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**THEME 1: REGIONAL AND SUB-NATIONAL TOURISM STATISTICS**

**TITLE: Regional tourism satellite accounts in a vastly diverse tourism economy**

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(This paper represents the views of the author and do not necessarily reflect the opinions of Statistics Canada)

**1. Introduction**

According to the World Tourism Organization (UNWTO), tourism has grown above its long-term average for the eighth consecutive year in 2017<sup>1</sup>. As such, it is not surprising to see governments dedicate more resources to developing sound tourism marketing strategies. Tourism marketing at the regional level has also increased, and with it, so has the demand for regional tourism statistics.

Demand for regional tourism statistics is especially important in geographically large and diverse economies like Canada, where tourism snapshots vary significantly across regions. While this diverse landscape leads to a need for regional tourism statistics, it also poses its biggest measurement challenge. Canadian travelers are mostly surveyed through self-reported online questionnaires. Consequently, it is difficult to measure travel in remote regions, where internet connectivity is limited. Alternatively, telephone interviews are not as cost effective as self-reporting.

How can you accurately capture tourism activity in remote regions that cannot be surveyed using conventional collection methods? Governments in remote regions, especially in Canada's territories (Yukon, Northwest Territories and Nunavut), are getting increasingly creative at measuring tourism activity. This includes expanding existing air, road and cruise exit surveys, as well as using administrative data such as hunting and fishing licenses and hotel guest registries. Statistics Canada is currently doing a feasibility study that will tap into these regional initiatives to enhance the measurement of travel.

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<sup>1</sup> World Tourism Organization. 2018. *UNWTO Annual Report 2017*, UNWTO, Madrid. [\[link\]](#)

On October 10, 2018, Statistics Canada released the *Provincial and Territorial Tourism Satellite Account, 2014*.<sup>2</sup> This regional tourism satellite account (RTSA) produced tourism statistics for each of Canada's ten provinces and three territories: from the coastlines of Prince Edward Island, to the Rocky Mountains of British Columbia, to the Northern Territories.

Tourism satellite accounts (TSA) developed by Statistics Canada, both national and regional, follow the UNWTO's *Tourism Satellite Account: Recommended Methodological Framework 2008* (TSA:RMF 2008) and *International Recommendations for Tourism Statistics 2008* (IRTS 2008) international guidelines, as well as those set by the Canadian System of Macroeconomic Accounts.

This paper will first explore the importance of regional tourism satellite accounts in Canada by painting a picture of the country's diverse tourism landscape. The next section will focus on results from Canada's most recent regional tourism satellite account: the Provincial and Territorial Tourism Satellite Account (PTTSA), 2014. The following sections will briefly review data sources used to estimate tourism demand, gross value added (GVA) and employment in the 2014 PTTSA, as well as identify the main challenges of producing regional tourism satellite accounts in Canada. The sixth section will define the role of alternative data sources such as big data in shaping tourism statistics moving forward. The paper will conclude with a discussion on future opportunities to measure tourism activity in Canada.

## **2. The importance of regional tourism satellite accounts: A Canadian perspective**

Nationally, tourism's contribution to GVA was 1.9% in 2014, ranging, by region, from a low of 1.2% in the territory of Nunavut, to a high of 3.0% in the province of Prince Edward Island. Both regions could not be more diverse in its tourism landscape.

Nunavut is the northernmost region of Canada, and at 2,093,190 km<sup>2</sup>, is the country's largest region. It has a population density of 0.02/ km<sup>2</sup>, the lowest among all regions in Canada. It is not considered a tourism hotspot, although cruises along the northern islands are increasingly popular during the months of July and August. Nunavut is inaccessible by car, and although some communities have roads, none of them are connected to one another. You can only fly in to Nunavut from a handful of Canadian cities. More than half of its tourism demand comes from its own residents.

