CAMBRIDGE SYSTEMATICS

Minneapolis - St. Paul Airport Special Generator Survey

Metropolitan Council Travel Behavior Inventory

Final report

prepared for

Metropolitan Council

prepared by

Cambridge Systematics, Inc.

April 17, 2012

www.camsys.com

report

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1.0 Background

Minneapolis-St. Paul Airport (MSP), the twin cities' primary airport, is one of the busiest in the Midwest. In addition to being a major Delta hub, the airport is served by 12 domestic and international airlines with direct flights to 122 domestic destinations and 26 international destinations serving over 15 million passengers per year. Apart from being a connection to the rest of the country and the world, MSP is a critical and unique feature that drives the local economy and impacts the local transportation network With passengers using taxi, limousine, van and shuttle services, rental cars, local bus, light rail and private vehicles to access MSP.

As part of the Metropolitan Council's (Met Council) 2010 Travel Behavior Inventory (TBI) effort, a suite of travel surveys are being administered to better understand travel in the region. The high visitor and resident activity at MSP renders it a location of special status in the region. Therefore, a special intercept survey of air passengers was commissioned to capture travel patterns of residents and visitors to and from the airport. The surveys were administered in June 2011. A team led by Cambridge Systematics (CS) performed the surveys on behalf of Met Council. The Cambridge Systematics team (CS Team) consisted of:

- **Cambridge Systematics**, who were responsible for overseeing the administration effort, data expansion and evaluating the quality of the data;
- **Kevin Tierney**, who designed the survey questionnaire and managed the field implementation effort; and
- **NexPro Personnel Services**, who provided field workers for the survey administration.

The main goal of the survey effort was to produce enough survey records to support the development of a stand-alone airport travel behavior model which could include airport trip generation and purpose, mode choice, and time-of-day models. As such, the survey focused on the collecting the information necessary to support such modeling efforts including: (a) the nature of the participant's air travel, (b) their local trip origins, and (c) the ground transportation they used to reach the airport.

This report outlines the entire airport survey effort. The report is structured as follows. **Section 2** presents an outline of the survey effort including the sampling plan, the questionnaire design and the field implementation effort. **Section 3** and **Section 4** discuss the weighting methodology and application. **Section 5** discusses some key findings from the weighted survey database while **Appendices A and B** provide additional detail about the questionnaire and results.

2.0 Survey Implementation

Typically, household surveys under-represent airport trips much the same way as transit trips or trips to special generators such as large malls or shopping areas are under-represented. Special airport surveys have been conducted in other regions to allow travel demand models to better represent the visitor market as well as resident airport trips. The airport survey conducted in the MSP airport was designed to support the development of the new activity based travel demand model. Therefore, special care was taken to design the sampling approach, survey design and field implementation procedures. This section outlines each of these steps in some detail.

2.1 SAMPLING PLAN

From a mathematical sampling viewpoint, the survey effort is based on a two-stage cluster sampling approach, with a stratified sample of departing flights as one cluster, and the systematic selection of passengers within the selected flights as a second cluster.

In this approach, flights are first stratified on the basis of their travel markets. Stratification variables could include flight categories such as short-haul vs. long-haul, domestic vs. international, regional jet vs. conventional jet. A random sample of flights in each of the final strata is drawn. Then passengers from the selected flights are surveyed. Because passengers arrive at the departure lounges at an irregular, unpredictable rate, it is typically best to develop a systematic means for fieldworkers to intercept the passengers based on departure lounge seats.

For the purpose of capturing the most diverse set of passengers utilizing the MSP, the key elements considered were:

- **Termini** – which are a surrogate for different carriers and different types of aircraft vehicles;
- **Destination and distance of air travel** – which are likely to influence the mode of transportation (for e.g. size of luggage) to access the airport;
- **Through vs. Originating trips** – which impact regional travel behavior with through riders having little to no travel outside MSP.

MSP traveler trips can be described as originating in, terminating in, or transferring though MSP.

- Trips terminating in MSP were not included as part of the survey as it was considered difficult to target passengers who land at the airport and are looking to leave the airport almost instantaneously.

- Passengers starting their trip from MSP and those transferring there have to wait at the gate area. It was considered relatively easy to target waiting passengers to complete a brief survey.

Though connecting passengers do not have ground transportation information to report and are unlikely to influence regional transportation demand, it is virtually impossible to discern originating and through passengers. Therefore, once recruited individuals were identified as through passengers, they were asked limited information about their air travel to provide a basic understanding of their purpose of travel at the MSP airport and no additional detail was captured.

2.2 SURVEY EFFORT

An in-person effort was planned for the airport to maximize participation rate. The survey was designed using a web-based survey software called Survey Gizmo® and administered using IPads®. The survey team utilized a combination of wireless internet and 3G connectivity to run the online version of the survey[1]. The survey data were automatically transmitted to an online database without any further need for data entry or transcription.

2.3 QUESTIONNAIRE DESIGN

The survey comprised primarily of questions that would help improve the understanding of decisions that travelers make when traveling to the Minneapolis-St. Paul Airport.

As this survey was collected as a supplement to the regional household travel survey, the primary focus was on the trip made to access the airport for those whose travel originated in the region. The survey was designed to determine the socio-demographics of people who made trips, the purpose of their travel and how these trips were made.

- Like the household travel survey, participants were asked when they arrived at the airport, also the mode, origin location and its type.
- In addition, details about the air trip such as purpose, duration and party size were also collected.
- Additional questions about the socioeconomics of the person and the nature of their travel to identify the household and people within the households who make such a trip and why were also included.

