

Developing tourism statistics at the sub-national level: the measurement of flows of trips and visitors

Central paper

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Summary: The measurement of tourism activity from the perspective of the consumption of visitors entails the estimation of the observation units – trip, visitor and travel party – and their corresponding characteristics. The 2008 International Recommendations for Tourism Statistics (IRTS 2008) is the conceptual framework for the development of basic statistics at the national level and at the sub-national level, as the latter is explicitly mentioned as an area where future extensions of the IRTS 2008 will be possible. “The need for measurements of tourism at the sub-national levels is stressed and the links between the national level and the sub-national levels, that might not totally coincide but bring complementary points of view on the activities associated with tourism in a given geographical territory, are presented”. It is also pointed out that the term “country”, used throughout the text, can be transposed to a different geographical level using the term “place” instead (either a region, municipality or other sub-national geographic location); nevertheless, the adaptations this would require present various challenges that are not always made explicit.

The UNWTO has reiterated on various occasions that the sub-national perspective has preference over other possible methodological extensions with respect to both the development of the System of Tourism Statistics as well as the Tourism Satellite Account project. The new international recommendations of 2008 (the aforementioned IRTS 2008 and the 2008 Tourism Satellite Account: Recommended Methodological Framework (TSA:RMF 2008)) form an integrated and compact framework between basic statistics and the TSA which provides the conceptual framework and the structure for the harmonization and reconciliation of most tourism statistics. This is the reason why, in addition to the references on the sub-national issue in Chapter 8 of the IRTS 2008, basic references on adapting the TSA to sub-national levels are also provided in Annex 7 of TSA:RMF 2008.

The conditions therefore exist to resolutely pursue a reflection process on how to make progress on the sub-national perspective as well as on how to tackle the different challenges that the adaptation of the conceptual framework of tourism statistics necessarily entails. This is a medium- to long-term process which would be greatly helped by, first of all, creating a network of bodies, professionals and researchers that have experience and knowledge in the field of the measurement and analysis of tourism activity at sub-national levels as well as in tourism destination management. It would also be important to find support in other areas of research such as travel and mobility given their many connections with tourism; as the new IRTS 2008 categorically states, “Tourism is a subset of travel and visitors are a subset of travelers. These distinctions are crucial for the compilation of data on flows of travelers and visitors and for the credibility of tourism statistics.”

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BACKGROUND

The recent approval by the United Nations Statistical Commission (UNSC) in March of this year of the new international recommendations on tourism statistics (IRTS 2008) and of the updated document of the Tourism Satellite Account (TSA:RMF 2008), gives shape to the conceptual framework of the System of Tourism Statistics (STS) with a hitherto unthinkable level of completeness and methodological consistency between both international recommendations (see Annex 1). Specifically, three aspects of tourism activity that are susceptible to measurement and international comparison are identified: visitor consumption, production of goods and services demanded by visitors, and the level of employment in tourism industries associated with this demand for goods and services. This paper will only discuss the first of these (visitor consumption).

As pointed out in the attached table the measurement of consumption by visitors requires three observation units: the visitor (a traveller who meets the three specific requirements to be classified as a visitor), trip (each trip is associated with its corresponding visits) and travel party. Associated with each of them is a set of related characteristics.

	Observation Units	Main related characteristics
Consumption	Visitors	Typology (overnight visitor – tourist-and same-day visitor – excursionist-) Country of residence Nationality
	Travel party	Size
	Trips	Main purpose (personal -split in 8 categories- / business) Duration Origin and destination Modes of transport Types of accommodation Organization Expenditure

There is a clear interrelation among the three observation units. For one thing, it is obvious that the visitor is at the centre of the entire architecture of data and indicators that constitute the basic information network of the STS, given that tourism refers to the activity of visitors and only trips taken by visitors qualify as tourism trips. On the other hand, one of the innovations of IRTS 2008 as compared to the Recommendations of 1993 is the introduction of the concept of travel party which provides coherence to the conceptual framework and gives support to greater rigour in the estimation and calculation of the number of visitors and trips.

3.2. Visitors are at the center of the observation of tourism. Nevertheless, visitors do not always travel alone: they might travel in parties, in which they share all or parts of the activities, visits and expenditures associated with their trip. A *travel party* is defined as visitors traveling together on a trip and whose expenditures are pooled.

International Recommendations for Tourism Statistics 2008 (IRTS 2008)

The development of tourism statistics over these past several years has given rise to various contributions to national systems of statistics: one is the estimate of the corresponding universes of visitors and trips (for which high-powered surveys are necessary). Nevertheless, the quality of this data suffers from something that has been observed in different countries and which the new recommendations draw attention to.

2.34. Observing tourism trips and visits is not the same as observing visitors as an individual might make more than one trip or visit during the period of observation. In the statistics for the three forms of tourism, (see paras 2.39. and 2.40.) the term **visitor** is often used instead of **tourism visit** or **tourism trip**. **It is recommended** that these concepts be clearly defined and differentiated in the statistical operations and presentation of the information.

International Recommendations for Tourism Statistics 2008 (IRTS 2008)

We have also learned that if we want the corresponding statistics to be useful for economic analysis and the design of strategies on the part of the tourism authorities such surveys should also measure the average values of their associated characteristics. That is to say, it is of little use to know, for example, the total expenditure by non-resident visitors if it is not possible to associate the corresponding average expenditure by visitors according to some of the principal characteristics associated with the trip (such as its organization, main purpose, types of accommodations, etc.).

These references to the conceptual framework of tourism statistics are applicable to the national level, but their adaptation to sub-national levels does not, at first approach, pose insurmountable difficulties.

2.3. As a general observation, it should be noted that in *IRTS 2008*:

- the term "country" can be transposed to a different geographical level using the term "place" instead (either a region, municipality or other sub-national geographic location);
- long-term is used as equivalent of a year or more and short-term, as less than a year.

International Recommendations for Tourism Statistics 2008 (IRTS 2008)

However, the IRTS 2008 goes much further and, as we will see in chapters B and C, provides basic guidelines on how to promote regional statistical development.

FROM THE NATIONAL TO THE SUB-NATIONAL PERSPECTIVE

It has already been mentioned that both the definition as well as the structuring, properly speaking, of the STS is possible following the approval of the two new international recommendations relative to tourism statistics. This means that it is possible to define an integrated and structured tourism information system about those observation units and related characteristics, using a common classification structure, in the perspective of international comparability of the corresponding data and indicators. As explained in Annex 1, the development of a System of Tourism Statistics is closely linked to the implementation of the Tourism Satellite Accounts (TSA). In fact, the TSA provides the conceptual framework and the organizational structure for the harmonization and reconciliation of most tourism statistics internally within the sector as well as with other economic statistics. From this perspective, it should be seen as an instrument to assist countries in the identification of data gaps and to guide them during the revision of existing data sources as well as in the development of new sources.

From this perspective, the reference to the TSA is apposite, as perhaps the biggest contribution of these new recommendations is that for the first time there exists an integrated framework for tourism statistics in which the TSA has played an essential role. Therefore, it should be highlighted from the outset that it is no coincidence that in contrast to the case of the TSA (whose conceptual framework was designed for the national level), no specific conceptual framework exists at the regional level.

Consequently, there are several very diverse challenges for the articulation of a system of statistical information in the case of tourism between the national level and the corresponding sub-national levels. For example, it will be necessary initially to concretely determine the territorial units of reference to be used to structure such a system. The UNWTO has proposed², that there be two:

- the **region**, identified as the administrative unit corresponding to the first level of territorial disaggregation of a country in terms of its political and administrative organization (for instance, level 2 of the NUTS in the European Union, the provinces of Canada, and the states of USA and Brazil);
- the **local tourism destination**, treated as a subregional territory (which might correspond to a single municipality or group of them) with substantial tourism activity.

In both cases, we are dealing with units whose respective competencies and capacities with respect to general institutional governance and destination management are at the extremes of other possible intermediate territorial entities. Both possess a precise administrative definition and both share the same set of information relative to certain basic statistical operations of the national system of statistics (population and household censuses, and economic censuses)

This International Conference of Malaga should allow us to make advances in the search for international consensus on the precise definition of “local tourism destination”, and on the appropriate typology of the different territorial units that would make up this sub-national universe.

