



**VISITOR EXIT SURVEYS  
DESIGN AND OTHER CONSIDERATIONS IN THEIR USE**

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## INTRODUCTION

Having access to up-to-date and reliable visitor information for an area or region is fundamental to the success of the tourism industry. Whether a government agency or a private sector operator, data sources that are rich both in scope and reliability are invaluable to a large number of users. Users include planners, economists, politicians, global tour operators, civic leaders, as well as persons making their living from investing and working in this sector.

The purpose of this paper is to provide a brief overview of what is needed for a visitor survey so that destination marketing organizations, municipal planners and other tourism stakeholders obtain a better appreciation of the effort involved in such an undertaking.

Sometimes referred to as “cordon” studies, visitor surveys use a design that literally draws a cordon (or imaginary fence) around a pre-identified area, facility, or even an entire province. Then, as visitors exit that area and pass through the cordon, they are counted and intercepted and asked a number of questions about their experiences, expenditures and about themselves and their travel parties.

The most common design for a visitor survey is that of an exit survey so that information gathered can focus on all aspects of the visitor’s experience, expenditures and activities on his or her visit. Occasionally an “entrance” survey may be undertaken in order to determine some special visitor characteristics. For example, if one wanted to know the proportion of tourists using public transit, a design to intercept visitors as they embark on a given public transit mode would be used.

- Typically several stages are required to implement a visitor survey—this could involve pre-counts and on-location interviewing or quick intercept interviews followed by telephone or self-completion survey methods;
- Specially trained interviewers are required and are strategically stationed on highways, doorways, gates, exits, entrances, or other sites where visitor “traffic” can be counted and intercepted for an interview;
- Large sample sizes are necessary to produce reliable data describing a full range of visitor types, destinations, trip purposes, activities, locations, activities and related expenditures;
- A comprehensive sampling plan is required that will include high as well as low traffic locations where visitors are intercepted for the study as well as peak and non-peak time periods so that the volume of visitors can be adequately represented;

- Data must be either physically retrieved (if in paper copy) from multiple locations or downloaded and compiled into a single database for computer processing;
- The data from the surveys (a sample of the total population) is often projected to the estimates of total visitors and then analysed.

Given the cost and complexity of Visitor Exit Surveys, major studies are conducted infrequently.

Of some value in setting parameters for visitor surveys are the two major studies conducted by Statistics Canada in partnership with the provinces and several federal departments involved in the promotion of tourism:

- The Travel Survey of Residents of Canada (known prior to 2005 as the Canadian Travel Survey), conducted monthly as a supplement of the Labour Force Survey, was developed to measure the volume, characteristics and expenditures of domestic travel. This survey provides information at the provincial and census division level (or county/district level), when sample sizes permit. In 2003, the CTS had enough sample to provide visitor profiles for 38 of Ontario's 48 census divisions.
- The International Travel Survey (ITS) gathers information from all persons entering or exiting Canada. This includes both Canadians as well as international visitors to Canada. The ITS captures detailed visitor information through a self-completed questionnaire. The completed questionnaires are then projected to the total counts of visitors to Canada compiled by Customs officers at border crossings.

## **THE ELEMENTS OF A VISITOR SURVEY DESIGN**

### **Universe Definition**

Key to the design of a Visitor Survey is the definition of the "Universe" that is to be included (or cordoned) in the study. What is the "population" of visitors that the researcher wishes to study? And, exactly how is this population defined?

Which particular visitors are of interest in the study? Is it domestic visitors or international visitors or both?

