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University of California at Berkeley

Development of a National Database of Air Passenger Survey Data

Research Report

**Proof of Concept Study for a National Database
of Air Passenger Survey Data**

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Preface and Acknowledgments

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Executive Summary

Air passenger surveys are routinely performed by airport authorities, regional planning agencies, and other organizations and are typically the only source of information on a range of air passenger travel characteristics, including trip purpose, travel party size, trip duration, trip end location, and airport ground access and egress mode. However, while this information forms an essential input to air travel forecasting and the airport planning process, the results of the majority of the air passenger surveys performed by airport authorities and other agencies are not readily available outside the sponsoring organization. In order to remedy this situation the research project described in this report is exploring the practical, technical, logistical and cost issues involved in establishing a web-based national archive of air passenger survey data that would greatly enhance the accessibility of this information, and well as encourage greater standardization of air passenger survey techniques.

A previous working paper prepared as part of this research, *Conceptual Design of a National Database of Air Passenger Survey Data* (Gosling, 2005), describes the motivation behind this research, presents a proposed operational concept for such a database and an initial estimate of implementation costs, reviews the potential sources of air passenger survey data, and discusses the issues that arise in integrating air passenger survey data from multiple sources. The current report presents the results of a more detailed proof-of-concept study that has been undertaken to further develop these ideas, assemble representative data and incorporate this information in a prototype web-based database. The report also documents the findings of a survey of potential users of the proposed national database to assess the availability of air passenger survey data and the likely support for and use of the database.

Availability of Air Passenger Survey Data and Potential Use of the Database

In order to better understand the frequency with which air passenger surveys have been performed at a variety of airports of different size and function and to assess the likely support for and use of a national database of air passenger survey information, the research team undertook a survey of potential users of such a database. The survey was sent to a sample of airport authorities, state and regional planning agencies, airport and aviation consultants and

other potential users of the proposed database, including members of the research community and government agencies.

The survey questions addressed three issues. The first question asked how many air passenger surveys the responding organization had undertaken or been involved in planning or performing in the past ten years. Details of the three most recent surveys were also requested. Consultants and other users were also asked about surveys the responding organization had made use of but had not been involved in performing. The next set of questions addressed how likely the organization would be to contribute information about the surveys that it had performed to a national archive. The questions distinguished between descriptive information about the survey, summary results such as a technical report, and detailed survey response data, as well as whether the information in the database were publicly available, only accessible by organizations that had contributed data, or only accessible by users with the express approval of the survey sponsor.

The survey was sent to slightly over 300 organizations and responses were received from just under half the organizations surveyed. The majority of the large hub airport authorities responded and slightly over half the larger metropolitan planning organizations (MPOs). Responses were received from somewhat under half the state aviation agencies and airport planning or aviation consulting firms. Perhaps not surprisingly a smaller proportion of the smaller MPOs responded, slightly under a third, since many of these agencies do not become involved in airport system planning. The lowest response rate was received from the medium hub airports, less than a quarter of those contacted, while a somewhat higher response rate was received from the small hub airports, with slightly over a third of those contacted responding. By combining the responses from the medium and small hub airports, the number of responses in each category of organization is sufficient to permit an analysis of the survey responses by the different categories, as well as to examine any differences in response by size of airport or MPO.

Survey Findings

As could be expected, the larger airports performed more surveys than the smaller ones. All the large hub airport authorities reported performing at least one survey in the past ten years and over half performed more than seven surveys. In contrast, a third of the medium and small hub airports reported that they performed no surveys at all and of those airports that did perform surveys, over half reported performing three or less over the past ten years. Compared to airport

authorities, relatively few state aviation agencies and metropolitan planning organizations reported that they performed air passenger surveys themselves. About a third of the state agencies reported performing surveys during the past ten years, while only about a fifth of the MPOs reported doing so. Not surprisingly, the MPOs performing surveys were generally those responsible for larger metropolitan areas, with about a sixth of the smaller MPOs reporting performing just one survey in the past ten years and none reporting more than that. However, two of the larger MPOs were each responsible for a region that included three commercial service airports and reported performing three surveys in the past ten years at each of the these airports.

From the survey responses it appears that on average large hub airport authorities perform about three air passenger surveys per year, although excluding one airport that reported performing about 35 surveys per year reduces this to about 1.3 per year. Medium and small hub airports perform surveys much less frequently and on average these airports reported performing about 0.4 surveys per year, although this statistic was skewed by one small hub airport that reported performing about four per year. The average across the other medium and small hub airports was only about 0.25 per year. If these responses are representative of the airports that did not respond to the survey (or were not included in the survey), it would appear that there are about 100 air passenger surveys being performed each year at all large, medium and small hub airports.

Among those state and regional agencies that did perform surveys, the state agencies performed an average of about 3.4 surveys over a ten-year period while the larger MPOs performed an average of about 1.8 surveys over a ten-year period. However, many of the state agency surveys involved multiple airports, as did several of the surveys by the larger MPOs. On average, those state agencies that performed air passenger surveys undertook surveys at about 3.8 airports per year, while the larger MPOs that performed surveys did so at an average of 0.4 airports per year. If these responses are representative of the agencies that did not respond to the survey or were not included in the survey, this would translate to air passenger surveys being performed at about 70 airports per year by state and regional planning agencies, of which about 90 percent would be performed by state agencies.

The likelihood of the sponsoring organizations for each of these surveys contributing information about the survey to a national database also varies widely, and depends on the

restrictions imposed on access to the data. In order to quantify the likelihood of a survey sponsor contributing survey information, it was assumed that 90 percent of respondents indicating that it was very likely they would contribute information would in fact do so, and that this percentage would reduce by 20 percent for each step in the likelihood scale, so that only 10 percent of those indicating that it was very unlikely they would contribute information would do so. On this basis, if information about the surveys were publicly available it appears that descriptive information for surveys at about 95 airports per year would be contributed to the database. This would increase to about 120 airports per year if access to the information were restricted to those with express approval of the survey sponsor. Survey response data would be contributed for surveys at about 70 airports per year if this were publicly available. This would increase to about 100 airports per year if access were restricted to those with express approval.

Although restricting access to the information appears to result in a significant increase in the number of surveys for which information would be contributed to the database, the ease of use of the database and its potential value would be greatly enhanced if the information within it were publicly available. Even the reduced number of surveys for which information might be publicly available still provides a substantial body of information, vastly in excess of what is readily available today.

The survey of potential users also addressed the anticipated usefulness of the proposed national database. While the anticipated usefulness varies across the different types of organization and for the different types of information about air passenger surveys that could be included in the database, a large majority of the airport authorities, state aviation agencies, and consultants and other potential users indicated that the database would be very useful or quite useful. While many of the metropolitan planning organizations did not anticipate that the database would be particularly useful, particularly for more detailed data or for airports outside their planning jurisdiction, over 60 percent anticipated that the ability to access summary results of air passenger surveys for airports within their planning jurisdiction through the database would be very useful or quite useful. Overall there appears to be widespread support for developing the proposed capabilities for the national database.

Survey respondents were provided the opportunity to include comments and suggestions in their responses. These comments provide some useful insights into a range of implementation

issues that would need to be addressed in developing the proposed database before their organizations would be likely to contribute survey response data to the proposed database.

Design and Implementation of a Prototype Database and Web Site

The design of a database to archive information from air passenger surveys at a national level will need to address both the range of information about a given survey that may need to be stored in the database, as well as the wide differences in structure and content of each individual survey. While it would be possible simply to store the information in the same format that it was originally saved by the sponsoring organization, using whatever file formats were adopted, it would be much more useful to convert it to a standard format that can be adapted to the specifics of individual surveys and to develop data conversion routines to reformat the information into the standard structure. These conversion routines could also incorporate data checking functions to flag missing information or apparent problems with the data.

As part of the proof of concept study, detailed data table specifications have been developed for a proposed relational database structure to support a national archive of air passenger survey information. Such a database could contain the following information relevant to or derived from a particular air passenger survey:

1. Descriptive information about the survey
2. Survey reports and other documents
3. Survey questions
4. Survey response data
5. Contextual information

In order to demonstrate the functionality of the proposed database, implementation of a prototype version is being undertaken as part of the ongoing development of a web site that has been established as part of the research project and the various tables are being populated with representative data for various air passenger surveys assembled in the course of the research.

The prototype web site has been created on a web server at the University of California at Berkeley, both as a platform to explore the issues involved in implementing a web-based archive of air passenger information and to begin to make the data assembled in the course of the study more readily available. Initially, the web pages were created as fixed HTML files, since this permitted easy updating and modification. However, as the database is being implemented,

some of these pages are being modified so that they are created dynamically from information in the database by Java scripts. In addition to information about selected air passenger surveys, the web site provides descriptive information about the research project and access to project reports, as well as links to other web-based information that may be of interest to anyone looking for information on or about air passenger surveys. The web site has also been used to support the survey of potential users of the proposed national database described above by enabling survey respondents to download survey questionnaires and complete the survey on-line.

Conclusions and Further Work

The survey of potential users of the proposed national database has provided valuable information on frequency with which air passenger surveys are performed by a range of different organizations, as well as the likely use of the information in the proposed national database. Assuming that the survey responses are representative of organizations that did not respond or were not included in the survey, it appears that the total number of air passenger surveys that could potentially be included in a national database might cover as many as 170 airports per year.

The development of the prototype database to date has identified the proposed content of the database and prepared an initial set of specifications for the required tables in a relational database structure. The challenge in implementing such a database is to provide the flexibility to accommodate the wide range of questions and approaches involved in different air passenger surveys within a standardized framework that allows users to integrate the information from multiple surveys and access the necessary definitional and contextual information about each survey to properly interpret the results. One way to facilitate this is through the use of a standard classification of survey questions, so that questions in different surveys that address similar issues can be easily identified, even if they use very different wording and present different response options to the survey subjects.

The development of a prototype web site to provide access to the information on selected air passenger surveys assembled in the course of the research has both identified some of the challenges involved in effectively presenting the wide range of information required to properly make use of air passenger survey results as well as demonstrated ways to address those challenges. Further development of this web site during the remainder of the research project

will significantly expand the usefulness and value of the web site and the expanding body of information to which it provides access.

Although having access to the results from air passenger surveys performed at other airports can leverage the information collected in surveys by airport authorities or aviation planning agencies at their own airports or in their own jurisdiction, perhaps the most valuable aspect of the proposed national database of air passenger survey data is the ability to corroborate the findings of different surveys. Without this ability, airport authorities and aviation planning agencies are left with no choice but to assume that the results of their surveys are valid. Since air passenger surveys performed at different airports often use different survey methodologies and are typically performed for a limited period at infrequent intervals, it would not be at all surprising to find that they give widely divergent results. While this is obviously of concern, if this leads to a better understanding of why apparent discrepancies have arisen and to methodological improvements that are able to resolve the issue or prevent it recurring, then that is a much better outcome than continuing to rely on information without knowing how valid it is.

The remaining tasks in the current phase of the research project are to complete the development of the prototype database and web site and to prepare an implementation plan for the development of an on-going national archive of air passenger survey information, should the Federal Aviation Administration (FAA) decide to proceed with this. The implementation plan will identify potential organizations to host the database, define the necessary technical and organizational procedures that would be needed to implement and maintain the archive, and develop detailed estimates of required resources and operating costs involved. Development of this plan will include further discussions with relevant FAA staff and representatives of other organizations that might be involved in hosting or supporting the database.

1. Introduction

This report has been prepared as part of a research project funded by the Federal Aviation Administration (FAA) to examine the feasibility and potential benefits of the development of a web-based national database of air passenger travel characteristics from air passenger surveys. A previous working paper prepared as part of this research, *Conceptual Design of a National Database of Air Passenger Survey Data* (Gosling, 2005), describes the motivation behind this research, presents a proposed operational concept for such a database and an initial estimate of implementation costs, reviews the potential sources of air passenger survey data, and discusses the issues that arise in integrating air passenger survey data from multiple sources. This report presents the results of a more detailed proof-of-concept study that has been undertaken to further develop these ideas, assemble representative data and incorporate this information in a prototype web-based database. The report also documents the findings of a survey of potential users of the proposed national database to assess the availability of air passenger survey data and the likely support for and use of the database.

Air passenger surveys are routinely performed by airport authorities, regional planning agencies, and other organizations and are typically the only source of information on a range of air passenger travel characteristics, including trip purpose, travel party size, trip duration, trip end location, and airport ground access and egress mode. While some of this information, although not all, is known by the airlines from the passenger trip reservation details, there is currently no requirement for the airlines to report this or otherwise make it available, and in fact most airlines would be very reluctant to release it and may not even preserve it in a readily accessible form. However, this information forms an essential input to air travel forecasting and the airport planning process, as discussed in the working paper mentioned above. In spite of the importance of this information, the results of the majority of the air passenger surveys performed by airport authorities and other agencies are not readily available outside the sponsoring organization.

In order to remedy this situation, the current research project is exploring the practical, technical, logistical and cost issues involved in establishing a web-based national archive of air passenger survey data that would greatly enhance the accessibility of this information, and well

as encourage greater standardization of air passenger survey techniques. The research is being performed by the National Center of Excellence for Aviation Operations Research (NEXTOR) with funding from the Airport Technology Branch of the FAA Technical Center at the request of the FAA Office of Airport Planning and Programming (APP-400).

The remainder of this research report consists of five chapters. Chapter 2 discusses the availability of air passenger survey data and the potential use of the proposed database, based on the results of a survey of potential users. Chapter 3 addresses the design and implementation of a prototype database to archive air passenger survey information in a consistent format. Chapter 4 describes a prototype web site that has been developed in order to explore the issues involved in implementing a web-based archive of air passenger information and to begin to make the data assembled in the course of the study more readily available. Finally Chapter 5 presents the conclusions from the proof-of-concept study and describes the planned work for the remainder of the project.

2. Availability of Air Passenger Survey Data and Potential Use of the Database

The effort required to establish and maintain a national archive of air passenger survey data will clearly depend on the number of such surveys that exist and the willingness of the sponsors of such surveys to contribute information to the archive. This in turn is likely to be influenced by how useful they perceive the availability of the archive to be. In order to better understand the frequency with which air passenger surveys have been performed at a variety of airports of different size and function and to assess the likely support for and use of a national database of air passenger survey information, the research team undertook a survey of potential users of such a database. This chapter presents and discusses the results of that survey.

The survey was sent to a sample of airport authorities, state and regional planning agencies, airport and aviation consultants and other potential users of the proposed database, including members of the research community and government agencies. Airport authorities and some state and regional planning agencies undertake air passenger surveys for their own needs. Airport planning and aviation consultants may help design and conduct such surveys and use the results of surveys in their work. They may thus be aware of surveys that have been performed, even if they were not directly involved in performing the surveys. The research community, government agencies and other industry organizations will generally make use of the results of surveys and may thus be aware of surveys that have been performed, although some government agencies may also sponsor surveys. The different roles of these various organizations resulted in the need for three different survey questionnaires, for the following types of organization:

- Airport authorities
- State and regional planning agencies
- Consultants and other potential users.

Survey Methodology

The survey questions addressed three issues. The first question asked how many air passenger surveys the responding organization had undertaken or been involved in planning or performing in the past ten years. Details of the three most recent surveys were also requested.

In the case of consultants and other users, a follow-on question asked about surveys the responding organization had made use of but had not been involved in performing. The next set of questions addressed how likely the organization would be to contribute information about the surveys that it had performed to a national archive. (These questions were omitted from the survey of consultants and other users). The questions distinguished between descriptive information about the survey, summary results such as a technical report, and detailed survey response data. Respondents were asked to state a separate response depending whether the information were publicly available, only accessible by organizations that had contributed data, or only accessible by users with the express approval of the survey sponsor.

The final set of questions addressed how useful the responding organization thinks that it would be to have access to air passenger survey information from a web-based archive and the type of information that would be most useful. In the case of state and regional planning agencies, the questions distinguished between surveys for airports within the agency's planning jurisdiction and those outside its jurisdiction. On the one hand such agencies may be less interested in information for airports outside their jurisdiction while on the other hand they may feel that they can more easily obtain air passengers survey information for the airports within their jurisdiction and that the web-based archive might be more useful as a way to access information for other airports.

Preliminary questionnaires were prepared and pre-tested by sending them to contacts in selected airport authorities and regional planning organizations to complete and return with any suggestions for improving the survey. The questionnaires were then revised to incorporate these suggestions and an additional questionnaire type developed to address the somewhat different situation of consultants and other potential users.

The final questionnaires for the three different groups of potential user are shown in Appendices A, B and C. These questionnaires were prepared as Microsoft Word forms that could be sent by e-mail to downloaded from the project web site, filled out, and returned by e-mail or fax. The questionnaires could also be printed, filled out by hand, and returned by fax. Finally, the three sets of questions were also posted on an on-line survey web site, SurveyMonkey.com, that allowed users to complete the questions on line and placed the resulting responses directly into a survey response database that could be downloaded by the project staff.

A sample of survey recipient organizations in each category of potential user was selected as described below and appropriate contact information assembled. The survey questionnaires were distributed by mail to e-mail to the recipients with a cover letter or message that explained the purpose of the survey and the scope of the project. Initial response to these first requests was fairly disappointing and several follow-up efforts were made to contact non-respondents by telephone or e-mail to encourage them to respond. These generated a significant number of additional responses.

Survey Sample

The sample of survey recipients was determined as follows:

- All the large and medium hub airports and half the small hub airports, as defined by the FAA on the basis of their 2003 calendar year enplaned traffic
- All the state aviation or aeronautics divisions within the state departments of transportation or state aeronautics or aviation departments where these are separate agencies
- All the metropolitan planning organizations (MPOs) serving metropolitan statistical areas (MSAs) or groups of MSAs with over 1 million population in 2003, all the California MPOs serving MSAs with a population between 250,000 and 1 million in 2003, and half the MPOs in other states serving MSAs with a population between 250,000 and 1 million in 2003.
- Selected airport planning and aviation consulting firms, identified through participation of their staff on relevant committees of the Transportation Research Board (TRB), participation in a workshop on air passenger survey methodology held in January 2004 at the TRB Annual Meeting, and from personal contacts by the research team
- Selected academic and other researchers and other relevant government agencies, identified on the same basis as the aviation and airport consultants.

Selection of the small hub airports was performed by ordering the airports by enplanements and selecting every other one. Selection of the smaller metropolitan planning organizations was performed by listing them by state and then MSA population and selecting every other one. This ensured a reasonable sample across different states. All of the MPOs in California with an MSA population over 250,000 were included because they participate in an Aviation System Planning Working Group organized by the California Department of Transportation and it was anticipated that they might therefore have a stronger interest in air passenger survey data than smaller MPOs in other states. This resulted in a total sample of a little over 300 survey recipients. The number of survey recipients in each category is shown in Table 2-1 below. The sample of large and medium hub airport authorities is smaller than the actual number of such airports because some airport authorities operate multiple airports.

Survey Response

The number of survey responses in each category by the end of July 2005 is shown in Table 2-1.

Table 2-1 Survey Sample Size and Response

Respondent Category	Sample Size	Number of Responses
Airport authorities – large hub	23	19
Airport authorities – medium hub	33	8
Airport authorities – small hub	34	13
	90	40
State aviation agencies	49	23
Metropolitan planning organizations - large	47	26
Metropolitan planning organizations - other	61	19
	108	45
Airport planning and aviation consultants	47	20
Research and other organizations	14	9
	61	29
Total	308	147

Overall, responses were received from slightly less than half the organizations surveyed. The majority of the large hub airport authorities responded and slightly over half the large MPOs. Responses were received from somewhat under half the state aviation agencies and airport planning or aviation consulting firms. Perhaps not surprisingly a smaller proportion of the smaller MPOs responded, slightly under a third, since many of these agencies do not become involved in airport system planning. The lowest response rate was received from the medium hub airports, less than a quarter of those contacted, while a somewhat higher response rate was received from the small hub airports, with slightly over a third of those contacted responding.

By combining the responses from the medium and small hub airports, the number of responses in each category of organization is sufficient to permit an analysis of the survey responses by the different categories, as well as to examine any differences in response by size of airport or MPO.

Survey Results

The number of surveys performed in the past ten years reported by each of the airport authorities responding to the survey is shown in Figure 2-1.