The fact should be pointed out that both in order to measure the economic contribution of tourism in these and other possible territorial entities (for example, zones / corridors / tourism sites, etc.), as well as to classify them into different categories of interest for management or analysis purposes (for example, mountain areas, coastal areas, urban areas, etc.), the great majority of these can be defined as aggregations of municipalities, which is the smallest observation unit in the great majority of countries in their population and housing census operations. It is for this reason that it would be very useful for the National Statistical Offices to consider the application in these operations of technologies of proven efficiency and utility such as the “application of Geographic Information Systems (GIS) and digital mapping”, as pointed out by the United Nations Statistics Division.³ This recommendation should also be applied, in our case, to the infrastructure of establishments and attractions related to tourism.

In any case, at present there are few regions and local tourism destinations that have a sufficient set of information to design and execute with the desirable rigour their institutional competencies in relation with tourism development in their respective territorial ambits. Beyond the statistical reality, it should not be overlooked that not in all regions where tourism

² *Adapting the National Tourism Satellite Account (TSA) Project to Subnational Levels* – UNWTO, Madrid, September 2005

³ *Handbook on Geographic Information Systems and Digital Mapping* – United Nations, New York, 2000.

is prominent do the pertinent regional authorities (whether in charge of tourism, economy, treasury, regional development, etc.) consider tourism as a factor of regional economic development. In these cases, it is probable that a large part of the regional tourism authorities (responsible for the design and execution of those competencies, notable among which are those relative to marketing) do not understand that it is necessary that the corresponding information systems allow a precise and powerful relationship between the measurement and the analysis of the economic contribution of tourism and destination management / planning.

It would therefore seem that the articulation of a national system with a sub-national reality would require advances at two levels:

- on the one hand, define the relations between the nation and the different regions and,
- on the other hand, between each of the region and their corresponding tourism destinations of a local scope

Regarding the first of these, not for each and every region in most countries is it possible right now, to make a strict identification of tourism activity as recommended in IRTS 2008. There are three main reasons for this:

- not all tourism variables (for instance, trips and forms of tourism) are additive or easily transportable from the national environment to subnational level;
- some activities cannot, strictly speaking, be regionalized (auxiliary activities of multiregional units), and for others, such as the interregional transport of passengers, measurement is even more complicated than at national level;
- the enormous amount of statistical information required because, although officially there are administrative boundaries separating the regions, there is free movement of people (as well as goods and services, etc.) which means that unless instruments are in place for monitoring flows to and from the region, no data might be available regarding those flows.

With respect to the second level of articulation, the information gap is surely greater since at the level of a local tourism destination there is less basic information than at the level of the region where it is situated, hence the greater need or advisability of having a set of indicators and modeling than in the other case. Consequently, here the challenge will be greater, as it would be necessary to forge consensus between the regional authority and those of the local tourism destinations regarding which information should be obtained from own sources and which should be modeled based on a sufficient quantity of regional data (which may well have to be created).

The new 2008 International Recommendations for Tourism Statistics refer explicitly to the first of articulation levels mentioned and point out some of the possible reasons for regional tourism authorities to possibly consider it a priority to work on closing the existing information gap between the national level and the corresponding regions⁴. It is more than probable that it would be the regional authorities of those territories with the greatest tourism activity that will lead this process in their respective countries.

⁴ These recommendations refer exclusively to the concept of “region” and therefore, could be adapted, when the time comes, to the municipal level or other sub-national geographical location, as indicated in paragraph 6.

- 8.26. Increasingly regional tourism authorities are interested in regional statistics and possibly some form of Tourism Satellite Account at regional level as a means of providing useful indicators for tourism enterprises and organizations in identifying possible business opportunities, assessing the volume and intensity of tourism business and determining the extent to which private and public regional tourism networks and clusters are interconnected.
- 8.27. This interest stems from the specific features of tourism across the regions of a country as well as different needs of regional tourism authorities, including, among others:
- the need to highlight or emphasize the importance of specific features of regions as tourism destinations;
 - the fact that characteristics and expenditure pattern of visitors going to a region can vary markedly across the regions;
 - the need to design policies to attract visitors (such as the type of demand that needs to be met) and investments (such as the infrastructure that need to be put in place) that are specific to regional objectives;
 - the need to adapt classifications of tourism characteristic products and of tourism industries by adding more details where relevant, while preserving the overall structure of the classification;
 - the need to be able to make comparisons of tourism, in terms of visitor numbers, characteristics and expenditure, across regions and between the regional and national levels.

International Recommendations for Tourism Statistics 2008 (IRTS 2008)

The UNWTO understands that Regional Tourism Administrations might take measures of various kinds to fill the information gaps, the following five being the most appropriate: conducting supplementary surveys, using administrative data, re-elaboration of statistics introducing new technologies and applying modelling techniques.

Paragraphs 22 to 29 will refer to the first of these initiatives, which in many countries is the preferred way (which is logical to a certain extent, as the institutionalized statistical approach--in the case of both NSOs as well as regional tourism departments--gives priority to the development of surveys at sub-regional levels as a first option). However, the UNWTO has been able to observe that for the authorities responsible for tourism, at both the national and sub-national levels, having survey-based statistical information is not always necessarily useful for the performance of their institutional competencies.

The other alternatives mentioned (see paragraphs 29 to 33) are not in any way marginal, as will be discussed throughout this document, since they can contribute decisively to the articulation of a system of tourism information between the national level and the different regions, as well as to the analysis of important aspects of tourism activity. Moreover, they may well be the necessary approach in order to articulate the aforementioned system between a region and its corresponding local tourism destinations.

The following paragraphs should be understood as a contribution towards a reflection on the necessary articulation between a System of Tourism Statistics at the national and regional levels that cannot always be carried out in a way that observes a golden rule in official statistics, which is the necessary complementarity and compatibility of national and regional accounting frameworks. This statement usually overlooks the fact that these two criteria can hardly be met simultaneously, which may well render futile a good deal of the debate on the complementarity requirement as a precondition for a region to be able to autonomously take its own decisions on how to go about covering the mentioned information gap.

In any case, and as far as the first initiative mentioned is concerned (conduct supplementary surveys), any proposal by the regional authorities should bear in mind that for purposes of their political and administrative organization, all countries have a territorial

institutional structure, determined by a greater or lesser degree of centralization or decentralization. This structure is reflected in the National Statistical System (NSS) and, consequently, affects the correspondent System of Tourism Statistics (STS).

From the standpoint of both supply and demand, it would be desirable that a national STS should determine, for the basic variables relevant to the measurement and analysis of tourism's economic contribution, for which territorial levels statistical information is available and identify the national or regional statistical body responsible for data capture and dissemination.

If this were the case, before taking measure with respect to regional statistical development, a feasibility study should be undertaken to identify exactly what statistics are available, where to obtain them or how to access them. Consequently, it would make it possible to avoid certain undesirable situations, such as for example⁵:

- inefficient use of resources, especially in regions where they are particularly scarce. It is not unknown for Regional Tourism Administrations (RTAs) not to have even the minimum resources needed to recruit staff with the appropriate knowledge and skills for analysing and interpreting the data currently available;
- lack of knowledge of exactly what statistics are available, where to obtain them or how to access them. It is absolutely essential to have a minimum amount of information to be able to assess tourism's contribution to the economy, especially from the demand side; otherwise, most of the information would be mere estimations;
- inconsistency of data collection over time and between geographical areas. Statistics need to be produced on the basis of classifications that are consistent over time and from area to area: this is especially important if data sources are restricted, in which case the maximum benefit may be gained by integrating two or more data sources to generate a derived set of statistics.

This analysis should serve to build up a kind of checklist of basic variables and indicators (number of trips, visitors, overnight stays, average daily expenditure of visitors, main purpose of the visit, etc.) according to the various territorial levels and the corresponding statistical or administrative unit responsible for their production.

This assessment should be seen as something more than placing the appropriate crosses in a matrix: first of all, it will necessitate some form of statistical debate about the main national sources to be used and the scope of the specific methods of regionalizing variables; it will also be necessary beforehand to adapt the definitions of those variables and indicators to the various territorial levels.

Some reasons have already been mentioned (see 23.) for carrying out an assessment of the national/regional linkage of the STS. The desirability should also be emphasized of approaching this task as the first step in developing a set of computer databases (which could, if appropriate, be integrated within a shared database) that would serve to centralize the national/regional data available in relation to those variables and indicators.

⁵ *Review of the Statistical Needs of Local Government*, New Zealand Ministry of Tourism, Wellington, November 2001.