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<sup>2</sup> Statistics Canada. No date. *Provincial and Territorial Tourism Satellite Account*. Last updated October 12, 2018. [[link](#)]

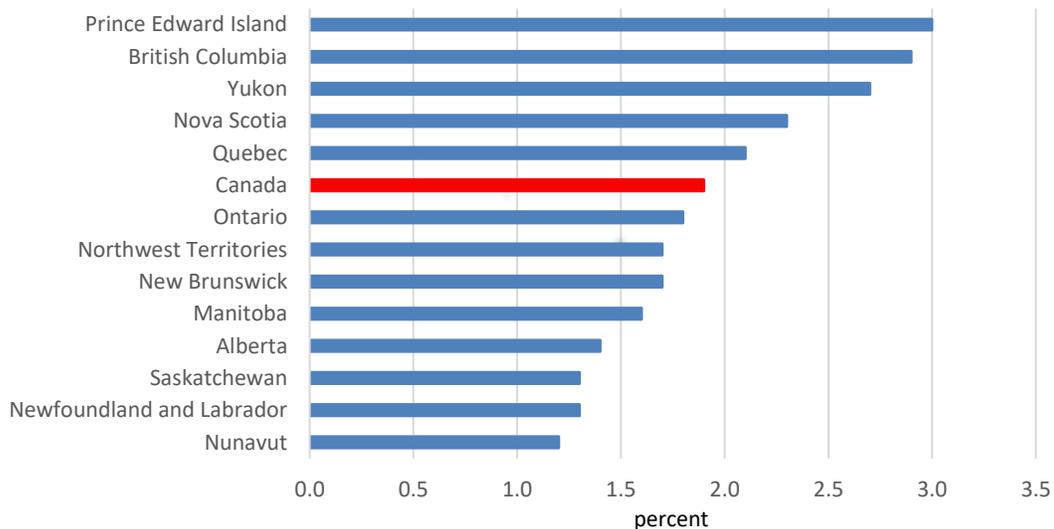
Prince Edward Island, on the other hand, is Canada’s smallest region, at 5,660 km<sup>2</sup>. It has a population density of 25.1/ km<sup>2</sup>, the highest among all regions in Canada. Tourism is one of the region’s economic drivers, even though its tourism season is relatively short. Most of the incoming traffic is via the 12.9 km-long Confederation Bridge that connects the Island to the mainland, although you can also enter by plane, boat and ferry. More than half of its tourism demand comes from residents of other provinces and territories.

The contrasts in Nunavut's and Prince Edward Island's tourism landscapes clearly demonstrate the importance of tourism satellite accounts at a regional level. Consequently, inferences at the national level do not hold true for all regions. For example, while passenger air transport accounts for 20% of tourism spending in Canada, it only represents 2% in Prince Edward Island, and 47% in the Northwest Territories. To fully understand tourism in Canada, one must break it down by region.

### 3. Results of the 2014 Provincial and Territorial Tourism Satellite Account

As stated in the previous section, tourism activity varied across provinces and territories in 2014, with its contribution to GVA ranging from 1.2% in Nunavut to 3.0% in Prince Edward Island. Nationally, tourists spent \$84.1 billion in Canada, contributing to 1.9% (\$35.0 billion) of GVA.

Chart 1: Tourism's contribution to GVA, by region



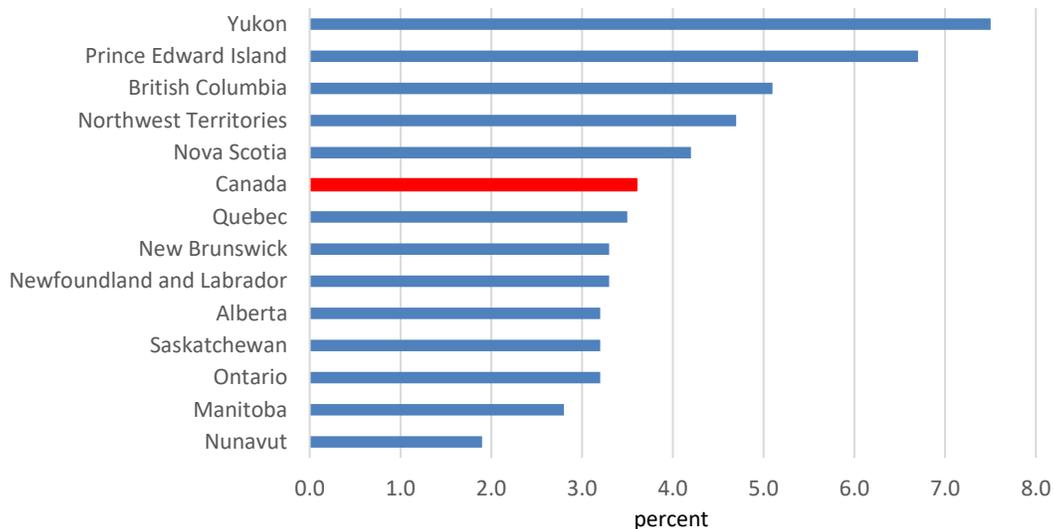
About three quarters of tourism activity in Canada was concentrated in the country's three largest tourism economies: Ontario, Quebec and British Columbia. This held true for tourism GVA, employment and expenditures. The source of tourism spending was