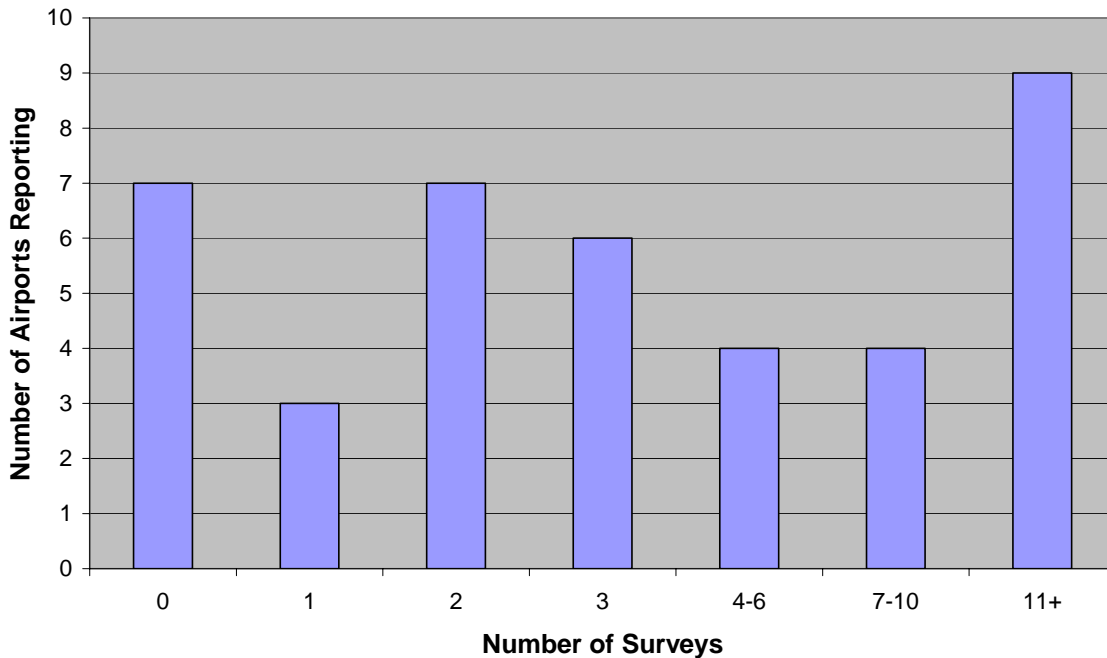
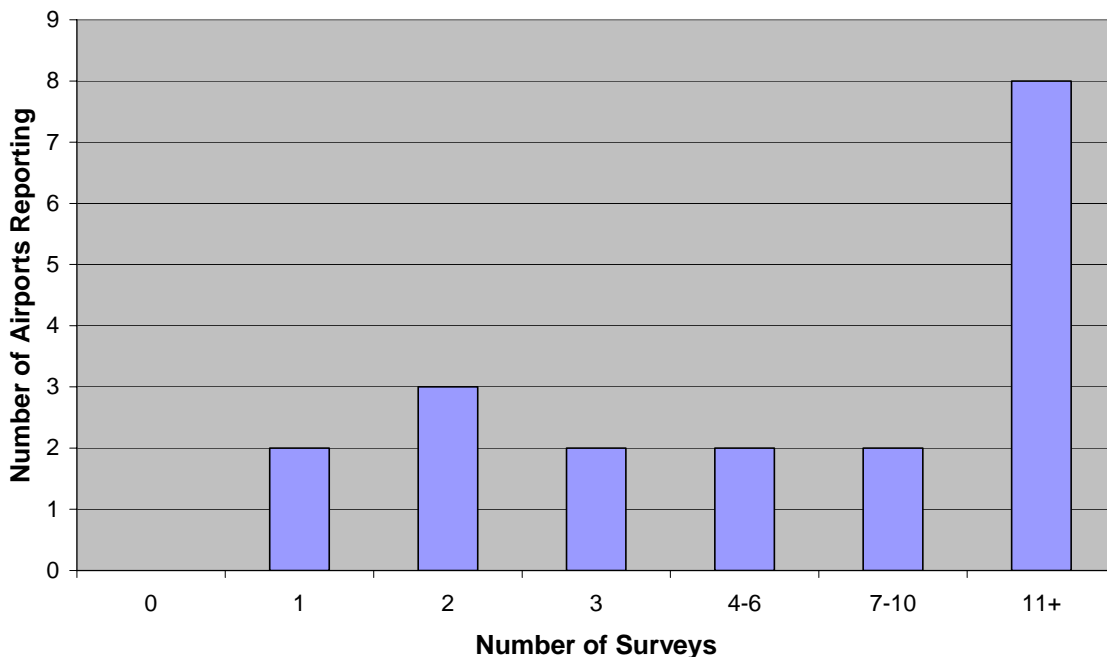


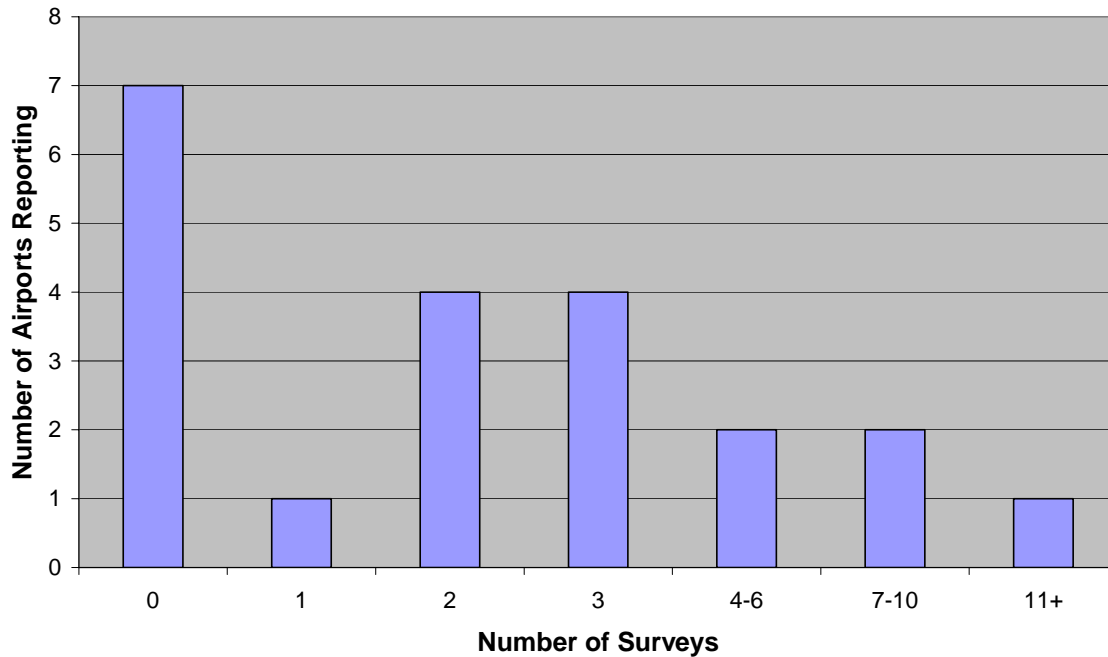
Figure 2-1 Number of Surveys Performed in Past Ten Years – Airport Authorities

It can be seen that the number of surveys performed by a given airport authority varies widely, with some airports reporting no air passenger surveys at all in the past decade and several reporting more than one per year on average. Indeed, a few airports reported a very large number of surveys, with four large hub airport authorities reporting an average of four or more per year and one airport authority stating that they had performed between 300 and 400 surveys over the past ten years. However, this response brings up the question of what constitutes “a survey”. If a survey is performed over a period of several days each month for a year, is that one survey or twelve? Similarly, if an airport authority that operates more than one airport conducts essentially the same survey at each airport, does the survey at each airport count as a separate survey? Because of the wide range of possible situations that could arise, the survey questionnaire provided no guidance to the respondents on how to define a separate survey, and thus the responses reflect what each respondent considered a separate survey.

As could be expected, the larger airports performed more surveys than the smaller ones, as shown in Figures 2-2 and 2-3. All the large hub airport authorities reported performing at least one survey in the past ten years and over half performed more than seven surveys.



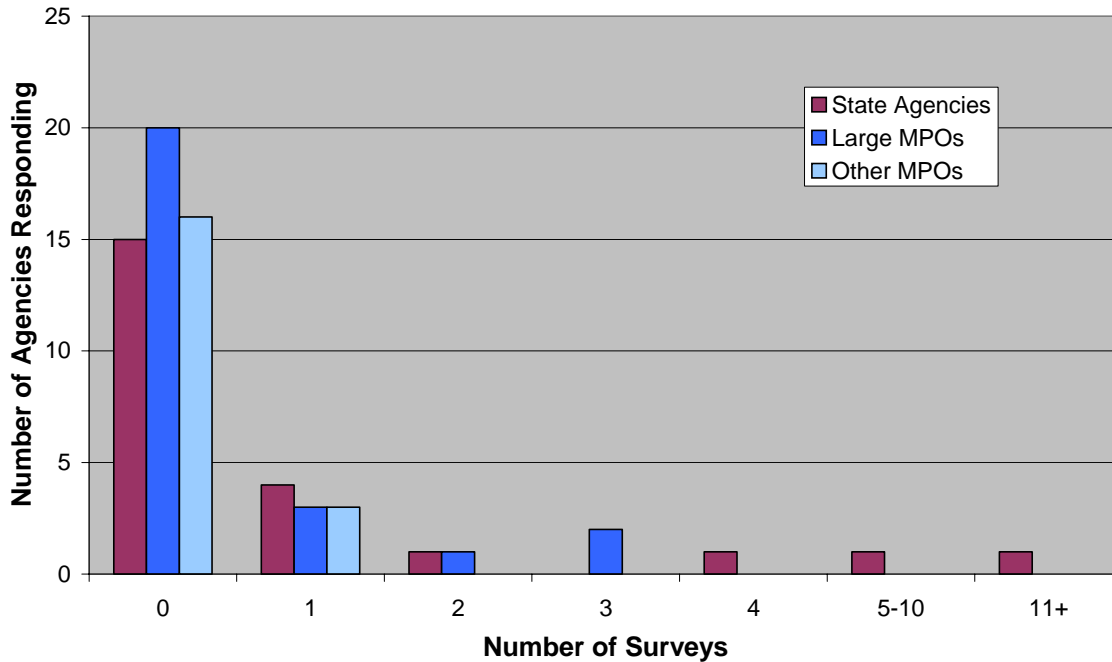
**Figure 2-2 Number of Surveys Performed in Past Ten Years
Large Hub Airport Authorities**



**Figure 2-3 Number of Surveys Performed in Past Ten Years
Medium and Small Hub Airport Authorities**

In contrast, a third of the medium and small hub airports reported that they performed no surveys at all and of those airports that did perform surveys, over half reported performing three or less over the past ten years. Only one airport reported performing more than one per year on average.

Compared to airport authorities, relatively few state aviation agencies and metropolitan planning organizations reported that they performed air passenger surveys themselves. About a third of the state agencies reported performing surveys during the past ten years, while only about a fifth of the MPOs reported doing so, as shown in Figure 2-4. Not surprisingly, the MPOs performing surveys were generally those responsible for larger metropolitan areas, with about a sixth of the smaller MPOs reporting performing just one survey in the past ten years and none reporting more than that. The most number of surveys reported by the larger MPOs over the ten year period was three. However, the two MPOs reporting three surveys in the past ten years were each responsible for a region that included three commercial service airports (the San Francisco Bay Area and the Baltimore/Washington DC region) and performed each of the three surveys at all three airports.



**Figure 2-4 Number of Surveys Performed in Past Ten Years
State and Regional Planning Agencies**

The one state agency that reported performing more than 10 air passenger surveys during the past ten years was not in fact an aviation agency, but rather a department of economic development and tourism, which performs regular surveys of air passengers visiting the state. However, the results of these surveys are shared with the state aviation agency, which uses them to support its aviation system planning activities and forwarded the survey to the other department to respond. This response was therefore treated as if it was from a state aviation agency.

Estimated Total Number of Air Passenger Surveys

From the survey responses it appears that on average large hub airport authorities perform about three air passenger surveys per year, although excluding one airport that reported performing about 35 surveys per year reduces this to about 1.3 per year. Medium and small hub airports perform surveys much less frequently and on average these airports reported performing about 0.4 surveys per year, although this statistic was skewed by one small hub airport that reported performing about four per year. The average across the other medium and small hub airports was only about 0.25 per year. If these responses are representative of the airports that

did not respond to the survey (or were not included in the survey), it would appear that there are about 100 air passenger surveys being performed each year at all large, medium and small hub airports.

Among those state and regional agencies that did perform surveys, the state agencies performed an average of about 3.4 surveys over a ten-year period while the larger MPOs performed an average of about 1.8 surveys over a ten-year period. However, many of the state agency surveys involved multiple airports, as did several of the surveys by the larger MPOs. On average, those state agencies that performed air passenger surveys undertook surveys at about 3.8 airports per year, while the larger MPOs that performed surveys did so at an average of 0.4 airports per year. If these responses are representative of the agencies that did not respond to the survey or were not included in the survey, this would translate to air passenger surveys being performed at about 70 airports per year by state and regional planning agencies, of which about 90 percent would be performed by state agencies.

Likelihood of Contributing Descriptive Information

The majority of airports responding to the survey indicated that the likelihood of contributing descriptive information about surveys that they performed to a national database of air passenger survey information varied between moderately likely (3 on a likelihood scale of 1 to 5 where 1 was not very likely and 5 was very likely) to very likely, as shown in Figure 2-5. Imposing access restrictions on the information increased the likelihood of contributing information for many airports. In particular it significantly reduced the number of respondents that indicated that they would be very unlikely to contribute the information. Restricting access to organizations that contribute information to the database increase the number of respondents that indicated that they would be quite likely to contribute information (4 or 5 on the likelihood scale) from about 40 percent of respondents to about 55 percent. Restricting access to those with express approval by the survey sponsor further increased the number of respondents that indicated that they would be very likely to contribute such information from about 20 percent of respondents to about 35 percent and reduced the number of respondents that indicated that they would be unlikely to contribute (1 or 2 on the likelihood scale) from about 20 percent to about 5 percent.

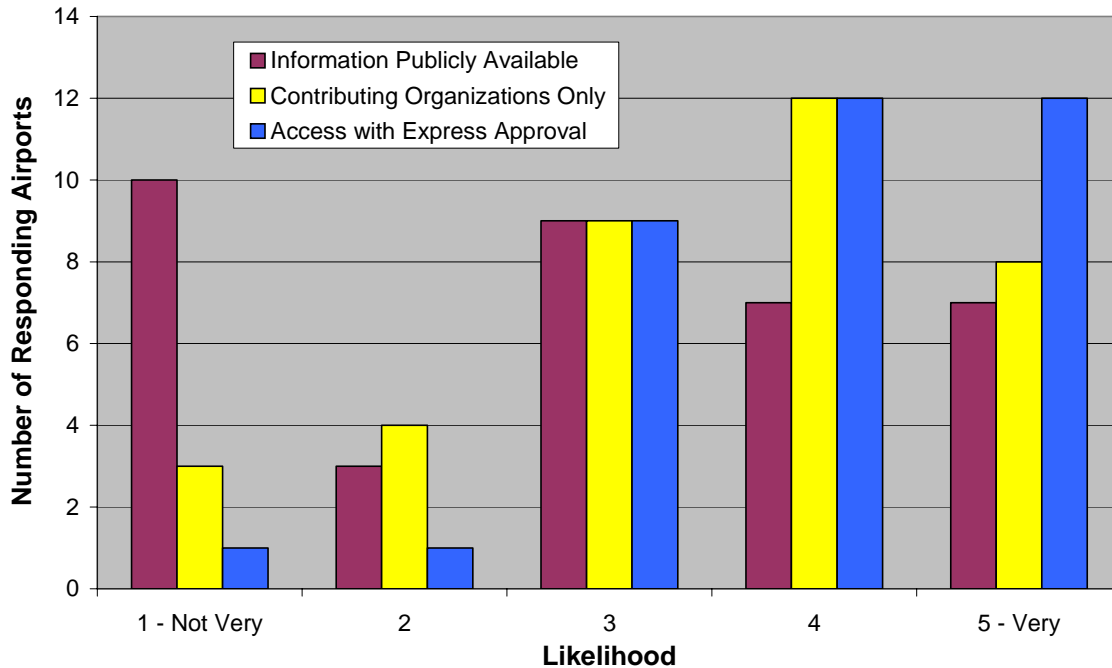
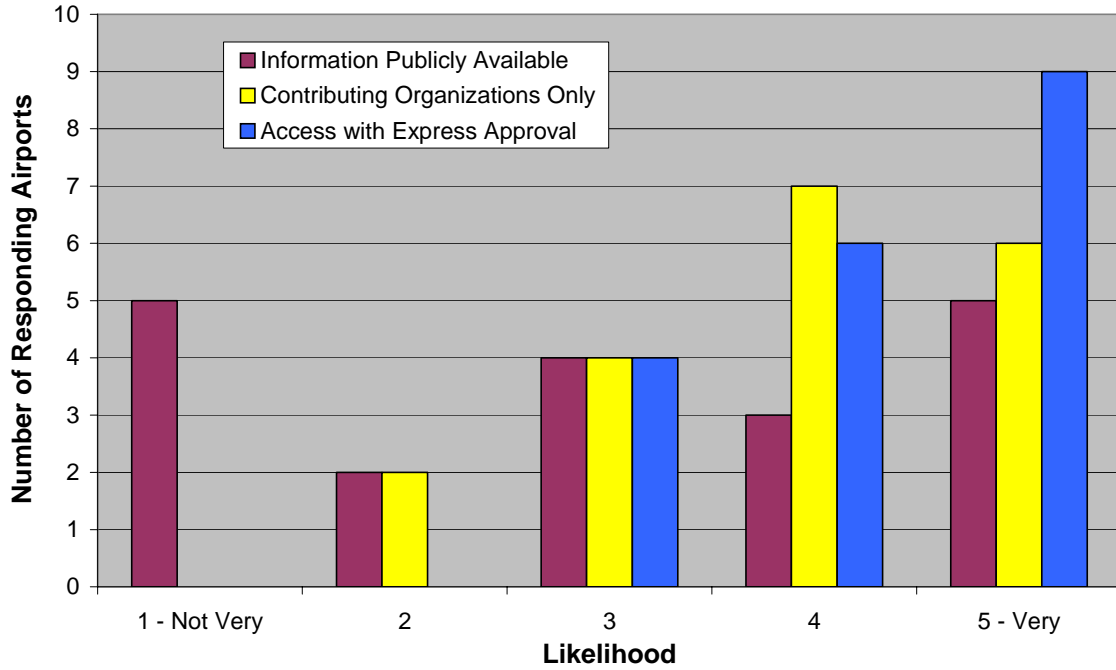


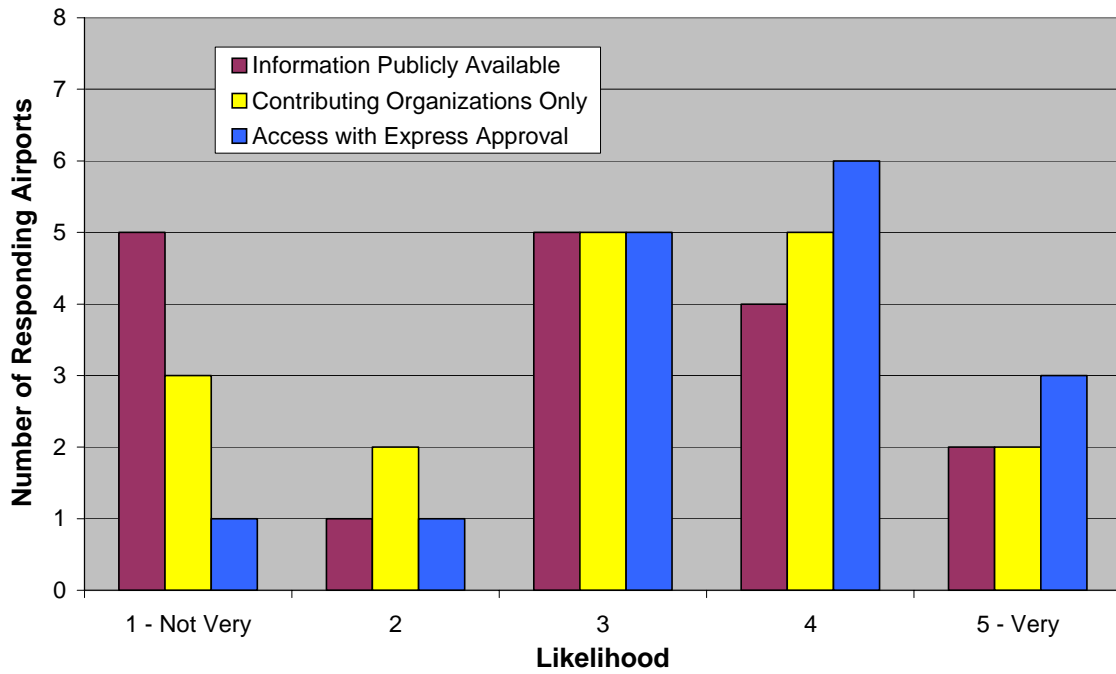
Figure 2-5 Likelihood of Contributing Descriptive Information – Airport Authorities

The respondents from large hub airport authorities indicated that they would be more likely to contribute descriptive information than those from medium and small hub airports, as shown in Figures 2-6 and 2-7. While respondents were fairly evenly distributed between very unlikely and very likely to contribute descriptive information if it were to be publicly available, the proportion that indicated that they would be quite likely to contribute (4 or 5 on the likelihood scale) increased from about 40 percent of respondents to about 70 percent if the information were restricted to contributing organizations and further increased to about 80 percent of respondents if the information were restricted to those with express approval by the survey sponsor.

Only about 35 percent of the respondents from medium and small hub airports indicated that they would be quite likely to contribute descriptive information if it were publicly available. This increased slightly to about 40 percent of respondents if the information were restricted to contributing organizations and to about 55 percent of respondents if it were restricted to those with express approval.

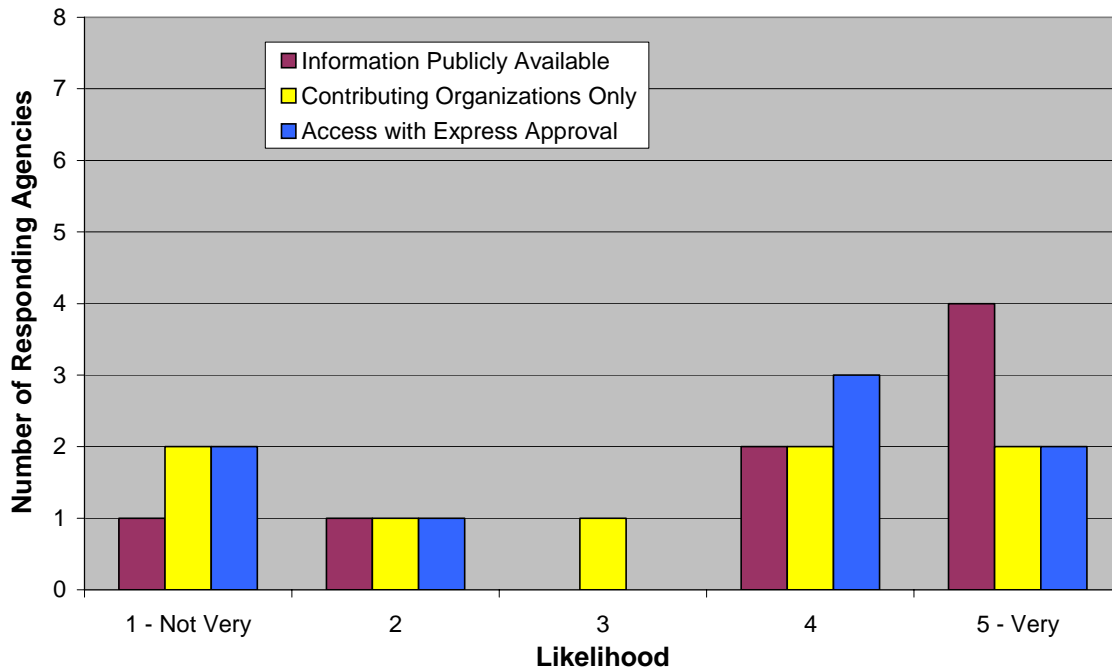


**Figure 2-6 Likelihood of Contributing Descriptive Information
Large Hub Airport Authorities**



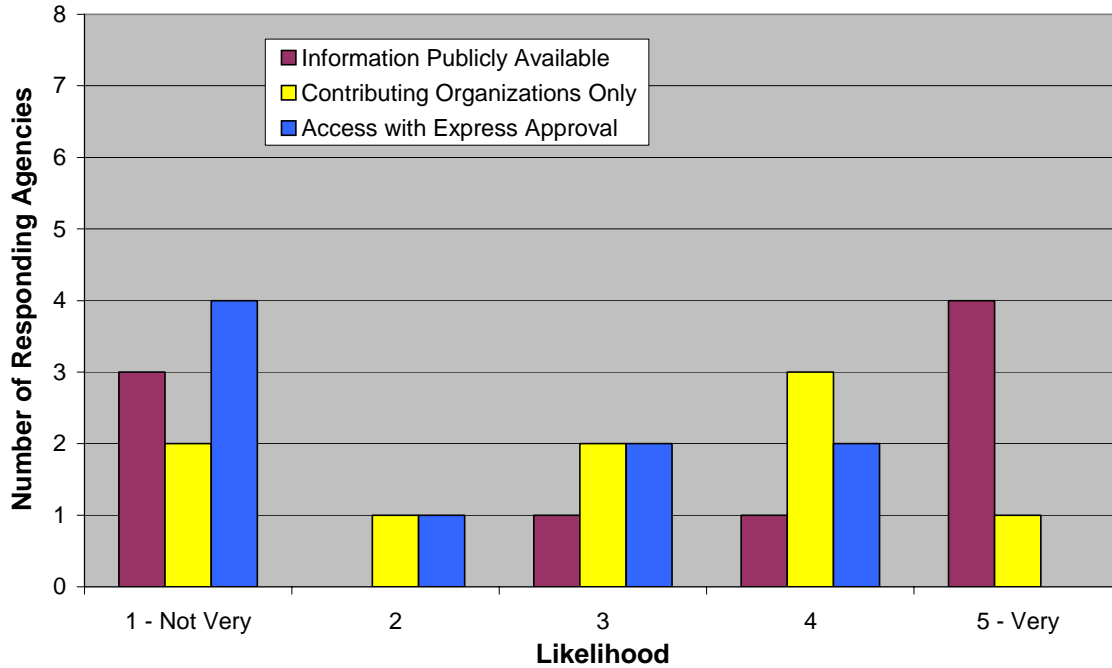
**Figure 2-7 Likelihood of Contributing Descriptive Information
Medium and Small Hub Airport Authorities**

Although relatively few state aviation agencies and metropolitan planning organizations reported performing any air passenger surveys, the likelihood of those that did contributing descriptive information indicated in the responses is shown in Figures 2-8 and 2-9.