<http://www.stats.govt.nz/NR/ronlyres/A7521BBD-BECD-493E-9D9B-6D21686AA327/0/reviewstatsneedslocalgovt.pdf>

These suggestions have been adopted by the UNWTO and ⁶ are more precisely set forth in the recommendations appearing in the IRTS where certain rules of the game that all actors must respect are very clearly established. These recommendations rest upon an obvious fact: National Statistical Offices have the competencies and legitimacy for the design and execution of the National Statistical System for the entire national territory.

- 8.28. Nevertheless, there are some statistical limitations in producing regional 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. In addition, regional estimates of tourism might not be compatible with those for other regions therefore undermining the credibility of tourism estimates, both for the regions and for the country as a whole.
- 8.29. Consequently, **it is recommended** as a first approach that national statistical offices, tourism authorities and/or other organizations with direct responsibility for tourism statistics promote the use of national instruments to collect tourism data at the regional and local levels using a common set of definitions, based on the present *International Recommendations*, permitting national tourism statistics to be “built-up” from data at the regional and local levels.
- 8.30. There are often differences between density of population, transportation accessibility, cultural behaviors, vicinity 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 (see paras. 2.50. to 2.54.) and takes into account these regional differences.
- 8.31. If this first approach is not feasible or is not considered completely satisfactory, especially in those regions where tourism is particularly relevant, the regional tourism authorities might wish to complement national data with other data in order to design policies and foster economic analysis tailored specifically to their own regions. In this case **it is recommended** that these new data follow international and national statistical standards and recommendations.

International Recommendations for Tourism Statistics 2008 (IRTS 2008)

It was pointed out earlier (see paragraph 18), that aside from conducting supplementary surveys, there are four other initiatives for closing these information gaps: these are using administrative data, re-elaboration of statistics, introducing new technologies and applying modelling techniques.

Tourist activity increasingly leaves “electronic fingerprints” of various kinds, thereby boosting the number of potentially usable records: the use of toll roads, credit cards, mobile telephones and access to specific tourism websites are some examples of this. The idea is obviously to select those records that could be of greatest interest and to develop the corresponding statistical controls and processing in order to be able to use them appropriately. Aside from the case of information generated by the regulatory authorities of the different types of traffic, there are other sources of an administrative nature, of which there exists a growing number of examples of their use at both the national and regional levels. Annex 2 provides some examples referring to credit and bank cards, toll payments on motorways, fiscal sources and municipal administration sources in the case of local tourism destinations.

Regarding the re-elaboration of statistics, an interesting exercise carried on by J. Pérez Mira⁷, applied to Spain, underlines the advisability of re-weighting the component of tourism prices derived from the system of consumer price indices. Among its conclusions are the following:

⁶ See *Adapting the National Tourism Satellite Account (TSA) Project to Subnational Levels* – Madrid, September 2005

⁷ Pérez Mira, J. (2002) *Price indices and tourism consumption in the framework of the tourism satellite account (TSA)*. Enzo Paci Papers on Measuring the Economic Significance of Tourism (Volume 2). World Tourism Organization, Madrid.

- “Weighting system of Consumer Price Indexes (CPIs) is based on household income / expenditure surveys which collect data on the basis of place of residence of households. This gives rise to a serious problem in monitoring the real prices actually paid by consumers when there is a geographic dislocation between the place of consumption and the place of residence. This is clearly the case for goods, which by definition are tourism-related in the measure in which consumption takes place outside the usual environment.
- CPIs include a weighting structure based on the content of the consumer’s shopping basket. Determining the content of the *visitor’s shopping basket* involves setting aside the consideration of the nature of the goods employed in the product classifications on which these indices are based, making it necessary to address the problem of establishing which products and which quantities correspond to tourism consumption (in each of the three different forms of tourism).
- If the portion of total consumption carried out by residents in their capacity as visitors is taken into account, the weighting structure can be seen to change substantially vis a vis the official CPIs”.

Another interesting example is contributed by L. Johnson⁸, and refers to the methodology followed by the Bureau of Tourism Research (BTR) to estimate the regional expenditure of international visitors to Australia. “The International Visitor Survey (IVS) collects information from respondents on total expenditure during each trip. While national data on international visitor expenditure has been available for some years, information on the distribution of this expenditure amongst Australia’s regions has not. As a single trip will often involve several destinations, regional expenditure estimates cannot simply be produced by aggregating survey responses. Instead, numerous assumptions need to be made if total trip expenditure is to be allocated amongst the regions visited on the trip. Recognising this gap, the BTR recently developed a modelling approach which was first applied to data from the 1997 IVS to produce consistent estimates of expenditure by international visitors at the State/Territory and regional level. The model uses survey data on total trip expenditure as well as data on expenditure in a randomly selected location. In very general terms, this modelling approach allocates foreign visitor expenditure to regions on the basis of where each night was spent and relative costs in the region”.

With respect to the use of new technologies applied for the capturing of statistical or other kinds of information, there are some examples that are of special interest for the measurement of the activity of visitors at both the national and sub-national levels, although it is probable that it will be the regional tourism authorities (especially in the case of those regions where tourism is especially prominent) that would have greater interest in promoting their use. Global Positioning System (GPS) units, Automatic Number Plate Recognition (ANPR) as well as cellular phones are instruments that are already being employed both as support to consolidated statistical developments at the national level (the case of GPS in household surveys on the mobility of travellers), as well as with sub-national studies relative to traveler transport (where mobility studies are of special interest to us, as mentioned later in this paper).

As for modelization, surely it must be insisted upon once again that without it, it is practically impossible to think that the regions (and definitely the local tourism destinations) can have a minimally complete information system for the purpose of supporting the measurement and analysis of the economic contribution of tourism and support a developed scheme for destination management and planning.

⁸ Johnson, L. (2002) *Measuring international visitor expenditure in Australia’s regions*. Bureau of Tourism Research (BTR). Australia

Data modelling techniques are used extensively to derive synthetic estimates (indicators) when the cost of obtaining small area statistics from a survey is too great. Each data source brings both strengths and weaknesses to the modelling process. Survey data are often restricted in their capacity to produce reliable estimates due to the restrictions of sample size whereas administrative data may bring good geographic coverage but may exclude certain groups of people from the population. Subtle changes within the population of a region may not always be recognized by the assumptions made in the modelling process, therefore synthetic estimates should always be used with care and movements over time should be used rather than absolute values generated by any modelling process.

ON THE MEASUREMENT OF VISITORS ACTIVITY AT SUB-NATIONAL LEVELS

This chapter focuses on the activity of visitors as consumers, from a limited perspective: the measurement of two observation units (visitors and trips) and only one of the characteristics associated with trips (their route, that is, their origin and destination). The approach is a limited one (as it leaves out travel party as an observation unit as well as all the other characteristics associated with both visitors and trips -see para. 2-), but in any case, it presents quite a few challenges in response to which the current development of tourism statistics and the corresponding analysis at sub-national levels is still far from providing the sufficient elements needed in order to put forward general orientations.

A good portion of the text of this chapter owes a debt to the various contributions and debates associated with last of the conferences organized by the International Steering Committee for Travel Survey Conferences (ISCTSC) in Annecy, France, May 25-31, 2008, which was attended by a large group of international researchers on travel and mobility. I am convinced that the experience accumulated over quite a number of years already with respect to research studies on these areas makes it possible and desirable, to consider the reciprocal benefits of a rapprochement with this group (in the following chapter, several indications in this respect are given). This conviction also has to do with some of the changes introduced in IRTS 2008, notable among which are the introduction of travel party as a new observation unit, the clear distinction between tourism and travel, as well as the explicit reference to the development of tourism statistics at sub-national levels.

Visitors

IRTS 2008 establishes very clearly something that is fundamental but is nevertheless not always kept in mind when undertaking regional exercises.

8.32. When developing tourism statistics at the sub-national level, it is important to be able to separate visitors to a region who have their place of usual residence within this region from those who come from other regions or other countries. **It is therefore recommended** that three subsets of visitors to or in this region be identified: residents from other countries (inbound visitors for the country as a whole), residents from another part of the national territory, and residents from this region.

International Recommendations for Tourism Statistics 2008 (IRTS 2008)

Aside from this, also paragraphs 8.29 of the IRTS (already mentioned in paragraph 28 of this document) touch on an aspects that, albeit well known by statisticians, are not usually applied in the case of household surveys designed for the measurement of domestic tourism: the only way to obtain a data set using this type of survey that would make inter-regional comparability within a country possible in a specific area of analysis is to have an effective sample that is sufficiently broad. NSOs and NTAs should do what is needed in order to make this possible, in the case of domestic tourism.