In tourism research, this is often a challenge. Thankfully, Canada and the World Tourism Organization (WTO) have developed definitions for a range of visitor-types so that some consistency can prevail across provincial and year-over-year studies. A number of important definitions are used in tourism research, as outlined below:

“Tourism comprises the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes” (WTO)

All types of travelers engaged in tourism are described as visitors. For the purpose of tourism statistics, visitors could be classified as:

International visitors: “Any person who travels to a country other than that in which s/he has his/her residence but outside his/her usual environment for a period not exceeding 12 months and whose main purpose of visit is other than the exercise of an activity remunerated from within the country visited” (WTO). International visitors include:

- tourists (overnight visitors) who stay at least one night in a collective or private accommodation, in the country visited and
- same day visitors who do not spend the night in a collective or private accommodation in the country visited.” (WTO)

Domestic visitors: “Any person residing in a country, who travels to a place within the country, outside his/her usual environment for a period not exceeding 12 months and whose main purpose of visit is other than the exercise of an activity remunerated from within the place visited” (WTO). Domestic visitors include:

- tourists (overnight visitors) who stay at least one night in a collective or private accommodation, in the place visited and
- same day visitors who do not spend the night in a collective or private accommodation in the place visited.” (WTO)

While the concept of “usual environment” has been employed differently by different countries, as of 2005, Canada uses the following definition of domestic travel:

***For trips of one or more nights, tourism includes the persons who take an out-of-town trip for any reason other than:***

- To commute to work or school
- For a routine sales or service call (including operating crews of commercial or transit vehicles)
- On diplomatic or military orders
- To move to a new residence (or help others move)
- For routine medical or health reasons
- For routine religious reasons
- To pick up someone or something
- For routine shopping

***For same day trips, tourism includes the persons who take an out-of-town trip of at least 40 kilometers one way for any reason other than those described above:***

## **Factors to Consider in the Determination of Sample Sizes**

In a cordon or visitor survey, the question arises; how large should the sample be?

Determining the sample size for this kind of survey is really no different than any other type of survey of public opinion, usage, attitude and so forth. The key considerations in how large the sample needs to be are:

- What is the estimated size of the universe under study? For example, how many visitors came last year; was it total 5,000 or 500,000?
- What level of accuracy or statistical precision is needed from the overall survey data, for instance, are the results to be used to estimate return on investment or predictions of future visitors? Do we need the results to be within +/-2% or +/-5% or is a larger margin of error acceptable for our results?
- What Confidence Level is needed in the results? Are the reported data to be accurate 19 times out of 20 (95% Confidence Interval) or is the more typical 9 times out of 10 (90% Confidence Interval) acceptable?
- Other considerations that affect the decision on the final sample size include:
  - What is the estimated incidence of “finding” these qualified visitors in the general population during the survey period? The smaller the incidence, the more expensive and time-consuming it will be to reach a desired final sample size. This will impact timing and field costs. (As a general rule-of-thumb, one would want a minimum of about 100 visitors in any given sub-group for analysis.)
  - How many different unique segments or population sub-groups are of particular interest in the analysis and what is the likely incidence of “finding” these groups? For instance, if we want to analyze visitors from each of the top 6 visitor origin markets, then we need to take this into account. If the goal is to undertake detailed analysis of the characteristics and behaviours of only those from BC, Alberta, the Prairies, Manitoba, Quebec, and the Maritimes, for instance, then a minimum of 100 visitors in each of the six groups is needed. This analysis goal will impact the total required sample size. At least 600 interviews are needed to meet the rule-of-thumb minimum for analysis.

- The complexity of the analysis can also dictate a larger sample. As in the example of the top 6 visitor origins, if we also wanted to analyze the results by gender, we effectively double our total survey sample size (2 X 6 or 12 cells each with a minimum of 100 respondents each) for a total sample of 1,200 interviews. Similarly, if we wanted to analyze the results by season and gender from the six origin markets, there will be 4,800 interviews required.

It is for the last mentioned reason that many visitor surveys have large sample sizes and large budgets for implementation. In many locations, the tourism market is highly developed and attracts a wide range of visitors. Sometimes the most lucrative visitor groups are found in relatively small numbers within the total visitor population.

Therefore, to study these niche groups in a general survey is disproportionately expensive due to their low incidence. Alternative strategies—the use of special panels, top-up or over-samples or commercial lists—may be needed to provide access to greater numbers of these low incidence groups.

