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A Study to Examine Differences Between In Person and Online Survey Data Collection Methodologies

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Abstract

The purpose of this study was to examine differences between the results of an in person or face-to-face direct spending survey and a post-event online direct spending survey. Participants in a large annual marathon held in the Mid-Atlantic Region of the United States were used as subjects for the study. The research methodology selected for this study included an in person survey instrument administered to out-of-town marathon participants prior to the start of the event during the race number and race timing chip pick-up period. The same survey instrument was administered online four days after the conclusion of the marathon to the same group of out-of-town marathon participants who did not previously respond to the in person survey. Analysis of data and results revealed that average direct spending for the online respondents was consistently and significantly higher than spending for the in person respondents on direct spending questions. Spending on lodging for both groups showed no significant differences. It was recommended that the use of online survey methods be considered when conducting direct spending studies for participant oriented sporting events when adequate e-mail addresses are available and the potential respondents have a certain level of computer literacy.

Key Words: *Marathon, Economic Impact, Survey Modes.*

Each week there are many economic impact studies being conducted at sporting events throughout the world. Sport commissions often hire consultants to conduct economic impact studies in an effort to show a "return on investment" when communities host sporting events. In the past, a number of sport researchers have focused their attention on analyzing the direct spending from out-of-town visitors on lodging, food and beverage, retail shopping, tourist attractions, entertainment and leisure, etc. Economic impact studies are important to event organizers and sponsors because they measure the monetary "impacts" that sporting events have on a community. Economic impact studies also provide, in a number of instances, justification for financing and hosting future sporting events.

Over the years, sport economic impact studies have examined spectator oriented events (Baade & Matheson, 2000; Baade & Matheson, 2001; Baade, Baumann & Matheson, 2008; Crompton & Lee, 2000; Gibson, Willming & Holdnak, 2002; Porter, 2001; Preuss, Seguin & O'Reilly, 2007; Rosentraub, 2000). These events have hundreds and sometimes thousands of spectators who travel long distances to see their teams play. The "new money" that is brought into a local economy is extremely beneficial. Normally, spectators are surveyed as they enter or exit a sporting event. These in person or face-to-face surveys have been a fixture at sporting events for many years. They are the lifeblood of direct spending and economic impact studies. The overall economic impact that a sporting event has on a particular community is further analyzed through the use of multiplier coefficients that help to determine the overall economic impact.

Economic impact is generally separated into three categories. The first category is total direct spending. According to Mondello and Rishe (2004), "this is the total dollar amount spent at games or events, as well as the amount spent for an entire stay (hotel rooms, food, rental car, etc.)...Generally speaking, only money originating outside the local economy and spent within the local economy is considered economic impact... (p. 332). The second economic impact category involves indirect spending. Mondello and Rishe (2004) describe indirect spending as the money that recirculates in the local economy as a result of the direct spending. This is spending that accrues to businesses that are indirectly impacted by the sporting event through their association with one of the directly impacted businesses. The third economic impact category is induced spending. This type of spending occurs when employers and employees at directly and indirectly impacted businesses receive money from out-of-town visitor spending. As a result, they will spend a certain amount of their new income in the community (Mondello & Rishe, 2004).

During the past twenty-five years, a growing number of economic impact studies have concentrated on participant oriented sporting events (Case, 2008; Chhabra, Sills & Cabbage, 2003; Cobb & Olberding, 2007; Crompton,

2001; Gratton, Dobson & Shibli, 2000; Mondello & Rische, 2004; Wilson, 2006). Marathons, half-marathons, 5K and 10K races, cycling events, triathlons and duathlons are examples of the many sporting events where spending by the participant is the primary focus of economic impact studies.

Regardless of the type of sporting event, selecting the correct survey data collection methodology is vital to the success of the study. In particular, questions about when to collect data, where to collect data and how to collect data must be answered before conducting an economic impact study. Understanding the advantages and disadvantages of using "in person" or face-to-face paper and pencil survey methods versus online survey methods is very important. In the past, the most common approach to collecting sport economic impact data was to develop a survey instrument and then collect data "in person" at sporting events.

The "mall intercept" survey collection approach has been commonly used to randomly select potential survey respondents as they enter and exit sport facilities and/or events. Sometimes data is collected at the sporting event while the event is in progress. In a number of instances, survey data has been collected from spectators and participants at the end or conclusion of a sporting event through in person or face-to-face survey methods or through the mailing of survey instruments to the homes of potential respondents. Telephone surveys have been another post-event option that has been used with success.