[1] There were some issues related to the 3G connectivity at certain gates, but these issues were resolved by switching to the wireless internet service provided by the airport.

The following pieces of data were collected.

- **Air trip**:
  - Screening questions including – destination, originating/connecting
  - Gate number
  - Travel party composition (party size, number of children)
  - Resident/visitor status; home location
  - Trip purpose
  - Trip duration
  - Amount of luggage – personal and party
- **Airport access trip**:
  - Trip origin location
  - Trip origin place type
  - Access travel mode
  - Access mode details (transit stops, parking, etc.)
  - Airport arrival time
- **Socio-demographics and other related information:**
  - Household characteristics (size, income, vehicles)
  - Personal characteristics (age, gender, employment status)
  - Air travel frequency

A detailed outline of the questionnaire is presented in **Appendix A** of this report.

2.4 FIELD IMPLEMENTATION

A key design element was the location of the survey data collection and the time taken for completion. The preferred locations for the surveys were flight departure lounges.

- At these lounges, passengers have largely (though not completely) organized themselves by flight.
- Further, the passengers have completed key steps such as passing through airport security, checked bags into the aircraft, purchased food and drink and are simply waiting to board their flights.
- As such, they are more likely to be amenable to interruption and may be interested in spending a few minutes with fieldworkers.

Fieldworkers were assigned to specific departing flights and gates well in advance. They arrived at the assigned gates 60 to 75 minutes prior to the flight

departure time, performed the survey with waiting passengers and with new passengers as they arrived at the gate, and completed the survey process when the flight boarding process began about 20 to 30 minutes prior to the flight departure time.

In the event of delayed flights, fieldworkers stopped the survey process at the original flight departure time to allow them to meet their survey schedule. Response rate was maximized by keeping the survey concise. To capture passengers of various markets and types, samples were targeted from both the Lindbergh and Humphrey termini.

- **Delta** is the largest carrier and operates exclusively out of the Lindbergh terminal. It flies more routes than any others, transfers many passengers and utilizes all the gates in concourses A through D, F and G in the terminal.
- Other **major airlines** in the Lindbergh terminal include American, Continental, Frontier, United and US Airways - each of which operates out of Concourse E.
- **Budget airlines** such as Southwest and AirTran operate out of the Humphrey Terminal (Concourse H).

The implementation of the survey occurred on weekdays between Thursday, June 23, 2011 and Thursday, June 30, 2011. On the first two days of the survey, a small number of samples (40 completed) were drawn from concourses A, B and C. This gave the interviewers the chance to consider site specific nuances and served as an informal pretest. The bulk of the surveys were taken from concourse H on June 27th, concourse E on June 28th, concourses A, B, C, F and G on June 29th and concourses F and G on June 30th.

3.0 Data Preparation for Survey Expansion

The sample size of the survey was based on the anticipated final uses of the survey data and the need to fit in both scheduled time and budget. Because a key use of the survey data will be relatively complex trip distribution models, the analytical calculation of minimum sample sizes is impossible.

- Based on previous models, the survey team anticipated that a random sample of 600 to 800 passengers could provide the data necessary to support the envisioned models.
- To support mode choice modeling, the goal was to seek enough responses from users of each potential mode. A sample size of about 600 passengers was expected to provide enough detail about all of the important modes such as private auto, shared ride, taxi, hotel shuttle and transit.

The survey effort collected information from 1,009 passengers which exceeded the original goals. However, only 556 passengers reported making an outbound trip from MSP, while 453 respondents reported using the airport as a connector between their origin and destination locations. These 556 completed surveys were sufficiently close to the originally targeted goal and were deemed sufficient for the detailed modeling effort.

However, prior to being used in modeling, it is important to weigh the data using known sources of air travel in MSP to obtain a more realistic picture of the impacts that air travelers have on the regional transportation network. This section outlines the key elements used to support expansion and summarizes the results from the expansion procedures.

3.1 EXISTING AIRLINE DATABASES

The US Government Office of Airline Information under the auspices of the Bureau of Transportation Statistics collects the Airline Origin and Destination Survey (DB1B), a 10% sample of domestic airline tickets on a quarterly basis. The information tracked includes - ticket costs, origins, destinations, transfers, airlines for every passenger in the sample.

This database is the most comprehensive repository of airline and air passenger information in the United States. For this reason, the DB1B was picked as the control database to weigh the airport passenger survey.

- Since the travel behavior inventory study spans over two years, a year's worth of data from the DB1B was selected for use in the survey expansion process.
- The period of analysis started in Quarter 2 of 2010 and extended until Quarter 1 of 2011. These DB1B databases were the most current data available at the time of survey expansion (conducted in late 2011).
- Tickets for trips involving MSP (1,353,811 in total) were identified and parsed from the full DB1B database. This subset of the full DB1B database served as the control for the expansion process.
- However, it must be noted that DB1B database only provides detailed information for domestic travelers and does not include any information about internal travel.

To support survey expansion, the DB1B data were segmented by three major categories:

- **Originating vs. Transfer**. All records from the MSP DB1B database were divided into three categories - originating, transfer, and terminating. The last category was not used for comparison or weighting since no passengers terminating in MSP were surveyed. Transfers accounted for 40% of ticket records with nearly 30% assigned to each of the other two categories.
- **Airline Carrier**. The database was segmented by the carrier on which each individual made the trip to identify the exact market share for each of the major airlines in MSP.
- **Trip Distance.** The DB1B database was also organized by trip distance, and by origin/destination airports. This information was also collected in the airport survey and could support a detailed expansion procedure. For passengers traveling through MSP, the distance between MSP and the final destination was used to be consistent with the survey which asked for the final destination only.

