

# **Evaluation of Departure-Gate Surveying for the OTTI Survey of International Airports at Dallas-Fort Worth International Airport**

## **Final Report (Revised)**

Prepared for

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Washington, DC

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April 2006

## **BACKGROUND**

NuStats was contracted to design and implement a beta test of field survey techniques for distribution of questionnaires to departing international air passengers at the gates of their departing flights. The goal of this evaluation is provide DHS, OTTI, and other government entities with reliable information on plausible methodological and operational enhancements to the in-flight survey design that can result in a higher level of data quality and usability. Using an experimental design approach described below, the study tested various field procedures. The results of this small test can support a cost benefit assessment through indicators of quality and efficiency.

NuStats was interested in the study and contributed extra resources to it because of the inherent value for testing methodological approaches that can be used in other transportation studies involving intercept interviewing of passengers. This type of study (for rail and bus passengers) is an important part of the NuStats consulting practice.

## **METHODS AND PROCEDURES**

Conducting surveys in an airport, in particular at departure gate boarding areas that are within the secure area, presents its own challenges. The first is gaining access to the airport. At Dallas-Fort Worth this required securing approval through the legal department, finding an airport sponsor for the study (a police captain who is the Department of Public Safety Assistant Vice President of Civilian Services) and verification from the Department of Homeland Security to substantiate the study. This process took approximately three weeks, although for planning purposes, allowing four weeks is advised due to airport turnaround time specifications. NuStats has some personal contacts with insight into navigating the DFW legal and security clearance process, however, airport websites are also excellent sources of information.

At many airports permission will need to be obtained from each individual airline in order to conduct the survey at their departure gates. Since the full study Survey of International Air Travelers currently conducts boarding area interviews at DFW this permission was not necessary for the beta test.

NuStats pursued several options for staffing the DFW beta test including using NuStats' own professional surveyors, other professional surveyors or temporary agency staff as surveyors. A small research firm in the Dallas area has a contract with DFW to conduct surveys sponsored by the airport on an ongoing basis. This firm was contacted for the beta test. Advantages were that interviewers possessed security clearance badges, had familiarity with the airport and had surveying experience, however, a major disadvantage was the prohibitive cost per interviewer hour that was outside of the scope of this project. Similarly NuStats professional surveyors were ruled out because of the added costs of travel and per diem expenses. Thus, a Dallas-based staffing agency was selected with offices within ten to fifteen-minutes drive of the airport. Four interviewers were needed to staff the beta test, and five were selected by the staffing agency for training so that one could fill in if another was unable to make a shift. These interviewers were paid a fairly modest rate per hour that was less than half of the Dallas-based professional research firm's quoted rate. This approach was selected to test the use of typical temporary agency staff as a way of conserving project resources for the full study.

The surveyors were required to get security clearance badges from the DFW airport. This entailed the surveyors appearing in person at DFW with a completed application, being fingerprinted and photographed and passing the criminal history records check. The cost at DFW was \$45 for fingerprinting and \$25 for a badge for a total of \$70 per person.

The surveyors were trained in a carefully structured training session (see the appendix to this report for the training materials) that included instruction on the three methods of questionnaire distribution, carefully following the proscribed schedule, and returning materials. The surveyors were supplied with roller carts to transport questionnaires to and from the temporary agency office and in and out of the airport. They were also supplied with a "to whom it may concern" letter describing the project and authorization from DFW, drop boxes for distribution-intensive use, signage, pens, tape, labeled envelopes for completed surveys, rubber bands, "surveyor" hats, and \$9 for parking per airport shift. In addition, the surveyors had (personal) cell phones that were used for communicating with them while they were in the field.

Some difficulties were encountered in the process of fielding the beta test that can be expected in the full study as well. These include cancelled or delayed flights (the Dallas area experienced heavy rain and flooding during the beta test field period), sampled flights not surveyed due to surveyor lateness or transportation issues, and difficulty in scheduling

employees to work shifts that start very early or end very late (the airport is open well beyond normal “business hours”). In particular fielding a project in a remote location without an airport-located base of operations was time consuming for project management and increased interviewer time daily commuting to and from the temporary agency office. Other issues with boarding area surveying include passenger mixing in the departure gate area (i.e. passengers waiting for multiple flights may be in the same departure gate area), some passengers do not wait in the departure gate areas at all, instead they may wait in airline lounges (“road warriors”), restaurants, nearby stores, etc. and only arrive at the departure gate a few minutes before boarding or during boarding itself.

## **FINDINGS AND CONCLUSIONS**

A total of 51 flights were surveyed, utilizing 153 interviewer labor hours. The total labor hours were carefully tallied so that the actual surveyor time spent in distributing questionnaires could be precisely measured. For each sampled flight, surveyors were required to start distributing questionnaires exactly 1 hour and 15 minutes prior to the scheduled boarding time for the flight, based on the assumption that at that time there would be at least some passengers already in the gate area. The surveyors were required to stop distributing questionnaires 10 minutes before the scheduled boarding time since by that time, it would be impossible for a passenger to complete the questionnaire prior to boarding the flight. This essentially meant that each flight had 1 hour and 5 minutes of questionnaire distribution time. Additional time was spent in collecting any questionnaires. The surveyors remained in the gate area until they were certain all potentially collected questionnaires had been retrieved.