In recent years, computer technology has changed the face of survey research. Many online survey computer programs are now commercially available for use. Online surveys are convenient and accessible to a large number of homes because more people have access to the internet through personal computers than years ago. As a result of the changing landscape of home computers and increased access to the internet, some basic questions involving economic impact research methods have surfaced. First, if given the choice, is an in person or face-to-face survey method better to use than an online survey method when collecting sport direct spending data? Second, are the results derived from in person surveys different from the results obtained from online survey methods?

Common sense would suggest that online survey methods are the best way to collect direct spending data associated with participant oriented sporting events because respondents, after the event is concluded, have a chance to gather receipts and look over credit card statements when responding to an online survey. Many sport researchers still collect economic impact data through the use of "in person" survey methods (Chhabra et al., 2003; Crompton, 2001; Gratton et al., 2000; Mondello & Rische, 2004; Wilson, 2006). Some researchers find the "in person" approach to be more personal and convenient since access to an e-mail list of event participants and/or spectators for an online survey may be difficult to obtain.

Literature Review

A number of studies (de Leeuw, 1992; Dillman, Sangster, Tarnai & Rockwood, 1996; Hochstim, 1967; Schwartz, Strack, Hippler & Bishop, 1991; Schuman & Presser, 1981) have examined the effects that different survey methodologies have on the quality and quantity of data that is collected via survey methods. For example, Hochstim (1967) reported that survey respondents are more likely to give socially acceptable responses when completing surveys face-to-face with an interviewer being present than when the interviewer is not present. Dillman and Bowker (2001) and Kehoe and Pitkow (1996) point out that using an online survey approach has the potential to increase the overall number of survey responses. Miller and Hogg (2000) found that online survey respondents were more likely to respond to sensitive questions than telephone survey respondents. Mann and Steward (2000) state that online survey methods offer considerable advantages when compared to other survey methods because online methods allow for a greater survey respondent reach by collapsing boundaries of time and space.

In one of the few studies conducted in a sport setting that looked at differences in survey methods, Olberding and Cobb (2007) found that the online survey approach is at least as effective as the telephone method when there is strong evidence that the population of interest utilizes a computer and e-mail. In a recreation and tourism setting, Dolnicar, Laesser and Matus (2009) found that online respondents have a lower dropout rate and produce less incomplete data when compared to traditional paper surveys that are mailed to potential respondents. They emphasize that survey format can dramatically influence the results of surveys and that multi-method survey approaches should be used whenever possible.

Purpose of Study

The purpose of this study was to examine differences between the results of an "in person" or face-to-face direct spending survey approach and an "online" direct spending survey approach for the same sporting event while using the same survey questions. The first survey method focused on responses from "in person" respondents and the second survey method focused on responses from "online" respondents. As mentioned previously, online surveys are becoming commonplace and it is important to examine their usefulness when compared to more traditional survey methods such as the "in person" approach. Very few sport direct spending studies have examined the use of different survey methodologies for the same sporting event.

Methodology

Groves (1989) points out that the results of surveys can be impacted if precautions are not taken when designing survey research studies. He describes four different sources of survey error. The first source relates to coverage and this occurs when all subjects in a particular sample do not have an equal chance of being selected or included in the group of potential survey respondents. A second source of error is sampling error and this takes place when the characteristics of the sample population are different from the population of interest. The third source of error is measurement error and this occurs when incorrect or inaccurate responses are received due to the poor wording of survey questions, interview bias, incorrect choice of survey method or a problem related to the respondent's behavior. The final source of survey error, according to Groves (1989), relates to non-response error which takes place when individuals who did not respond to the survey might have answered survey questions differently than individuals who actually completed the survey.

Competitors in an annual marathon event were used as participants for this study. The marathon event is one of the largest marathons conducted on the East Coast of the United States and it is held each year during the month of March. Participants in the marathon event also had the option to run shorter distances (e.g., half marathon).

A total of 12,400 out-of-town runners participated in the 2008 event. The total number of registered participants in the event was 18,646. The marathon event additionally sponsored a Sports Expo and a number of charity activities.