**Figure 2-8 Likelihood of Contributing Descriptive Information
State Aviation Agencies**

In contrast to the airport authorities, restricting access to the information does not appear to increase the likelihood of state aviation agencies or metropolitan planning organizations contributing descriptive information about the surveys. Indeed, a number of state and regional planning agencies indicated in their response that they would be less likely to contribute this information if it were not publicly available. This may reflect policies by those organizations (or even legal requirements) to make planning information widely available. Of course, in either case the survey sponsor is usually not the airport operator, and thus the questions asked in the surveys may focus on air party travel characteristics that the survey sponsors do not consider particularly sensitive. About 70 percent of the state aviation agencies and about 60 percent of the metropolitan planning organizations indicated that they would be quite likely to contribute descriptive information to a national archive if it were to be publicly available.

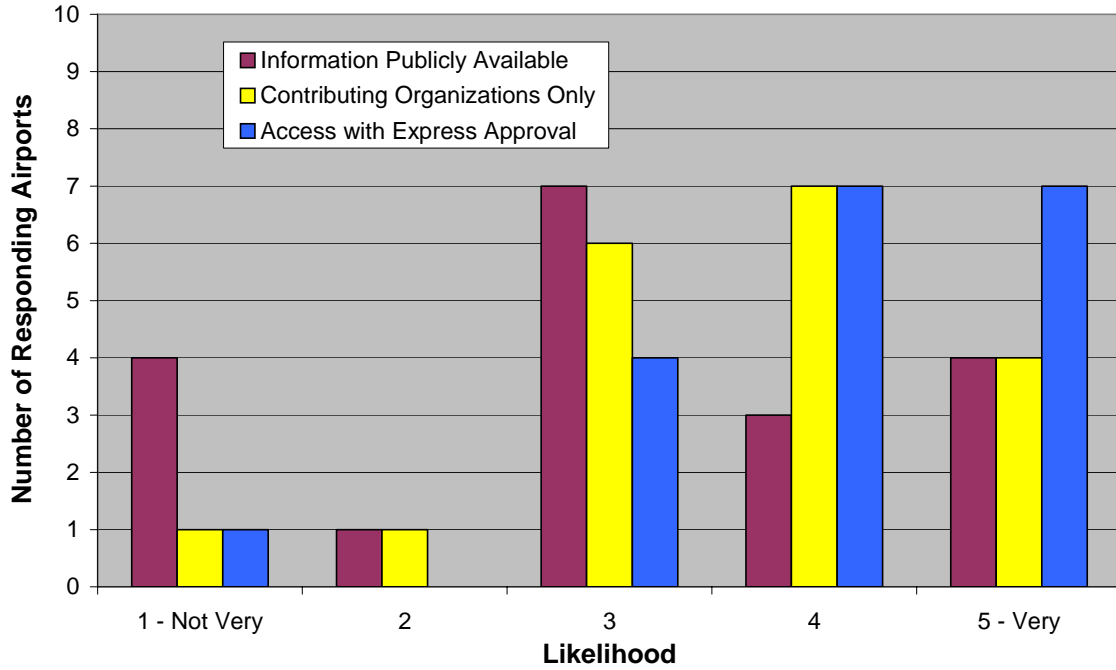


**Figure 2-9 Likelihood of Contributing Descriptive Information
Metropolitan Planning Organizations**

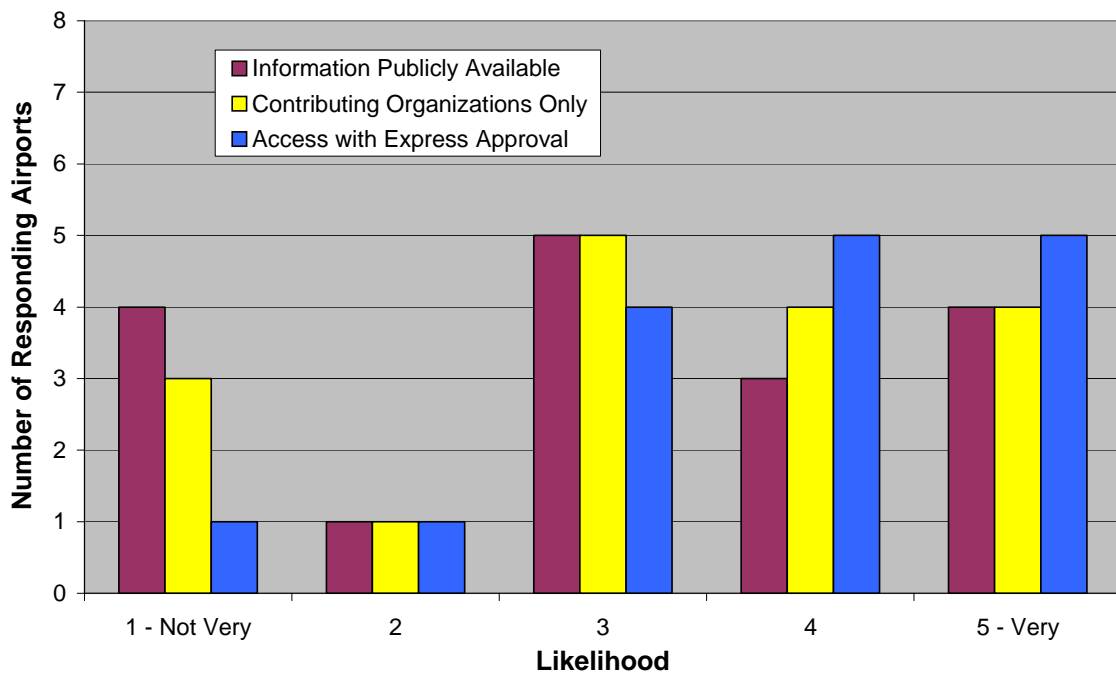
Likelihood of Contributing Summary Results

In addition to contributing descriptive information about the air passenger surveys that they have performed, respondents were asked about the likelihood of contributing summary results, such as reports documenting the survey findings. In most cases, responses indicate a somewhat higher likelihood of contributing summary results compared to contributing descriptive information about the surveys. The responses from large hub airport authorities are shown in Figure 2-10 and those from medium and small hub airports are shown in Figure 2-11.

Comparison of the responses from large hub airport authorities with those shown in Figure 2-6 for the likelihood of contributing descriptive information show a lower number of responses indicating that they would be very likely to contribute summary information compared to those very likely to contribute descriptive information but a larger number that would be moderately likely to contribute this information (3 or 4 on the likelihood scale). There was also a lower number of responses indicating that they would be quite unlikely to contribute summary results (1 or 2 on the likelihood scale) if the information were to be publicly available compared to the corresponding responses for contributing descriptive information.



**Figure 2-10 Likelihood of Contributing Summary Results
Large Hub Airport Authorities**



**Figure 2-11 Likelihood of Contributing Summary Results
Medium and Small Hub Airport Authorities**

Comparison of the responses from medium and small hub airports with those shown in Figure 2-7 for the likelihood of contributing descriptive information show a generally higher likelihood of contributing summary results than description information. The number of responses indicating that they would be very likely to contribute summary results if these were made publicly available was twice the number that indicated that they would be very likely to contribute descriptive information under these conditions, and the number that indicated that they would be very unlikely to contribute summary results under these conditions went down. The greater willingness to contribute summary results than the more limited descriptive information is unexpected, but may reflect uncertainty over what descriptive information would be involved or the fact that reports presenting summary results are likely to be readily available and fairly easy to provide, and may be public available already anyway.

As with descriptive information, the indicated likelihood of airport authorities contributing summary results increases as the availability of the information becomes more restrictive. This change is more pronounced in the responses from the large hub airport authorities than in those from the medium and small airports, as it is for the likelihood of contributing descriptive information.

The responses from those state aviation agencies and metropolitan planning organizations that performed air passenger surveys indicated a generally higher likelihood of contributing summary results than the likelihood of contributing descriptive information about the surveys, just as it was for the medium and small hub airports, although the likelihood decreased with greater restrictions on access to the information, as it did for descriptive information.

Likelihood of Contributing Survey Response Data

Respondents from airport authorities indicated that in general they would be less likely to contribute the detailed survey response data than they would descriptive information or summary results, as shown in Figure 2-12, particularly if the information were publicly available. In this situation less than 20 percent of respondents indicated that they would be quite likely to contribute survey response data. This increased to about 35 percent of respondents if the data were to be restricted to contributing organizations and to almost 60 percent if the data were to be restricted to those with express approval. About 25 percent of respondents indicated that they would be moderately likely (3 on the likelihood scale) to contribute survey response data if this

were publicly available, and this did not change significantly if access to the data were restricted to those with express approval, although it did increase to about a third of respondents if access were restricted to contributing organizations. This apparent anomaly is due to a greater shift in likelihood scale value from 3 to higher values with the increased restriction than from lower values to 3. Even so, about 15 percent of respondents indicated that they would be quite unlikely (1 or 2 on the likelihood scale) to contribute survey response data even if the data were restricted to those with express approval.

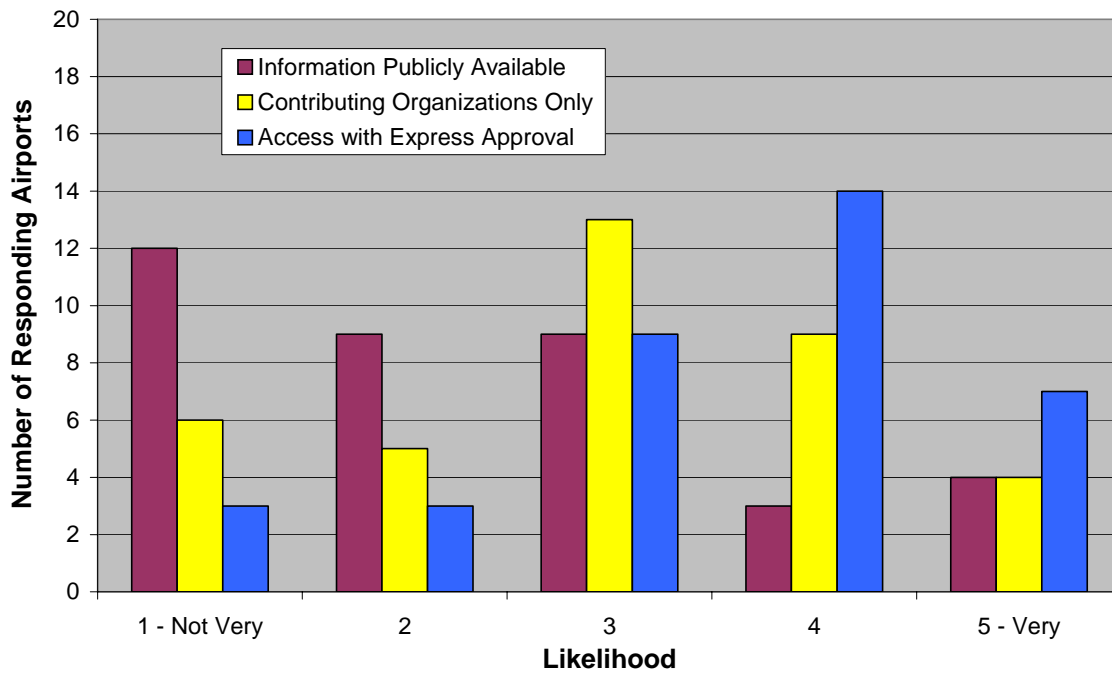
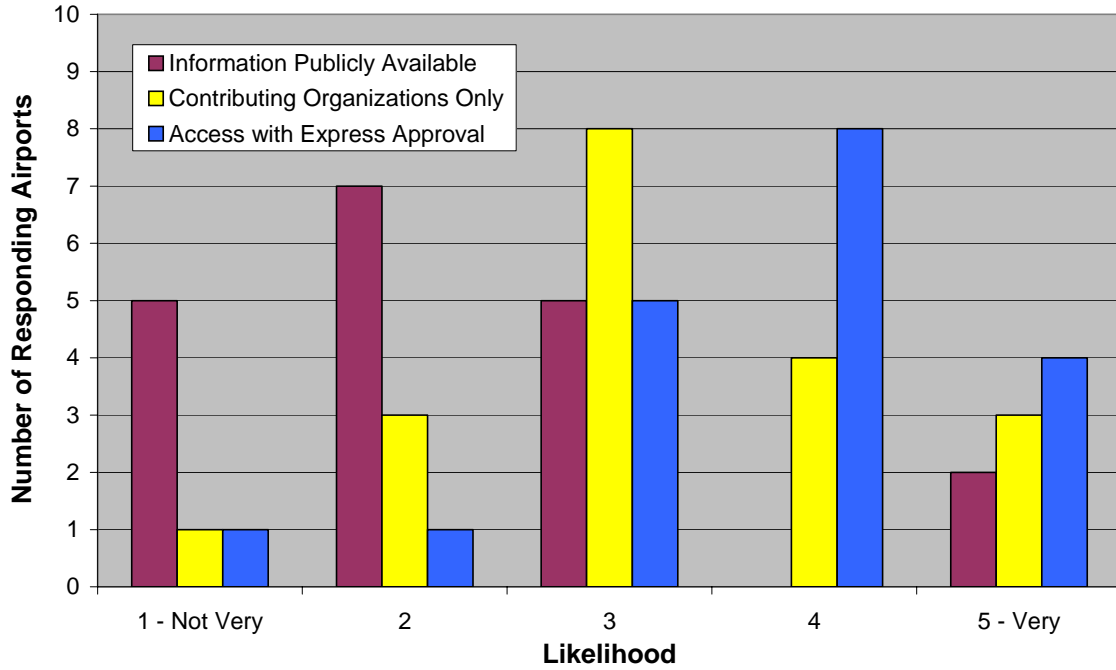
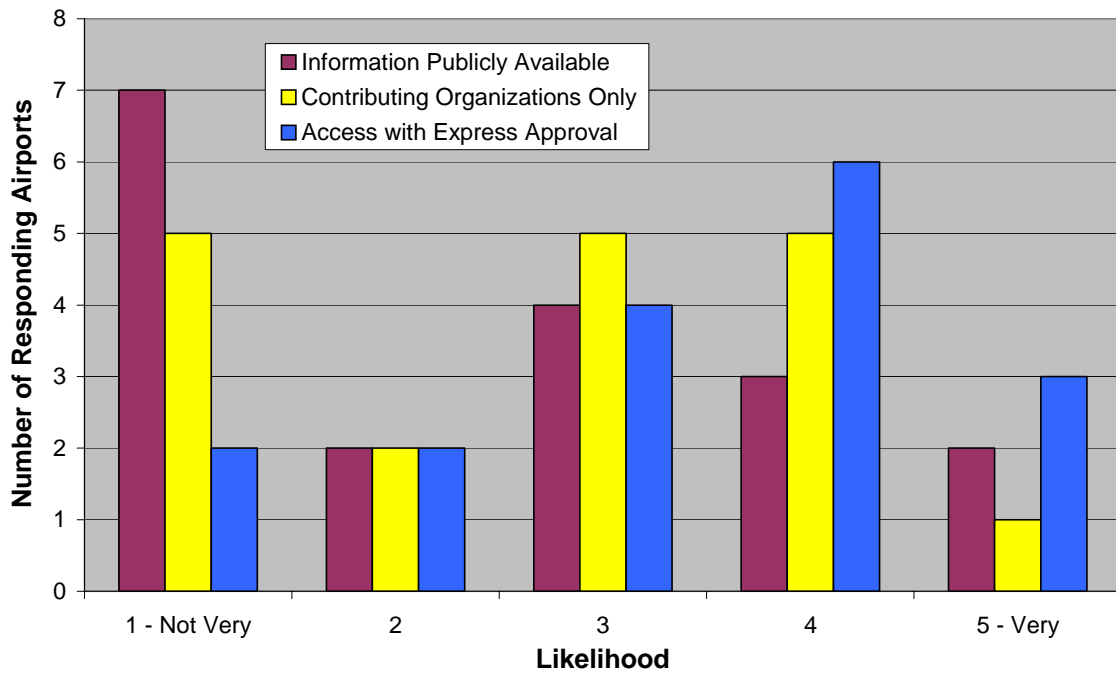


Figure 2-12 Likelihood of Contributing Survey Response Data – Airport Authorities

The corresponding responses for large hub airport authorities and medium and small hub airports are shown in Figures 2-13 and 2-14. As with the likelihood of contributing descriptive information, a higher proportion of respondents from medium and small hub airports indicated that they would be quite unlikely to contribute survey response data than in the case of the large hub airport authorities. If access to the data were to be restricted to those with express approval by the survey sponsor, about 90 percent of respondents from the large hub airport authorities indicated that they would be moderately likely or quite likely to contribute survey response data, compared to only about 75 percent of those from medium and small hub airports.



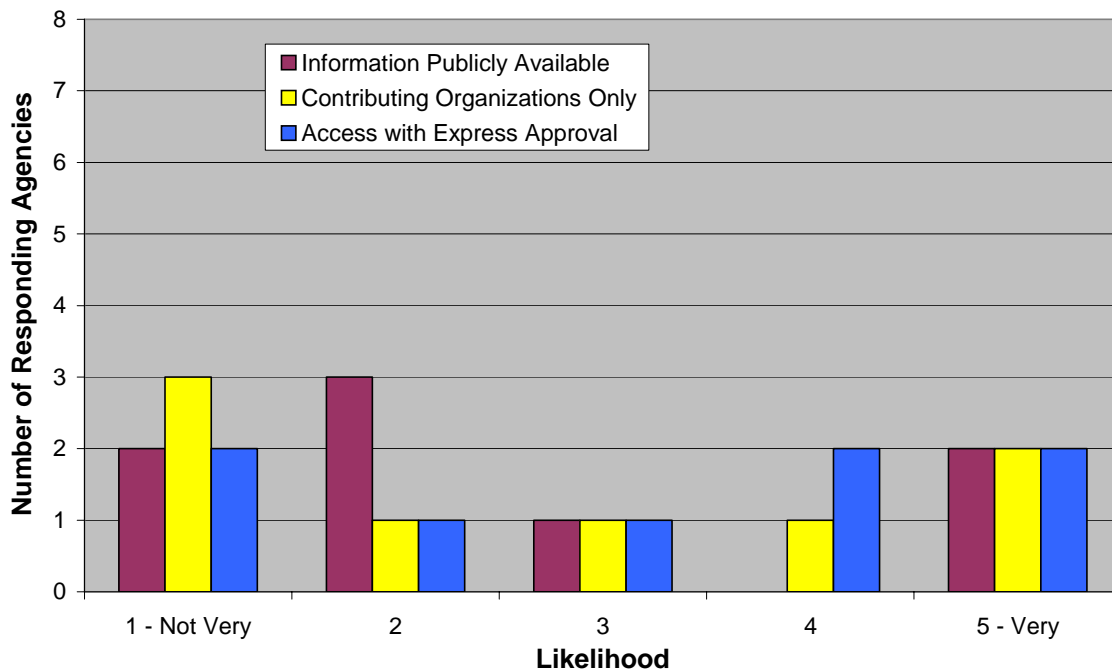
**Figure 2-13 Likelihood of Contributing Survey Response Data
Large Hub Airport Authorities**



**Figure 2-14 Likelihood of Contributing Survey Response Data
Medium and Small Hub Airport Authorities**

In contrast to the responses from the large hub airport authorities, that indicated that only about 10 percent of respondents would be quite likely to contribute survey response data if it were publicly available, about 25 percent of responses from medium and small hub airports indicated that they would be quite likely to contribute survey response data even if it were publicly available.

Figures 2-15 and 2-16 show the likelihood of those state aviation agencies and metropolitan planning organizations that performed air passenger surveys contributing the survey response data, as indicated by the responses received from those organizations. Although the number of responses are somewhat limited, due to the relatively small number of state aviation agencies and MPOs that reported performing any air passenger surveys, they generally indicate a fairly low likelihood of contributing the survey response data, with only about 15 percent of the state aviation agency responses and only about a third of the MPO responses indicating a quite high likelihood (4 or 5 on the likelihood scale) of contributing survey response data if it were publicly available.