similar in Ontario and Quebec, with domestic spending twice as high as interprovincial and international exports combined. However, British Columbia relied more heavily on international exports, with its share of spending at 36.7%.

Domestic demand includes spending in a province or a territory by residents of that province or territory. Interprovincial demand (or interprovincial exports) includes spending in a province or territory by residents of another province or territory. International demand (or international exports) includes spending by international visitors.

Tourism's share of employment was highest in Yukon (7.5%) and lowest in Nunavut (1.9%). There were 642,900 tourism jobs in Canada, which represented about 3.6% of all jobs.

Chart 2: Tourism's contribution to employment, by region



Tourism's contribution to employment was higher than its contribution to GVA in all provinces and territories. This is due to the reliance of several tourism industries on part-time, temporary and lower-paying jobs, especially in the food and beverage services industry.

Domestic demand was the predominant source of tourism spending in 10 of the 13 jurisdictions. The share of domestic demand was highest in Saskatchewan (74.3%) and Quebec (70.4%). In contrast, the share was lowest in Prince Edward Island (24.0%), which relies more heavily on interprovincial exports. Nationally, domestic demand was \$51.7 billion.

Interprovincial exports had the highest share in Prince Edward Island (53.2%) and Yukon (38.9%). The lowest shares of interprovincial exports were in Nunavut (5.5%) and Quebec (10.4%). At the national level, interprovincial demand was \$12.7 billion.

International exports were \$19.8 billion nationally, and were the leading contributor to tourism demand in Yukon only.

	Tourism's contribution to GVA	Tourism's contribution to employment	Tourism GVA	Tourism employment	Tourism demand	Domestic demand	Inter-provincial exports	International exports
	%	%	millions of dollars	thousands of jobs	millions of dollars			
<b>Canada</b>	<b>1.9</b>	<b>3.6</b>	34,958.3	642.9	84,080.9	51,657.1	12,656.6	19,767.3
Newfoundland and Labrador	1.3	3.3	417.3	7.7	1,070.6	608.2	364.8	97.4
Prince Edward Island	3.0	6.7	159.9	5.0	406.4	97.5	216.1	92.7
Nova Scotia	2.3	4.2	829.2	19.1	2,135.4	1,069.6	553.6	512.3
New Brunswick	1.7	3.3	500.4	12.0	1,301.0	711.4	413.5	176.5
Quebec	2.1	3.5	7,178.7	139.6	17,638.8	12,413.1	1,835.2	3,390.9
Ontario	1.8	3.2	12,059.5	225.3	29,875.8	19,843.2	3,331.2	6,701.4
Manitoba	1.6	2.8	977.5	18.2	2,497.1	1,612.8	470.2	413.8
Saskatchewan	1.3	3.2	996.4	18.7	2,266.0	1,683.6	399.4	182.7
Alberta	1.4	3.2	5,216.4	75.1	11,140.5	6,803.4	1,931.6	2,405.1
British Columbia	2.9	5.1	6,438.9	118.6	15,266.4	6,641.3	3,026.0	5,599.3
Yukon	2.7	7.5	72.1	1.9	181.8	53.4	21.8	106.3
Northwest Territories	1.7	4.7	81.2	1.4	230.0	80.6	89.5	60.0
Nunavut	1.2	1.9	27.6	0.3	71.2	39.5	3.9	27.8

***Tourism gross value added per capita as a complementary measure of tourism's contribution to economic activity***

One of the principal statistics used to compare tourism activity between economies, especially in RTSAs, is its contribution to GVA. Tourism's contribution to GVA is the tourism GVA divided by economy-wide GVA (which is the sum of tourism and non-tourism GVA). It measures how much of the production of a region is attributable to tourism demand.