A sporting event direct spending survey instrument developed by one of the authors was selected for use in this study. The instrument has been used in over thirty sport direct spending and economic impact studies. Selected questions on the survey instrument were modified to fit this study. Over the years, a number of experts who conduct direct spending and economic impact studies have reviewed the survey instrument and provided feedback that was used to refine the instrument. The 26-question survey instrument includes a variety of questions that are aimed at direct spending and economic impact information. Additional questions on the survey instrument are used to collect demographic information. Seven specific categories of direct spending associated with a marathon event were measured. The types of questions on the survey instrument ranged from questions about participant spending on lodging and retail shopping to questions about food and beverage expenditures (see Table 5).

In this study, great care was taken to avoid the sources of survey error that were previously described by Groves (1989). The same survey questions were used for both the in person and online surveys. Also, surveys were administered for the same event and involved the same sample population with the same demographic characteristics for the in person and online respon-

dents. The only difference was that the online survey was administered after the sporting event rather than just prior to the start of the event.

Participants for the In-Person, Face-to-Face Survey

Participants for the "in person" survey were individuals from out-of-town who participated in a large marathon event. "In person" survey data was collected at the race number and timing chip pick-up period prior to the start of the race. Trained survey collection staff were positioned outside the race number and timing chip pick-up area that was located inside a large convention center. The convention center also served as the location for a Sports Expo. Participants were required to pick-up their race number and timing chip at the same location and access to the pick-up area was limited to one entrance.

Trained survey collection staff randomly selected potential race participant respondents as they entered and exited the race number and timing chip area. The survey instrument took approximately five minutes to complete. Respondents to the survey were provided with the survey instrument, a clip board and pencil. They had the option to sit at a table or stand while completing the survey. No names or identifying information were required on the survey instrument. Survey data collection continued right up to the start of the race.

Participants for the Online Survey

Wording of questions for the online direct spending survey was identical to the wording used for the "in person" survey. It should be noted that the potential online survey respondents appeared to have an adequate level of computer literacy as the marathon organizers communicate with the race registrants on a regular basis via e-mail. The event organizers also ask the race participants to complete online forms and race information requests. The survey instrument was sent by e-mail to all marathon participants four days after the conclusion of the marathon event. A four day waiting period was selected in order to give event participants time to return home. Studies from previous years showed that the event participants, on average, traveled over 700 miles and most traveled to the event by personal automobile. A six day waiting period would have moved the reception of e-mails into the weekend where the e-mails might not have been opened. The four day waiting period was calculated to be the optimal amount of time to send out the survey via e-mail. Potential respondents to the survey were asked to complete the survey only if they were considered "out-of-town" participants for the event and they did not complete the "in person" direct spending survey that was administered during the "in person" race number and timing chip pick-up period. Respondents were considered to be out-of-town if they traveled at least 120 miles (one

way) to the city where the marathon was being held and/or they stayed overnight at an area hotel/motel while participating in the race.

Analysis of Data and Results

The average age of the out-of-town "in person" respondents was 38 years and the average age of the out-of-town "online" respondents was 40 years of age. Gender of the out-of-town "in person" respondents was listed at 54% female while the online respondents were 60% female. The size of the immediate travel party was rounded to 3 for both the in person and online respondents. 95% of the out-of-town "in person" and 90% of the "online" respondents selected Caucasian as their race. Both groups of respondents reported a middle to upper middle class family income level with an above average education level. The "in person" out-of-town respondents indicated that they traveled, on average, 754 round-trip miles to the event while the online respondents traveled an average of 706 miles round-trip. Most in person and online respondents reported that they stayed in a hotel or motel in Virginia Beach for an average of two nights while occupying, on average, just over one hotel/motel room per night.

Part I. Comparison of average spending per party for in person and online survey methods

Average spending per party was calculated for the "in person" and "online" group respondents for the seven direct spending questions on the survey. The plot involving profiles of the two groups (Figure 1) shows that the average spending per party for the "online" group is consistently higher than the average spending for the "in person" group except for question 8.