**Figure 2-15 Likelihood of Contributing Survey Response Data
State Aviation Agencies**

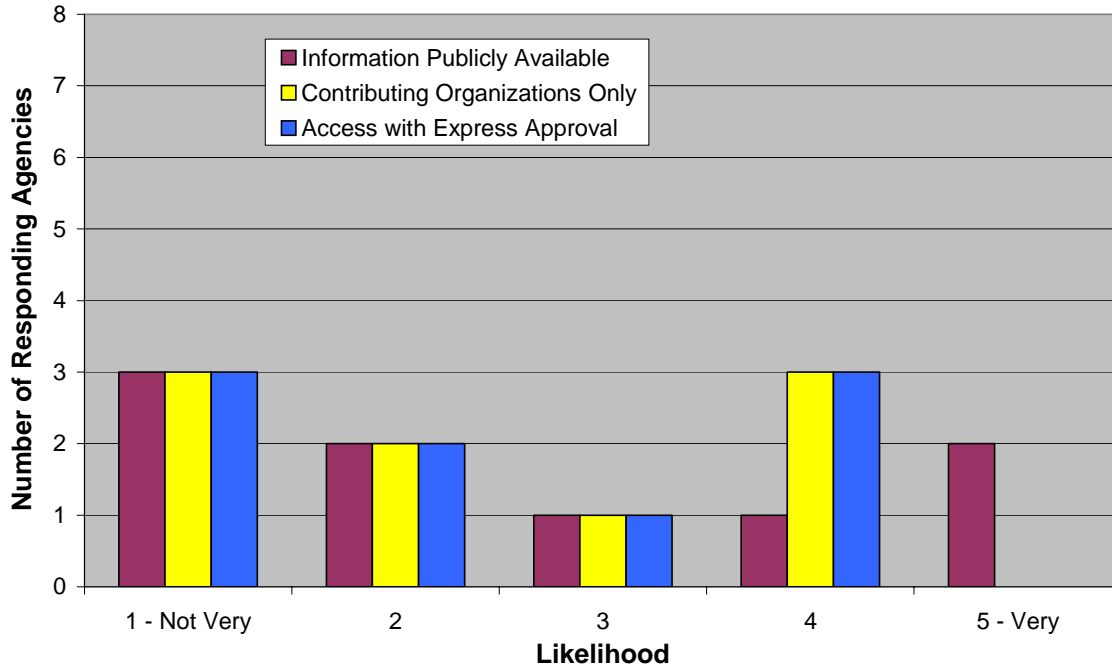


Figure 2-16 Likelihood of Contributing Survey Response Data Metropolitan Planning Organizations

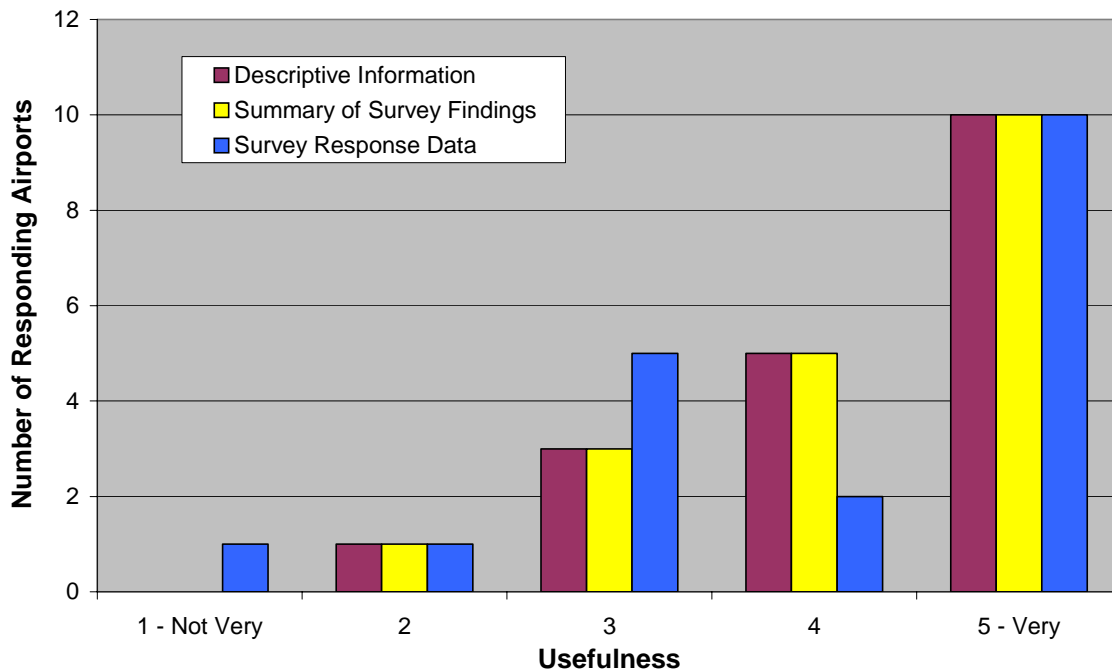
In the case of the state aviation agencies, the likelihood of contributing survey response data increases somewhat with restrictions on access to the data, although this does not appear to apply in the case of the MPOs, where the two respondents that indicated that they would be very likely to contribute survey response data if it were publicly available indicated a lower likelihood if there were restrictions on access to the data. However, the lack of change in the number of responses with likelihood scale values from 1 to 3 conceals two opposite effects in the responses, with some respondents indicating an increased likelihood of contributing survey response data if access to the data is restricted while others indicated a reduced likelihood.

Usefulness of a Web-based Archive

The final set of questions in the data asked about the respondents' assessment of how useful it would be to their organization to have access to air passenger survey information through a national web-based archive of air passenger survey information. In the case of the state aviation agencies and metropolitan planning organizations the survey distinguished between survey information for airports within their planning jurisdiction and those outside it. It was anticipated that these organizations would generally be more interested in air travel

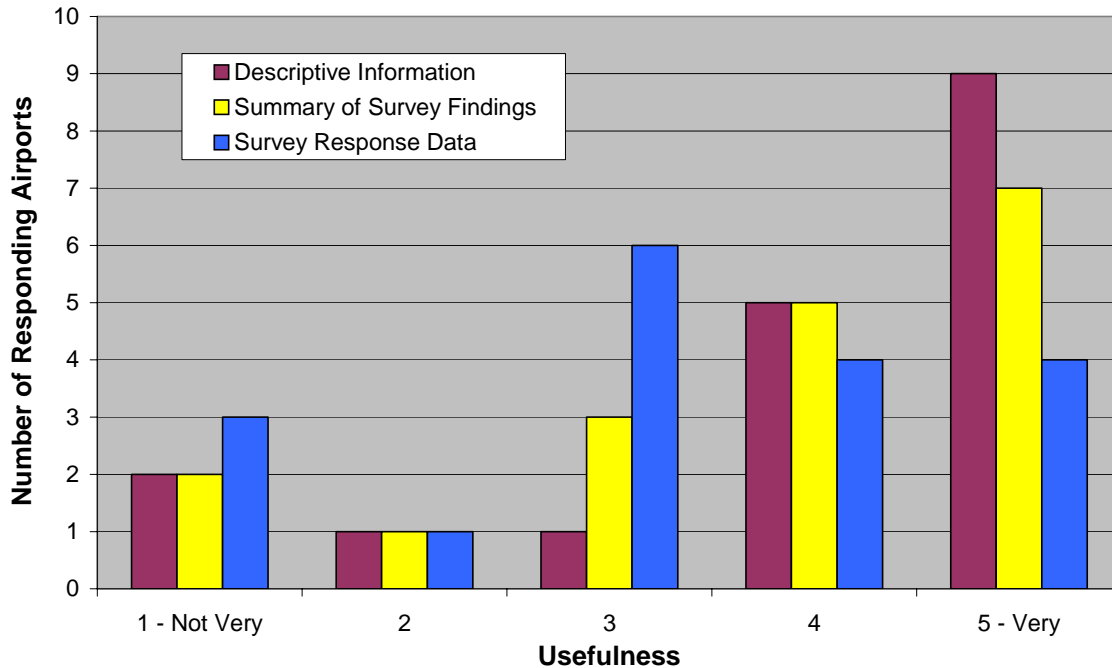
characteristics at airports within their planning jurisdiction. On the other hand, they may well already have access to this information and thus may be more interested in the ability to access information for surveys performed at airports elsewhere. The questions also distinguished between the three types of information discussed above: descriptive information, summaries of survey findings, and detailed survey response data.

The results for large hub airport authorities are shown in Figure 2-17. About half the respondents anticipated that the archive would be very useful, with about a further 25 percent indicating that it would be quite useful (a value of 4 on a scale from 1 to 5 where 1 is not very useful and 5 is very useful). Respondents appeared to regard descriptive information and a summary of survey findings as equally useful, with some responses anticipating the detailed survey response data would be less useful. However, the total number of responses that anticipated the having access to survey response data to be very useful was the same as the number that anticipated that access to descriptive information would be very useful.



**Figure 2-17 Usefulness of a Web-Based Archive of Survey Information
Large Hub Airport Authorities**

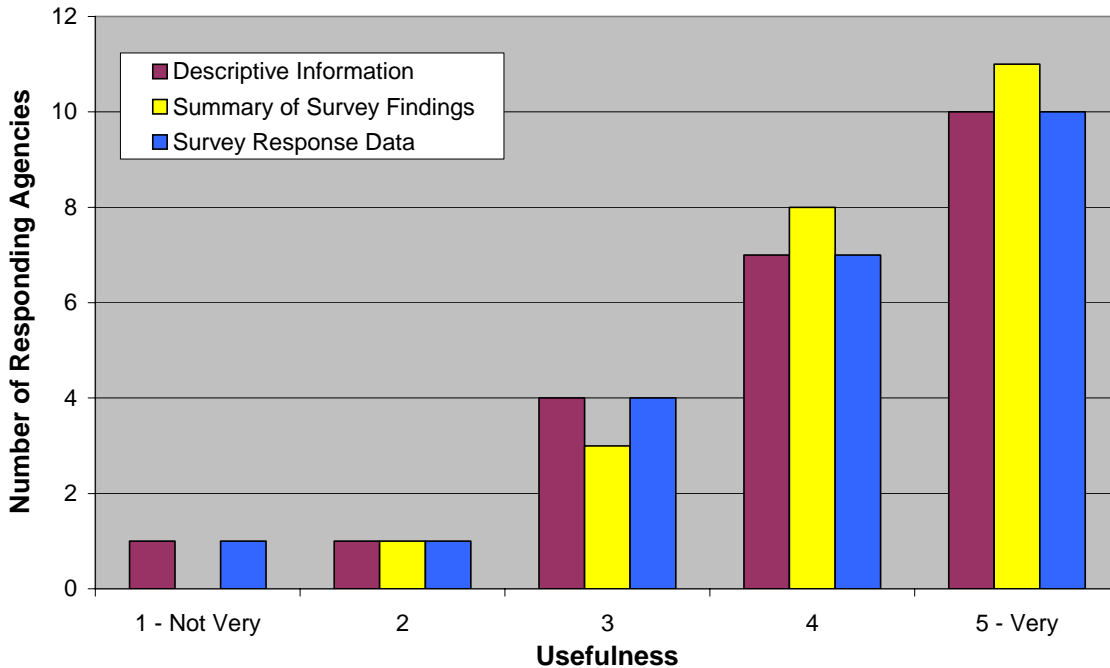
The corresponding results for medium and small hub airports are shown in Figure 2-18.



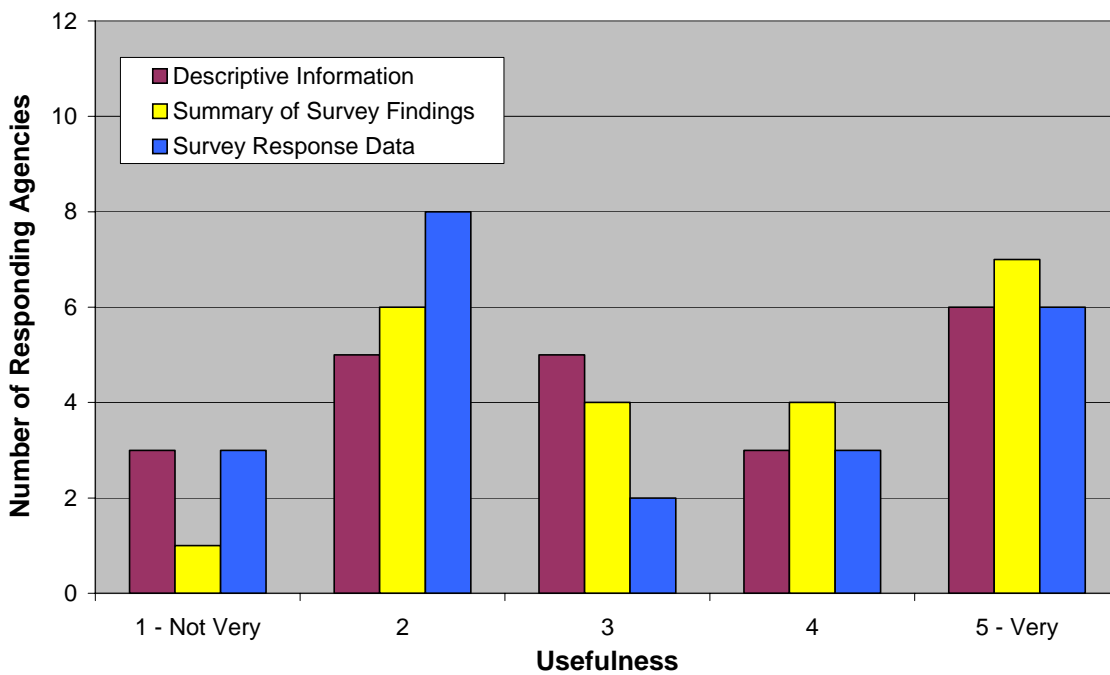
**Figure 2-18 Usefulness of a Web-Based Archive of Survey Information
Medium and Small Hub Airport Authorities**

About the same proportion of responses anticipated that access to descriptive information about air passenger surveys at other airports would be very useful or quite useful as for the large hub airports, although the usefulness of access to summaries of survey findings or survey response data was generally anticipated to be less than was indicated in the responses from the large hub airports, with access to survey response data being less useful than access to summaries of survey findings.

The survey responses from state aviation agencies for airports within their planning jurisdiction and those outside their jurisdiction are shown in Figures 2-19 and 2-20. The three types of information were anticipated to be more or less equally useful for airports within the planning jurisdiction, with about 45 percent of responses anticipating that the archive would be very useful and a further 30 percent anticipating that it would be quite useful. The usefulness of the archive for access to information for airports outside the planning jurisdiction was significantly less, with only about 40 percent of responses anticipating that it would be very useful or quite useful, with a similar number of responses for each of the three types of information.



**Figure 2-19 Usefulness of a Web-Based Archive of Survey Information
State Aviation Agencies – Airports Within Planning Jurisdiction**



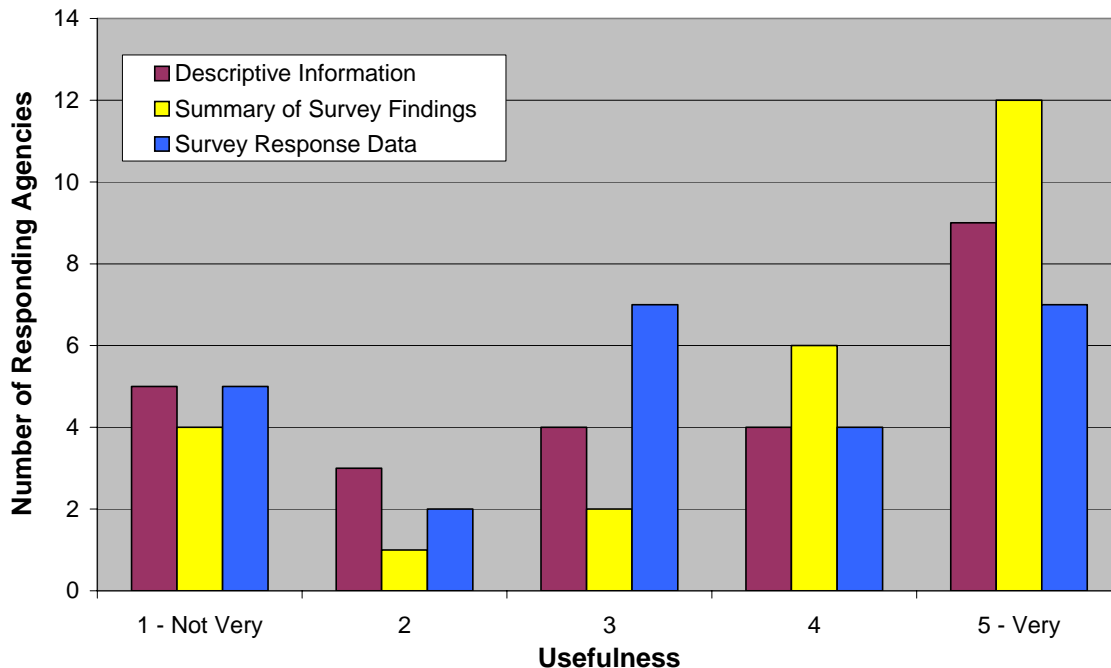
**Figure 2-20 Usefulness of a Web-Based Archive of Survey Information
State Aviation Agencies – Airports Outside Planning Jurisdiction**

However, the relative usefulness of the different types of information for airports outside the planning jurisdiction varied for those responses that anticipated that the archive would not be particularly useful (a value of 1 to 3 on the usefulness scale), with the survey response data being less useful than summaries of survey findings or descriptive information.

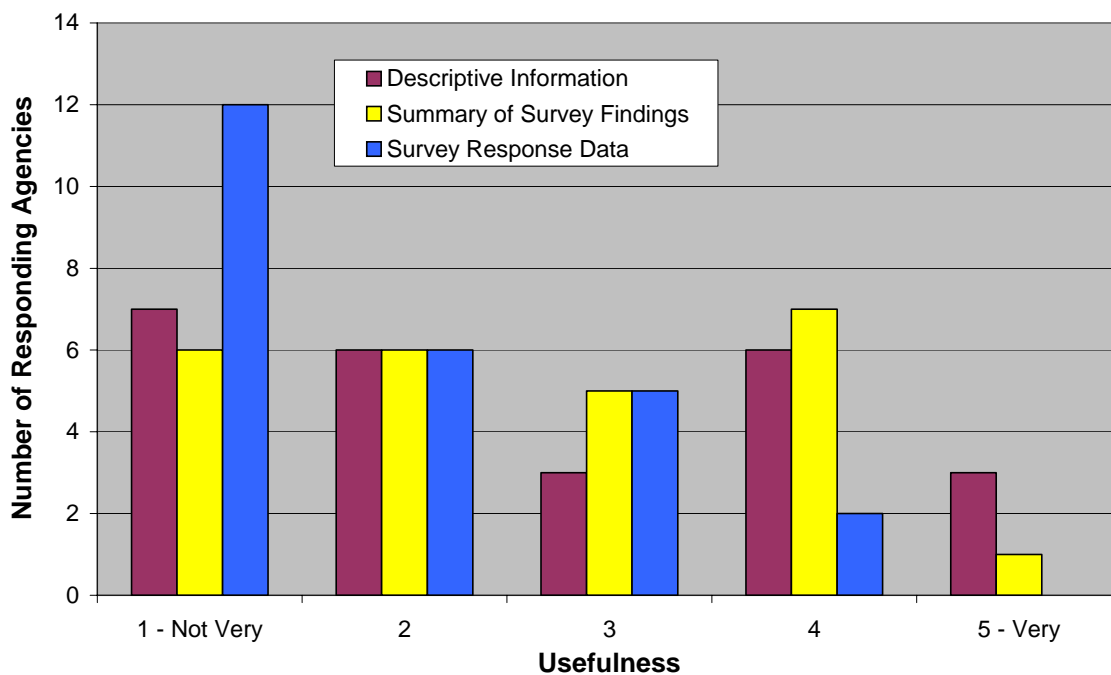
The anticipated usefulness of the archive by respondents from the larger metropolitan planning organizations is shown in Figures 2-21 and 2-22 for airports within the MPO planning jurisdiction and those outside it. The corresponding results for the responses from smaller MPOs are shown in Figures 2-23 and 2-24.

For all the MPOs the anticipated usefulness of the archive varied by the type of information. For airports within the planning jurisdiction of the larger MPOs, about 70 percent of responses from those MPOs anticipated that access to summaries of air passenger survey findings would be fairly useful (quite useful or very useful), while about half the responses anticipated that access to descriptive information about the surveys would be fairly useful and about 45 percent anticipated that access to survey response data would be fairly useful. For airports outside their planning jurisdiction, only about 35 percent of the responses anticipated that access to descriptive information about air passenger surveys or summaries of the survey findings would be fairly useful and less than 10 percent anticipated that access to survey response data would be fairly useful, with no responses anticipating that access to survey response data would be very useful. The relatively high interest shown by the larger MPOs in having a web-based access to air passenger survey information for airports within their jurisdiction is a little surprising, since they can presumably obtain this information directly from the airports in question. However, the lower level of interest in having access to information about air passenger surveys at airports outside their jurisdiction is not at all surprising, since most MPOs have probably given very little thought to how they would use such information if it were more readily available.

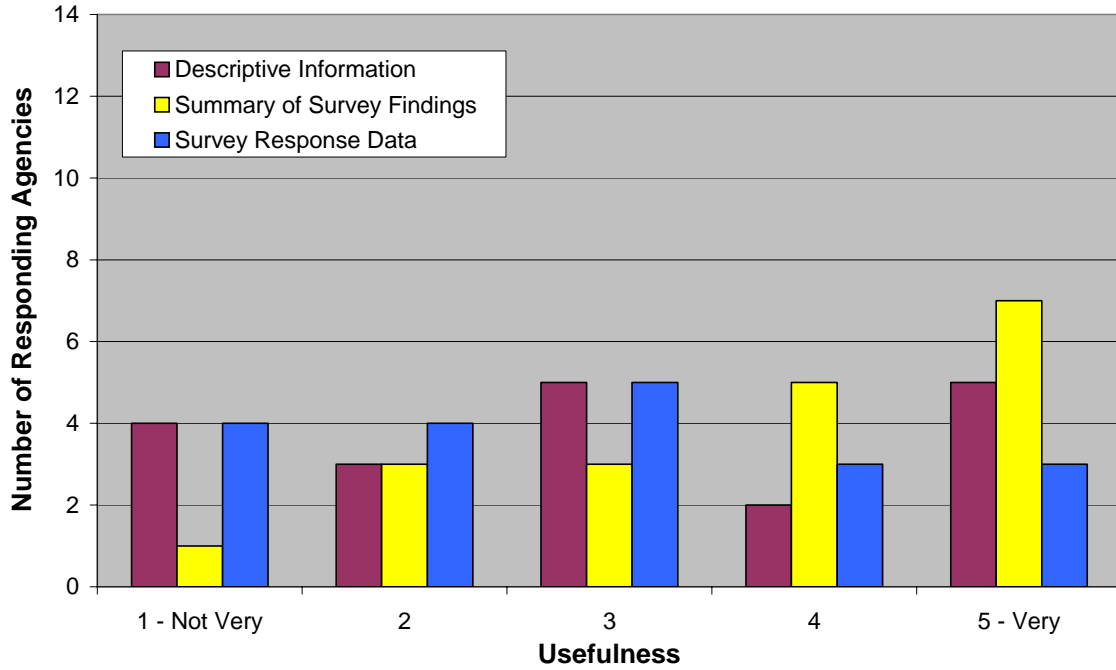
As might be expected, responses from the smaller MPOs showed a lower level of interest in having web-based access to air passenger survey information than the responses from the larger MPOs, as can be seen by comparing Figures 2-23 and 2-24 with Figures 2-21 and 2-22, although it should be noted that there were somewhat fewer responses from the smaller MPOs.