Three elements play a key role in determining tourism's contribution to GVA: the importance of tourism industries within an economy, the importance of other (non-tourism) industries within an economy and the proportion of an industry's output that is consumed by tourists.

The relative importance of tourism industries within an economy is therefore not only defined by its tourism industries, but also by their outputs that are consumed by "non-tourists", and by all the other industries that are not influenced by tourism activity. Considering the definition of tourism's contribution to GVA above, in the presence of dominant non-tourism industries within an economy, tourism's contribution to GVA can be smaller, especially in smaller economies.

Furthermore, GVA may be sensitive to the volatility of these dominant non-tourism industries. Opening new mines or oil and gas extraction facilities, for example, can lead to significant increases in production in non-tourism industries. Conversely, shutdowns may lead to large drops in production. These types of events, which are not related to tourism whatsoever, may eventually lead to volatility in a region's tourism's contribution to GVA.

Tourism GVA per capita may be used as a complementary measure to tourism's contribution to GVA. By focusing on tourism industries only, tourism GVA per capita, compared to tourism's contribution to GVA, minimizes the impact of dominant non-tourism industries.

Tourism GVA per capita was highest in Yukon (\$1,958) and the Northwest Territories (\$1,851). This means that, adjusting for the regions' population<sup>3</sup>, GVA attributable to tourism demand was highest in Yukon, averaging \$1,958 per person. It is not surprising to see these two regions rank higher in terms of tourism GVA per capita, considering their high dependence on non-tourism industries such as mining (copper in Yukon, diamonds in Northwest Territories).

Alberta and Saskatchewan, which rely heavily on the energy sector, also fared much better when looking at tourism GVA per capita.

	Tourism's contribution to GVA		Tourism GVA per capita	
	%	rank	dollars	rank
Canada	1.9	-	984	-
Newfoundland and Labrador	1.3	11	790	10
Prince Edward Island	3.0	1	1,096	5
Nova Scotia	2.3	4	880	8
New Brunswick	1.7	7	663	13
Quebec	2.1	5	874	9

<sup>3</sup> Statistics Canada. No date. *Table 17-10-0005-01 Population estimates on July 1st, by age and sex, all age groups*. Accessed October 8, 2018. [\[link\]](#)

Ontario	1.8	6	882	7
Manitoba	1.6	9	763	12
Saskatchewan	1.3	11	889	6
Alberta	1.4	10	1,270	4
British Columbia	2.9	2	1,386	3
Yukon	2.7	3	1,958	1
Northwest Territories	1.7	7	1,851	2
Nunavut	1.2	13	765	11

#### 4. Data sources

The PTTSA estimates are derived from four main data sources: the supply and use tables, travel surveys, industry surveys and the Canadian Productivity Accounts.

##### ***Supply and use tables***

Statistics Canada produces annual national and regional supply and use tables. The regional supply and use tables, available for each province and territory, offer a level of detail identical to their national counterpart. They cover 236 industries, 278 categories of final demand and 496 product groups, and provide a statement of the structure of economic activity in a given region.

The supply and use tables integrate data from survey and administrative sources available at Statistics Canada. Given their comprehensive nature and the coherence analysis implicit in their compilation, the supply and use tables are used as an integrating mechanism to benchmark the Canadian System of Macroeconomic Accounts.

The PTTSA uses the supply and use tables to derive estimates of tourism supply and GVA as well as to estimate parts of tourism demand, specifically domestic and interprovincial demand by residents of the territories.

The properties and relationships present within the supply use tables allow the PTTSA to adopt a framework, classifications and production systems that are already in place for the national TSAs, which lead to significant efficiencies.

##### ***Travel surveys***

Two travel surveys provide the bulk of the tourism spending estimates of the PTTSA.