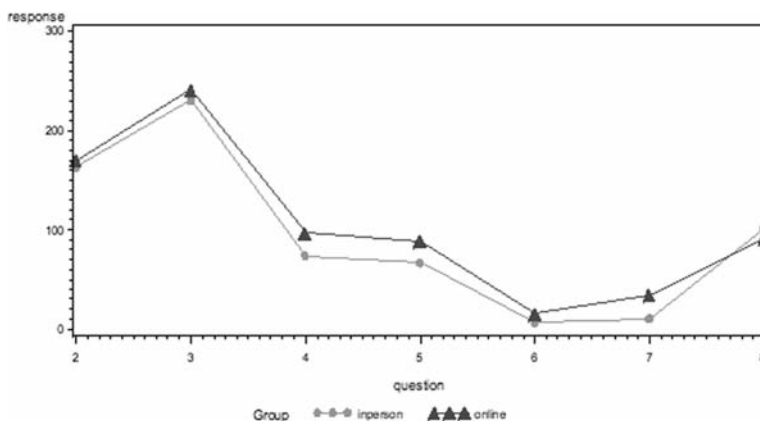


Figure 1: Profiles of "In Person" and "Online" Direct Spending for Group Responses.

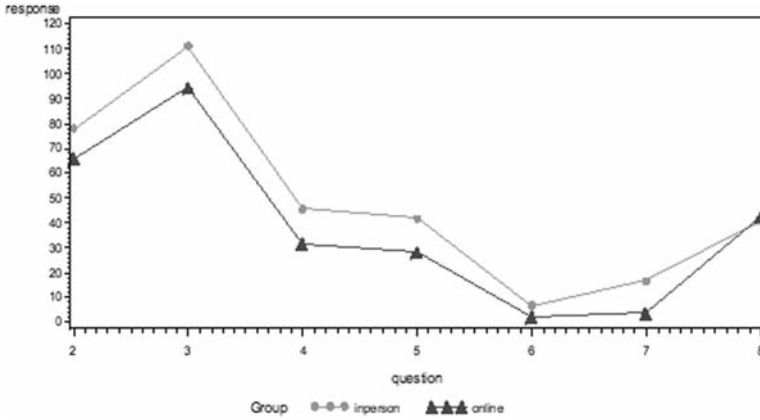


Figure 2: Profiles of "In Person" and "Online" Direct Spending for Individual Responses.

There are 7 dependent variables (Q2-Q8) in this data, so both multivariate analysis (MNOVA) for the mean vectors and univariate analysis (ANOVA) for the mean responses for each question were applied to the data set. Once the hypothesis of equality of the mean vectors is rejected, the univariate test will allow the researchers to identify which question has a difference.

In order to see if significant differences exist between the "in person" and "online" groups, the equality of mean vectors and the equality of the means for each of the seven questions were tested. All hypothesis testing was done by SAS. A total of 1,020 useable surveys (816 online and 204 in person surveys) were collected and analyzed during this study.

A. Test for the equality of mean vectors per party for the two groups
 H0: Mean vectors are equal vs. H1: Mean vectors are not equal.

Table 1. SAS Output of Multivariate Analysis for Mean Vector Per Party

MANOVA Test Criteria and Exact F Statistics for the Hypothesis of No Overall Group Effect
H = Type III SSCP Matrix for Group
E = Error SSCP Matrix
S = 1 M = 2.5 N = 505

Statistic	Value	F Value	Num DF	Den DF	Pr > F
Wilks' Lambda	0.96194636	5.72	7	1012	<.0001
Pillai's Trace	0.03805364	5.72	7	1012	<.0001
Hotelling-Lawley Trace	0.03955900	5.72	7	1012	<.0001
Roy's Greatest Root	0.03955900	5.72	7	1012	<.0001

Table 1 provides the SAS output of the multivariate analysis. P-value is less than 0.0001, so the null hypothesis H0 is rejected at significance level $\alpha = 0.05$, which implies that the mean vectors are not equal and the two groups are significantly different from each other.

B. Test for the equality of means per party for each of the seven questions

H0: The means at Question i are equal vs. H1: The means at question i are not equal where $i = 2, 3, 4, 5, 6, 7, 8$.