There is growing international evidence with respect to the complexity of this type of surveys not only in terms of the efficiency of the sampling designs (theoretical samples do not usually take into account the propensity to travel of the reference population) but also in terms of the difficulties to achieve a reasonable degree of permanence in the sample over time. One typical case is that of the United States where there is increasing difficulty in carrying out telephone surveys. It has been estimated that at this time 45% of households have some type of barriers to telephone contact such as caller-ID.

It is also a fact that in the case of tourism and in other types of travel surveys, this type of surveys suffer especially from recall bias relative to the estimation of the volume of trips undertaken (see paragraphs 56 and ff.); we are faced with a particular type of non-sampling errors that is of particular importance. "All statisticians and researchers know that data accuracy is a combination of sampling errors and non-sampling errors. It can be misleading to compute confidence intervals that take no account of non-sampling errors such as non-response errors and measurement errors. This is a particular concern in travel surveys because respondents are often unable to describe their travel behaviour exhaustively, and may have a vague or even biased perception of the main characteristics of their trips (for instance the distance travelled)"⁹.

But it is not only household surveys that present important challenges for their use at sub-national levels in relation with the measurement of domestic tourism in a given region. The sub-national adaptation of the model border survey proposed by UNWTO for measuring inbound tourism¹⁰ also presents challenges that are perhaps even bigger. Indeed, it has to be admitted that the creation of a statistical universe of non-resident arrivals at sub-national level raises considerable practical difficulties.

Systems for road traffic counts, are based on a simple concept (daily territorial entry-exit differentials), but whose final result remains closely linked to different variables that are sensitive and difficult to control. They can undergo methodological improvements, but they are not sufficient to produce visitation data in terms of stays (only overnights) unless new technologies could be used jointly. The calculation of overnights in a given space should necessarily be accompanied by surveys in order to accurately determine the average number of occupants per vehicle (at all axes and all directions of travel) as well as the rate of absence of the residents of the perimeter of observation.

Even the simple observation of registration plates over a certain number of days is not sufficient to classify a vehicle as a proxy of "visitor/s", and moreover, this possibility of observation will not survive, at least in Europe, the planned harmonization of registration plates, since the identification of the country of origin of the vehicle will become optional.

In view of all of this, the following question must be posed: Can the use of new technologies be useful for estimating with greater rigour traveller flows at sub-national levels? And as a corollary, a complementary question arises: What experiences do tourism researchers have regarding the applicability of these new technologies? The response that we can give to both questions is critical, since if it is not possible to respond in the affirmative to either, then it is obvious that it will be impossible to obtain regular and statistically robust estimations on the universe of visitors, and consequently, the estimations of the characteristics associated with them and the corresponding trips undertaken by them will inevitably have a stigma attached to their lack of credibility.

⁹ *A Study of Non-Response in the GPS Sub-Sample of the French National Travel Survey 2007-08*, Philippe Marchal, Sophie Roux, Shuning Yuan, Jean-Paul Hubert, Jimmy Armoogum, Jean-Loup Madre and Martin Lee-Gosselin – paper presented to ISCTSC, Annecy, France, 25 – 31 May, 2008.

¹⁰ *Tourism as an International Traded Service – A Guide for Measuring Arrivals and Associated Expenditures of Non-Residents* – UNWTO, Madrid 2005

We at least know that the reality is not so dramatic in the case of tourist-heavy sub-national circumscriptions and where the system of accommodation statistics is well developed (insofar as the completeness of the different forms of accommodation and the quality of the estimations itself are concerned): at least in these cases, it is possible to obtain a partial statistical universe (that of tourists staying at accommodations) although it would be necessary to estimate the weight of same-day visitors in order to complete the measurement of visitor flows, as well as that of those tourists not using paid accommodation.

But there are other reasons to be optimistic: there is growing experience in the area of the measurement and analysis of travel and mobility which is of extraordinary interest for us. In the following sections, three innovative instruments will be discussed:

- Automatic Number Plate Recognition (ANPR)
- Cellular phones
- Global Positioning System (GPS) units

The use of new technologies is conditioned either by its experimental nature or because of the absence of sufficient consensus among researchers regarding the degree of reliability of one or more of the instruments used. Nevertheless, judging by the good number of papers presented at the recent congress of the ISCTSC mentioned earlier, it would seem to be an accepted fact that at least for two of them (of special importance for tourism) it has been possible to ascertain their performance and utility: automatic number plate recognition (ANPR) and portable GPSs applied to household surveys, to will be discussed later in this paper (see paragraphs 60, 65 and ff.).

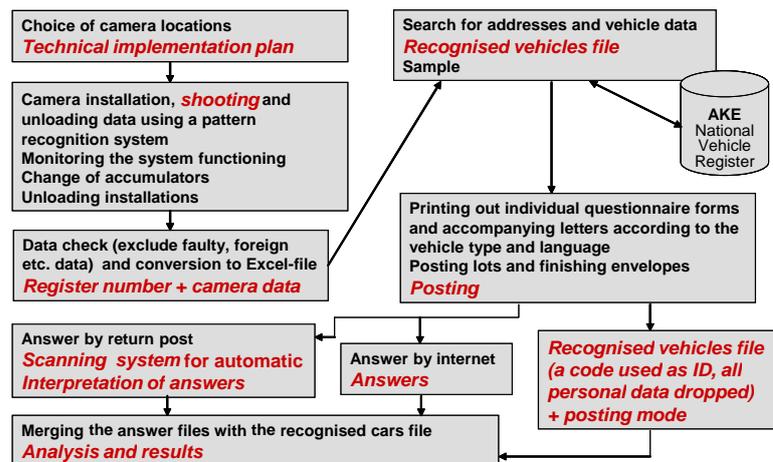
As for the first of these instruments, it should be recalled that manual number plate surveys have a long tradition in transport planning; they are primarily used to determine the origin, destination and through traffic of an area. Among the most used applications of ANPR systems are vehicle classification, travel time measurements, through traffic surveys, route choice observations and estimation of Origin/Destination matrices. Normally ANPR-systems consist of two components: firstly the camera that detects passing vehicles and continuously send the images to a computer and, secondly, software that recognizes number plates with its characteristics and stores them in a database.

Such an instrument could be very useful for the identification of the number of same-day visitors in the case of inbound / outbound tourism in border regions with high visitation by this type of visitors. However, in the case of domestic tourism its use would most probably require not only a greater number of units (as in the case of border crossings their number is relatively small), but also--more critically--the combination of this instrument with complementary systems, as would be the case of driver surveys.

The extensive transport survey carried out in 2007/2008 for the Helsinki Metropolitan Area uses a novel design as it combines "automatic plate recognition O/D surveys (with 80,000 cars), automatic traffic counts and household interviews with travel diary of around 20,000 persons. This is an initiative that is aimed at replacing the traditional design of stopping vehicles and passing a questionnaire directly to the driver. With these three elements, the aim is to construct O/D matrices differentiated by purpose of trips and time periods. Especially the O/D survey will be used to check the soundness of the car trip matrices obtained from the household survey and for calibration if needed. The matrices will be used for modeling purposes as well"

As described in the following outline, the process designed for the aforementioned study utilizes cameras that provide location data (road section, direction and fields), exact passing time, and number plate. The recognized plate numbers were used as keys when retrieving additional data from the vehicle database administrated by the Finnish Vehicle Administration

Description of the Process



In a pilot exercise, a recognition rate of 90% of number plates was achieved by the installed cameras. The author of the study points out among her conclusions that “as the recognition rate was very high even using such temporary camera installations it can be recommended to use ANPR also in more detailed analysis of traffic flows i.e. to have several cameras closing the target area, e.g. the Inner City, and then match registration numbers between the different points to find out the flows. This method can be used without any questionnaires but if we want to know any additional information about the trip, e.g. trip reason, a questionnaire must be accompanied¹¹.

Regarding the use of cellular phones, there is no conclusive opinion on their applicability except, perhaps, the possibility in principle that operators could find potential clients among the tourism authorities in order to carry out a statistical operation for the measurement of flows of travellers in given sub-national areas. As pointed out in a study conducted recently in South Africa, “the nature of the cellphone data and data collection process might bring about a need for specialist data organizations relying on new techniques, new technology and know-how. It is doubtful if transport planners are ideally positioned to collect cellphone data. Whereas the transport planner is generally involved in every step of origin-destination or general transport surveys, cellphone data collection is an unfamiliar process and the process, including sample selection and survey administration, is entirely dependant on the cooperation of the service provider who is usually a profit driven organisation”¹²

Trips

The following box contains the paragraphs of the IRTS 2008 referring to the definition of this observation unit.