## **Survey Implementation Plan**

How many visitors should be “intercepted” in an exit study and how many interviewers will be needed at each exit location? When should these interviewers be on shift? The answers to these questions are revealed in the design of the survey fieldwork or implementation plan. A number of elements are needed to complete the plan:

- By this point, decisions would have already been made regarding the coverage area of the “cordon”; how wide will the net be cast? For instance, is every highway leading out of a province be included in the cordon?—what about visitors leaving by air, train or motorcoach; what about scheduled versus unscheduled air or other travel? Typically, all modes of travel should be covered since visitors who use different modes of transportation may have different travel characteristics.
- Secondly, after the “cordon” is drawn, count information is needed in order to estimate the universe of people, flights, trains, private vehicles, or buses moving through the cordon. With some idea of the volume of movement at each exit point by mode of transportation, one can then finalize decisions as to whether it is either necessary or cost effective to include this exit point or mode in the survey or not. A sense of the “traffic” volume can often be obtained from various published sources, for example current Transport Canada flight data and/or local department of highways vehicle count information.

- Now that the exit routes are confirmed as having enough “volume” to cost-justify inclusion in the study, the variation in visitor traffic flows needs to be factored into the interviewing schedule. To be representative of the total traffic, the design should include a number of time periods for data collection taking obvious variations into account;
  - Morning versus afternoon and/or evening periods;
  - Weekday versus weekend/statutory holiday times;
  - Peak and Non-Peak seasons, e.g., spring, summer, winter, fall and shoulder seasons.

## Sample Frame and Design Issues

Considering all the requisite variables in the design, one may have a rather complex matrix. For instance, the design of a regional visitor survey could include a number of highway, air flight, and motorcoach interviewing stints, collectively referred to as primary sampling units (PSU).

These interviewing stints would then be detailed into weekday and weekend assignments wherein interviewers would be deployed either by time block (morning) or by departing bus or flight (WestJet Flight 74 at 7:00 pm).

Exactly how many of these interviewing stints would be completed on any given day would be determined by total PSU in the universe, the density of the PSU and the number of target interviews for the survey, i.e., the target sample size.

Sample selection is one of the most important factors in the quality of information supplied by any survey. However, if the sampling plan lacks proper coverage (called “coverage error”), then problems arise. Coverage error is common in visitor surveys and results from:

- Not randomly sampling from the entire population under study;
- Not including certain visitor sub-populations, e.g. convention goers; or
- Not surveying in key time periods throughout the year, or any other time frame under consideration (a season, or the active period for a specific short-term event).

These errors will inhibit your ability to develop an accurate estimate of the total visitor population because of the foregoing exclusions. You will have too many gaps in the data so that the survey does not accurately represent the tourism population you are studying.

Every survey has sampling error, unless you have interviewed 100% of the study population (a census). Increasing the sample size will reduce sampling error. However, there is also “noise” that can affect survey data called “non-sampling”

error. This is distortion that can occur in the data, no matter how large your sample size is. Non-sampling error can include the following problems.

- Many of the answers on the survey are not completed, or are incorrect or result from poor wording or bad interviewing techniques;
- Missing data that arises because certain identifiable groups failed to respond to the survey, for example, because of language or comprehension difficulties;
- Missed interviewing days due to staff shortages, weather problems or other factors. (Typically, “lost” interviewing days would be re-booked for a similar time slot but sometimes this is not done.)

## **Sample Selection**

In a cordon study, the “unit of measurement” is the visitor. And, we need to select a definition for the visitors we wish to study. For example it could be:

*“All visitors who came here for a pleasure trip and who stayed more than one night and who traveled to this destination more than 80 kilometers from home”.*

A “visitor” is not a local person (living within the cordon area). There may be other stipulations on any given study, for instance, the exclusion of those traveling on business or those who otherwise do not qualify on the basis of demographics or length of stay (same-day visitors may be excluded for example).

- Therefore, a method of screening out the non-qualifying persons is needed.
- Secondly, we need to estimate or confirm the total traffic at our interview locations during the “survey period”.
- Furthermore, we need to collect the total traffic at the selected locations for the interviewing stints.

