization for the studied area in order to obtain information about their profile and, thus, to be able to implement more effective tourist policy measures. This information can be obtained from the fieldwork survey conducted.

In this article, no specific analysis of the results obtained for the Alt Penedès is undertaken, given that its interest is limited to the tourism agents of this particular *comarca*. However, it is important to show, by way of example, the type of results that can be obtained to characterize day tripper profiles (in terms of age, gender, where they are from and home place) and the type of actions they undertake in the territory (spending behaviour, make-up and size of travel group, travel motivation, activities carried out, length of stay in the town and wider area etc.). Figures 8 to 11 show some of these results.

Conclusions

This article presents a methodology for the characterization and quantification of day trippers, one of the most important groups in the tourism sector, but, for various reasons (difficulties of definition and obtaining adequate statistical information), day trippers are rarely analysed. This article

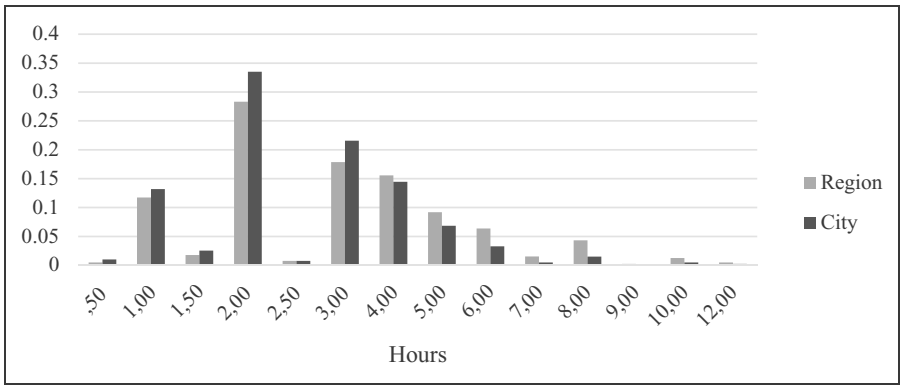


Figure 9. Example of day tripper characterization. Hours in the municipality and in the region.

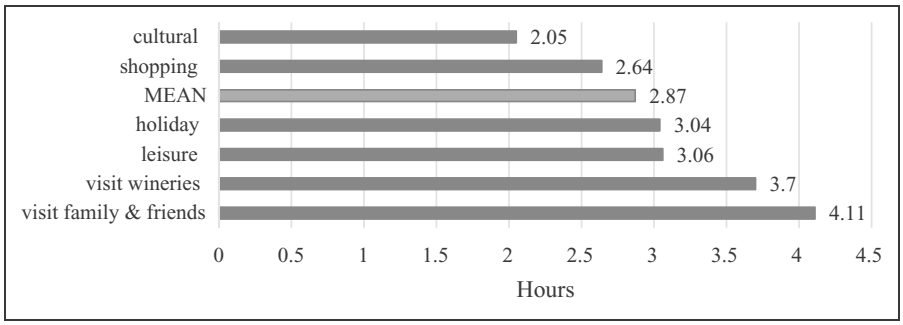


Figure 10. Example of day tripper characterization. Hours in the municipality in terms of travel motivation.

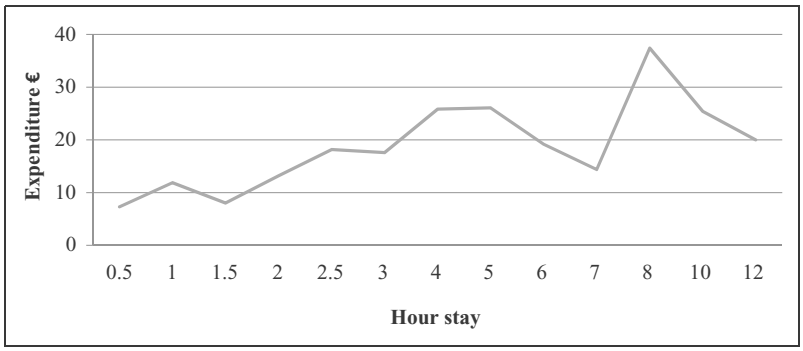


Figure 11. Example of day tripper characterization. Expenditure in the municipality.

seeks to go some way in rectifying this by applying the methodology to the case of the Alt Penedès, a *comarca* in Catalonia.

It is essential to develop a new, innovative methodological approach to address a critical aspect of the management of local destinations. Here, as well as proposing such a methodology, we also

contribute some initial results, which demonstrate the feasibility of implementing the proposed methodology and indicate its potential for future extensions.

The article proposes an operational definition of day trippers, which is especially suitable for small areas, such as municipalities, counties (e.g. *comarcas*) and broader regions, in which the concept of urban system plays an important role in defining the day trip scenario.

The article's main contribution is to formulate two basic quantification methodologies (based on either pre-existing mobility data or on primary data gathered in the field) and to analyse the differences obtained in their respective estimations. Our results suggest that, when using secondary data for the same year as the data obtained in the field, and with a larger sample size, the estimations can be quite similar. This points to the complementary nature of the two methods. Hence, one of the main conclusions to be drawn from the study is the importance of undertaking statistical operations that include mobility surveys for both weekdays and holidays.

The article also points to the need to study in greater depth what we refer to as 'full-time day tripper' as their impact on the territory (in terms of spending and demand for activities and facilities) appears to be quite distinct.