3.2 AIRPORT SURVEY DATABASE - AIRLINES

Respondents in the survey were tracked by the airlines they were flying based on the departure gate numbers that were collected during the survey. Respondents were grouped into three broad categories (**Table 3.1**):

- **Delta Airlines**. Delta is by far the largest carrier in the airport with over 75% of all passenger activity at MSP attributed to Delta. Therefore, respondents using Delta were placed in a separate category. Of the 556 respondents whose trips originated at MSP, 207 respondents reported boarding from a Delta (or Alaska Air) gate. This is a lower percentage than reality.

- **Non-Delta Lindbergh Terminal Airlines.** Delta operates out of all but one concourse at the Lindbergh Terminal. This non-Delta concourse is shared by other national airlines such as American Airlines and Continental Airlines. 117 respondents that boarded in concourse E of the Lindbergh Terminal were placed in this category.
- **Humphrey Terminal Airlines.** The 156 respondents who reported boarding in the Humphrey Terminal were placed in a separate category. These respondents either board low-cost carriers such as Southwest, Sun Country and AirTran or some select international carriers such as Iceland Air.

In addition, the respondents were further segmented based on whether their trips were originating in MSP or were merely transferring in MSP.

Table 3.1 Respondents by Airline Grouping

Airline Category	Transfer	Originating
Delta Airlines	394	246
Non-Delta Airlines in Lindbergh Terminal	32	142
Budget Airlines in Humphrey Terminal	27	168

Source: CS Analysis of Airport Survey

3.3 AIRPORT SURVEY DATABASE – TRIP DISTANCE

Of the 556 respondents whose trip originated at MSP, 76 reported making an international trip. Of the remaining 482 respondents, 44 reported making a trip shorter than 500 miles, 187 reported making a trip between 500 – 1,000 miles while the remaining 325 made trips over 1,000 miles. **Table 3.2** below shows the transferring and originating respondents traveling at these distances. All distances are from MSP to the final destination.

Table 3.2 Distance Between MSP and Destination

Distance (miles)	Transfer	Originating
Less than 500	59	44
500 to 750	62	71
750 to 1,000	55	116
1,000 to 1,500	126	175
1,500 to 2,000	80	80
Greater than 2,000	71	70

Source: CS Analysis of Airport Survey

4.0 Survey Expansion

This section discusses the actual survey expansion procedures outlined in **Section 3.0**. **Sections 4.1 through 4.3** discuss a piece-wise adjustment process that compares the differences between the survey results and the data from the DB1B database. **Section 4.4** describes the final expansion procedure that was used to adjust the survey results. This procedure is a combination of all three adjustments described in **Sections 4.1 through 4.3**.

4.1 TRANSFER AND ORIGINATING PASSENGERS

Nearly 45% of all survey respondents (which only focused on "through MSP" and "from MSP" travelers), travel through MSP, closely matching the 44% of people leaving MSP (29% of total) in the DB1B. This indicates that the transferring passengers were just as likely to be surveyed as departing passengers. An adjustment factor is needed to match this to the total passengers. The proposed adjustment factors are described in **Table 4.1**. All other adjustment factors proposed in the next sub-sections are limited only to the "From MSP" market.

Table 4.1 Through and Originating Passengers

Passenger Travel Type	Survey	DB1B Control Data	Adjustment Factors
From MSP	556 (55.10%)	733,543 (35.72%, 56% of departing)	1.30[2]
To MSP	-	732,875 (35.69%)	
Through MSP	453 (44.90%)	586,966 (28.59%, 44% of departing)	0.64

Source: CS Analysis of Airport Survey and the DB1B Database

4.2 AIRLINES

The DB1B data were aggregated into the same three broad airline categories that were used to segment the survey data. This comparison was limited to the "from MSP" type movements only. Results from the comparison are presented in **Table 4.2** along with a brief description of the adjustment factors that will be applied to correct for the differences in the distribution of airlines. The table

[2] For the expansion, the "from MSP" trips collected from the survey will be counted twice to account for "to MSP" trips that were never collected during the survey.

indicates an over-representation of passengers traveling from the Humphrey terminal.

Table 4.2 Mix of Respondents by Airlines in the Survey and DB1B

Airlines	Survey	DB1B Control Data	Adjustment Factors
Delta	207 (42.9%)	423,049 (59.1%)	1.38
Other Lindbergh Terminal Airlines	119 (24.7%)	162,016 (22.6%)	0.91
Humphrey Terminal Airlines	156 (32.4%)	130,504 (18.2%)	0.56

Source: CS Analysis of Airport Survey and the DB1B Database

4.3 TRIP LENGTH

The destinations traveled by survey respondents were classified into different categories based on the distance traveled and were compared against the distributions outlined by the DB1B database. Eight distance bins were created and the results of the survey vs. DB1B are presented in **Table 4.3**.

Results indicate that minor adjustment factors are necessary to control for the distribution of destinations (by distance). The largest adjustment factors are necessary for distances of 2,000-5,000 miles (under-represented) and less than 250 miles (over-represented).

Table 4.3 Distance from MSP to Destination in the Survey and DB1B

Distance Segments	Survey	DB1B Control Data	Adjustment Factors
< 250 miles	1.0%	0.4%	0.42
250-500 miles	12.0%	9.6%	0.80
500-750 miles	12.5%	9.5%	0.76
750-1,000 miles	16.5%	13.3%	0.81
1,000-1,500 miles	37.9%	35.4%	0.93
1,500- 2,000 miles	15.4%	20.1%	1.31
2,000-5,000 miles	4.7%	11.5%	2.45
> 5,000 miles	0.0%	0.1%	1.00

Source: CS Analysis of Airport Survey and the DB1B Database

4.4 COMBINED WEIGHTING SCHEME

A cross-classification weighting methodology was developed to finalize the expansion procedures. **Table 4.4** shows the number of respondents in each cross-

tabulated weighting category and compares them against the DB1B database. Some categories with limited number of responses were combined to improve the robustness of the expansion procedures. This expansion procedure only includes domestic, originating (or terminating) passengers with good geocoding information.