## **Data Collection and Costs**

Results from Cordon Visitor Surveys tend to be both widely used and relied upon for making estimates--and for some years after the data are collected. For these reasons, it is important to take all steps to ensure that the data are accurate and valid. Refusal rates to these surveys depend on a number of circumstances including how much time the visitor has at that moment, and whether the main



component of data collection is in-person, over the phone or self-completion (Internet or mail back).

The most important factor in establishing high cooperation rates for an on-site visitor intercept survey is the amount of time the visitor has for the interview. For example, asking visitors for a few minutes of their time in an airline waiting lounge will likely result in close to 100% compliance, whereas asking for time in a survey while visitors are exiting an attraction or exhibit might be less successful. Generally, response rates range from a low of 15% to a high of 60%; it really does depend on several factors including data collection method, questionnaire length, design, incentives for participation, visitor time available, and so forth.

Visitor surveys can be conducted in a number of ways, but are traditionally conducted through in-person interviews using either paper questionnaires or a PDA (Personal Digital Assistant) to capture responses. Variations on data collection methods are:

- Conduct a brief in-person interview (to capture some basic descriptive data to compute non-response bias), and then give the respondent a self-completion survey to fill out and return by mail. Incentives are effective in stimulating higher return rates.
- Another approach is to again gather some basic information in-person and obtain either a telephone number or email address to implement a more detailed follow-up interview when the visitor arrives home. Again, incentives can be an effective inducement to both speedy and complete responses.

Total survey costs and costs per completed interview vary widely in that they depend on a number of factors including: geographic and temporal coverage requirements, sample size, visitor incidence, the number of exit/entry points and the mode(s) of visitor travel that must be represented. However, of the two approaches described above, the first is generally less expensive than the second, all else being equal.

Below are two examples of exit surveys provide to give an approximate idea of the costs involved:

**Name:**           **The International Travel Survey**

*Supplier:*       *Statistics Canada*

*Costs:*           *\$2 million per year, not including counting and distribution of questionnaires*

*Description:* *Customs officers count all visitors who enter Canada through all land-ports, airports and seaports and record their country of origin, the mode of transportation used and, for most modes, the length of stay in Canada. To a sample of them they also distribute a questionnaire that the visitor is supposed to fill out and return to Statistics Canada upon exit. Approximately 1 million*

*questionnaires are distributed to the Customs offices around the country. The costs mentioned above do not include the counting and distribution of questionnaires by Customs officers.*

**Name: Niagara Falls Visitors Study**

*Client: City of Niagara Falls Canada, Niagara Falls Visitor and Convention Bureau, Human Resources Canada*

*Supplier: TNS Canadian Facts*

*Costs: \$1 million*

*Description: This was a three-part research program designed to uncover growth opportunities for tourism in Niagara Falls, Canada. The study consisted of an analysis of customized data sets derived from the most recently completed International and Canadian Travel Surveys, a qualitative assessment of tour packagers/wholesalers serving Niagara Falls, and a custom quantitative survey of North American visitors to the city.*

*The custom survey was designed to measure attitudes, behaviours and satisfaction with Niagara Falls as a tourist destination among fully independent travellers resident in Canada and the United States. Roadside exit-intercept screening interviews were conducted throughout a full 12-month period among travel parties leaving Niagara Falls by private vehicle. Nine exit-intercept points along a cordon defining the city were used for this purpose. An augment sample was also conducted at Casino Niagara during late evening hours. Follow-up telephone interviews were completed with visitors soon after having returned home from their trips. Just over 76,000 vehicles were diverted at the roadside, and 9,509 North American FIT visitors identified for subsequent telephone interviewing. A total in-tab sample of 4,322 qualified visitors was achieved.*

No matter which method is used, the questionnaire must always be pre-tested to ensure it communicates effectively and is easy to complete for the respondent. This is especially important for the use of any self-completion method (mail-back, email, or fax-back). In this kind of data collection, the comprehension of the questions is subject to “self-interpretation”, e.g., no interviewer is available to assist in helping the respondent understand what is being asked.