Table 2. SAS Output of Univariate Analysis for Each Mean Per Party

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Q2	1	7899.182887	7899.182887	0.38	0.5367
Q3	1	2445.467888	2445.467888	0.05	0.8270
Q4	1	47939.24919	47939.24919	5.91	0.0152
Q5	1	61558.9033	61558.90333	4.80	0.0287
Q6	1	7496.058652	7496.058652	5.02	0.0252
Q8	1	39007.36549	39007.36549	6.81	0.0092

Because the mean vectors differ, it is necessary to determine at which point the groups differ. The results of a univariate analysis are provided in Table 2 which gives the test results for all seven tests. As can be seen, the p-value of Q4, Q5, Q6, Q7 and Q8 are very small (less than $\alpha = 0.05$), so the null hypothesis for these questions is rejected (see Table 2). For these five questions, the responses of the two groups are significantly different from each other. But for Q2 and Q3 (p-values are larger than $\alpha = 0.05$), the two groups have about the same response levels so the differences are not significant.

Part II. Comparison of average "individual" spending for in person and on-line survey methods

The average direct spending per individual was calculated for the responses to the seven questions (Q2-Q8) for "in person" or face-to-face and online respondents. Figure 2 shows the profile for the two groups. The profile of the individual respondent is very similar to the group respondent profile (see Figure 1).

A. Test for the equality of mean vectors per individual for the two groups

H0: Mean vectors are equal VS. H1: Mean vectors are not equal

Table 3. SAS Output of Multivariate Analysis for Mean Vector Per Individual

MANOVA Test Criteria and Exact F Statistics for the Hypothesis of No Overall Group Effect
H = Type III SSCP Matrix for Group
E = Error SSCP Matrix
S = 1 M = 2.5 N = 504

Statistic	Value	F Value	Num DF	Den DF	Pr > F
Wilks' Lambda	0.94125338	9.01	7	1010	<.0001
Pillai's Trace	0.05874662	9.01	7	1010	<.0001
Hotelling-Lawley Trace	0.06241319	9.01	7	1010	<.0001
Roy's Greatest Root	0.06241319	9.01	7	1010	<.0001

Table 3 gives the SAS output for this test of multivariate analysis. P-value is less than 0.0001, so the null hypothesis H_0 is rejected at the significance level $\alpha = 0.05$, which implies that the mean vectors are not equal. The two groups are significantly different from each other.

B. Test the equality of the means per individual at each of 7 questions

H_0 : The means at Question i are equal vs. H_1 : The means at question i are not equal where $i = 2, 3, 4, 5, 6, 7, 8$.

Table 4. SAS Output of Univariate Analysis for Each Mean Per Individual

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Q2	1	16598.3066	16598.30668	4.05	0.0445
Q3	1	19980.26782	19980.26782	2.06	0.1520
Q4	1	25571.68985	25571.68985	8.40	0.0038
Q5	1	31384.06251	31384.06251	14.40	0.0002
Q6	1	2506.793499	2506.793499	24.54	<.0001
Q7	1	7369.409504	7369.409504	38.73	<.0001
Q8	1	1686.956528	1686.956528	1.91	0.1677

Table 4 shows the SAS output for the univariate test. As can be seen, for Q2, Q4, Q5, Q6 and Q7, the p-values are less than the 0.05 significance lev-

el, so the two groups are significantly different on these five questions. However, Q3 and Q8 exhibited very similar responses and the differences were determined to be not significant.

Summary and Conclusions

As Sport Commissions and Convention and Visitor Bureaus strive to bring sporting events to communities, direct spending and economic impact studies will likely continue to provide a necessary service by collecting valuable data for local communities. Data from direct spending studies is used to help determine if the event was a financial success or failure. The methodology used to survey spectators and participants at sporting events should be valid and reliable. In the past, a majority of direct spending and economic impact studies have been conducted "in person" while using paper and pencil survey instruments.

With advances in computer technology over the past twenty years, the use of online surveys has become convenient and widespread. In this study, "in person" and "online" survey methods were examined. Common sense suggested that the online survey approach would be the best approach for gathering survey data.

Results of this study showed that direct spending patterns for online survey methods were higher when compared to "in person" survey methods. If the two survey methods were truly similar, then the overall results of this study would have been identical or very similar. However, the results of this study revealed that significant differences did exist. It is likely that part of the reason for the differences between online and in person survey data collection methods was that "in person" survey data is collected prior to and during the sporting event. Therefore, the researcher must rely on estimates from the respondents for some of the direct spending categories as the event is still in progress. Online survey methods, on the other hand, are conducted after the event and allow respondents to review receipts and credit card statements in the comfort of their home and respond to the survey on a personal computer.