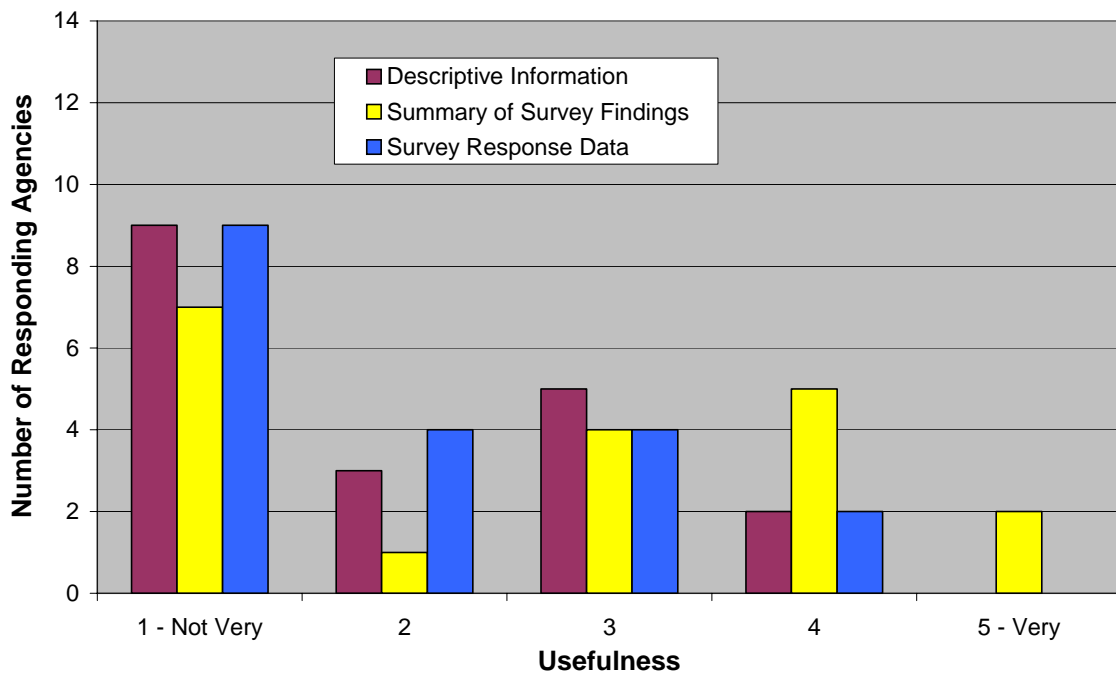
**Figure 2-21 Usefulness of a Web-Based Archive of Survey Information
Larger MPOs – Airports Within Planning Jurisdiction**



**Figure 2-22 Usefulness of a Web-Based Archive of Survey Information
Larger MPOs – Airports Outside Planning Jurisdiction**



**Figure 2-23 Usefulness of a Web-Based Archive of Survey Information
Smaller MPOs – Airports Within Planning Jurisdiction**



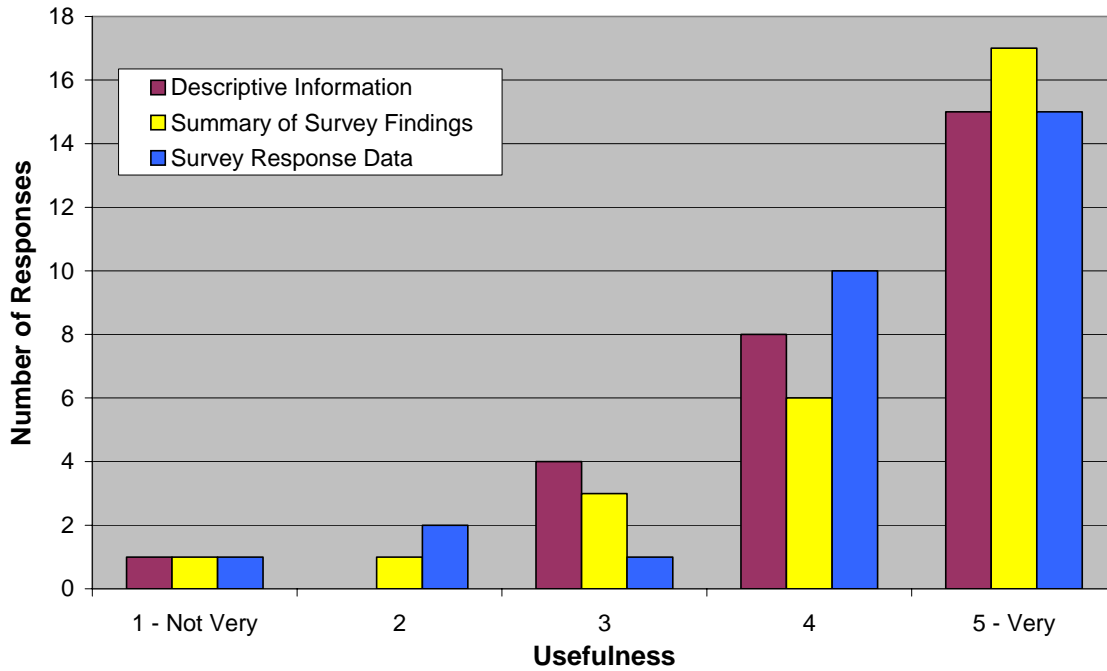
**Figure 2-24 Usefulness of a Web-Based Archive of Survey Information
Smaller MPOs – Airports Outside Planning Jurisdiction**

About 65 percent of the responses anticipated that it would be fairly useful to have web-based access to summaries of air passenger survey findings for airports within their planning jurisdiction, while about 35 percent anticipated that having access to descriptive information about these surveys would be fairly useful and about 30 percent anticipated that have access to the survey response data would be fairly useful. The responses indicated that web-based access to the corresponding information for surveys at airports outside their jurisdiction would be significantly less useful, with only about 35 percent of the respondents anticipating that access to summaries of findings for these surveys would be quite useful, while only about 10 percent of responses anticipated that access to descriptive information about the surveys or survey response data would be fairly useful. None of the responses anticipated that access to descriptive information about surveys at airports outside their planning jurisdiction or survey response data would be very useful, and only about 10 percent anticipated that access to summaries of survey findings would be very useful.

The stronger interest in access to summaries of survey findings compared to access to descriptive information and survey response data by both larger and smaller MPOs is not really surprising. Simply knowing that a survey was performed and having some information about the details of how it was performed and contacts for further information is significantly less useful than knowing something about the survey findings. On the other hand, most MPOs, and particularly the smaller ones, do not undertake the type of detailed analysis of air traveler characteristics and behavior that would require access to the detailed survey response data. However, this is not to say that if the ability to perform such analysis fairly easily was a feature of a national air passenger survey database these MPOs might discover that they can address a broader range of questions than they currently have the capability to consider.

In addition to airport authorities and state and regional planning agencies, the survey of potential users of the proposed national archive of air passenger survey information included airport planning and aviation consultants, researchers and other potential users. These organizations typically do not undertake air passenger surveys themselves, although they may assist in planning and even conducting such surveys, but they do frequently make use of the results of air passenger surveys. Although the survey asked about specific air passenger surveys that the respondents had been involved in planning, performing or using, this was primarily to gather information about surveys that the research team may not already be aware of from the

responses from airport authorities and state and regional planning agencies. The primary motivation to include consultants and other potential users in the survey was to determine how useful they anticipated a web-based archive would be to their needs for air passenger survey information. Their responses to this are shown in Figure 2-25.



**Figure 2-25 Usefulness of a Web-Based Archive of Survey Information
Aviation Consultants and Other Users**

Perhaps not surprisingly, given their need for air travel data to support planning studies and research, the majority of responses indicated that web-based access to all aspects of information about air passenger surveys would be fairly useful, with over half the responses indicating that all types of information would be very useful. About 60 percent of the responses anticipated that access to summaries of survey findings would be very useful, while about 55 percent of responses anticipated that access to descriptive information would be very useful and about 50 percent anticipated that access to survey response data would be very useful (one respondent only provided an assessment for survey response data). However about 85 percent of responses anticipated that access to survey response data would be fairly useful, compared to about 80 percent of responses that anticipated that access to descriptive information or

summaries of survey findings would be fairly useful. Respondents who indicated that access to one of the three types of information would be less useful (a value of 1 to 3 on the scale of usefulness) generally anticipated that access to descriptive information would be more useful than summaries of survey findings, which in turn would be more useful than access to survey response data.

Type of Descriptive Information

Survey respondents were asked to indicate which of five types of descriptive information about air passenger surveys would be most useful to their organization. Multiple responses were allowed. Table 2-2 shows the proportion of those respondents who anticipated that web-based access to descriptive information would be moderately to very useful (values of 3 to 5 on the scale of usefulness) that indicated that a particular type of descriptive information would be most useful. In the case of state and regional planning agencies, the selection was based on the anticipated usefulness of descriptive information about surveys at airports within their planning jurisdiction.

Table 2-2 Anticipated Need for Different Types of Descriptive Information

Type of Information	Airport Authorities			MPOs		
	Large Hub	Medium & Small Hub	State Aviation Agencies	Larger Regions	Smaller Regions	Consult. & Other Users
Survey methodology and sample size	94%	93%	71%	82%	58%	93%
Questions asked in the survey	100%	100%	100%	94%	100%	100%
Cost of performing the survey	72%	73%	48%	65%	42%	43%
Uses to which survey results have been put	78%	73%	71%	59%	92%	54%
Contacts for more information	72%	67%	57%	88%	58%	86%

It can be seen from Table 2-2 that there do not appear to be significant differences between the need for different types of information by large hub airport authorities and medium and small hub airports. For all categories of respondents, the questions asked in a survey were the most widely mentioned need, followed in the case of the airport authorities by information on survey methodology and sample size. Other types of information are more or less equally useful to airport authorities, with around 70 percent of the responses that identified descriptive information as moderately to very useful indicating a need for this information.

A smaller proportion of state aviation agency responses indicated a need for information on survey methodology and less than half indicated a need for information on the cost of performing the survey. This could reflect the fact that very few state aviation agencies perform air passenger surveys. Only about 55 percent of these responses indicated a need for contacts for more information, possibly because these agencies feel that they already have good contacts at the airports within their planning jurisdiction.

In contrast to the state aviation agencies, the responses from the larger MPOs indicated a greater anticipated need for information on survey methodology and sample size, the cost of performing the surveys, and contacts for more information, perhaps resulting from a recognition that they may decide to perform air passenger surveys themselves in the future, or even have plans to do so. However, these responses also indicated a lower interest than the airport authorities and state agencies in the uses to which the survey results have been put. The responses from the smaller MPOs show a quite different pattern from the larger MPOs, with much less interest in survey methodology, costs and contacts for more information, and a greater interest in the uses to which the survey results have been put.

Finally, the responses from the airport planning and aviation consultants and other potential users show the least interest of the various categories of survey respondent in information on the costs of performing the surveys and the uses to which the survey results have been put, but a strong interest in survey methodology and sample size, and contacts for more information. This seems quite reasonable, since consultants and researchers generally are not involved in deciding how to pay for performing surveys and their use of air passenger survey results is typically part of a fairly well defined project or task. However, understanding the way in which the survey was performed is important to their use of the results.

Respondent Comments

The survey questionnaires provided a place for respondents to add any comments or suggestions. Many of the comments were provided as clarification of some of the responses to the other questions in the survey, but others made useful points regarding the need for and issues involved in the development of a national archive of air passenger survey information. These have been summarized in Appendix D in a de-identified form.

Many of the comments provide useful insight into the concerns of the survey respondents that would have influenced their responses to the questions in the survey. In addition, the comments from the metropolitan planning organizations indicate a wide range of involvement in airport planning activities, and even in the awareness of how the information contained in an air passenger survey might be useful in the surface transportation planning activities that those agencies are involved in.

The comments also raised a number of issues that would need to be addressed in developing a national archive, or that might limit the willingness of survey sponsors to share information about their surveys:

- a. Detailed survey response data may involve location-specific or survey-specific aspects or nuances that could lead to misinterpretation if used by someone not familiar with the circumstances of the survey or the airport;
- b. Survey response data may contain personal information that would need to be protected from disclosure;
- c. Information about the characteristics of the air travelers using the airport may be viewed as commercially sensitive in situations where airports are competing to serve the same market;
- d. The ability to make survey information more widely available may be limited by contractual arrangements with the organization performing the survey;
- e. Some information contained in air passenger surveys may be viewed as sensitive from aviation security considerations.

These issues could be addressed in different ways. Obviously any data fields that allow air passenger survey respondents to be identified can simply be eliminated from the database before it is placed in the archive or recoded in a way that de-identifies the respondent.

Generally, about the only information requested in an air passenger survey that might allow the respondent to be directly identified would be their home address or possibly the name or address of their employer, if this was asked (it rarely is). Address data is usually only requested to identify the general area where the respondents began their trip to the airport and is typically geo-coded to some system of analysis zones (such as postal zip codes) anyway. Once this has been done, the exact address is typically not used again so its removal from the data would not result in the loss of any useful information. While it may be argued that knowing the destination, travel date, flight, and general vicinity of a respondent's home or trip end might allow someone who was very familiar with the details of that particular respondent's trip (e.g. a neighbor or friend) to guess the identity of the respondent, that anyone in such a position would go looking for this information from an air passenger survey appears a little far fetched. In any event, if they knew the respondent well enough to guess at their identity from their responses to particular survey questions, they would probably already know their likely answers to the other questions anyway.

Concerns about misinterpretation of the data could be addressed in one of two ways. Access to the data could be restricted to those who have been authorized by the survey sponsor. This would allow the sponsor an opportunity to explain any special circumstances, or even to require that they be given the opportunity to review any findings or conclusions before they are published or quoted elsewhere. Alternatively, the database could include an explanation about any special circumstances that a user of the data should be aware of in order to properly interpret the information. Of course, many airports and public agencies routinely put large amounts of data on their web sites, all of which is open to misinterpretation, so air passenger survey data is really no different in this respect. None the less, it would probably be helpful for any national archive to include clear warnings about the importance of properly understanding the circumstances under which the data from a given air passenger survey was collected before trying to draw any conclusions from it.

The question of the commercial sensitivity of the results of an air passenger survey is one that each survey sponsor will have to decide for itself in the light of the particular questions that were asked in the survey. Responses to obviously sensitive issues, such as customer satisfaction questions, can simply be removed from the data prior to it being submitted to the archive. In a multi-airport competitive environment, each airport will have to decide whether the advantage of

knowing something about the air passengers using competing airports outweighs any disadvantage of allowing those airports to know similar information about its own passengers.

Situations can arise in which the ability of survey sponsor to release survey findings or data may be limited by contractual arrangements with the organization performing the survey. It is hard to imagine that a responsible public agency would use its own funds to pay another organization to perform a survey and then allow that organization to own the data that it was paid to collect. However, situations do arise in which an airport allows a private firm or industry organization to perform a survey of air passengers using the airport in return for access to the survey results. These surveys often focus on customer satisfaction issues, not only with the services and facilities provided by the airport but also in some cases with the service provided by the airline being used. It is not envisaged that surveys of this type would form part of the proposed national archive.

Finally, the idea that information on the travel characteristics of air passengers using an airport might somehow compromise airport security seems hard to justify in light of the fact that only one respondent to the survey brought up this issue. If there really were a threat to security from having this information publicly available, it would seem surprising that the other airports were not aware of this. Never the less, before dismissing this concern out of hand it may be worth exploring this further with the airport that apparently brought up the issue.

Some of the survey respondents pointed out in their comments that air passenger surveys are sometimes performed primarily to gather information on visitors to a region, or even the U.S. in general, to support the activities of travel and tourism development agencies. While these surveys typically focus on such issues as visitor spending patterns and interest in specific activities or destinations, they also often gather information on air party travel characteristics and may even include responses from residents as well as visitors, if only because until air travel parties are surveyed, it may not be possible to determine whether they are visitors or not. This suggests an opportunity to expand the scope of such surveys to meet multiple needs for air passenger survey information. While this will most likely increase the cost of performing such a survey, that may be much more cost-effective than performing two separate surveys.

Restrictions on Access to Survey Data

The responses to the survey of potential contributors to the proposed database indicate that the likelihood of airport authorities contributing information about and results of the surveys they have sponsored would generally be higher if there were restrictions on access to the data. (State and regional agencies appear less concerned about this issue and generally willing to have the results of surveys they sponsored publicly available). One type of access restriction would restrict access to those organizations that had contributed information to the database. This would effectively limit the use of the database to organizations that have sponsored air passenger surveys, but would prevent the “free rider” problem of organizations benefiting from access to survey information collected by others but not sharing their own data. A more restrictive level of access would restrict access to the data for a given survey to users who have obtained express approval of the survey sponsor. Both types of restriction would require some form of user identification and password control to allow access, in one case to the entire database and in the other to specific information. There would be a significant overhead involved in managing these access restrictions and the associated approvals.

Freedom of Information Act Issues

Implementation considerations of any such restrictions bring up the question of whether any restricted contents of the proposed database would be subject to disclosure under the Freedom of Information Act (FOIA) if the operation of the database were to be sponsored by the Federal Aviation Administration (or any other Federal government agency). Following discussion with FAA legal counsel, it appears that the data itself would not be subject to FOIA disclosure if the maintenance and operation of the database were undertaken by an outside organization on behalf of the FAA, even if this was funded by the FAA, so long as the data were not made a deliverable of any contract to maintain and operate the database. FAA staff could have access to the results of specific surveys with the approval of the organization contributing those results, in the same way as any other user, but this information would not be subject to FOIA.

On the other hand, if FAA personnel were to establish and maintain the database directly, then the data could well be subject to FOIA disclosure, which would effectively preclude the use of access restrictions except as a mechanism to know who is accessing the data. However, as a

practical matter, the FAA is unlikely to have the staff resources to operate the database itself without the assistance of an outside support contractor.

3. Design and Implementation of a Prototype Database

The design of a database to archive information from air passenger surveys at a national level will need to address both the range of information about a given survey that may need to be stored in the database, as well as the wide differences in structure and content of each individual survey. While it would be possible simply to store the information in the same format that it was originally saved by the sponsoring organization, using whatever file formats were adopted, it would be much more useful to convert it to a standard format, even if the data content differs widely from survey to survey. The former approach allows users to access the data fairly easily and minimizes the work involved in establishing and maintaining the database, but imposes on the users the burden of converting the data from multiple surveys to a consistent format. It also would make it almost impossible to provide the capability to automatically analyze the information in the database, since there would be no consistency in how it is represented.

Therefore a more useful approach would be to define a standard data structure that can be adapted to the specifics of individual surveys and develop data conversion routines to reformat the information into the standard structure. These conversion routines could also incorporate some data checking functions to flag missing information or apparent problems with the data. In the best case, this data checking process could allow the database maintenance personnel to work with the survey sponsor to resolve any issues and thereby improve the quality and usefulness of the information. In the worst case, they would at least enable the system to alert users to apparent problems with the data so that they can decide whether these are in fact problems, and if so whether those problems could affect their use of the data. In the case of problems that affect the planned use of the data, the users would be left to resolve the problems on their own.

Database Content

There are at least five different types of information that would need to be stored in a database of air passenger survey information:

1. Descriptive information about the survey
2. Survey reports and other documents
3. Survey questions

4. Survey response data
5. Contextual information

Descriptive Information

This is the most basic level of information about the survey and would include such details as the sponsoring organization, the dates when it was performed, the data collection methodology, the sample size, and so forth. Much of this information would be in the form of descriptive text. It should include appropriate contact information to enable users to request additional information about the survey that is not available in the database. This information would alert users of the database to the existence of the survey and establish the context for any additional, more detailed information available in the database. The descriptive information could also include links to web pages of the sponsoring organization where additional information is available.

Survey Reports and Documents

In many cases, reports presenting the findings of a survey or other survey related documents, such as questionnaires, field instructions, or coding manuals, may be available on the survey sponsor's web site and accessible through links in the descriptive information. However, in some cases the survey sponsor may not wish to post this information on its own web site (or may not have a suitable web site) but may be willing to have the information available from the database. In this case, the documents can simply be stored as separate files that can be accessed through links from the descriptive information. It would be desirable to convert such documents to a standard format, such as Adobe Acrobat PDF files.

Even if the survey sponsor has posted these documents on its own web site, there may be a good case to include separate copies of the documents in the database and link to these from the descriptive information. Organizations revise and restructure their web sites from time to time and web links may no longer work. Older material may even be removed from the web site. By preserving copies of the documents in the database, they will remain accessible to future users.

Survey Questions

Although the details of the questions asked in the survey may be presented in survey reports or other documents, it is desirable to have these available in a more structured format. Apart from the greater ease of access to the questions compared to having to track down the questionnaire in a separate document, storing these as a data table will facilitate analysis of question wording across multiple surveys as well as linking the question wording to the response data where this is available.

There are two different aspects to question wording. The first is the exact wording of the questions itself. For example “What is the purpose of your air trip today?” The second is the wording of any predefined responses that are provided on the questionnaire or presented on field data recording forms or electronic data collection systems. Each of these predefined responses is typically assigned a numeric or alphabetic code, and the correspondence between these codes and the actual wording of the response is often referred to as codebook. In some cases the codebook has been developed dynamically as survey respondents gave different answers to questions that permit an open-ended response. Thus all the response codes may not actually appear on the questionnaire. This is typically how responses of the form of “Other (describe) _____” are handled. In other cases where many responses are possible, such as the name of the destination airport, it is common not to include all the options on the questionnaire, even if they have been predefined (for example by using the standard three-letter airport code).

Therefore the second aspect to the survey questions is defining the codebook, so that survey responses can be interpreted, and the options that were presented to the survey respondent are known. The latter point is an important consideration that is often overlooked in interpreting survey data. When survey respondents are presented with a fixed set of alternative responses, they are likely to select the one that best fits their situation, whether or not it is an accurate description of the response that they would prefer to give. We have all experienced the situation of trying to complete a form that asks us to select among alternatives, none of which is really the correct description of the information that we have been asked to provide, and struggling to choose the most appropriate answer.

A third type of information that would be useful to provide in a structured format would be a standard classification of question topics. This would permit the type of analysis that could address such issues as “Did this survey ask about trip purpose and which question was it?” By

linking this information to the information in the codebook table, it would further be possible to explore such issues as which trip purpose options were provided in those surveys that asked about trip purpose.

Survey Response Data

This is typically the most detailed information, and may not be made available by all survey sponsors. It will usually take the form of a large table in which each row represents one survey response and each column represents the answer to a specific question. Large parts of the table may be empty if respondents do not answer every question, or different columns are used for different responses to the same question (for example if multiple responses are possible for a given question).

Because the answers to some survey questions may be sensitive, for example the home address of survey respondents or the response to questions about customer satisfaction, the survey sponsor may decide to eliminate the answers to some questions, even if the answers to other questions are made available. In this situation there would need to be a standard code for such fields to indicate where information was provided by the respondent but has not been included in the response data provided.

A related issue arises with the increasingly common practice of geo-coding address data provided by survey respondents. This permits the location to be associated with any desired zone system (such as postal zip codes or regional traffic analysis zones) through the use of geographical information system (GIS) software. The resulting geo-coded location is typically expressed as a latitude and longitude. Depending on the precision of the geo-coding, this may permit the address of a location to be identified, even if the original address data itself has been eliminated. While this can be avoided by also eliminating the geo-coded coordinates from the data file, this rather defeats the purpose of performing the geo-coding in the first place.