The Travel Survey of Residents of Canada (TSRC)<sup>4,5</sup> measures tourism activity by Canadian residents travelling within its boundaries. It provides data on business and personal tourism expenditures by province or territory, including the traveller's place of residence, purpose of travel, places visited, duration of stay, and types of accommodation and modes of transportation used. This information is all used in compiling the PTTSA.

The International Travel Survey (ITS)<sup>6,7</sup> measures tourism activity by international visitors travelling to Canada and by Canadian residents travelling outside the country. This survey also provides data for Canada's Balance of Payments with other countries. Like the TSRC, the ITS provides data on business and personal travel expenditures by province or territory visited. It also supplies information on the traveller's place of residence, purpose of travel, places visited, duration of stay, and types of accommodation and modes of transportation used. In addition, it provides information on international passenger fares and modes of transportation used to enter and leave Canada.

### ***Industry surveys***

In addition to the supply and use tables, the PTTSA draws on industry surveys to derive estimates of tourism supply. These surveys are mostly used to extract non-tourism output from the supply and use tables that would otherwise be considered as tourism output.

Industry surveys, which offer industry (and product) detail greater than what is available in the supply and use tables, are used to disaggregate the tables into *tourism* and *non-tourism* components.

Most of the industry surveys used in producing the 2014 PTTSA are extensions of the Annual Survey of Services Industries. These included extensions on:

- Amusement and recreation;
- Automotive equipment rental and leasing;
- Food services and drinking places;
- Performing arts;
- Spectator sports, event promoters, artists and related industries;

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<sup>4</sup> The TSRC was replaced by the National Travel Survey in 2018. The National Travel Survey covers travel by Canadians in Canada and outside the country.

<sup>5</sup> Statistics Canada. No date. *Travel Survey of Residents of Canada (TSRC)*. Last updated April 17, 2018. [\[link\]](#)

<sup>6</sup> The ITS was replaced by the Visitor Travel Survey in 2018. The Visitor Travel Survey covers travel by international visitors in Canada.

<sup>7</sup> Statistics Canada. No date. *International Travel Survey: Electronic questionnaires and Air Exit Survey (ITS)*. Last updated May 25, 2018. [\[link\]](#)

- Travel arrangement services;
- Traveller accommodation services;

The Passenger Bus & Urban Transit Survey was also used. Also, several other industry surveys were used indirectly in producing the supply and use tables.

### ***Canadian Productivity Accounts***

PTTSA estimates of employment attributable to tourism demand are derived from the Canadian Productivity Accounts (CPA). Estimates represent the number of jobs (and not the number of persons employed). The CPA are benchmarked to the latest supply and use tables and are estimated by province and territory and by industry.

## **5. Challenges in producing the regional tourism satellite accounts in Canada**

There are challenges in building tourism satellite accounts, even more so when building a regional dimension. This section will explore the two main challenges encountered when building the 2014 PTTSA and how Statistics Canada addressed them.

### ***Measuring tourism in remote locations***

Canada's diverse landscape includes remote regions, where measuring tourism activity is particularly difficult using conventional collection methods.

The TSRC, which is the principal data source of domestic and interprovincial demand, measures tourism spending by residents of the ten provinces via an electronic questionnaire accessed online. It includes spending by these residents when travelling within their own province, as well as spending elsewhere in Canada, including in the territories. It does not, however, survey residents of Yukon, Northwest Territories and Nunavut, because internet connectivity in the territories is limited.

The ITS measures tourism spending by all Canadians (including residents of the territories) travelling outside of the country, as well as by international travellers visiting Canada (including the territories).

Alternative data sources needed to be explored to measure tourism spending by residents of the territories travelling in Canada (either within their territory or elsewhere).

Two alternative data sources were considered: the Survey of Household Spending (SHS), which were used to compile previous national and regional TSAs, and the supply and use tables, specifically the household final consumption expenditure (HFCE) on tourism products. Ultimately, the SHS was not used as the principal source, as 2014 data was

unavailable, and 2015 data used an updated classification and only covered the territories' capital cities. HFCE, as part of the supply and use tables, uses the same classifications as the PTSTA.