2.29. Trips taken by visitors are tourism trips

2.30. A domestic or an outbound tourism trip refers to the travel of a visitor from the time of leaving his/her usual residence until he/she returns: it thus refers to a round-trip. An inbound tourism trip refers to the travel of a visitor from the time of arriving in a country to leaving. A tourism trip is characterized by its **main destination**, among other characteristics (e.g., main purpose).

¹¹ *A Pilot of Using Automatic Number Plate Recognition for OD-Survey of Vehicles*, Tuuli Jarvi., paper presented to ISCTSC, Annecy, France, 25 – 31 May, 2008.

¹² *Deriving Transport Data with Cellphones: Methodological Lessons from South Africa*, Stephan Krygsman and Tom de Jong, paper presented to ISCTSC, Annecy, France, 25 – 31 May, 2008.

- 2.31. The **main destination** of a tourism trip is defined as the place visited that is central to the decision to take the trip. However, if no such place can be identified by the visitor, the main destination is defined as the place where he/she spent most of his/her time during the trip. Again, if no such place can be identified by the visitor, then the main destination is defined as the place that is the farthest from the place of usual residence.
- 2.32. A **domestic trip** is one with a main destination within the country of residence of the visitor. An **inbound or outbound trip** is one with a main destination outside the country of residence of the visitor. An outbound tourism trip might include visits to places within the country of residence in the same way as a domestic trip might include visits outside the country of residence of the visitor. An inbound trip, however, only includes visits within the country of reference.
- 2.33. The term **tourism visit** refers to a stay in a place visited during a tourism trip. The stay does not need to be overnight to qualify as a tourism visit. Nevertheless, the notion of stay supposes that there is a stop. Entering a geographical area without stopping there does not qualify as a visit to that area. **It is recommended** that countries define the minimum duration of stops to be considered as tourism visits.
- 2.34. Observing tourism trips and visits is not the same as observing visitors as an individual might make more than one trip or visit during the period of observation. In the statistics for the three forms of tourism, the term **visitor** is often used instead of **tourism visit** or **tourism trip**. **It is recommended** that these concepts be clearly defined and differentiated in the statistical operations and presentation of the information.

International Recommendations for Tourism Statistics 2008 (IRTS 2008)

There exists sufficient evidence that the record of the number of trips declared by a respondent (whether in household or other kinds of surveys) usually is underestimated due to one or both of the following circumstances: one has to do with the respondent burden entailed by responding to this type of questions, with the resulting tendency of the respondent to declare not to have travelled during the reference period; the second is recall bias and has to do with the difficulty to remember trips undertaken (especially short trips).

Although we do not now the number of countries that have household surveys designed to estimate domestic tourism that use paper diaries, there does exist sufficient experience on the part of travel and mobility researchers (especially beginning in the 1990s) showing that it is a useful instrument for avoiding recall bias insofar as the respondents exhaustively record the number of trips undertaken throughout the requested period of reference.

“Completing an activity diary is known to be quite demanding. Respondents tend to forget report short trips especially and make errors in reporting the details of their activity-travel patterns. Current technology such as cellular phones and PDAs allow immediate testing of responses and prompt respondents to verify responses that may be wrong or inconsistent. Such technology is however also quite expensive. In the present study, therefore, a traditional approach was used. Data checking and cleaning was conducted after the diary data came in, using dedicated software. That is, a series of rules for diagnosis and cleaning were used to improve data quality. It seems that unless substantial financial resources are available, this is the best way of improving the quality of activity diary data”.

“Since their widespread adoption, several decades ago, most household travel surveys have used a diary format that is administered prospectively, either through a telephone recruitment and postal (mail out-mail back) diary survey, a face-to-face interview at the household’s door, or an entirely postal survey. Most have been trip diaries, in which respondents are asked to report each trip that they undertake in a day. In most cases, a trip is defined as being the travel from an origin to a destination, without intermediate stops (except for changes in travel mode or for traffic-related stops, such as traffic signals) (Parvataneni, Stopher, and Brown, 1982). In other cases, the diaries are designed to collect details about each trip segment, where a segment is defined as that part of a trip that is carried out on a

single mode of travel (Axhausen, 1995). In the former case, the diary requires the reporting of what generally averages about four trips per person, together with all of the details about modes used, time started, time ended, purpose, persons accompanying, etc. In the latter case, this results in average segment counts of perhaps twelve or more, especially when including walk segments at the start and end of all car trips”¹³.

However, the application of GPS units in the past several years in various types of surveys (see paragraphs 65 and ff.) has revealed significant underestimation in the record of trips in different surveys that used paper diaries. A recent study¹⁴ conducted in France using these units in a sub-sample of the National Travel Survey 2007 / 2008 is quite illustrative in this respect, since the GPS datalogger allows the measurement of some details that are never given by respondents in conventional surveys:

- Description of very short trips, which are often forgotten;
- Route choice;
- Precise information on access/egress time and waiting time;
- The description of short trips made from an unusual place of residence (e.g. during holidays or long professional trips).

Routes

Interregional origin/destination flows constitute a set of data (normally represented in a matrix) that makes it possible to associate, in general, the distribution of trips made by members of households residing in one region (origin) to other places in the country of reference (destinations) and to estimate the average length of those trips. This information is vital for establishing the propensity for travel in regions of origin and the demographic and behavioural factors associated with the tourists generated by such regions, as well as the average daily expenditure associated with the corresponding visitor flows, between other relevant parameters for tourism analysis. That association is obviously incomplete, because in travelling from one region to another it may be necessary to cross the territory of other areas.

The data gathered, as well as the corresponding estimate of overnight stays, should be checked against data obtained from accommodation surveys and from other administrative records available from either traffic management bodies, motorway concession holders or even credit and debit cards. This internal reconciliation between sources is crucial for ensuring the credibility of data supporting origin / destination matrices.

In order to estimate routes it is necessary to identify the origin and final destination of the trip, as well as the parts (visits) that constitute it. Consequently, all the surveys used for this should approximate these routes in a similar manner. Given that in order to obtain these matrices it is indispensable to ask a set of questions, the UNWTO suggests that a model module be designed to record trips for tourism purposes in both household surveys and in visitor surveys at the destination (as many Tourism Information Centres do).

¹³ *Sample Size Requirements for Multi-Day Travel Surveys: Some Findings*, Peter Stopher, Kara Kockelman, Stephen Greaves and Eoin Clifford – paper presented to ISCTSC, Annecy, France, 25 – 31 May, 2008.

¹⁴ *A Study of Non-Response in the GPS Sub-Sample of the French National Travel Survey 2007-08*, Philippe Marchal, Sophie Roux, Shuning Yuan, Jean-Paul Hubert, Jimmy Armoogum, Jean-Loup Madre and Martin Lee-Gosselin – paper presented to ISCTSC, Annecy, France, 25 – 31 May, 2008.

Household surveys are the preferred source for this type of information, but it is essential to ensure that the survey design and sample size are fit for this purpose¹⁵. IRTS 2008 itself points out this fact

3.31. "For sub-national analysis of domestic tourism, it is also essential to characterize trips according to the place of usual residence of the visitor, his/her personal characteristics and the main destination of the trip. This information, usually collected through household surveys, is often represented in matrices showing the number and duration of trips by origin and destination."

International Recommendations for Tourism Statistics 2008 (IRTS 2008)

It was already mentioned (para. 60) the use of the system of paper diaries and the fact that the evidence provided by GPS units shows significant underestimation in the number of trips recorded through the paper diary system. Now, it is of interest for us to point out that these diaries were also used to record the route of each of the trips, and therefore we should mention here exactly what the GPS system consists of.

"GPS-based data collection methods are potentially more accurate and less of a burden on respondents when compared to paper diary methods, while exact locations of trip destinations and travel times can be recorded. Moreover additional characteristics such as exact routes can be recorded. The Global Positioning System is a satellite-based positioning system. When a GPS data logger receives signals from at least three satellites (or four satellites when time is also measured), the position of a GPS receiver can be determined, accurate to within approximately 10 metres. The location on the earth at which a GPS receiver is situated is saved in location coordinates. In addition to location coordinates, GPS data loggers record the times at which they were situated at these locations. As a consequence, the accuracy of the GPS-based travel data depends much less on the respondents' memory and the effort they are willing to make in retrieving addresses and taking notes when compared with paper diary methods. These improvements in accuracy are confirmed by various studies comparing travel behaviour data recorded using GPS devices, data recorded by respondents in paper diaries and data obtained by means of telephone surveys"¹⁶.