There are two possible ways to handle this problem. One is to use the geo-coded coordinates to assign the location to a fairly fine zone system, such as regional traffic analysis zones or census tracts. The problem with this solution is that this can make it difficult to reassign the locations to a different zonal system where these are not fully nested (for example, census tracts often cross postal zip code boundaries) or if the zonal system is revised. This difficulty can be partly addressed by using several zonal systems of different levels of resolution,

such as census blocks, postal zip codes, and census city or place codes. A second, and perhaps better, way is to round the geo-coded coordinates to a resolution that does not permit the specific address to be identified, but is still close enough to the original location to allow location-specific information to be derived, such as proximity to different transportation services. These coordinates can then be used with any desired zonal system. Since many users of the database may not have access to GIS software, there may be merit to using both approaches.

Contextual Information

In addition to the survey data itself, it may be helpful to the use of survey response data to provide some contextual data for the airport in question or the region within which it is located, such as airport traffic levels or regional population. This is clearly a somewhat open-ended issue, and the relevant information rather depends on the purpose for which the survey data is being analyzed. However, by providing some of the more commonly needed information as part of the database, it saves the users the trouble of having to locate this from other sources in order to interpret the significance of the survey results. Where the contextual data is fairly extensive, such as demographic data for the analysis zones used in presenting the survey results, it may be sufficient to provide links to other web-based data sources where this information is available.

At a minimum, it would seem reasonable to provide the following information:

1. Annual passenger enplanements at the airport by airline for the year in which the survey was performed
2. Annual connecting traffic at the airport by airline as a percent of enplaned passengers for the year in which the survey was performed
3. Population of the region served by the airport for the year in which the survey was performed
4. A map of the region served by the airport showing the analysis zones used in the survey response data
5. Distance to the airport by highway from each analysis zone used in the survey response data.

Database Structure

The five different types of information stored in the database can generally be represented by defined tables, although the exact content of the tables may need to vary from survey to survey. In some cases, such as survey reports, the information will comprise discrete files than can be stored in a dedicated directory. Descriptions of these files, together with their location, will need to be stored in a data table so that this information can be easily accessed by database management software and the data files downloaded as necessary. Since the various data tables can be organized in a relational structure by individual survey, there will need to be a top level data table that provides information on the surveys that are contained in the database. This data table can also contain information related to the management of the database, such as the date that information on different surveys was added or revised.

The following sections discuss the information to be included in each data table and provide detailed specifications for the tables. The tables do not specify the field widths as these are likely to depend on the specific implementation, as well as experience with the amount of information that needs to be stored in some of the text fields. Numeric and date field types are self-explanatory. Text field types are typically implemented as fixed length fields. Memo field types are variable length text fields that may contain punctuation and formatting information. Code field types contain predefined codes. Logical field types are a special case of codes fields that can take the values TRUE or FALSE. Depending on the implementation, code and logical fields may be defined as short text fields or a specific field type.

Database Reference Tables

These tables list the surveys contained in the database and provide other information related to the management of the database. The Survey Index table lists each survey together with the information provided about that survey and any restrictions on access to that data, provides links to the data tables containing the detailed information, and includes the dates when the survey was added to the database and for the most recent revision of the data. It is likely that the information contained in the survey index table will evolve as new needs are identified in the course of developing the database. An initial specification for this table is shown in Table 3-1.

Table 3-1 Data Table Specification – Survey Index Table

Field Name	Description	Type
Survey_ID	Survey identification code	Text
Survey	Survey name (if defined)	Text
Airport	Airport name	Text
Airport_Code	Airport three-letter code	Text
Sponsor	Name of survey sponsor	Text
Year	Year survey performed (or commenced)	Numeric
Created	Date record created	Date
Modified	Date record last modified	Date
Documents	Survey documents available	Logical
Questions	Survey questions available	Logical
Responses	Survey response data available	Logical
Context	Contextual data on survey available	Logical

In addition to the Survey Index table, it will be necessary to store information on recognized users of the database with their access login names and passwords. If any restrictions on access to various parts of the database are to be implemented, the database reference tables would need to include the restricted parts of the database that users are authorized to access. Since the latter information is likely to be survey specific, there will need to be at least two different tables, one of which defines the users and the other lists which restricted parts of the database each user can access. If restrictions can be imposed at the field level within certain tables, it may be convenient to organize this information in a separate table that lists the fields that a given user is authorized to access. Depending on the security arrangements for the database site, it may be desirable to maintain these tables in a separate database, possibly on a different server. Passwords would generally be stored in a separate encrypted file. Initial specifications for these tables are shown in Tables 3-2 to 3-4.

The User Index table can also be used to store contact information about other individuals, such as contact staff at survey sponsor organizations.

Table 3-2 Data Table Specification – User Index Table

Field Name	Description	Type
User_ID	User identification code (internal)	Text
FirstName	First name	Text
LastName	Last name	Text
Suffix	Name suffix (<i>e.g.</i> Jr. or AICP)	Text
Salutation	Salutation (Mr., Ms., Dr.)	Code
Title	Position title	Text
Department	Department or unit	Text
Organization	Organization name	Text
Address1	First line of mailing address	Text
Address2	Second line of mailing address	Text
City	City name	Text
State	State (U.S.)	Code
Province	Province or state (if not U.S.)	Text
Country	Country (if not U.S.)	Text
Zip	Zip code or postcode	Text
Tel	Telephone number	Text
Fax	Fax number	Text
Email	E-mail address	Text
Login	Login name	Text
User_Class	Assigned user classification	Code

The user classification defined in Table 3-2 is for internal use and could include such categories as super-users (database management staff who have authorized access to the entire database), users whose organization has submitted information to the database, or users with special access privileges to restricted parts of the database. It could also be used to record information about the use of the database by different users.

Table 3-3 Data Table Specification – Dataset Access Permissions

Field Name	Description	Type
User_ID	User identification code (internal)	Text
Survey_ID	Survey identification code	Text
Dataset	Dataset identification code	Text
Field_Access	Need for specific field access authorization	Logical
Start	Effective date of authorization	Date
End	End date of authorization	Date

Table 3-4 Data Table Specification – Data Field Access Permissions

Field Name	Description	Type
User_ID	User identification code (internal)	Text
Survey_ID	Survey identification code	Text
Dataset	Dataset identification code	Text
Field	Field name	Text

Since providing access permission for individual fields will require a separate record for each field, the data field access permission table could be quite large. By placing this information in a separate table, this reduces the size of the dataset access permission table and only requires a search to determine which fields a user is authorized to access in those cases where this applies.

Descriptive Information

This table contains the descriptive information for each survey. There would be a single table with the same fields for each survey. Each survey would form a single record. The proposed specification for this table is shown in Table 3-5. Where a survey involves several distinct survey periods (waves), additional data for each period would be contained in a supplementary Survey Wave Description table, as shown in Table 3-6.

Table 3-5 Data Table Specification – Survey Description

Field Name	Description	Type
Survey_ID	Survey identification code	Text
City	Name of associated city	Text
State	State where associated city is located	Text
Submittal	User ID of person submitting the original data	Text
Revised	User ID of person submitting most recent revised data	Text
Contact	User ID of contact person for public display	Text
Sample	Sample size	Numeric
Method	Description of survey methodology	Memo
Start	First day of survey data collection	Date
End	Last day of survey data collection	Date
Waves	Number of survey periods	Numeric
Report	Availability of summary report	Code
Title	Summary report title	Text
Author	Summary report author(s)	Text
Published	Remainder of citation to summary report	Text
Report_URL	URL for summary report	Text
Website	URL for survey information on sponsor website	Text
Questions	Availability of survey questions	Code
Format	Location and format of survey questions	Text
Citation	Reference citation to document(s) with survey questions	Text
Previous	Number of previous surveys by sponsor at this airport	Numeric
Year	Year previous survey performed	Numeric
In-DB	Previous survey included in database	Logical
Previous_ID	Survey identification code of previous survey	Text
Prior	Year(s) of prior surveys	Text
Responses	Public availability of survey response data	Code
Publications	Number of publications from survey in database	Numeric

Table 3-6 Data Table Specification – Survey Wave Description

Field Name	Description	Type
Survey_ID	Survey identification code	Text
Wave	Survey period number	Numeric
Start	First day of survey data collection period	Date
End	Last day of survey data collection period	Date
Sample	Sample size for survey data collection period	Numeric
Change	Questions changed from previous period	Logical

Most of the foregoing field descriptions are self-explanatory. The text description of the location and format of the survey questions is to record such information as “Survey Questionnaire included as Appendix A in Summary Report”.

Reports and Documents

As noted above, survey reports and other documents that are included in the database will generally be stored in a separate directory in a suitable file format for downloading. A reference table will be required to record citation information and file names and locations. Including some descriptive information about the documents in the table will permit some analysis of the types of documents included in the database.

Since the number of documents associated with each survey is not likely to be very large, it may be sufficient to have a single table that would store the information for all the documents referenced in the database. An initial specification for this table is shown in Table 3-7.

Survey Questions

Storing information on survey questions in the database is somewhat more complicated than the descriptive information, due to the variation in survey formats and questions. The questions for a given survey can be stored in two separate tables, one of which describes the questions and the other documents the predefined or valid responses and their assigned codes in the survey response data (traditional codebook information). By adopting a standard naming convention for these tables, such as *Survey_Questions* and *Survey_Codes*, where *Survey* is the

survey identification code, it will be possible to access them automatically with database access functions. Initial specifications for these tables are shown in Tables 3-8 and 3-9.

Table 3-7 Data Table Specification – Document Index

Field Name	Description	Type
Survey_ID	Survey identification code	Text
Doc_Seq	Document sequence number	Numeric
Date_Created	Date document record created in database	Date
Date_Added	Date document added to the database	Date
Date_Revised	Date document information last revised	Date
Title	Document title	Text
Author	Document author(s)	Text
Published	Remainder of citation to document	Text
Pub_Date	Publication date given in document	Date
Doc_URL	URL for downloading document	Text
Location	Location of document for downloading	Code
Abstract	Abstract from document or other source	Memo
Source	Source of abstract if not document itself	Text
Type	Document type	Code

Since surveys that were performed in more than one wave or period may have had changes in the survey questions from one period to the other, the design of the survey question data tables provides for different information for different periods. For surveys that were performed over a single period, or for which there were no changes in the survey instrument for the different periods, this value will be one.

As shown in Table 3-8, a given question will take responses of one of several forms: categorical, numeric, free form text (e.g. an address), date or time. Only categorical responses (those for which a predefined set of response codes are defined) require a definition of codes in the Survey Codes table. Categorical responses may be assigned numeric or alphabetic codes. However, for standardization of the data tables, numeric codes will be stored as text.

Table 3-8 Data Table Specification – Survey Questions

Field Name	Description	Type
Period	Survey period	Numeric
Question_Seq	Question sequence number in survey	Numeric
Question_Num	Question number shown on survey instrument	Text
Question	Question wording	Text
Response	Type of response (categorical, numeric, text, date, <i>etc.</i>)	Code
Number	Number of distinct responses possible	Numeric
Number_text	Number of text responses possible	Numeric
Question_Type	Standardized question classification	Code

Table 3-9 Data Table Specification – Survey Codes

Field Name	Description	Type
Period	Survey period	Numeric
Question_Seq	Question sequence number in survey	Numeric
Response_Seq	Sequence number of possible response for codebook	Numeric
Response_Type	Type of response (categorical or text)	Code
Response_ID	Response code given on survey instrument	Text
Response_Text	Sequence number of related response category for text	Numeric
Response	Wording of response given on survey instrument	Text

Some categorical response questions may have associated text fields for some responses, such as “9. Other (describe) _____”. In such a case, there are two parts to the potential response, the category response code (9 in the above example) and the associated text, requiring two records in the Survey Codes table. The text response is assigned a different response sequence number from that of the category itself and the sequence number of the category is entered in the Response_Text field for the text response record, as shown in Table 3-9. The inclusion of the text response as a separate record in the Survey Codes table provides a

means to link the field in the survey response data table containing the text to the associated response category. The Response_Text field for a categorical response that has an associated text field can contain the response sequence number for the text response record, thus simplifying the process of determining whether a particular response category has an associated text field.

Survey Response Data

The survey response data will consist of two tables. The first table contains the response data itself, with each record (row) forming a response and each field (column) containing the responses to a particular survey question. The first field is generally a unique response identification code, such as a questionnaire serial number.

The second table provides the field definitions for each of the fields in the response data table, and links these to the associated questions and response codes in the Survey Questions and Survey Codes tables. Initial specifications for this table is shown in Table 3-10.

Table 3-10 Data Table Specification – Survey Response Fields

Field Name	Description	Type
Field_Name	Name of data field	Text
Field_Type	Data type (categorical, numeric, text, date, <i>etc.</i>)	Code
Response	Survey response data (TRUE) or other data (FALSE)	Logical
Description	Description of field	Text
Question	Question sequence number in survey	Numeric
Response	Response sequence number (categorical text responses)	Numeric

In order to facilitate processing categorical survey question response codes in the survey response data, some restrictions on the assignment of response codes and response sequence numbers in the Survey Codes table are desirable. The response codes for categorical responses in the survey response data should be numeric and use the response sequence number in the Survey Codes table. For categorical responses that include additional text fields, the categorical responses should appear first in the sequence of responses in the Survey Codes table followed by

the text fields in the same sequence as the categorical responses to which they relate. While this is not essential, it will reduce the amount of searching required to identify the meaning of a particular response code or field for categorical response questions in the survey response data. If the source data for the survey responses uses a different coding convention for a given question, it will be necessary to recode the data to the standard convention described here.

As suggested by the reference to the response identification code, the survey response data table can contain fields that do not correspond directly to survey questions responses. These could include fields containing such data as recoded survey responses, response weighting factors, or geo-coded coordinates of locations given in the survey responses. Where these fields assume categorical values that need to be defined, they can be assigned a question sequence number in the Survey Questions table higher than the number of actual questions. The Question_Num field can be set to “Derived” or some other convention to clarify that this is not part of the actual survey questions. The associated response codes can then be defined in the Survey Codes table in the normal way.

Contextual Data

As discussed above, the contextual information for each survey can take a variety of different formats. Some data, such as the population of the region served, takes only one value for each survey and can be stored in a single table covering all surveys with one record per survey. This table can also serve as an index to the availability and extent of other contextual information, as shown in Table 3-11.

Other data, such as passenger enplanements by airline or distance from analysis zones to the airport will require separate tables, due to the different structure or number of data fields from one survey to another. These tables can be identified through a standard table-naming convention similar to the Survey Questions tables, such as *Survey_AirlinePax* or *Survey_ZoneData*. Examples of the structure of such tables is shown in Tables 3-12 to 3-14. In the case of zonal data there is the possibility that the survey response data may contain information for more than one zone system (such as cities and zip codes). Thus an additional index table will be required to store information about the different zone systems used, as shown in Table 3-13.

Table 3-11 Data Table Specification – Survey Contextual Data

Field Name	Description	Type
Survey_ID	Survey identification code	Text
Population	Population of region served	Numeric
Enplaned_Pax	Passenger enplanements at airport for year of survey	Numeric
Connect_Pct	Connecting passengers as percent of enplanements	Numeric
Airline_Pax	Airline passenger enplanement data available	Logical
Zone_Data	Analysis zone data available	Logical
Zone_Systems	Number of different zone systems in zone data table	Numeric
Other_Data	Other data files available	Logical

Table 3-12 Data Table Specification – Airline Passenger Data

Field Name	Description	Type
Airline_Code	Two-letter airline code	Text
Airline_Name	Airline name	Text
Enplaned_Pax	Passenger enplanements at airport for year of survey	Numeric
Connect_Pct	Connecting passengers as percent of enplanements	Numeric

Other data contextual information can be stored as data files or documents. Reference information for these files or documents can be stored in a separate data table, as shown in Table 3-15.

Development of the various contextual data files and creation of the associated data tables is likely to involve a significant amount of work. While utility routines can be developed to facilitate entering the necessary information in a standard format and uploading the associated data files and documents, much of the burden of creating the original information is likely to rest with the survey sponsor. However, to the extent that this information is required for analysis of the survey results anyway, it may well be readily available to the survey sponsor.

Table 3-13 Data Table Specification – Zonal System Reference

Field Name	Description	Type
Survey_ID	Survey identification code	Text
Zone_System	Sequence number of zonal system for survey	Numeric
Zone_Desc	Description of zonal system	Text
Map_Avail	Map of zone system available	Logical
Map_URL	URL of zonal map file	Text
Dist_Units	Units of distance in zone data file	Text

Table 3-14 Data Table Specification – Zone Data

Field Name	Description	Type
Zone_System	Sequence number of zonal system for survey	Numeric
Zone_ID	Identification of zone	Text
Distance	Distance of zone centroid from airport	Numeric

Table 3-15 Data Table Specification – Zonal System Reference

Field Name	Description	Type
Survey_ID	Survey identification code	Text
Zone_System	Sequence number of zonal system for survey	Numeric
Zone_Desc	Description of zonal system	Text
Map_Avail	Map of zone system available	Logical
Map_URL	URL of zonal map file	Text
Dist_Units	Units of distance in zone data file	Text

Need for a Standard Relational Database Structure

The previous section has described the proposed structure for a relational database to support a national archive of air passenger survey information. Much of the information

containing the proposed database tables, although not all, is typically stored in system files created by commercial statistical analysis software, such as SAS (<http://www.sas.com>) or SPSS (<http://www.spss.com>). Indeed, many sponsors of air passenger surveys store the results of the surveys using such files. It may therefore be asked why not use such system files directly as part of the national archive. There are at least two reasons to convert the information to standard relational database tables.

The first is the proprietary nature of the commercial statistical software system files. It is generally necessary to have a copy of the software to be able to read the files. Not only may users of the database not have access to such software but older versions of the software may not be able to read files created with newer versions.

The second reason is the need for a standard representation of the information contained in the archive, both to facilitate comparison of information from multiple surveys as well as to support web-based access to the information. The internal representation of the survey information contained in statistical analysis system files created by or for survey sponsors will not generally be in a consistent format, and thus require reformatting in order to be usable within a national archive. Aside from the technical issues involved in enabling the website software to access information stored within the structure of proprietary system files, if the data has to be reformatted anyway it makes sense to then store it in a more readily usable form.

Database Implementation

Implementation of a prototype version of the proposed database is being undertaken as part of the ongoing development of the prototype web site described in the following chapter. The various tables described in the previous section are being established as a relational database on a database server at the Institute of Transportation Studies at the University of California using MySQL software. This permits the data to be accessed by web applications, as discussed in the following chapter.

In order to demonstrate the functionality of the proposed database, the various tables are being populated with representative data for various air passenger surveys assembled in the course of the research.

4. Development of a Prototype Web Site

In order to explore the issues involved in implementing a web-based archive of air passenger information and to begin to make the data assembled in the course of the study more readily available, a prototype web site was created on a web server at the University of California at Berkeley. Initially, the web pages were created as fixed HTML files, since this permitted easy updating and modification. However, as the database described in the previous chapter is being implemented, some of these pages are being modified so that they are created dynamically from information in the database by Java scripts. This simplifies the task of updating and maintaining the information on the web site.

This chapter describes the functionality of the prototype web site, as of the end of July 2005. As the database described in the previous chapter is fully implemented, the web site will be enhanced to take advantage of the additional capabilities of the database. Since the detailed design of the website has evolved over the course of the project, some of the capabilities described in this chapter were not initially available, and changes were made over time in the information content and formatting of many of the web pages.

Structure of the Prototype Web Site

The layout of the home page of the web site is shown in Figure 4-1. This provides a short description of the project and contains navigation buttons on the left of the page to other features of the web site.

Project Description

This page contains a more extensive description of the scope of the project, as shown in Figure 4-2.

Survey Information

This page allows users to access the information on air passenger surveys contained on the web site. As shown in Figures 4-3 and 4-4, it provides several ways to access the information for a given survey, including an interactive map, pull-down menus, and lists of surveys.