Lodging was the category that exhibited similarity for both group and individual respondents when using online and in person survey methods. Hotel reservations are made weeks in advance and hotel prices are usually known prior to the trip. Whether someone answers the lodging question prior to the race or after the race, the results will likely remain the same. Registration was the other category where spending patterns appeared to be similar. This is another area where respondents (both in person and online) know the costs prior to taking the trip. Most event registrations are paid weeks in advance.

Data from the online surveys reflected significantly higher individual spending patterns for questions 2, 4, 5, 6 and 7. It appears that data derived from

the post-event online survey is more accurate. In person surveys, for the most part, provide estimates of expected spending just prior to and during the event. Sometimes the spending is not known until the participant leaves the event and heads home. Post-event online surveys, on the other hand, allow the participants to return home and look at receipts and credit card statements in order to report more accurate responses online. In person surveys force the respondent to estimate on certain categories as the final bills have not been paid. In some situations, very good estimates are possible for in person surveys as many people tend to budget ahead of time.

When collecting data for spectator oriented sporting events, the best approach to data collection may be to use a combination of “online” and “in person” survey methods. Dolnicar et al. (2009) recommended multi-method survey approaches in the findings of their study. Participant oriented sporting events usually have comprehensive e-mail lists of participants that can be obtained from event organizers. However, spectator oriented sporting events do not have access to such lists unless the researchers are looking at lists of season ticket holders and tickets purchased through various online vendors (e.g., Ticketmaster). In person and mall intercept approaches may be of particular value to spectator oriented economic impact studies.

In conclusion, it is recommended that future direct spending studies of participant oriented sporting events consider the pros and cons of using "in person" and/or "online" survey methods. Again, the results of this study suggest that the post-event online approach is likely the best choice. Obviously, access to a group of subjects who have a computer and e-mail is essential for an online survey to be successful. Some groups appear to be more computer literate and “savvy” than others. The sport organization must be willing to share the e-mail addresses with the sport researchers. As computer technology continues to expand, online survey programs will likely become more "user friendly" for both the researcher and the respondent. The future looks very bright for the use of online survey methods to collect direct spending data involving participant oriented sporting events.

Table 5. *Sporting Event Direct Spending Survey*

This is a survey of participant spending associated with this marathon event. No names and identifying information are required. All responses will be kept confidential. Please give estimates for your **entire** stay.

For questions 2-9, please estimate (in even dollars, U.S.) how much money you and your immediate travel party will spend during your entire stay.

Please note: If you have already answered this survey in person at the marathon event, then please do not answer it again.

1. Is this sporting event the reason you are visiting Virginia Beach? **(Circle one)**
 - a. Yes
 - b. No
2. Food and beverage \$ _____
(e.g., restaurants, fast food, convenience stores, groceries,...)
3. Lodging \$ _____
(e.g., hotel/motel, condo, camp grounds, time share, cottage, ...)
4. Retail shopping \$ _____
(e.g., clothing, event souvenirs, t-shirts, event merchandise, ...)
5. Transportation \$ _____
(e.g., local rental car, gas, taxi, parking, chartered bus, tolls, shuttle, ...)
6. Tourist attractions \$ _____
(e.g., boat tours, science museum, bus tours, Battleship Wisconsin, ...)
7. Entertainment and recreation \$ _____
(e.g., movies, dancing, night life, water park, golf, tennis, go cart racing, ...)
8. Registration and fees \$ _____
(e.g., registration for this sporting event, ...)
9. Other (specify) \$ _____
(e.g., list other major expenses not identified previously...)
10. The dollar amounts listed for questions 2-9 were for
 - a. Myself and my immediate travel party
 - b. The team or sport group travel party
 - c. Other (specify) _____
11. What is your connection to this sporting event? **(Circle one)**
 - a. Coach
 - b. Team manager
 - c. Parent
 - d. Spectator
 - e. Participant or athlete in this event
 - f. Other (specify) _____
12. Please provide the 5-digit zip code of the location that you are traveling to the City of Virginia Beach from? _____ If you are from another country, then please list the name of the country. _____
13. What is your total estimated round-trip mileage to the City of Virginia Beach? _____
14. What type of transportation did you use to travel to the City of Virginia Beach? **(Circle one)**
 - a. Personal car or van
 - b. Local rental car or van
 - c. Out of town rental car or van
 - d. Airplane
 - e. Chartered bus
 - f. Other (specify) _____

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