Table 4.4 Originating Respondents in Weighting Categories

	Survey (non-international, geocoded)			DB1B		
Distance (miles)	Delta	Rest of Lindbergh	Humphrey	Delta	Rest of Lindbergh	Humphrey
Less than 500	16	12	14	58,240	21,077	19,617
500 to 750	37	15	8	55,536	17,669	11,671
750 to 1000	39	23	47	71,423	28,961	15,164
1000 to 1500	63	40	60	170,479	56,257	56,898
Over 1,500	49	21	20	63,561	37,519	19,686

Source: CS Analysis of Airport Survey and the DB1B Database

The final weighting is produced by dividing the DB1B total by the survey total and multiplying by 15.6/365 to account for: (a) the fact that the DB1B is a sample, and (b) the fact that the survey records must show daily airport visitors (and not yearly). The factor 15.6 is the inverse ratio of the passenger total in DB1B to that from the government Office of Airline Information's Air Carrier Statistics (T-100) database which contains full data, not a sample. The originating passengers are multiplied by an additional factor of 2 to represent those terminating in MSP. **Table 4.5** discusses the final expansion factors for respondents belonging to each of the key market segments.

Table 4.5 Weighting of Originating Respondents

Distance (miles)	Delta	Rest of Lindbergh	Humphrey
Less than 500	311.1	150.1	119.8
500 to 750	128.3	100.7	124.7
500 to 1,000	156.5	107.6	27.6
1,000 to 1,500	231.3	120.2	81.1
Over 1,500	110.9	152.7	84.1

Source: CS Analysis of Airport Survey and the DB1B Database

A stand-alone weighting analysis was carried out for transferring passengers using the same methodology. However, different categories were combined based on data availability (**Table 4.6**). The data reveal that most transferring survey respondents and at least 98% of passengers transferring in MSP in the DB1B sample used Delta.

Table 4.6 Weighting of Transfer Respondents

Distance (miles)	Delta	Humphrey and Rest of Lindbergh
Less than 500	92.11	2.75
500 to 750	14.60	2.75
500 to 1,000	60.91	5.58
1,000 to 1,500	84.33	5.58
1,500 to 2,000	36.84	4.14
Over 2,000	73.31	4.14

Source: CS Analysis of Airport Survey and the DB1B Database

The weighting of international flights was much simpler. Because DB1B contains only domestic flights, the T-100 database was used. According to the latter database, 13.7 times as many of the passengers fly domestic than international from MSP. Therefore, the international passengers in the survey were weighted as a group to be one 13.7th of the weighted sum of the domestic passengers.

5.0 Data Analysis and Findings

This section discusses some of the key findings from the weighted survey. A detailed frequency distribution of every question in the survey is presented in **Appendix B**.

Only a third (190) of the 556 passengers whose trips originate at MSP were local residents while the remaining two-thirds were visitors to the greater Minneapolis area (**Table 3.3**). About 30 percent of residents reported making a business-related trip as compared to over 40 percent of visitors. Conversely, 35 percent of residents reported traveling on a vacation as compared to 14 percent of visitors.

Table 5.1 Trip Purpose (Weighted)

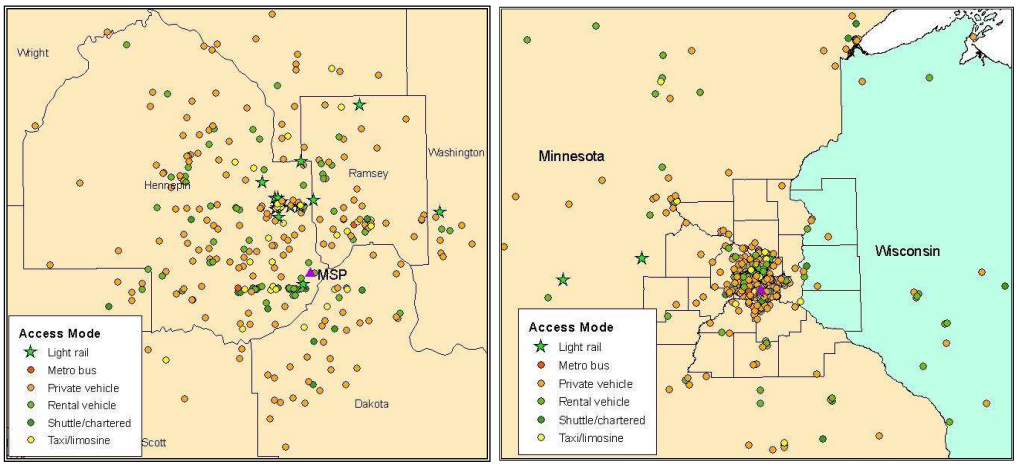
Purpose of Travel	Resident	Visitor	Resident	Visitor
Business	7,246	19,359	29%	45%
Convention/Conference	303	1,930	1%	4%
Military	231	120	1%	0%
Personal business	339	1,551	1%	4%
Travel to or from school	166	382	1%	1%
Vacation/Pleasure	8,604	6,037	35%	14%
Visit friends or relatives	7,399	13,922	30%	32%
Volunteer Work	316	81	1%	0%

Source: CS Analysis of Airport Survey

5.1 ORIGIN LOCATIONS

Passengers for whom MSP was the originating airport, were asked to provide the address from which they came to the airport. With the assistance of Met Council, these locations were geocoded to under the market shed for MSP. The map in **Figure 5.1** shows the (unweighted) distribution of the origins of records which could be geocoded.