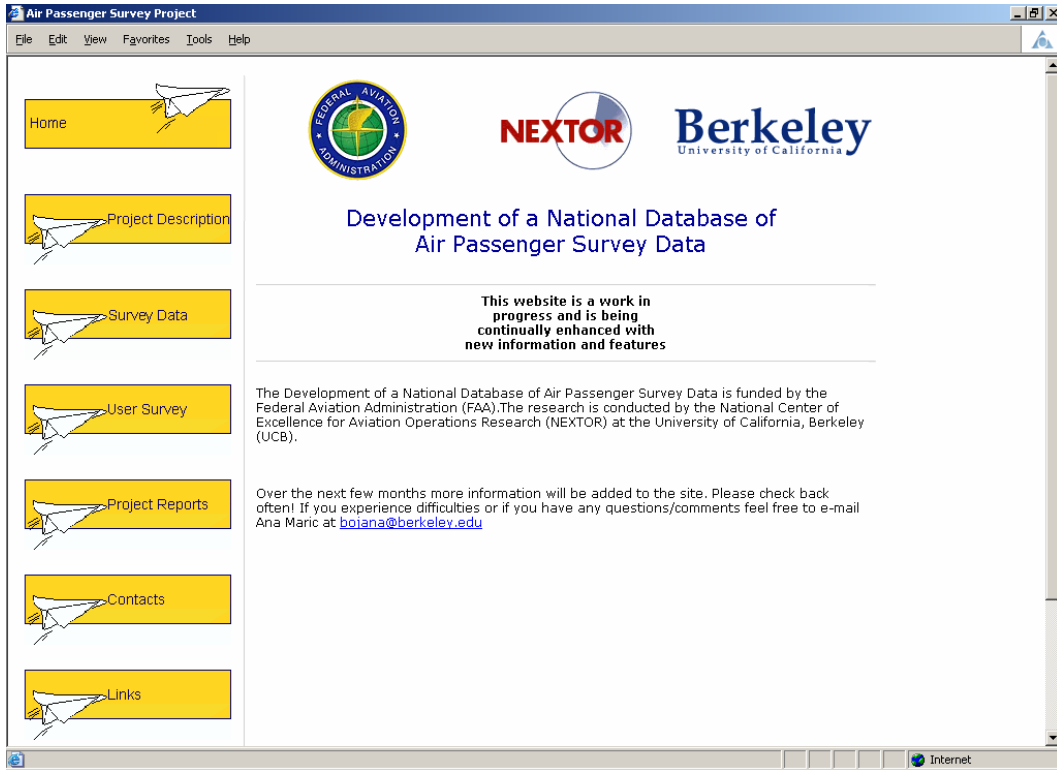


Figure 4-1 Prototype Web Site Home Page

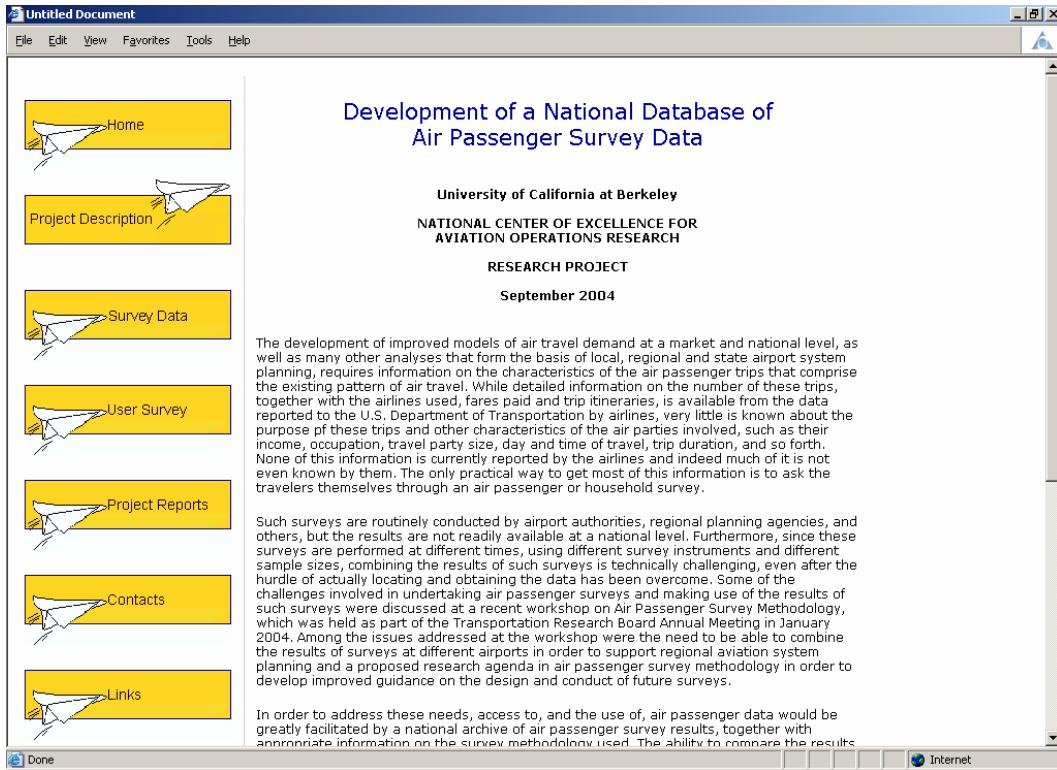


Figure 4-2 Project Description

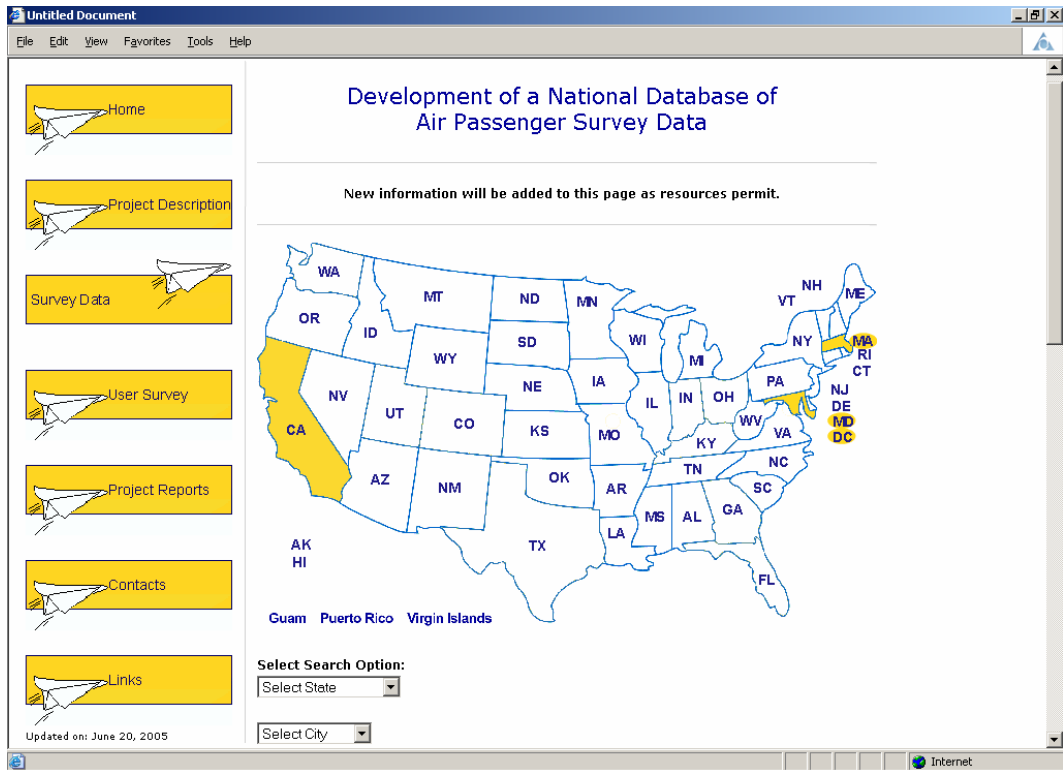


Figure 4-3 Reference Page for Air Passenger Survey Information on Web Site

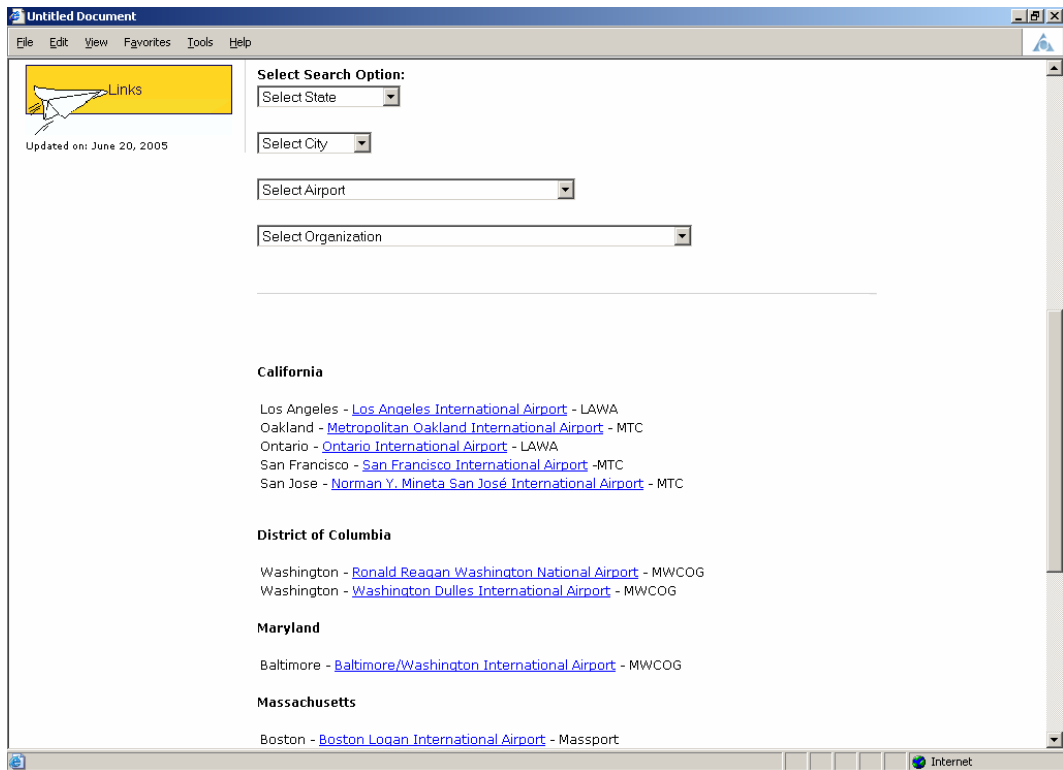


Figure 4-4 Reference Page for Air Passenger Survey Information on Web Site (cont.)

The interactive map on the Survey Information reference page can be used by clicking one of the states shown on the map. This will take the user to the relevant part of the lists shown in Figure 4-4. Similarly, the pull-down menus can be used to select a state, city, airport, or sponsoring organization. The subsequent lists show those airports for which survey information is available on the web site, organized first by state and city, and then by organization sponsoring the survey.

While the different options may appear somewhat redundant with the current amount of information on the website, as the number of surveys in an operational database increase, these options will allow users to more easily access the information for specific airports.

Survey Description

Clicking on one of the airports listed on the Survey Information reference page displays a page providing more detailed information about the most recent survey for that airport for which information is available on the web site. A typical page for Los Angeles International Airport is shown Figure 4-5.

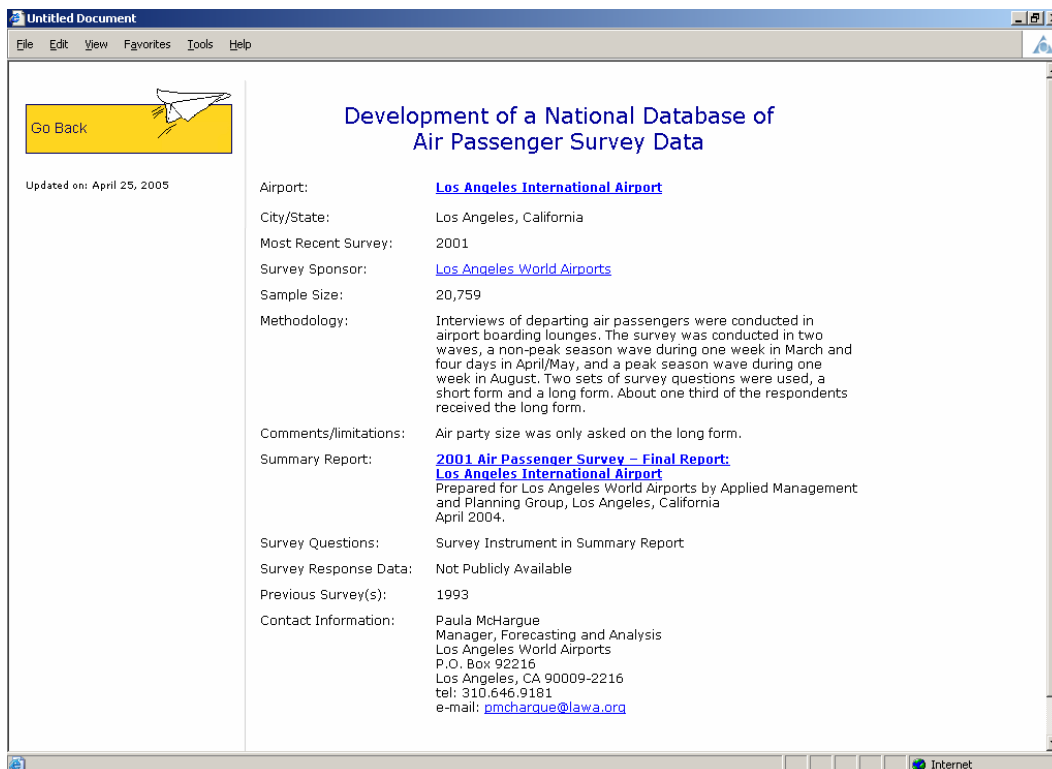


Figure 4-5 Typical Survey Description Page

These pages provide a set of standard information for each survey, as well as links to more detailed information. The standard information includes:

- The associated city and state
- The date (year) of the most recent survey
- The organization sponsoring the survey
- The survey sample size (number of respondents)
- A description of the survey methodology
- Comments on the survey or discussion of any limitations in application of the survey results that the user should be aware of
- Details of any summary report on the results of the survey
- Information on the questions included in the survey
- Availability of the survey response data
- Dates of previous surveys at the same airport
- Contact information for the relevant staff person at the sponsoring organization for any questions about the survey or to obtain more information.

The airport name and the name of the sponsoring organization are provided as hyperlinks to the web sites for the airport and organization (if different), where these exist. Similarly, the title of the survey summary report is provided as a hyperlink to that document if it is available either in the national database, on the sponsor's web site, or elsewhere. The dates of previous surveys at the same airport are provided as hyperlinks to the relevant survey description page on the website if this information is available in the database. Finally, the e-mail address for the contact person at the survey sponsoring organization is given as a standard e-mail hyperlink that opens a window to generate an e-mail message.

The description of the survey methodology will generally include how the survey was performed (e.g. an interview survey of departing air passengers in the airline boarding lounges), the dates during which the survey was performed, and whether the survey attempted to collect responses from all air passengers or only one response per air party.

If information on the survey questions is available in the database, the entry for the information on the questions will include a hyperlink to a web page that displays the questions

and allows the user to display or download the survey response codes for each question. If the questions are not available on the database, but the survey questions are shown in the survey summary report or another document, the entry indicates where this information can be obtained. Similarly, if the detailed survey response data is included in the database, the entry for the availability of the survey response data will include a hyperlink to a web page that allows authorized users to download the data.

User Survey

This page was added to the web site to support the survey of potential database users described in Chapter 2. Although the initial analysis of survey results has been completed, the page has been left on the web site in case organizations that were invited to participate in the survey but have not yet responded choose to do so in the future, or other organizations that were not part of the original survey elect to provide the requested information.

The web page contains a short description of the survey, as shown in Figure 4-6, together with links to allow users to download the relevant questionnaire or respond to the survey online.

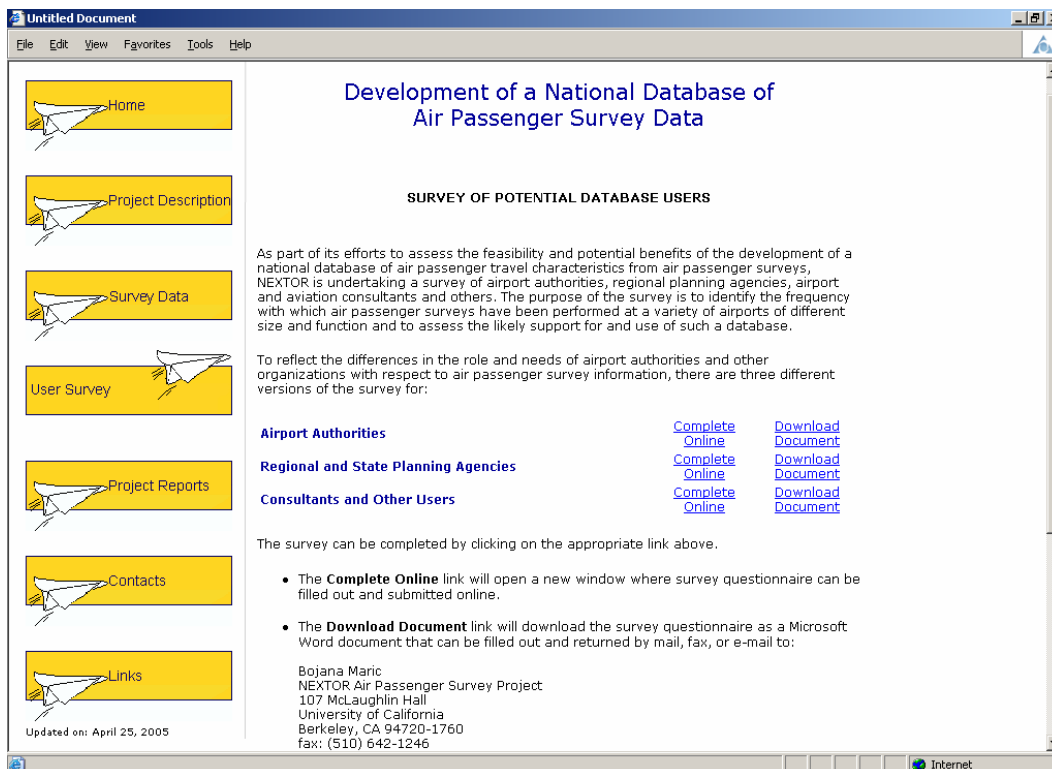


Figure 4-6 Potential Database User Survey Page

The options to complete the survey online takes the user to a commercial online survey web site (SurveyMonkey.com) where the relevant questions can be completed from the user's web browser and the response submitted automatically. These responses are stored in a secure database on the SurveyMonkey website for later download by the research team.

Project Reports

This page lists the reports prepared in the course of the project, together with a short abstract for each, as shown in Figure 4-7. The title of the report is shown as a hyperlink which allows the user to download the report itself.

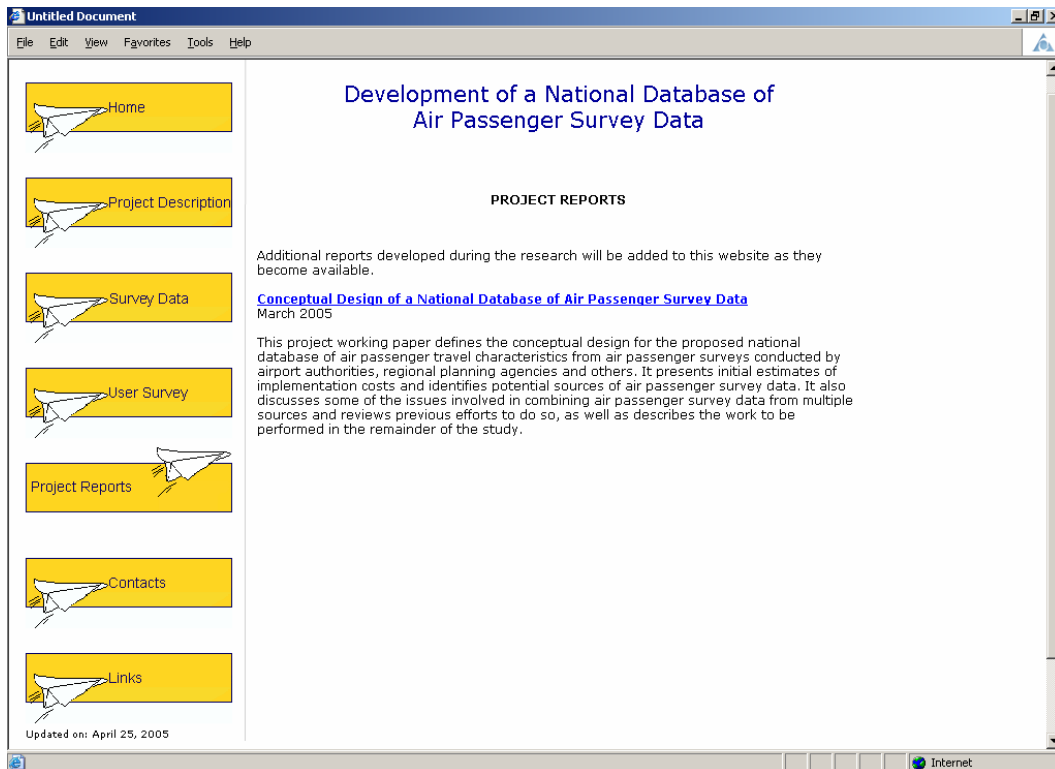


Figure 4-7 Project Report Page

Contacts and Links

The Contacts page provides contact information for the members of the research team.

The Links page provides links to a variety of web sites that may be of interest to anyone looking for information on or about air passenger surveys.

5. Conclusions and Further Work

This report has documented the findings of a proof-of-concept study undertaken as part of the research project and described the efforts to date to develop a prototype database of air passenger survey information and a prototype web site to provide online access to that information. The proof-of-concept study has also included a survey of potential users of the proposed national database of air passenger survey information.

Survey of Potential Users

The survey of potential users of the proposed national database has provided valuable information on frequency with which air passenger surveys are performed by a range of different organizations, as well as the likely use of the information in the proposed archive.

The frequency with which air passenger surveys are performed by different types of airport and other aviation planning organizations varies widely. Among airports, most large hub airports perform air passenger surveys at varying intervals from several times per year to every few years, with medium and small hub airports performing air passenger surveys less often. If the survey responses are representative of the airports that did not respond to the survey (or were not included in the survey), it would appear that there are about 100 air passenger surveys being performed each year at all large, medium and small hub airports. State aviation agencies and metropolitan planning organizations are much less likely to perform air passenger surveys than airport authorities, as might be expected, with only about a third of the state aviation agencies and an even smaller proportion of the MPOs reporting performing any surveys. However, those state agencies that do perform surveys typically do so at many airports throughout the state and some of the larger MPOs perform surveys at multiple airports within their region. Assuming that the survey responses are representative of the state and regional planning agencies that did not respond or were not included in the survey, it appears that these agencies perform air passenger surveys at about 70 airports per year. Thus the total number of air passenger surveys that could potentially be included in a national database might cover as many as 170 airports per year.

The likelihood of the sponsoring organizations for each of these surveys contributing information about the survey to a national database also varies widely, and depends on the

restrictions imposed on access to the data. In order to quantify the likelihood of a survey sponsor contributing survey information, it was assumed that 90 percent of respondents indicating that it was very likely they would contribute information would in fact do so, and that this percentage would reduce by 20 percent for each step in the likelihood scale, so that only 10 percent of those indicating that it was very unlikely they would contribute information would do so. On this basis, if information about the surveys were publicly available it appears that descriptive information for surveys at about 95 airports per year would be contributed to the database. This would increase to about 120 airports per year if access to the information were restricted to those with express approval of the survey sponsor. Survey response data would be contributed for surveys at about 70 airports per year if this were publicly available. This would increase to about 100 airports per year if access were restricted to those with express approval.

Although restricting access to the information appears to result in a significant increase in the number of surveys for which information would be contributed to the database, the ease of use of the database and its potential value would be greatly enhanced if the information within it were publicly available. Even the reduced number of surveys for which information might be publicly available still provides a substantial body of information, vastly in excess of what is readily available today.

The survey of potential users also addressed the anticipated usefulness of the proposed national database. While the anticipated usefulness varies across the different types of organization and for the different types of information about air passenger surveys that could be included in the database, a large majority of the airport authorities, state aviation agencies, and consultants and other potential users indicated that the database would be very useful or quite useful. While many of the metropolitan planning organizations did not anticipate that the database would be particularly useful, particularly for more detailed data or for airports outside their planning jurisdiction, over 60 percent anticipated that the ability to access summary results of air passenger surveys for airports within their planning jurisdiction through the database would be very useful or quite useful. Overall there appears to be widespread support for developing the proposed capabilities for the national database.

Comments provided by survey respondents provided some useful insights into a range of implementation issues that would need to be addressed in developing the proposed database

before their organizations would be likely to contribute survey response data from air passenger surveys that they had performed.

Development of a Prototype Database and Web Site

The development of the prototype database to date has identified the proposed content of the database and prepared an initial set of specifications for the required tables in a relational database structure. The challenge in implementing such a database is to provide the flexibility to accommodate the wide range of questions and approaches involved in different air passenger surveys within a standardized framework that allows users to integrate the information from multiple surveys and access the necessary definitional and contextual information about each survey to properly interpret the results. One way to facilitate this is through the use of a standard classification of survey questions, so that questions in different surveys that address similar issues can be easily identified, even if they use very different wording and present different response options to the survey subjects.

The development of a prototype web site to provide access to the information on selected air passenger surveys assembled in the course of the research has both identified some of the challenges involved in effectively presenting the wide range of information required to properly make use of air passenger survey results as well as demonstrated ways to address those challenges. It is felt that the current form of the prototype web site already provides significant utility by making the results of a very diverse set of air passenger surveys more readily available to the potential user community. Further development of this web site during the remainder of the research project will significantly expand the usefulness and value of the web site and the expanding body of information to which it provides access.