Scope of the TSRC is significantly different than the HFCE. The TSRC measures spending while on business and leisure tourism trips. HFCE is limited to personal expenditures. In other words, compared to the TSRC, HFCE excludes business tourism expenditures but includes non-tourism personal expenditures. As a result, levels of HFCE cannot accurately reflect domestic and interprovincial tourism spending by residents of the territories.

However, HFCE was determined to be a good predictor of tourism expenditures by residents of the provinces, as measured by the TSRC. Hence, HFCE data was used to obtain estimates of tourism expenditures by residents of the territories.

More specifically, domestic tourism demand by residents of the territories was derived from all HFCE categories, excluding the following:

- *PEC15110 - Expenditure by Canadians abroad;*
- *PEC15120 - Expenditure by Canadians in other provinces or territories;*

HFCE by non-residents in Canada and by Canadians residing in other provinces or territories, which are embedded in each HFCE category, were then netted out to obtain estimates of domestic tourism demand. These two HFCE categories were:

- *PEC15210 - Expenditure by non-residents in Canada;*
- *PEC15220 - Expenditure by Canadians residing in other provinces or territories.*

Interprovincial tourism demand by residents of the territories was derived from the HFCE category *PEC15120 - Expenditure by Canadians in other provinces or territories.*

Trade data from the supply and use tables were then used to distribute interprovincial tourism spending from the territories into provinces and territories visited.

Statistics Canada is currently doing a feasibility study that will aim to improve tourism statistics in the territories by leveraging its new National Travel Survey, building on existing efforts by the territories' governments and exploring the use of alternative data. This initiative would enhance data from the travel surveys by providing additional measures of interprovincial and international tourism activity in each territory, and provide a measurement of tourism activity by residents of the territories travelling within their own territory.

### ***Regional estimates based on smaller sample sizes***

Another challenge of the PTSTA is the use of small samples from the travel surveys to derive estimates of tourism demand.

Statistics Canada's travel surveys are based on a relatively small sample of total travellers, and therefore cover a small portion of total spending. In addition, travel surveys are most likely based on recall of events as opposed to detailed records and do not follow a rigorous process of data confrontation. As a result, samples from the travel surveys are likely to suffer from outlying values or respondent error that impact the quality of estimates, especially at the regional level.

Validation of tourism demand derived from travel surveys is done by confronting the demand and supply of each tourism product and analyzing tourism product ratios. Tourism product ratios, defined as the tourism demand for a certain product (from travel surveys) divided by its supply (from the supply and use tables), have historically been quite stable through successive iterations of tourism satellite accounts (both national and regional) in Canada.

Since estimates of tourism supply obtained from the supply and use table are more reliable, tourism product ratios that fall outside an expected range may indicate problems with estimates of demand.

## **6. Using big data to measure tourism across Canada**

Several initiatives are currently being explored at Statistics Canada to better measure the economy at the national, regional and even sub-regional levels. Statistics Canada is increasingly turning towards the use of big data and administrative data as alternatives or supplements to surveys. This may have a direct impact on how we measure tourism across Canada.

Defining big data is difficult, as it is constantly evolving. In an attempt to describe big data, the seven V's of big data have been referenced (see Demunter (2017)): *volume*, *variety* and *velocity* as the three core V's, along with *veracity*, *validity*, *volatility* and *value*.

Big data usually involves large data sets that can be obtained directly from suppliers, purchased from third-party providers or built by scraping large amounts of information from the internet. The strength of this alternative data source comes from the sheer volume of information it provides. It may also offer geographical granularity that may otherwise be unattainable through conventional data collection methods. And while there are often questions about the veracity of the data (i.e., how much noise is in the data) and operational issues with analyzing millions of data points, the cost effectiveness can outweigh the challenges.

Under a recent study conducted at Statistics Canada, big data was used to measure the value of peer-to-peer accommodation rental services such as AirBnB. The findings will

be released in early 2019. These services are partially covered on the demand side (i.e., travel surveys), but may be underrepresented on the supply side of the Canadian System of Macroeconomic Accounts, at both the national and regional level.