## **Estimating Volumes of Visitor Traffic**

At each interviewing stint, one or more interviewers will be assigned to take “traffic” counts or tallies;

- At highways of the number of each type of vehicle (including commercial vehicles tallied separately) and the number of people in each vehicle;
- At airports, the total number of people waiting at the airline gate and a tally of all non-qualifiers approached;
- At train stations, the total number of people waiting to board and a tally of non-qualifiers approached;
- At bus stations, the total number of people waiting to board and non-qualifiers.

These counts are used to estimate the total population of visitors by travel mode so that a systematic method of respondent selection can be applied during the interviewing phase. As such, the time periods when these counts take place should be as representative as possible of all available periods.

These tallies may represent the most accurate estimate of the “Universe” that existed during your survey period. Certainly in terms of modes used, the actual field counts are current data generated during the survey period, rather than secondary data reported through some other means.

With this information, we know the probability of respondent selection for each and every interviewing stint. This approach gives us a reliable “selection” routine (e.g., approach every 8<sup>th</sup> person on a Tuesday morning stint) in order to maintain a simple random sampling of visitors. In addition, we learn the incidence or proportion of visitors to non-visitors by interviewing stint.

***Here is an example as to how the counting stints are determined:***

Suppose we want to estimate the total population of those who visited an area during the summer. Furthermore, we believe that visitors who come during the week are different from those who come during the weekend and that this is also the case for morning and afternoon visitors. As such, we will have the following sampling periods available:

- Weekday mornings (from 8:00 am to 12:00 pm). For the three-month period we are interested in, there are 5 days times 4 weeks times 3 months equal to 60 available sampling periods of week-days mornings;
- Weekday afternoons (from 12:00 pm to 9:00 pm). There are 5 days times 4 weeks times 3 months equal to 60 available sampling periods for week-days afternoons.

- Weekend mornings (from 8:00 am to 12:00 pm). For the three month period we are interested in, there are 2 days times 4 weeks times 3 months equal to 24 available sampling periods of week-end mornings;
- Weekend afternoons (from 12:00 pm to 9:00 pm). There are 2 days times 4 weeks times 3 months equal to 24 available sampling periods for week-end afternoons.

Now suppose that we sample 50% of the available sampling periods for each type of sampling period (i.e., 30 from weekday mornings and afternoons and 12 from the week-ends mornings and afternoons) and that we find the following counts:

- Weekday mornings: 600 visitors from Ontario, 200 from Other Canada and 300 from the US;
- Weekday afternoons: 300 visitors from Ontario, 100 from Other Canada and 500 from the US;
- Weekend mornings: 1,000 from Ontario, 200 from Other Canada and 800 from the US;
- Weekend afternoons: 1,500 from Ontario, 50 from Other Canada and 1,000 from the US.

Then our estimates of the total visitors from each origin, by time period, will be:

For weekday mornings:

Ontario origin:  $600 \times 2 = 1,200$

Other Canada origin:  $200 \times 2 = 400$

USA:  $300 \times 2 = 600$

For weekday afternoons:

Ontario origin:  $300 \times 2 = 600$

Other Canada origin:  $100 \times 2 = 200$

USA:  $500 \times 2 = 1,000$

For weekend mornings:

Ontario origin:  $1,000 \times 2 = 2,000$

Other Canada origin:  $200 \times 2 = 400$

USA:  $800 \times 2 = 1,600$

For weekend afternoons:

Ontario origin:  $1,500 \times 2 = 3,000$

Other Canada origin:  $50 \times 2 = 100$

USA:  $1,000 \times 2 = 2,000$

Or a total of 6,800 visitors from Ontario, 1,100 from Other Canada and 5,200 from the US.