Figure 5.1 Maps of Ground Trip Origin Locations with Access Mode



Source: CS Analysis of Airport Survey

The origin locations fall into the following areas:

- 437 in the 19 county region with 9 in Wisconsin and 428 in Minnesota,
- 17 in the rest of Wisconsin,
- 77 in the rest of Minnesota, and
- Six in other states including Iowa (4), North Dakota (1) and South Dakota (1).

5.2 GROUND TRIP

Mode of Access: A vast majority of residents (over 80 percent) reported traveling to the airport using a private vehicle. Over 70 percent of visitors chose either rental or private vehicles as their access mode to the airport. Transit usage was pretty low with about 5 percent of residents and 3 percent of visitors using light rail to access the airport. These trips came mostly from the urban areas.

Table 5.2 Access Mode (Weighted)

Access Mode	Frequency	Percentage
Light rail	2,436	4%
Metro bus	156	0.2%
Private vehicle	35,358	52%
Rental vehicle	15,425	23%
Shuttle/chartered service	4,828	7%
Taxi/limousine	9,623	14%

Source: CS Analysis of Airport Survey

Table 5.3 breaks this into the mode by purpose of the air travel. People traveling on business had the greatest diversity modes – likely due to company expensed rental or transport services and urban locations with access to light rail and buses. Vacationers, most of whom were locals leaving, strongly preferred private vehicles as did those who were visiting people in the area or at their destination.

Table 5.3 Access Mode by Travel Purpose (Weighted)

Trip Purpose	Light rail	Metro bus	Private vehicle	Rental vehicle	Shuttle/ chartered service	Taxi/ limousine
Business	1,291	128	9,064	8,487	2,016	5,382
Convention	192	0	412	201	238	1,190
Personal business	0	0	689	669	108	425
Travel to/from school	81	0	355	84	28	0
Vacation/Pleasure	559	28	8,892	2,099	1,087	1,897
Visit friends/family	313	0	15,400	3,884	696	730
Other	0	0	465	0	283	0

Source: CS Analysis of Airport Survey

Party size had a great deal of influence over the choice of mode for participants in the survey. Only small parties chose public transportation while the more people in a party more likely to take a transport service (shuttle or chartered) or a rental vehicle.

Table 5.4 Access Mode by Party Size (Weighted)

Party Size	Light rail	Metro bus	Private vehicle	Rental vehicle	Shuttle/ chartered service	Taxi/ limousine
1	1,841	28	22,907	7,187	2,030	7,176
2	484	0	7,839	5,364	816	1,567
3	0	0	2,179	1,141	306	264
4	0	0	1,172	815	238	192
5	0	0	573	473	231	0

Source: CS Analysis of Airport Survey

The surveys were spread over times of day and the airport arrival time was collected for non-transfers. About half of those surveyed arrived before noon, and over one third arrived between 1 and 5 PM. (see Table 5.5) None had a time before 5 AM or after 9:15 PM.

Table 5.5 Airport Arrival Time (Weighted)

Arrival Time	Frequency	Percentage
Early Morning	21,379	32%
Morning	14,762	22%
Afternoon	25,250	38%
Evening	4,884	7%

Source: CS Analysis of Airport Survey

5.3 AIR TRAVEL

The destination played a role in survey participants' carrier. Delta flies nearly half of its passengers between one thousand and fifteen hundred miles from MSP. Most transfers on non-Delta airlines were destinations far from MSP. Each carrier group has passengers spread somewhat evenly over the distance bands, except for the much higher one thousand and fifteen hundred mile group.

Table 5.6 Distance to Destination from MSP by Carrier Group (Weighted)

	Transfers			Originating		
Distance to Destination	Delta	Rest of Lindbergh	lumphrey	Delta	Rest of Lindbergh	lumphrey
Less than 500	2,813	11		5,289	1,952	1,677
500 to 750	1,010	6		4,957	2,157	1,247
750 to 1000	2,497	11	67	6,105	2,853	1,379
1000 to 1500	9,009	143	39	14,897	5,336	5,025
1500 to 2000	2,616	25	12	4,627	2,830	1,598
Greater than 2000	4,811	488	407	3,655	1,506	1,061

Source: CS Analysis of Airport Survey

Interestingly, Delta had a much lower luggage to person ratio. Table 5.7 shows the percentage of respondents whose parties fell into the given average luggage per person ranges. In Humphrey, which houses fee-free Southwest, more than half of the people were in groups with more than 1 piece of luggage per person.

Table 5.7 Average Luggage Per Person by Carrier Group (Weighted)

	Delta	Rest of Lindbergh	Humphrey
No luggage	50%	43%	38%
Up to 1	17%	11%	8%
1 to 2	31%	42%	47%
More than 2	2%	4%	7%

Source: CS Analysis of Airport Survey

5.4 SOCIO-DEMOGRAPHICS

For integration into the regional model, demographics were collected about the air travelers, transferring and originating. Men comprised slightly more of the sample than women, and the age groups were relatively evenly represented.