Because raw data are not directly usable (traces are not segmented, there are missing segments, there is no information neither on transport means nor on trip purposes), increasing research has been carried on developing post-processing work required to derive GPS records (collected either on vehicle-based or person-based) to be used for analysis and model estimation.

"Travel behaviour characteristics like travel times and distances can be derived almost directly from GPS logs because a GPS logger records exact positions and exact times. However, for deriving modal choice and destination types visited additional data like GIS data and respondent characteristics and smart algorithms are needed. Due to the fact that deriving modal choice and destination types visited is relatively complicated, different research projects to date have explored and experimented with possibilities for deriving these characteristics, but they all leave room for improvement"¹⁷

¹⁵ For the relation between sample size and tourism regional analysis see *Sample size of New Zealand "Domestic Tourism Survey" (DTS) and tourism regional analysis*, Review of core tourism statistics – full report – Tourism Research Council, New Zealand, December 2002.

¹⁶ *Deriving and Validating Trip Destinations and Modes for Multi-Day GPS-Based Travel Surveys: A Large-Scale Application in the Netherlands*, Wendy Bohte and Kees Maat – paper presented to ISCTSC, Annecy, France, 25 – 31 May, 2008.

¹⁷ *Deriving and Validating Trip Destinations and Modes for Multi-Day GPS-Based Travel Surveys: A Large-Scale Application in the Netherlands*, Wendy Bohte and Kees Maat – paper presented to ISCTSC, Annecy, France, 25 – 31 May, 2008.

EXPLORING POTENTIAL CONNECTIONS BETWEEN TRAVEL/MOBILITY AND TOURISM

Following the outline presentation of the conceptual framework used for the measurement and analysis of tourism activity (see para. 2 and Annex 1), it is obvious that there exist connections between tourism and travel / mobility (as areas of statistical analysis and measurement) and therefore it would be feasible to identify some initiatives of mutual interest. Schematically, it would make sense to reflect, on the one hand, the possible complementarity in terms of the information needed and of the corresponding sources of information (the case of household surveys would be the most obvious example) and, on the other hand, on the contributions of the more extensive research tradition in the case of mobility with regard to traffic flows (as compared to tourism, where the main efforts of the past several years have been focused on establishing the foundations of a set of data and indicators that is sufficiently robust to meet the needs of the public authorities responsible for tourism).

The following paragraphs contain some initial comments that could orient this search for coordination of potential initiatives between the two disciplines.

Observation units and associated characteristics. While in mobility research it is taken for granted that all movements are carried out by the resident population, tourism activity by non-residents could distort the proper measurement of those flows (provided that these are significant in the specific scope of investigation). It is obvious that in certain countries the use of infrastructure elements, their maintenance and even their design is affected by the phenomenon of tourism. The difference between the present population and the resident population at specific times of the year is enormous in many countries (France and Spain are two cases). For example, in the archipelago of the Balearic Islands, the resident population is approximately 1 million persons and the arrival of non-residents for tourism purposes annually reaches a figure of nearly 12 million, with over 60% of this flow being concentrated in the months from June to September.

Moreover, because it is also critical for tourism to identify the main purpose and main destination of the trip as well as the principal activities undertaken while on a trip (there is a list of examples of activities associated with each of the 9 purposes identified), research on mobility can find references of interest in IRTS 2008.

Measurement of visitor activity. The use of GPS devices in research on mobility is making it necessary to develop post-processing data software. Beyond the implications for the purpose of avoiding the over-burdening of respondents and correcting underestimations of trips in household surveys, these experiments can be of enormous interest for the tourism community in a very specific aspect of the measurement of visitor activity: tourism statisticians cannot directly ask respondents whether they are tourists or same-day-visitors, or ask them directly how many tourism trips they carried out during the period of reference. That is to say, the main variables of the study (trip and visitor) are necessarily variables derived from some related characteristics: subjects are asked about the number of trips taken, their duration and their main purpose, etc., and with this information it is possible to derive whether the traveler in question qualifies as a visitor or not.

Household surveys as a privileged source of statistical information. Tourism is beginning to have these sources on a periodic basis (the model case is that of Europe, where the European Parliament legally obliges all member countries of the European Union to report quarterly statistics, for example, on domestic tourism) while mobility has a long tradition in this respect. It could be appropriate to discuss whether it would be beneficial to pool efforts with regard to the conduct of high-powered surveys every 5/8 years (certain countries have already been conducting Household Travel Surveys for some time) although it would seem obvious that in the case of tourism, it would be necessary to have additional

household surveys with greater periodicity (whose articulation with the aforementioned surveys would constitute an issue that would have to be defined). On the other hand, there is growing evidence with respect to the enormous complexity of household surveys for the case of tourism, and especially so, with regard to the efficiency of the sample (many households do not undertake tourism trips), as well as the underestimation of the number of trips (especially those of short duration).

Statistical and other types of errors. Tourism and travel / mobility statisticians share the concern that in the case of the measurement of traveller flows, errors unrelated to sampling could be of capital importance when assessing the robustness of the data generated by the surveys.

In-depth studies of outbound-tourism markets. The strong orientation of Tourism Administrations (both national and sub-national) with respect to tourism promotion campaigns, explains that the necessary tourism information (both statistical and non-statistical) must make reference to the degree of satisfaction in destinations and to an entire set of characteristics associated with both the visitor and the trip. This type of studies, necessarily, do not usually have a precise periodicity (due to their high cost as these are studies with large samples and due to the complexity of the questionnaires normally used).

Linking survey data and administrative records. In tourism there is an increasingly widespread culture with respect to the importance of using statistics based on administrative records in terms of both integrating this data with survey data, as well as for completing the information of national Systems of Tourism Statistics (STS). Concrete examples can be found in Annex 2.

The development of tourism statistics at sub-national levels. The experience of research studies on travel and mobility and the use of new technologies in a good many of them is especially valuable for the development of tourism statistics at sub-national levels.

The local tourism destination as a framework of analysis. One fairly obvious possibility of a joint venture between tourism and travel / mobility in sub-national domains is the case of local tourism destinations as the central focus of many research studies: besides measuring the trips to these territories there is also the need to measure the visits through them. From the perspective of tourism, aside from the need for a definition of a local tourism destination, there is also the need to have precise information on the corresponding routes carried out by visitors.

International comparability. The international tourism community has recently carried out an enormous effort to update the concepts, definitions and classifications used over the past 15 years in order to obtain tourism statistics that are comparable and which make it possible to better identify and measure the tourism reality. This effort is something that the community of travel and mobility researchers could take advantage of as an element of reflection.

On the possible institutional support by tourism administrations. Tourism administrations (especially at the national level) are assuming leadership, in an increasingly determined manner, regarding the development of national STSs with growing participation with National Statistical Offices with respect to boosting household and border surveys for the measurement of the different forms of tourism. Consequently, it is feasible to propose to National Tourism Administrations, and possibly to certain Regional Tourism Administrations in regions where tourism is especially significant, to provide institutional support to initiatives shared between statisticians and researchers of tourism and travel / mobility.