The methodological questions raised in seeking to obtain primary data have given rise to various considerations, combined with in-depth analyses, when choosing the best tool for each set of circumstances. Indeed, the quantification of day trippers necessarily leads to the analysis and characterization of the method of estimating the number of day trippers from fieldwork designed ad hoc for this purpose.

A key aspect of the surveys described is just where they should be conducted. Likewise, it is essential to employ proper weighting factors that allow researchers to make the transition from the fieldwork survey to subsequent analyses that provide reliable representation. Relationships need to be established between the numbers of tourists and day trippers, between numbers of tourists and local residents and so on, so as to shift the analysis from the field to the population represented. In other words, perhaps one of the main obstacles to overcome is obtaining the necessary information about a group so that it can be attributed the role of reliable sample of reference.

The final part of this article presents the quantitative estimations of the number of day trippers in the Alt Penedès when applying the two proposed methodologies. Preliminary estimations obtained show (a) that the pilot methodology can be applied and that the two sets of results are similar enough to ensure the quality of the procedure, especially if it increases the sample size; (b) that the two are complementary procedures for obtaining information; (c) that there are approximately one million weekend day trippers each year in the Alt Penedès and more than three million throughout the whole year (including weekdays) and (d) that the fieldwork facilitates the characterization of the day tripper, providing information about the type of trip made, the people that accompany the day tripper, the duration of the trip, the reason/s for the trip and the amount of money spent.

The figures recorded for weekend day trippers contrast with figures for overnight stays in the *comarca* estimated at 43,207 in 2013. Although this last figure is not directly comparable with those obtained in the article (either at weekends – about one million, or on weekdays and holidays – approximately 3.1 million day trippers), it points to the importance of day trippers in the sector.

Finally, a number of recommendations can be made to enhance the study of the phenomenon of the day tripper: (a) the need to expand the sample size to guarantee a better quantification and characterization; (b) the convenience of recovering/updating the survey of daily mobility; (c) the need to influence the design of Daily Mobility Surveys to ensure better base information for the quantification of day trippers on the basis of secondary data; (d) the desirability of expanding the

focus group to include not only local and regional experts in tourism but also those in mobility; (e) the need to examine the potential use of big data for quantifying the day tripper phenomenon and, finally, (f) the desirability of improving the weighting coefficients used to quantify weekday day trippers on weekdays and Daily Mobility Surveys conducting surveys with day trippers.

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Notes

1. For example, Eurostat only present data for day trippers for 2014 and only at national level. More exhaustive data are expected for 2018 (Eurostat, 2013). The Spanish Statistical Institute (INE) only present data for 2015 at autonomous community's level.
2. The inter-area movements that occur when the origin and destination are within the same urban system will not be considered as day trips; however, inter-area movements that occur between municipalities in different urban systems will.
3. Some of the problems considered in this section were already outlined by Cluzeau (1988).
4. The utility of these two sources of information is discussed in the next section, in which we define the methodology for constructing the usual environment.
5. At the time of writing, the most recent data were for 2012, which are the ones used.
6. The Metropolitan Area of Barcelona comprises 36 municipalities from the province and 59% of its population.
7. We are grateful to the Metropolitan Transportation Authority and the Metropolitan Area of Barcelona who have provided us data from these surveys.
8. The Census of Population includes mobility data only in relation to work and study. The mobility surveys of the EMT and AMB also include shopping and leisure trips (broken down into several subcategories), visits to relatives or places of worship. These additional motives tie in better with the concept of day trips.
9. This threshold of 4.5% is considered appropriate for the *comarca* of the Alt Penedès analysed in this article. In extending the methodology to other areas, this threshold might be reconsidered.
10. Madre et al. (2007) offer a list of similar transport surveys for different European countries.
11. The Census only collects labour mobility and, for reasons of budget austerity, the 2011 Census (with data being published in 2012 and 2013) did not gather information from the whole population, limiting itself to a sample only. For this reason, the mobility data are only published for the larger municipalities.
12. For example, Altafulla is not in the *comarca* of the Alt Penedès but it forms part of the usual environment of Vilafranca del Penedès. Therefore, a displacement Altafulla → Vilafranca is considered an example of daily mobility and not a day trip. However, as Altafulla does not form part of the usual environment of Sant Sadurní d'Anoia, a displacement Altafulla → Sant Sadurní is considered a day trip.
13. One different between both approaches is that the first one cannot capture day trips from tourists, contrary to the second.

14. This survey records 24,710 displacements originating in municipalities of the Metropolitan Region of Barcelona, corresponding to 5946 people. Of these, the destination of 1535 displacements is the Alt Penedès. We then eliminated displacements undertaken in order to 'return to usual home' giving us 38 that can be considered day trips based on the criteria established in the section 'Operational definition of day trippers' (see Table 4).
15. As early as 1969, Colenutt suggested the possibility of day trippers visiting more than one location during their trip.
16. This is a widely used procedure in events, museums and similar sites (see, e.g. Cela et al., 2007; Chirieleison et al., 2013; Duffield, 1989; Gibson, 2007; Lade, 2009, 2010; Riddington et al., 2000; Stoddard and Clopton, 2015; Stoddard et al., 2008; Underday-Hill and Lyle, 2007). Sainaghi (2008) and Kauppilaa and Karjalainen (2012) use a different approach, analysing the type of passes bought by visitors: these authors assume that tourists and residents buy several-day passes, while day trippers buy one-day passes.
17. Canestrelle and Costa (1991) used a similar strategy in Venice.

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