Table 5.8 Respondent Age Groups and Gender (Weighted)

Age group	Frequency	Gender	Frequency
24 and under	17,196	Female	41,251
25 - 34	18,510	Male	50,067
35 - 44	14,049		
45 - 54	20,198		
55 - 64	13,972		
65 and over	9,426		

Source: CS Analysis of Airport Survey

Participants were asked to give their income group as shown in Table 5.9. The sample favored higher income groups, as does air travel, but each group was represented. The high income (above $100k) passengers comprised more of the originating group, 50%, than they did in the transfer group, 40%. This suggests that the median income of local residents and visitors is greater than that for other MSP passengers.

Table 5.9 Respondent Income Groups (Weighted)

Income	Transfer	Originating
Less than $10,000	2%	4%
$10,000 to $19,999	5%	3%
$20,000 to $29,999	6%	3%
$30,000 to $39,999	5%	5%
$40,000 to $49,999	6%	7%
$50,000 to $64,999	9%	12%
$65,000 to $79,999	13%	8%
$80,000 to $99,999	14%	8%
$100,000 to $149,999	21%	23%
$150,000 to $199,999	8%	15%
$200,000 or more	11%	12%

Source: CS Analysis of Airport Survey

A. Survey

MSP Airport Traveler Survey - June 27 2011

Gate Number

_____

What is your final flight destination today?
(((Abbreviated destination name is acceptable)))

_____

Flight Information

Are you connecting at this airport from a flight, or did you come to the airport for this flight by some means of ground transportation?

( ) Connecting from another flight

( ) Came to airport by a ground transportation mode

_____

Residency

Are you a resident of the Minneapolis / Saint Paul area (or a nearby area) starting a trip today, or are you a visitor to this area who is getting ready to leave this area?

( ) Resident ( ) Visitor

_____

Trip Purpose

What is the primary purpose of the air trip you are beginning today?

( ) Business

( ) Convention/Conference

( ) Vacation/Pleasure

( ) Visit friends or relatives

( ) Personal business

( ) Military

( ) Travel to or from school

( ) Other (please specify)

Visitor Trip Purpose

What was the primary purpose of your trip to the Minneapolis / Saint Paul area or surrounding region?

( ) Business
( ) Convention/Conference
( ) Vacation/Pleasure
( ) Visit friends or relatives
( ) Personal business
( ) Military
( ) Travel to or from school
( ) Other (please specify)

Trip Duration

How many nights will you be away from your home on this trip?

_____

Visitor Trip Duration

How many nights were you away from your home on this trip?

_____

Travel Party

Including only yourself and those in your party, how many people traveled to the airport with you and will be flying with you to your destination?"

( ) 1	( ) 2	( ) 3
( ) 4	( ) 5	( ) 6 or more

How many people in your travel party are less than 18 years old? _____

How many pieces of luggage did you check for your flight today? _____

In total, how many pieces of luggage did your travel party check for your flight today? _____

_____

Origin Type

At which of these types of places did you start your trip to the airport today?

( ) Private home
( ) Hotel, motel, or inn
( ) A place of business
( ) A school, college, or university
( ) Convention center
( ) Tourist attraction, such as the Mall of America
( ) Military facility
( ) Restaurant
( ) Other (please specify)

_____

Hotel/Motel Name

What is the name of this hotel, motel, or inn?

_____

_____

Origin Place Name

What is the name of this place?

_____

_____

Origin City or Town

In what city or town is the place you started your trip to the airport?

_____

_____

Origin Address

What is the street address of the place you started your trip to the airport? (Please provide street number and street name)

_____

_____

Origin Cross Streets

Can you tell us the street names of a nearby intersection to the place you started your trip to the airport?

Cross Street 1:: _____

Cross Street 2:: _____

_____

Airport Access Time

At what time did you leave the place you started your trip to the airport?

_____ [ ] AM [ ] PM

And at what time did you arrive inside this airport terminal today?

_____ [ ] AM [ ] PM

_____

Airport Access Mode

How did you get from the place you started from to the airport today?

( ) Private vehicle
( ) Rental vehicle
( ) Taxi
( ) Limousine
( ) Light rail transit
( ) Hotel shuttle service
( ) Shared ride service
( ) Scheduled out-of-state bus service
( ) Charter bus service
( ) Metro bus service
( ) Other (please specify)

Auto Access

Which of the following best describes your private vehicle trip to the airport?

( ) The vehicle you drove or rode in is parked at the airport until you return to the airport

( ) The vehicle you drove or rode in is parked at an off-airport parking facility until you return to the airport

( ) You were dropped off at the terminal by a vehicle that was driven away without parking

( ) You were dropped off by a vehicle that was parked in an airport lot for a short time before being driven away

( ) The vehicle was a rental car that was returned today

( ) Other (please specify)

On-Airport Parking

Which airport parking area did you use today?

( ) Terminal 1-Lindbergh BLUE, RED, GREEN or GOLD Ramp

( ) Terminal 2 – Humphrey PURPLE Ramp / VALUE PARKING

( ) Terminal 2–Humphrey ORANGE Ramp / VALUE PARKING

( ) Terminal 1-Lindbergh SHORT TERM Parking

( ) Terminal 2-Humphrey SHORT TERM Parking

( ) Terminal 1-Lindbergh VALET Parking

( ) Terminal 1-Lindbergh EPARK ELITE Parking

( ) Terminal 2-Humphrey EPARK ELITE Parking

( ) Other (please specify)

Off-Airport Parking

Which off-airport parking facility did you use today?

( ) Park-N-Fly Minneapolis Airport (Minneapolis)

( ) Park-N-Go Airport Parking (Bloomington)

( ) EZ Air Park (Eagan)

( ) Team Parking (Saint Paul)

( ) Other (please specify)

SurePark

Did you use the airport's SurePark information system today to determine parking availability at the airport terminals?