As a result of this study, a measurement for peer-to-peer accommodation rental services will be included in the Canadian System of Macroeconomic Accounts. This will have a direct impact on future tourism satellite accounts' measurement of supply, GVA and employment in Accommodation services, especially since preliminary analysis suggests the use of peer-to-peer accommodation rental services has grown significantly in the last few years.

The use of banking data by Canadian residents is also being investigated at Statistics Canada. While this is not limited to tourism, or even to its larger subset of travel, assumptions can be made to a reasonable degree of certainty that certain transactions should fall under the umbrella of tourism activity. Data on residency, points of transactions, products purchased, frequency of transactions and dates of transactions all provide valuable information that help determine whether transactions were likely undertaken by tourists.

Finally, beginning in 2019, payments card (credit and/or debit) data will be used to measure tourism expenditures by international visitors. This initiative will provide expenditures at the sub-regional level and will complement measurements of tourism expenditures obtained from the Visitor Travel Survey (which replaced the ITS in 2018).

While alternative data provide an abundance of possibilities, it should be used with caution, especially when measuring tourism activity. The main concern surrounding its use when building TSAs centers on the ability (or lack thereof) to distinguish between travel and tourism. Whether this source will allow us to identify (and exclude) non-tourists such as commuters, seasonal workers, students on long-term programs, is not entirely clear.

## **7. Conclusion**

Tourism satellite accounts are integral to the measurement of the economic activity of tourism. They not only allow for a comprehensive analysis and understanding of tourism activity, but it does so in a manner that enables comparability across industries, regions and countries. TSAs are even more valuable in geographically large countries where tourism may take on a variety of forms.

Tourism satellite accounts also lay the groundwork for other studies on tourism activity. Statistics Canada's national TSA currently has several extensions. The National Tourism Indicators measure tourism supply, demand, GVA and employment and provide a similar level of detail to the TSA but in a much more timely fashion, with second quarter

2018 estimates released in September 2018.<sup>8</sup> The Provincial and Territorial Human Resource Module of the Tourism Satellite Account<sup>9</sup> measures labour in tourism industries. The Government Revenue Attributable to Tourism<sup>10</sup> measures the impact tourism has on government revenues through income taxes, contributions to social insurance plans, sales of goods and services and taxes on products and production. The Canadian TSA was also recently linked to the Canadian Culture Satellite Account<sup>11</sup>, to identify overlapping activity, and work has also been done to linking the Canadian TSA to the Canadian Environment Account, specifically water use, energy use and greenhouse gas emissions, to understand environmental impacts and sustainable tourism.

The future of Statistics Canada's Provincial and Territorial Tourism Satellite Account is promising, with funding to produce regular estimates every three years. This will facilitate the development of various extensions at a regional level. Contingent on funding and capacity, development work could focus on regional tourism indicators, as well as regional government revenue attributable to tourism. Future work could also include the development of a demand-side regional human resource module.

A comprehensive review of available data at the regional level (e.g., regional governments, tourism bureaus and businesses) should be undertaken to better understand tourism regionally. Most regional governments in Canada produce some statistics on tourism activity that could serve to complement other data sources, or validate PTTSA estimates. Initiatives like Statistics Canada's feasibility study looking to improve the measurement of tourism activity in the territories may serve as an example of collaboration between federal and regional governments in producing and standardizing tourism statistics.

Big data also provide exciting opportunities. Not only may it complement existing travel surveys, it may also lead to the development of sub-regional tourism statistics, not considered a viable possibility until recently. However, until we fully understand measurement implications for tourism activity, its use should be carefully monitored.

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<sup>8</sup> Statistics Canada. No date. *National tourism indicators, second quarter 2018*. Last updated September 27, 2018. [\[link\]](#)

<sup>9</sup> Statistics Canada. No date. *Provincial-territorial human resource module of the Tourism Satellite Account, 2018*. Last updated June 7, 2017. [\[link\]](#)

<sup>10</sup> Statistics Canada. No date. *National tourism indicators, first quarter 2017*. Last updated June 29, 2017. [\[link\]](#)

<sup>11</sup> Statistics Canada. No date. *Tourism spending on culture and sport products, 2016*. Last updated June 4, 2018. [\[link\]](#)

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