ANNEX 1. SYSTEM OF TOURISM STATISTICS (STS) AND ITS LINKS WITH THE NATIONAL STATISTICAL SYSTEM

1. The National Statistical System (NSS) encompasses a series of statistical functions that correspond to a group of bodies that conduct statistical activities. Statistical activity encompasses all the activities starting from planning and scheduling up to the dissemination of the statistical information produced: the capture, design, production, processing, compilation, storage, publication and dissemination of the statistical information produced.
2. The coverage and extension of these NSSs at any given time can be conditioned by a series of factors, such as:
 - the organization and legal structure of the institutional bodies that produce statistical information (mostly public);
 - the legally established links and administrative mechanisms between these bodies and the Central Unit for coordination and integration;
 - the human and material resources assigned to statistical activities in these bodies
3. The overall aim of the NSS is to provide users with reliable, consistent and appropriate statistical data relative to the country's socio-economic structures and developments, at different territorial levels, and which is geared to international comparisons with the results obtained in the different countries. To this end, NSSs must include, in addition to all the statistical sources existing at a given time, other methodological and instrumental elements that are necessary for its development.
4. Both on account of its aim and content, NSSs must therefore harmonize statistical information at the various national (or federal, where appropriate), infra-national and international levels, through appropriate coordination and integration, to which end a centralizing unit must exist (in almost all cases, these are the National Statistical Offices –NSO–).
5. For the purposes of this task, *harmonization* is taken to mean the controlling activity that makes it possible to ensure that a particular statistical process meets the purpose assigned to it within the NSS; *coordination* is taken to mean the function that serves to balance different statistical programmes from the twofold standpoint of activities and projects of those bodies that produce statistical information; *integration* is a function geared to ensuring the connection and assembly of the different statistical information in a given NSS.
6. Regarding the integration function, the following aspects should be highlighted: *instrumental elements* (concepts, definitions, classifications, data and indicators, national and international recommendations, etc.) on the one hand, and *integrated statistical information systems* (systems of national accounts and socio-demographic statistical systems based either on international or national standards) on the other.
7. Of the two, the System of National Accounts (SNA) is doubtless the most developed. In this respect, it would be desirable for a greater balance to be achieved between the two systems in the future, insofar as they are interrelated through certain concepts, definitions and classifications, and to some extent, because the separation of economic and social statistics is in part conventional since many statistical variables are at the same time of an economic and social nature, or affect both economic and social issues without distinction.

8. There exists a relationship of reciprocity between these integrated statistical information systems and the production of basic statistics: the former systems condition the quantity and typology of the basic statistics necessary for their design and realization, and on the other hand, the latter have to be elaborated using concepts, definitions and classifications that form part of the reference framework, both conceptual and for the presentation of the information of those systems and must also take into account the results tables proper to them. Consequently, integrated systems become the centre of gravity for statistical work in all areas.
9. A System of Tourism Statistics (STS) should be understood, as that part of the NSS providing reliable, consistent and appropriate statistical information on the socio-economic structure and the developments of tourism, integrated within all the economic and social statistics related to other fields, at different territorial levels (national –or federal, where appropriate-, infra-national and international).
10. The design of national STSs should be viewed as the basic coordination and integration framework of all the statistical information produced by all stakeholders in tourism. Concepts, definitions, classifications, data, indicators, aggregates and table of results relating to tourism, designed so as to secure an exhaustive description of the tourism phenomenon in all its aspects (physical, social, economic, etc.) and a measurement of its economic contribution within a context of international comparability are a structural part of the NSS.
11. Regarding its socio-economic aspect, the STS can be defined as a set of components, of statistical nature, made of the statistical sources themselves and the corresponding data obtained (i.e. statistics drawn from surveys, administrative records, or of a synthetic nature – like the TSA –, etc.), the specific tools, methodological references and instruments used at some stages of the process that the generation of statistics entails (as is the case of concepts, definitions, classifications, databases, etc.), and also the instrumental and organizational resources used in all these processes. As a consequence, the STS encompasses the technical aspects of field operation, the creation of statistical infrastructure, the elaboration of the results, and the completion of work leading to an integration of the data into a system of information.
12. UNWTO wishes to recall that, at the fifth session of its General Assembly held in New Delhi in 1983, it established the general guidelines for most of its work on the international harmonization of tourism concepts and statistics. The *1993 Recommendations on Tourism Statistics* (adopted by the Commission in 1993 and published in 1994) represent the first international recommendation; a second one (the *2000 Tourism Satellite Account: Recommended Methodological Framework*) was published in 2001. Both recommendations determine the basic foundations of a System of Tourism Statistics. Since then, there have been many contributions from institutions and individuals alike, finally enabling us to construct the necessary bases for enhancing the credibility of the measurement of tourism's economic importance.
13. The new *International Recommendations for Tourism Statistics 2008* and *2008 Tourism Satellite Account: Recommended Methodological Framework* constitute the new framework that defines the STS at this time. As such, they should be used as a reference for harmonization, coordination and integration of available tourism statistical information, although this information might extend in the coming years beyond the still restricted domain these recommendations touch upon. For instance, by extending the concept of consumption including other components of the demand (such as collective consumption and gross fixed capital formation, developing the sub-national perspective, etc.)

14. Although it is the countries' responsibility to carry out the development of the STS, the UNWTO recommends this should follow the Basic Principles of Official Statistics approved by the United Nations Statistical Commission (11/15 April 1994) as indicated in IRTS 2008 chapter 9.
15. Those principles provide guidelines for establishing and maintaining a credible STS and therefore, the use of such principles should be understood as a necessary condition to maintain users' confidence in tourism statistics and, particularly, to help guaranteeing the integrity, transparency and confidentiality of the individual data and the public access to the available statistics.
16. As previously mentioned, the development of a System of Tourism Statistics is closely linked to the implementation of the Tourism Satellite Accounts (TSA). In fact, the TSA provides the conceptual framework and the organizational structure for the harmonization and reconciliation of most tourism statistics internally within the sector as well as with other economic statistics. From this perspective, it should be seen as an instrument to assist countries in the identification of data gaps and to guide them during the revision of existing data sources as well as in the development of new sources.
17. The following scheme highlights the basic core of the STS for international comparability purposes. It identifies two basic organizational networks of information
 - the basic information network (identified with a basic core of tourism data and indicators and supported by the IRTS 2008 as its conceptual background)¹⁸ and
 - the measurement of tourism economic contribution network (which finds in the TSA:RMF 2008 its conceptual background)both of them with their corresponding components

¹⁸ In the UN System, Tourism is included in "Economic Statistics" covering "statistics regarding visitor's activity (such as arrivals / departures, overnight stays, expenditure, main purpose of the trip, etc.) associated to different forms of tourism (inbound, domestic and outbound), tourism industries activity and infrastructure, employment and tourism satellite accounts"

INTERNATIONAL COMPARABILITY AND NATIONAL SYSTEMS OF TOURISM STATISTICS (STS): THE BASIC CORE

A. The basic information framework

1. Concepts and definitions

- 1.1. Visitors and tourism trips
- 1.2. Tourism supply
- 1.3. Employment in the tourism industries
- 1.4. Main observation / statistical units and related characteristics

Concepts and definitions	Units	Main related characteristics
Visitors	Visitors	Typology (Overnight visitor-tourist- /same-day visitor-excursionist) Country of residence / regions Size
	Travel party	
Tourism trips	Trips	Main purpose Duration Main destination Modes of transport Types of accommodation used Organization Expenditure
Tourism supply	Establishments	<u>Non-monetary</u> Size Other non-monetary characteristics specific for each tourism industries <u>Monetary</u> Output Intermediate consumption Gross value added Compensation of employees
Employment in the tourism industries	Establishments Jobs	Size Status in employment Hours of work Full-time equivalence

2. Classifications

- 2.1. Forms of tourism
- 2.2. Classification of products acquired by visitors
- 2.3. Classification of activities serving visitors

3. Tables of results

- 3.1. Inbound tourism
- 3.2. Domestic tourism
- 3.3. Outbound tourism
- 3.4. Tourism industries
- 3.5. Employment in the tourism industries
- 3.6. Related indicators

B. The TSA framework

1. Concepts and definitions

- 1.1. Demand perspective
 - 1.1.1. Internal tourism consumption
- 1.2. Supply perspective
 - 1.2.1. Tourism gross value added
 - 1.2.2. Tourism gross domestic product

2. Classifications

- 2.1. Products (consumption and non-consumption products)
- 2.2. Industries (tourism industries and other industries)

3. Tables of results

- 3.1. Contribution of tourism to the national economy
- 3.2. Internal tourism consumption, by products and forms of tourism
- 3.3. Domestic tourism consumption, by products and categories
- 3.4. Inbound tourism consumption, by products and categories
- 3.5. Gross value added and tourism gross value added, by industries
- 3.6. Tourism gross value added, by components
- 3.7. Domestic supply of goods and services, by products

ANNEX 2. DEVELOPING STATISTICS FROM ADMINISTRATIVE SOURCES: A REGIONAL INSIGHT

Aside from the case of information generated by the regulatory authorities of the different types of traffic, there are other sources of an administrative nature traditionally used for statistical purposes. When appropriately filtered, they can contribute to the development of a system of tourism statistics at both the national and regional levels.