( ) Yes ( ) No ( ) Don't Know

Light Rail

At what station did you board the Light Rail Transit to come to the airport today?

( ) Target Field Station
( ) Warehouse District/Hennepin Avenue Station
( ) Nicollet Mall Station
( ) Government Plaza Station
( ) Downtown East/Metrodome Station
( ) Cedar - Riverside Station
( ) Franklin Avenue Station
( ) Lake Street/Midtown Station
( ) 38th Street Station
( ) 46th Street Station
( ) 50th Street/Minnehaha Park Station
( ) VA Medical Center Station
( ) Fort Snelling Station
( ) American Boulevard Station
( ) Bloomington Central Station
( ) 28th Avenue Station
( ) Mall of America Station
( ) Not Sure

How did you get to that boarding station?

( ) Walked
( ) Dropped off by a private automobile
( ) Drove or rode in a private vehicle that is parked near that station
( ) Rode a bus
( ) Dropped off by a taxi or shuttle service
( ) Bicycle
( ) Other (please specify)

Hotel Shuttle

Last night, did you stay at the hotel that provided you with the shuttle service?

( ) Stayed overnight
( ) Went to hotel today to use shuttle
( ) Don't Know

) Do you have a vehicle parked at the hotel?

( ) Yes ( ) No ( ) Don't Know

Shuttle Service

Which shuttle or van service did you use today?

( ) Super Shuttle
( ) Chippewa Valley Airport Service
( ) Executive Express
( ) GO Carefree Shuttle
( ) GO Rochester Direct
( ) Jefferson/Greyhound
( ) Land To Air Express
( ) Lakes Express
( ) NWT Express
( ) Rice Lake Shuttle Service
( ) Rochester Shuttle Service
( ) Skyline Shuttle
( ) Other (please specify)

Bus Service

Which bus service did you use today?

( ) Metro Transit
( ) Jefferson/Greyhound
( ) Charter bus for your travel group
( ) Other (please specify)

Where did you board the bus to come to the airport today? _____

How did you get to that boarding location?

( ) Walked
( ) Dropped off by a private automobile
( ) Drove or rode in a private vehicle that is parked near that bus stop
( ) Rode a different bus
( ) Dropped off by a taxi or shuttle service
( ) Bicycle
( ) Other (please specify)

Cost Reimbursement

Will you be reimbursed by an employer or someone else for the cost you incurred traveling to the airport?

( ) Yes, reimbursed in full
( ) Yes, reimbursed in part
( ) Not reimbursed / paying costs yourself
( ) No cost
( ) Don't Know

Resident Return

Will you return to the Minneapolis / St Paul area through this airport?

( ) Yes ( ) No ( ) Don't Know

When you return, will you go from the airport to the same place that you started your trip or will you go to some other place first?

( ) Same place
( ) Different place
( ) Don't Know

Resident Return Place

When you return, what type of place will you go to when you leave the airport?

( ) Private home
( ) Hotel, motel, or inn
( ) A place of business
( ) A school, college, or university
( ) Convention center
( ) Tourist attraction, such as Mall of America
( ) Military facility
( ) Restaurant
( ) Other (please specify)

What is the name of this place? _____

In what city or town is this place? _____

Resident Return Trip

How will you get from the airport to this place?

( ) Private vehicle
( ) Rental vehicle
( ) Taxi
( ) Limousine
( ) Light rail transit
( ) Hotel shuttle service
( ) Shared ride service
( ) Scheduled Out-of-State shuttle service
( ) Metro bus service
( ) Charter bus service
( ) Other (please specify)

At about what time-of-day will you leave the airport when you return?

_____ [ ] AM [ ] PM

_____

Resident Trip Frequency

In the past 12 months, including this trip, how many times have you flown out of this airport?

_____

_____

Visitor Arrival

Did you arrive in the Minneapolis / St Paul area through this airport?

( ) Yes ( ) No ( ) Don't Know

When you first arrived, did you go from the airport to the same place that you started your trip or did you go to some other place first?

( ) Same place

( ) Different place

( ) Don't Know

_____

Visitor Arrival Place

When you first arrived, what type of place did you go to when you left the airport?

( ) Private home

( ) Hotel, motel, or inn

( ) A place of business

( ) A school, college, or university

( ) Convention center

( ) Tourist attraction, such as Mall of America

( ) Military facility

( ) Restaurant

( ) Other (please specify)

What is the name of this place? _____

In what city or town is this place? _____

_____

Visitor Arrival Trip

How did you get from the airport to this place?

( ) Private vehicle
( ) Rental vehicle
( ) Taxi
( ) Limousine
( ) Light rail transit
( ) Hotel shuttle service
( ) Shared ride service
( ) Scheduled out-of-state shuttle service
( ) Metro bus service
( ) Charter bus service
( ) Other (please specify)

) At about what time-of-day did you leave the airport when you first arrived on this trip?

_____ [ ] AM [ ] PM

_____

Visitor Trip Frequency

In the past 12 months, including this trip, how many times have you visited the Minneapolis/St. Paul area and flown out of this airport?

_____

_____

MSP Website Usage

Did you use the airport website, mspairport.com, prior to coming to the airport?

( ) Yes ( ) No ( ) Don't Know

What type of information did you obtain from mspairport.com prior to coming to the airport?

[ ] Airline flight information

[ ] Parking information
[ ] Ground transportation information
[ ] Other type(s) of information

_____

About the Traveler

Please tell us your age. _____

Please tell us your gender.

( ) Male ( ) Female

Please tell us your home zip code.

_____

Including yourself, how many people live in your household?

( ) 1
( ) 2
( ) 3
( ) 4
( ) 5 or more

How many of the people that live in your household are 18 or under years old?