Benefits of Access to Data from Multiple Surveys

One of the more obvious benefits to an airport authority or aviation planning agency of having access to detailed air passenger survey data collected at other airports or in other regions is the ability to analyze information from respondents in those surveys who were traveling to the airport or region in question. Apart from expanding the potential sample of survey responses, surveys of departing passengers at one airport provide information on the characteristics of arriving passengers at their destination airport. Since surveys at different airports are often

performed at different times of the year and using different survey methodologies, comparing their results can contribute to a better understanding how air travel characteristics vary over the year and the sensitivity of air passenger survey results to the details of the methodology involved. This in turn can help extrapolate from the findings of surveys conducted over one or two fairly short periods to an estimate of average characteristics for the year as a whole and improvements in the survey methodology used. Improving the availability of information on the details and findings of past air passenger surveys will also facilitate research on air passenger survey methodology and analysis. In view of the considerable cost of performing surveys of this sort, and the importance of their findings for a wide variety of planning and operational decisions, there is an urgent need for improved guidance on the conduct of air passenger surveys and the analysis of the data obtained from them.

Perhaps the most valuable aspect of the proposed national database of air passenger survey data is the ability to corroborate the findings of different surveys. Without this ability, airport authorities and aviation planning agencies are left with no choice but to assume that the results of their surveys are valid. Since air passenger surveys performed at different airports often use different survey methodologies and are typically performed for a limited period at infrequent intervals, it would not be at all surprising to find that they give widely divergent results. While this is obviously of concern, if this leads to a better understanding of why apparent discrepancies have arisen and to methodological improvements that are able to resolve the issue or prevent it recurring, then that is a much better outcome than continuing to rely on information without knowing how valid it is.

Final Steps in the Project

The remaining tasks in the current phase of the research project are to complete the development of the prototype database and web site and to prepare an implementation plan for the development of an on-going national archive of air passenger survey information, if the Federal Aviation Administration (FAA) decides to proceed with this.

Continuing development of the prototype database and web site includes assembling additional information for selected air passenger surveys and converting this information into the relational database tables described in Chapter 3, developing the necessary Java routines to enable the prototype web site to access these data and display them, and developing utility

routines to support data entry, user access to restricted data, and analysis of survey response data available on the web site.

The implementation plan for an ongoing national archive of air passenger survey information includes identification of potential organizations to host the database, definition of the necessary technical and organizational procedures that would be needed to implement and maintain the archive, and development of detailed estimates of required resources and operating costs involved. Development of this plan will include further discussions with relevant FAA staff and representatives of other organizations that might be involved in hosting or supporting the database.

References

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Appendix A

Airport Authority Survey Questionnaire

University of California at Berkeley

NATIONAL CENTER OF EXCELLENCE FOR AVIATION OPERATIONS RESEARCH

Development of a National Database of Air Passenger Survey Data

SURVEY OF POTENTIAL AIR PASSENGER SURVEY DATABASE USERS

Airport Authorities

This survey is being undertaken by the National Center of Excellence for Aviation Operations Research (NEXTOR) as part of research for the Federal Aviation Administration on the feasibility and potential benefits of the development of a web-based national database of air passenger travel characteristics from air passenger surveys conducted by airport authorities, regional and state planning agencies, and others. The purpose of the survey is to identify the frequency with which air passenger surveys have been performed at a variety of airports of different size and function and to assess the likely support for and use of such a database.

The research is primarily concerned with surveys addressing air passenger travel party characteristics (trip duration and purpose, party size, ground access modes, etc.). This survey is not intended to address passenger satisfaction surveys, unless they also gather statistical data on air party travel characteristics.

Please return the completed survey by **April 22, 2005** to:

Bojana Maric
NEXTOR Air Passenger Survey Project
107 McLaughlin Hall
University of California
Berkeley, CA 94720-1760
fax: (510) 642-1246
e-mail: bojana@berkeley.edu

After providing the information requested and completing the responses to the questions below, the survey questionnaire can be saved, printed (if necessary) and returned by e-mail, fax or mail.

THANK YOU FOR YOUR HELP

Respondent: Name _____
Title _____
Organization _____
Phone/e-mail _____ / _____

Q.1 How many air passenger surveys have been performed at the airport(s) operated by your organization during the period 1995 to 2004?

Number of surveys: _____

For each survey, please indicate the month(s) and year performed, the airport(s) surveyed, and (if performed by another organization) the organization undertaking the survey.

(Please provide information for the three most recent surveys if more than three)

<i>Survey Date (month/year)</i>	<i>Airport(s)</i>	<i>Organization Performing the Survey (if applicable)</i>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Q.2 If a web-based archive of air passenger survey information were to be established, how likely would your organization be to contribute **descriptive information** about your air passenger surveys to the archive? *(Please check one number in each case)*

	Not very likely				Very likely
(a) If the data were to be publicly available	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
(b) If the data were only accessible by other organizations that have contributed data	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
(c) If the data were only accessible by users with your express approval (e.g. by using a password that you would issue)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Q.3 If a web-based archive of air passenger survey information were to be established, how likely would your organization be to contribute **summary results** (e.g. reports) from your air passenger surveys to the archive? *(Please check one number in each case)*

	Not very likely				Very likely
(a) If the data were to be publicly available	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
(b) If the data were only accessible by other organizations that have contributed data	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
(c) If the data were only accessible by users with your express approval (e.g. by using a password that you would issue)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Q.4 If a web-based archive of air passenger survey information were to be established, how likely would your organization be to contribute **detailed survey response data** from your air passenger surveys to the archive? *(Please check one number in each case)*

- | | Not very
likely | | | | Very
likely |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| (a) If the data were to be publicly available | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| (b) If the data were only accessible by other organizations that have contributed data | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| (c) If the data were only accessible by users with your express approval (e.g. by using a password that you would issue) | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |

Q.5 If a web-based archive of air passenger survey information were to be established, how **useful** do you think it would be to your organization to have access to survey information for other airports? *(Please check one number in each case)*

- | | Not very
useful | | | | Very
useful |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| (a) Descriptive information about the surveys (e.g. methodology, questions, sample size) | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| (b) Summaries of survey findings (e.g. reports) | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| (c) Detailed survey response data | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |

Q.6 What types of descriptive information about air passenger surveys performed by other organizations would be most useful to your organization? *(Please check all that apply)*

- | | |
|--|--------------------------|
| (a) Survey methodology and sample size | <input type="checkbox"/> |
| (b) Questions asked in the survey | <input type="checkbox"/> |
| (c) The cost of performing the survey | <input type="checkbox"/> |
| (d) Uses to which the survey results have been put | <input type="checkbox"/> |
| (e) Contacts for more information | <input type="checkbox"/> |

Please feel free to add any comments or suggestions below:

THANK YOU

Appendix B

Regional and State Planning Agency Survey Questionnaire

University of California at Berkeley

NATIONAL CENTER OF EXCELLENCE FOR AVIATION OPERATIONS RESEARCH

Development of a National Database of Air Passenger Survey Data

SURVEY OF POTENTIAL AIR PASSENGER SURVEY DATABASE USERS

Regional and State Planning Agencies

This survey is being undertaken by the National Center of Excellence for Aviation Operations Research (NEXTOR) as part of research for the Federal Aviation Administration on the feasibility and potential benefits of the development of a web-based national database of air passenger travel characteristics from air passenger surveys conducted by airport authorities, regional and state planning agencies, and others. The purpose of the survey is to identify the frequency with which air passenger surveys have been performed at a variety of airports of different size and function and to assess the likely support for and use of such a database.

The research is primarily concerned with surveys addressing air passenger travel party characteristics (trip duration and purpose, party size, ground access modes, etc.). This survey is not intended to address passenger satisfaction surveys, unless they also gather statistical data on air party travel characteristics.

Please return the completed survey by **April 29, 2005** to:

Bojana Maric
NEXTOR Air Passenger Survey Project
107 McLaughlin Hall
University of California
Berkeley, CA 94720-1760
fax: (510) 642-1246
e-mail: bojana@berkeley.edu

After providing the information requested and completing the responses to the questions below, the survey questionnaire can be saved, printed (if necessary) and returned by e-mail, fax or mail.

THANK YOU FOR YOUR HELP

Respondent: Name _____
Title _____
Organization _____
Phone/e-mail _____ / _____

Q.1 How many air passenger surveys have been performed **by** or **for** your organization at the airports within your planning jurisdiction during the period 1995 to 2004?

Number of surveys: _____ (if none, skip to Q.5)

For each survey, please indicate the month(s) and year performed, the airport(s) surveyed, and (if performed by another organization) the organization undertaking the survey.

(Please provide information for the three most recent surveys if more than three)

<i>Survey Date (month/year)</i>	<i>Airport(s)</i>	<i>Organization Performing the Survey (if applicable)</i>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Q.2 If a web-based archive of air passenger survey information were to be established, how likely would your organization be to contribute **descriptive information** about your air passenger surveys to the archive? *(Please check one number in each case)*

	Not very likely				Very likely
(a) If the data were to be publicly available	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
(b) If the data were only accessible by other organizations that have contributed data	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
(c) If the data were only accessible by users with your express approval (e.g. by using a password that you would issue)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Q.3 If a web-based archive of air passenger survey information were to be established, how likely would your organization be to contribute **summary results** (e.g. reports) from your air passenger surveys to the archive? *(Please check one number in each case)*

	Not very likely				Very likely
(a) If the data were to be publicly available	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
(b) If the data were only accessible by other organizations that have contributed data	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
(c) If the data were only accessible by users with your express approval (e.g. by using a password that you would issue)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Q.4 If a web-based archive of air passenger survey information were to be established, how likely would your organization be to contribute **detailed survey response data** from your air passenger surveys to the archive? *(Please check one number in each case)*

- | | Not very
likely | | | | Very
likely |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| (a) If the data were to be publicly available | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| (b) If the data were only accessible by other organizations that have contributed data | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| (c) If the data were only accessible by users with your express approval (e.g. by using a password that you would issue) | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |

Q.5 If a web-based archive of air passenger survey information were to be established, how **useful** do you think it would be to your organization to have access to survey information for airports **within your planning jurisdiction** from air passenger surveys performed by other organizations? *(Please check one number in each case)*

- | | Not very
useful | | | | Very
useful |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| (a) Descriptive information about the surveys (e.g. methodology, questions, sample size) | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| (b) Summaries of survey findings (e.g. reports) | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| (c) Detailed survey response data | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |

Q.6 If a web-based archive of air passenger survey information were to be established, how **useful** do you think it would be to your organization to have access to survey information for airports **outside your planning jurisdiction**? *(Please check one number in each case)*

- | | Not very
useful | | | | Very
useful |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| (a) Descriptive information about the surveys (e.g. methodology, questions, sample size) | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| (b) Summaries of survey findings (e.g. reports) | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |
| (c) Detailed survey response data | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> |

Q.7 What types of descriptive information about air passenger surveys performed by other organizations would be most useful to your organization? *(Please check all that apply)*

- (a) Survey methodology and sample size
- (b) Questions asked in the survey
- (c) The cost of performing the survey
- (d) Uses to which the survey results have been put
- (e) Contacts for more information

Please feel free to add any comments or suggestions below:

THANK YOU

Appendix C

Consultant and Other Potential User Survey Questionnaire

University of California at Berkeley

NATIONAL CENTER OF EXCELLENCE FOR AVIATION OPERATIONS RESEARCH

Development of a National Database of Air Passenger Survey Data

SURVEY OF POTENTIAL AIR PASSENGER SURVEY DATABASE USERS

Aviation Consultants, Researchers, and Other Potential Users

This survey is being undertaken by the National Center of Excellence for Aviation Operations Research (NEXTOR) as part of research for the Federal Aviation Administration on the feasibility and potential benefits of the development of a web-based national database of air passenger travel characteristics from air passenger surveys conducted by airport authorities, regional and state planning agencies, and others. The purpose of the survey is to assess the likely support for and use of such a database, as well as to identify the frequency with which air passenger surveys have been performed at a variety of airports of different size and function.

The research is primarily concerned with surveys addressing air passenger travel party characteristics (trip duration and purpose, party size, ground access modes, etc.). The database is not envisaged as including passenger satisfaction surveys, unless they also gather statistical data on air party travel characteristics.

As a potential user of such a database, we would appreciate your participation in the survey. Please return the completed survey by **April 29, 2005** to:

Bojana Maric
NEXTOR Air Passenger Survey Project
107 McLaughlin Hall
University of California
Berkeley, CA 94720-1760
fax: (510) 642-1246
e-mail: bojana@berkeley.edu

After providing the information requested and completing the responses to the questions below, the survey questionnaire can be saved, printed (if necessary) and returned by e-mail, fax or mail.

THANK YOU FOR YOUR HELP

Respondent: Name _____
Title _____
Organization _____
Phone/e-mail _____ / _____

Q.1 How many air passenger surveys has your organization been involved in **planning or performing** during the period 1995 to 2004?

Number of surveys: _____ (if none skip remainder of this question)

For each survey, please indicate the month(s) and year performed, the airport(s) surveyed, and (if performed **by** or **for** another organization) the organization undertaking the survey.

(Please provide information for the three most recent surveys if more than three)

<i>Survey Date (month/year)</i>	<i>Airport(s)</i>	<i>Organization Undertaking the Survey (if applicable)</i>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Q.2 How many **other** air passenger surveys has your organization **made use of** in its planning or analysis activities during the period 1995 to 2004?

Number of surveys: _____ (if none skip remainder of this question)

For each survey, please indicate the month(s) and year performed, the airport(s) surveyed, and the organization undertaking the survey.

(Please provide information for the three most recent surveys if more than three)

<i>Survey Date (month/year)</i>	<i>Airport(s)</i>	<i>Organization Undertaking the Survey</i>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Q.3 If a web-based archive of air passenger survey information were to be established, how **useful** do you think it would be to your organization to have access to the information about or from those air passenger surveys, assuming that surveys from a broad range of airports were included in the archive? *(Please check one number in each case)*

	Not very useful				Very useful
(a) Descriptive information about the surveys (e.g. methodology, questions, sample size)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
(b) Summaries of survey findings (e.g. reports)	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
(c) Detailed survey response data	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Q.4 What types of descriptive information about air passenger surveys performed by other organizations would be most useful to your organization? *(Please check all that apply)*

(a) Survey methodology and sample size	<input type="checkbox"/>
(b) Questions asked in the survey	<input type="checkbox"/>
(c) The cost of performing the survey	<input type="checkbox"/>
(d) Uses to which the survey results have been put	<input type="checkbox"/>
(e) Contacts for more information	<input type="checkbox"/>

Please feel free to add any comments or suggestions below:

THANK YOU

Appendix D

Comments and Suggestions Offered by Respondents to Potential User Survey

Airport Authorities

- 1-1. Information on airport access modes, utilization of check-in options, wait times for check-in, security check and baggage, percentage patronage of retail/food-beverage, spending and related demographic breakouts of the customer base would be of use.
- 1-2. If detailed survey response data is provided, there needs to be appropriate legal disclaimers (e.g. the agency does not warranty the data for any particular use; provided for information only; data is copyright and owned by the agency; etc.).
- 1-3. The ability to provide information may be limited by survey contractual obligations. Personal data (including the number of trips, trip duration and purpose, party size, and ground access information) is zealously protected. The contract may specify that the source data is the property of the surveyor, not the airport, and the airport is prohibited from sharing data or results.
- 1-4. Our survey databases are often very large and complicated. They require an understanding of the weighting factors and the structure of the database in order to be used properly. Our concern in posting the database publicly without controls on users is that it may be used improperly and then conclusions drawn from the data which are made public, putting the airport in a position of having to defend its own analysis. We are always open to providing data for academic and industry research to but want to have an opportunity to understand how the data is to be used and make sure that it will be used properly.
- 1-5. Survey data related to air service development is sensitive since airports compete for airline service.
- 1-6. Empirical data on air passenger characteristics is an essential tool in marketing airports, but it is very labor intensive to accrue such data and then adequately analyze it. Having access to such data for other airports would be highly useful for internal and external decisions on marketing. However most airports could be very hesitant to share such data due to competitive considerations. If it were to be made available, there would probably have to be some kind of control of access to individual reports.

State Aviation Agencies

- 2-1. The information could be useful in airport system planning, but it would have to be updated regularly to be of any real value. I believe the information would be extremely valuable to the airport managers and consultants, or anyone preparing a business plan for the airport.
- 2-2. All passenger activity surveys in our state are conducted by airport sponsors. This information is collected by the state when available as part of our system planning effort.

- 2-3. The state regularly surveys passengers to our state as part of our visitor information programs.
- 2-4. Since the state Aviation Division deals primarily with airports that do not have scheduled passenger service, we seldom have a need for detailed air passenger survey information. If the surveys were to be conducted at busier general aviation reliever airports and at airports in small communities with limited passenger service, there may be some applicability.
- 2-5. We use passenger surveys to get service area regions, leakage and aviation impacts of air travel visitors.
- 2-6. These data would be helpful in planning studies.
- 2-7. Commercial service airports in our state have conducted air passenger surveys but we do not have copies of their results. Web base products will enhance our planning and development initiatives.
- 2-8. This agency enforces state aviation law, inspects and regulates airports (airside only), and provides capital funding (airside only). We have little involvement in passenger services or other landside activities.
- 2-9. It would also helpful to have air fare cost comparisons.
- 2-10. The state aviation agency has backed away from conducting its own surveys (or having one performed by consultants) in recent years because of the very competitive nature of the airport markets within our state. Market areas are close enough that significant leakage occurs between them. Therefore, airport sponsors do not relish the idea that information developed by the state may be used in the eternal game of "catch-up". We do receive information from each sponsor in the state that we use for general planning purposes (mostly infrastructure development). I don't expect this general trend to change, as the competitive climate amongst airports is more pronounced than ever. The idea of web-based information and data exchange is intriguing, but I wonder about the source. If sourced correctly, such a service would be quite valuable for our efforts, and to the extent that we could, we would contribute.

Metropolitan Planning Organizations

- 3-1. We do not have any direct services that we provide to air passengers. Our airport related functions only deal with land use and airport compatibility.
- 3-2. Survey results describing how people get to the airport (mode of transportation) would be useful to our organization.
- 3-3. Our agency does not perform air passenger surveys. At one point we had an agreement with the major hub airport in our region to get their survey information. We have been informed that due to security concerns, they will no longer release that information.
- 3-4. Our agency would use this information in a variety of ways, depending on the details of the surveys. We would be interested in knowing a wide range of information about the regional air travel market, such as: locations of travelers/trip origins (home, office, hotel, other); methods of travel to/from airports; routes and modes taken; income, education,

and other demographic data; details about both their air and ground travel behavior (types of air trips, frequency, etc.), parking use, airport and airline choice information, and other data. We would likely use this information for regional airport system planning purposes and for regional airport ground access planning and coordination with airport sponsors, ground access providers, and transportation agencies (State DOT, transit, local). While we have not done air traveler surveys before, we may want to do some in coordination with airport sponsors, and information about what other region's experience has been with their surveys (cost, who to hire, scope, issues, etc.) would be helpful to us.

- 3-5. It is my opinion that only summary reports and contact information should be on the website. Descriptive information (sample size, methods, cross-tabs, etc) would most likely be included in the report. A report is important (as opposed to just raw data or descriptive information) because surveys contain too many nuances - it is dangerous to look at "raw data" without some explanation attached. One must take care with the use of public record data. Confidentiality issues are paramount. That is the reason for our hesitancy to provide detailed survey response data. In addition, raw data could easily be misinterpreted without knowing the survey nuances. This agency and the primary airport in our region already work cooperatively to collect and share air passenger data. A web-based mechanism is not required for local use. The most important information that could be gleaned from a web database would be a brief summary of survey activity and a contact person. Generally, there are so many nuances in survey material that a personal contact is almost always required to properly interpret the data.
- 3-6. This information would be useful for updating the Long Range Transportation Plan and comparing current function with future projections.
- 3-7. Passenger survey information would be helpful to us for overall planning information. It is not likely that our Board would be willing to pay much money for this information.
- 3-8. Our organization deals primarily with surface transportation planning issues. Air traffic is of interest primarily where it interfaces with the highway system.

Airport Planning and Aviation Consultants

- 4-1. This database would be very helpful since, frequently, consultants need to obtain information on trends, statistics, etc. at other airports.
- 4-2. This would be very valuable to our clients. I guess my only concern is ensuring that comparisons aren't made among surveys that used very different methodologies.
- 4-3. It would be helpful for all doing surveys to have a guide for structuring consistent surveys across major airports that would have some standardization in the types of questions and some key wording, but could be tailored for local specifics (parking area names, etc.)
- 4-4. I feel that this idea is long overdue. Too much time and effort has gone into producing airport survey data that ends up in a paper report on someone's shelf. Since most of this data has been produced with public funds, it should be readily accessible.

- 4-5. As an airport consultant, domestic survey results can be an important study asset to determine how people in competitive markets, or potentially competitive markets, travel to and from airports, for what purpose, and what transport options are available.
- 4-6. We often need the data that passenger surveys contain for terminal planning but often none have been done recently and the project won't support the time that it takes to complete one or there has been one completed and we do not have access to the result.
- 4-7. In my experience travel characteristic data is frequently obtained from customer satisfaction surveys.

Research Community and Other Potential Users

- 5-1. Regarding the usefulness of different types of information, it is not unusual to find reports based on survey data. Thus summaries of survey findings may be useful, but are not unusual. Good, robust survey approaches as well as detailed free response observations are often not published, however. Thus, including this information would set the proposed database apart. All of the items of descriptive information identified in the survey could potentially be very useful. However, I would caution not to include contacts for more information unless those people are genuinely able and willing to respond to requests for more information. An unresponsive contact would decrease the credibility of the entire contact list.
- 5-2. The U.S. Department of Commerce has administered the Survey of International Air Travelers (also referred to as the In-Flight Survey) since 1985. A contractor to the Department surveys flights departing the U.S. from 26 international gateway airports on a monthly basis. Most surveys are self-administered by passengers on-board the flights, but many are taken in the gate boarding area. In 2003, as with every survey year, there were 12 monthly samples with a total of 60,826 respondents. About half were non-U.S. residents and half were U.S. residents. Over 60 international airlines participate in the survey. The survey focuses on passenger travel characteristics, consumer behavior and demographics.
- 5-3. For comparative research purposes, the most important thing to include is detailed response definitions. Definitions of ground access mode choices are particularly important. Confusion with regard to the many varieties of rubber-tire access modes can be particularly confusing. At a minimum, characterization is needed in terms of scheduled vs. non-scheduled and high-occupancy vs. single-party passenger vehicles.
- 5-4. Eventually if out of this effort we could have a general core of questions in a standard format that would be great. Then we would be able to use data from multiple airports to perform more complete analyses.
- 5-5. Bridging the gap between "traditional" passenger surveys with operational information, such as schedules, timing, etc., is needed. More information regarding passenger travel and the evolution of the network will be very useful. More information regarding types of passengers, and determinants of their travel will be also useful. Information regarding passenger flows and the conditions at the terminal (e.g., security screening, etc.) will be useful as well. More integration is needed between operational designs (for the terminal and airspace) and the characteristics of passenger flows.