The controlled distribution time per flight involved separating the amount of time that surveyors spent in activities other than distributing questionnaires. These non-distribution activities were part of the total labor resource expended; they included:

- getting to the airport,
- entering the airport through security with their survey materials,
- walking to the international terminal and to the assigned gate for a sampled flight,
- waiting for the pre-determined time to start distributing questionnaires,
- walking to the next sampled flight assigned to them,
- collecting materials at the end of a work shift, and

- leaving the airport with a 15-minute allowance for returning to the temporary labor agency office.

Overall, the non-distribution time accounted for 54% of the total labor expended. This means that one hour of distribution time requires 1.18 hours of additional labor time. We estimate that in a longer effort, with greater efficiencies and more experienced staff, this burden of non-distribution labor can be reduced by 25% so that each hour of distribution time may only need about 0.95 hours of preparation, travel and support time.

For the analysis of our results, we focused on the distribution time spent on task. We used three different approaches for distributing questionnaires and retrieving them when completed. These three approaches were:

- Solo surveyors – one surveyor per departing sampled flight – concentrating on just distributing questionnaires to the maximum number of passengers and simply passing out the questionnaires without providing any encouragement or assistance to the passengers. This is referred to as “Solo, Distribution-Intensive”.
- Solo surveyors – one per flight – concentrating on giving passengers as much assistance as possible and encouraging the passengers to complete the questionnaire; this was done at the expense of distributing to everyone. This is referred to as “Solo, Completion-Intensive”.
- Dual surveyors – two per sampled flight – in which one surveyor concentrated on distributing questionnaires and the other followed and talked to passengers encouraging them to complete the questionnaire and helping them with any completion effort. This is referred to as “Team, Completion-Intensive”.

Surveys were counted as completes if they had answers on every page and most questions were answered. Legitimate skips in the questionnaire were expected to be followed. The following table shows the results of the test.

Method	Hours	Complete Questionnaires	Completion Rate (Completes/Hour)
Solo, Distribution Intensive	16.3	124	7.6
Solo, Completion Intensive	17.6	121	6.9
Team, Completion	36.3	120	3.3

Intensive			
Total, Including All Methods	70.2	365	5.2

The outcome suggests that the best results are secured by concentrating on distributing the maximum number of questionnaires to all passengers. The expenditure of time for encouraging passengers to complete the questionnaire does not produce a higher rate of completion; in fact the rate is reduced slightly, from 7.6 completed questionnaires per hour to only 6.9. Surprisingly, the use of two surveyors – one to mostly distribute and the other to encourage completion – did not produce any improvement at all and would not justify the placing of two surveyors on a single departing flight.

We also calculated an estimated participation rate – the percent of potential eligible passengers that actually complete a questionnaire that we retrieve and use for analysis. This of course does not include the potential completed questionnaires that passengers may be willing and able to fill out after they have boarded the flight. Based on the capacity of each flight (using aircraft size and estimating the rate of family groups traveling together based on the type of flight), we calculated a participation rate, summarized in the following table.

Method	Maximum Eligible Passengers (Max. Eligible Pass.)	Complete Questionnaires (CMs)	Participation Rate (CMs/Max. Eligible Pass.)
Solo, Distribution Intensive	1,531	124	8.1%
Solo, Completion Intensive	1,656	121	7.3%
Team, Completion Intensive	2,070	120	5.8%
Total, Including All Methods	5,257	365	6.9%

As with completion rate, the best participation rate is produced by single surveyors concentrating on distributing questionnaires to the maximum number of passengers and not spending time seeking to persuade or assist passenger to complete the questionnaire.

The DFW airport has characteristics that may differentiate it from other, larger international airports. Flights out of DFW tend to be smaller planes flying to Mexico than larger

international hub airports will have. Comparing participation rates by the size of the aircraft we found higher participation rates for the smaller planes.

Aircraft Size	Number of Flights	Participation Rate (CMs/Max. Eligible Pass.)
Smaller (Estimated maximum passengers 50 to 75)	10	11.9%
Medium (Estimated maximum passengers 130 to 185)	26	5.8%
Larger (Estimated maximum passengers 234 to 320)	15	5.5%

An important caveat that needs to be considered is the fact that the surveyors were not professionally trained interviewers. One element of the design of this test study was to use “average” temporary employees at a typical, fairly modest pay rate, train them in a short, but effective training, and record the results. This approach was selected to test its feasibility under the hypothesis that it would conserve project resources if used for the full Survey of International Air Travelers study. It is possible that well trained interviewers, who would also require higher hourly pay, could produce better results through encouraging and assisting passengers in the completion of the questionnaire. In fact, as a result of this test study, NuStats recommends using professional interviewing staff for departure gate surveying. The amount of effort expended in gaining security clearance to the Dallas-Fort Worth International Airport negates any savings that might have been attained by using lower-paid, temporary staff.

In conclusion, it appears that assigning one surveyor to each sampled flight and having that surveyor concentrate on maximum distribution of questionnaires produces the best results. Under this procedure, and with improved efficiencies in the assignment of sampled flights so that non-distribution labor time is reduced, we conclude that one hour of total surveyor labor (including distribution time and non-distribution time) will produce about 4 completed and usable questionnaires. With more efficient scheduling of flights at larger airports and use of professional interviewers, it may be possible to realize a gain in efficiency of completed surveys per total surveyor hour by up to fifty percent.