However, there are other sources that are especially useful for the regional analysis of tourism activity:

a) *Credit and bank cards.*

The use of this source of information has been undertaken in France: initially the Regional Tourism Commission of Burgundy¹⁹ used a significant sample of bank cards with the aim of estimating the turnover of tourism industries, undertaking for this purpose surveys at establishments (in order to be able to estimate the “touristicity” rate in each of the tourism industries). This pioneering work was related to the elaboration of regional tourism accounts for 2000.

Subsequently, as a result of the sinking of the oil tanker Erika in December 1999 and “the substantial negative effects on the tourism activity in the affected regions, the State Secretariat for Tourism began its involvement in the matter in early 2000 and has asked the National Tourism Observatory (ONT) to establish an observation mechanism in order to measure the effects of this disaster on the tourism activity of the affected areas. A great deal was at stake since the objective of the exercise was to assess the damages suffered in order to determine the size of the compensation that could be expected and to support the government’s negotiations for the IOPC Funds to shoulder part of this compensation.

The ONT launched several actions, but one of them was of more general interest since it led to the consideration of activities whose business turnover is influenced by tourism, and to the measurement of tourism expenditure.

The Observatory was provided with highly interesting information by Groupement Cartes Bancaires (an organization that ensures the security of the interbank card system for payment and cash withdrawal, and which has highly accurate statistics regarding the number of transaction and the volume of payments). This led to an inquiry into the degree of “touristicity” of economic activities.

We shall present the data used, the adjustments made to make data from different periods comparable, an analysis of the seasonality of bank card payments, certain considerations regarding the “touristicity” of activities and some insights regarding the possibility of using this basis to estimate tourism expenditure by type of activity²⁰.

¹⁹ CRT de Bourgogne (2003). *L’industrie touristique en Bourgogne. La mesure des chiffres d’affaires touristiques*. France. Exploring regional extensions for the Tourism Satellite Account (TSA) - UNWTO Headquarters, Madrid, Spain, 5 February 2003

²⁰ Bernardet, M. (2002) “*Tourism-Sensitive*” *Economic Activities*, Enzo Paci Papers on Measuring the Economic Significance of Tourism (Volume 2), World Tourism Organization, Madrid.

b) *Toll payments on motorways*

A study by M. Houee²¹ identifies a case of concrete application in France, in which seven points were taken in a day over 9 straight hours to estimate the flow of incoming traffic by nationality based on the number of private transport vehicles paying toll, average occupancy and the nationality of the license plate. Depending on the structure of the road network of a given tourism region or zone, this method could be a useful tool for modelling tourism activity.

c) *Fiscal sources*

The UNWTO recently turned to the OECD to suggest that it use tourism as a case study in relation with a project for the development of short-term statistics of the services that this Organization is carrying out. The document presented²² includes a mention of the statistical use of fiscal sources and business statistics in the case of tourism industries, which we believe is interesting to reproduce.

“Our first approach to analysing the national experiences on which this document is based was structural, that is, how some available fiscal sources in some countries with more developed tax structures offer information that we have seen to be enormously useful for the analysis of the economic structure of tourism industries.

From this point of view, we believe that sources such as VAT and the Business Income Forms – including either Corporation/Individual /Partnership/Sole Proprietorship Taxes – and Employer Returns Tax (or equivalent figures in different countries)²³, are the basis for three types of application that are of special interest for tourism:

- For finding out the population of companies associated with tourism so that a set of basic economic ratios of a structural nature (with their corresponding annual updates) can be related to them at the levels of activity identified in the above-mentioned list of tourism characteristic products and industries. This would be especially useful for promoting the economic analysis of tourism from the point of view of supply and would also support the development of TSAs.
- For the purpose of economic policy, specifically in the area of employment. Fiscal sources allow tourism companies to be grouped according to size (by number of workers or other criteria) with the necessary rigour and precision. They also allow certain economic variables (such as turnover, capital expenditure and wages and salaries) to be associated with such groups. This leads the way to rigorous formulation on the potential of tourism to create jobs;

²¹ Houee, M. (2003). *Le trafic autoroutier comme vecteur de connaissance de la fréquentation touristique étrangère: application au réseau de la SAPPR*. France. Exploring regional extensions for the Tourism Satellite Account (TSA) - UNWTO Headquarters, Madrid, Spain, 5 February 2003

²² World Tourism Organization (2003). *New Statistical Initiatives in the Field of Tourism*. Enzo Paci Papers on Measuring the Economic Significance of Tourism (Volume 3). World Tourism Organization, Madrid.

²³ For example, in New Zealand, Australia and Canada, the tax equivalent to VAT is called Goods and Services Tax. This is based on the same concept as VAT but it works differently in some cases. In the US, this tax is applied by the State rather than on a federal level and receives many different names although the most common name is “retail sales tax”. These are usually taxes on retail sales rather than on value added.

- Design of statistical actions of various types with regard to both structural and short-term perspectives, as described in Chapters II and III of this document.

These applications comply with an important fact fully described in the following chapter of this document. The structural business surveys designed by NSOs do not usually use the level of breakdown needed in the classification of economic activities for tourism analytical purposes whereas fiscal sources (especially VAT) do. This is simply because, it would be very costly to increase the degree of breakdown needed in such surveys, whereas fiscal sources are usually exhaustive by definition so the activity codes used entail a high level of breakdown.

This factor is basic for evaluating to what extent the information obtained from the collection of VAT (both annually and over shorter periods) may be relevant for analysis of the current situation of all or some of the tourism characteristic industries, as with other sub-sets such as Wholesale and / or Retail Trade services, given the pronounced seasonality of tourism activity.

An additional reference to the use of fiscal sources is mentioned by P. Bisset²⁴ in relation with the decision taken in 1996 by Statistics Canada to embark on a major project to improve the quality of its provincial economic statistics.

“In the middle 1990’s the Canadian Federal Government promised to replace the existing Goods and Services Tax (GST) with a system that generates equivalent revenues, is fairer to consumers and to small business, minimizes disruption to small business, and promotes federal-provincial fiscal co-operation and harmonization”. In April 1997, a new "Harmonized Sales Tax" (HST) was introduced in the provinces of Nova Scotia, New Brunswick, and Newfoundland and Labrador. The HST replaced the GST and the three different provincial sales taxes with a single value-added tax in the three participating provinces.

The HST levies tax on the value added at each stage of the production process of both goods and services. The revenues generated by the tax are collected by Revenue Canada (Canada’s central tax agency) and "pooled" in a central fund. A HST Revenue Allocation Formula divides these revenues among the participating federal and three provincial governments.

Statistics Canada was asked to provide the statistical information required for the revenue allocation formula. Thus was born the Project to Improve Provincial Economic Statistics (PIPES). This request provides a major challenge to Statistics Canada on a number of fronts, including the challenge of minimizing respondent burden. A tremendous amount of detailed information is required to distribute accurately the pooled tax revenues among the four participating governments. If each business filing HST were obliged to collect, maintain and report on all the data necessary to allocate the pooled revenues properly a significant burden would result. It is obvious that this situation is not acceptable for several reasons, including its undermining of two major benefits which the HST was to promise: to lower compliance costs and increase simplicity in the federal and provincial tax systems.

The paradox faced by Statistics Canada is that it must provide large volumes of detailed provincial economic data (the majority of which traditionally is obtained via surveys of Canadian businesses) without undue increase in respondent

²⁴ Bissett, P. (2003). *Use of tax data in the production of provincial economic statistics*. Statistics Canada, Canada.

burden. Moreover, the prevailing view at Statistics Canada is the perception that the "goodwill" of small business is already stressed by the current business survey.

The result has been the development of the mantra to maximize the use of administrative data sources.

d) *Municipal administration sources in the case of touristic municipalities.*

The municipal government of Calviá has carried out an initial estimation of the weight that tourism represents in this municipality located on the island of Majorca (Spain), which with a population of 40,000 inhabitants receives around 1,700,000 visitors a year with overnights estimated at 18.2 million annually. The peculiarity of this exercise²⁵ was in its approach to estimating tourism activity on the supply side of tourism services based on the business tax census of the municipality's Economic Activity Tax, selecting those headings relevant to tourism and estimating the part of their production going to non-resident visitors.

²⁵ Nájera Aranzábal, M. (2001) *The Tourism Satellite Account and Touristic Municipalities: An Instrument for Quality and the Sustainability of Local Tourism Activity*. "Tourism Satellite Accounts: Credible Numbers for Good Business Decisions", 8,9, 10 May 2001 Vancouver, Canada

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