In conclusion, the field tallies play several important roles in the fieldwork planning and design:

1. The counts are used to design a systematic simple random selection (every “nth” visitor) of respondents. We will be able to prepare a plan to deploy interviewers in each of the time periods to match against the estimated visitor volumes (e.g., during weekday mornings versus weekend mornings), and,
2. We will be able to instruct interviewers in how to “screen” visitors to interview against various target quotas. For instance, we will know, in advance, roughly how many visitors will be from Ontario versus Other Canada or the US so that we can ensure that we have an adequate number of completed interviews (or self-completion questionnaires distributed) within each group for our analysis.
3. If the tallies are completed by mode, we can also plan detailed interviewing assignments for visitors traveling by vehicle, plane or train, etc.

## **Weighting and Data Projection**

Most survey results consist of averages or means and percentages. One of the goals of a visitor survey is to make some inferences about the impact of tourism, for instance. We may want to suggest from the survey results “the expenditures made by visitors from the United States are significantly higher than expenditures from visitors from Germany.”

However, conclusions like this cannot be made from survey data unless the survey findings are based on a random and representative sample. Given variations in respondent selection, refusal rates, and other factors, it is highly unlikely that the survey produced a perfectly representative sampling (despite the care taken in respondent selection as discussed in the preceding section). Therefore, some statistical estimation and weighting is needed.

Without going into a lengthy discussion of statistics, two types of weights are usually needed to calibrate visitor survey results as follows:

- A Design Weight is used to correctly estimate a given population parameter; for instance, from Statistics Canada’s International Travel Survey, we may know that 30% of Ontario visitors were from the United Kingdom and just 15% were from Germany. But, in our survey, by design, we may have interviewed only 20% of visitors from each of these two countries. A design weight would be used to bring the survey results back

into the “correct” proportions of 30% and 15% of the total results, respectively.

- Adjustment Weights are frequently used in surveys to account for the fact that older people (those over the age of 65 years), for example, tend to like to complete surveys more than persons who are younger. Again, using a reliable source for identifying a known population statistic, e.g., age of overseas visitors to Ontario, one can adjust the ratio of older versus young in the survey so as to negate a possible skew in results from over or under representing a particular age group. Effectively this adjusts for variations in response rate by demographics.

## OPTIONS, ALTERNATIVES AND VARIANTS

The discussion above focused on studies that attempt to capture all visitors to an area while maintaining strict adherence to rules of selection probability. The need to cover all of the geography circumscribed by a pre-defined cordon while following these rules has a substantial cost impact

However, if the objective of the study is to determine the volume and characteristics of a sub-set of visitors to an area, then the costs could be reduced substantially.

For example, if a study is attempting to find the volume and characteristics of visitors to an area that use commercial accommodation, then a design whereby participating hotels could hand out a paper questionnaire to their guests to be filled out during the last day of their stay and deposited into a hotel “box”, could be undertaken at relatively low cost. The box could then be delivered to a market research firm for inputting the data into a database and for analysis.

The substantial savings of this type of study design could be in the hundreds of thousands. For example, a study that the Ministry of Tourism undertook in 1986 in Northern Ontario to measure the impact of visitors to remote tourism establishments had a price tag in the neighborhood of \$150,000 rather than in the millions of dollars.

In this design it is critical that the following elements (steps) be known (followed):

1. Total number of accommodation establishments in the area by type, size, seasonality and location to permit the weighting of the data when the study is completed;
2. Participation in the study of a sufficient number of operators to ensure adequate representation and to allow for sample stratification by:
  - Accommodation type (i.e., hotel, motel, campground, etc)
  - Location (downtown vs. suburban, or city X vs. city Y)

- Size (small hotels vs. large hotels)
  - Seasonality, if applicable (hotels open during the winter only vs. all-year-around)
3. Total number of counts every month by the participating operators to permit weighting of the establishment's questionnaires to total counts for a specific establishment in the sample.

## **CONCLUSIONS**

Visitor surveys require forethought, care and attention in their design and implementation. This is not only because of the investment necessary for this type of study, but also because the information generated is relied upon very extensively. The above discussion provides an overview of the basic principles and approaches used in cordon-type tourism travel surveys. When commissioned, each individual study in this research class generally does not proceed until detailed sample plans and interviewing guides have been developed and approved. These documents are invariably customized to the unique characteristics of each study, but are all based on the principles outlined above.