_____

_____

About the Traveler 2

Which of the following describes your current work status?

( ) Employed full-time
( ) Employed part-time
( ) Unemployed
( ) Homemaker
( ) Student
( ) Retired
( ) Other (please specify)

How many automobiles, vans, pickup trucks, and motorcycles are available to your household?

_____

Which category does your annual household income fall in?

( ) Less than $10,000
( ) $10,000 to $19,999
( ) $20,000 to $29,999
( ) $30,000 to $39,999
( ) $40,000 to $49,999
( ) $50,000 to $64,999
( ) $65,000 to $79,999
( ) $80,000 to $99,999
( ) $100,000 to $149,999
( ) $150,000 to $199,999
( ) $200,000 or more

_____

Thank You!

Thank you for taking our survey. Your response is very important to us.

_____

B. Survey Data Weighted Frequency Distributions

Table B.1 Arrival Location Type (Visitors)

	Frequency	Percentage
A place of business	330	4%
A school, college, or university	84	1%
Hotel, motel, or inn	4,078	50%
Other	201	2%
Private home	2,795	34%
Restaurant	452	6%
Tourist attraction	231	3%

Source: CS Analysis of Airport Survey

Table B.2 Bus Service

	Frequency	Percentage
Charter bus for your travel group	1,101	88%
Metro Transit	156	12%

Source: CS Analysis of Airport Survey

Table B.3 Bus Access

	Frequency	Percentage
Dropped off by a private automobile	353	28%
Drove or rode in a private vehicle that is parked near that bus stop	312	24%
Walked	618	48%

Source: CS Analysis of Airport Survey

Table B.4 Airline Group

	Frequency	Percentage
Delta	63,519	68%
Other Lindbergh	17,318	19%
Humphrey	12,513	13%

Source: CS Analysis of Airport Survey

Table B.5 Domestic / International Flights

	Frequency	Percentage
Domestic	81,302	87%
International	12,047	13%

Source: CS Analysis of Airport Survey

Table B.6 Distance from MSP to Destination

	Frequency	Percentage
< 250 miles	2,479	3%
250-500 miles	10,497	11%
500-750 miles	9,376	10%
750-1,000 miles	12,912	14%
1,000-1,500 miles	34,448	37%
1,500- 2,000 miles	11,709	13%
2,000-5,000 miles	10,219	11%
> 5,000 miles	1,709	2%

Source: CS Analysis of Airport Survey

Table B.7 Duration of Trip to MSP

	Frequency	Percentage
Up to 20 min		
20-40 min		
40-60 min		
1-1.5 hrs		
1.5-2 hrs		
2-3 hrs		
3-5 hrs		
5-10 hrs		

Table B.8 Employment Status

	Frequency	Percentage
Employed full-time	60,504	67%
Employed part-time	6,532	7%
Homemaker	1,373	2%
Other (please specify)	1,015	1%
Retired	9,988	11%
Student	8,605	9%
Unemployed	2,768	3%

Source: CS Analysis of Airport Survey

Table B.9 Gender

	Frequency	Percentage
Female	41,251	45%
Male	50,067	55%

Source: CS Analysis of Airport Survey

Table B.10 Luggage per Person

	Frequency	Percentage
0	43,677	47%
Up to 1	13,861	15%
1 to 2	32,972	35%
more than 2	2,839	3%

Source: CS Analysis of Airport Survey

Table B.11 Household Income

	Frequency	Percentage
Less than $10,000	2,389	3%
$10,000 to $19,999	2,866	4%
$20,000 to $29,999	2,720	4%
$30,000 to $39,999	4,007	5%
$40,000 to $49,999	5,222	7%
$50,000 to $64,999	8,845	12%
$65,000 to $79,999	6,990	9%
$80,000 to $99,999	7,226	9%
$100,000 to $149,999	17,275	23%
$150,000 to $199,999	10,234	13%
$200,000 or more	8,895	12%

Source: CS Analysis of Airport Survey

Table B.12 Children in Household

	Frequency	Percentage
0	36,253	55%
1	12,286	18%
2	11,987	18%
3 or more	5,926	9%

Source: CS Analysis of Airport Survey

Table B.13 Household Size

	Frequency	Percentage
1	17,586	22%
2	33,257	42%
3	14,502	18%
4 or more	14,544	18%

Source: CS Analysis of Airport Survey

Table B.14 Household Vehicles

	Frequency	Percentage
0	3,673	4%
1	21,088	24%
2 or more	64,450	72%

Source: CS Analysis of Airport Survey

Table B.15 Children in Travel Party

	Frequency	Percentage
0	13,989	63%
1	3,758	17%
2 or more	4,533	20%

Source: CS Analysis of Airport Survey

Table B.16 LRT Station

	Frequency	Percentage
28th Avenue Station	267	11%
38th Street Station	120	5%
Downtown East/Metrodome Station	316	13%
Franklin Avenue Station	28	1%
Government Plaza Station	311	13%
Mall of America Station	28	1%
Nicollet Mall Station	580	24%
Target Field Station	384	16%
Warehouse District/Hennepin Avenue Station	403	17%

Source: CS Analysis of Airport Survey

Table B.17 LRT Access

	Frequency	Percentage
Dropped off by a private automobile	266	11%
Dropped off by a taxi or shuttle service	541	22%
Drove or rode in a private vehicle that is parked near that station	111	5%
Rode a bus	533	22%
Walked	986	40%

Table B.18 Offsite Parking

	Frequency	Percentage
EZ Air Park (Eagan)	312	10%
Other (not specified)	376	12%
Other (private home)	81	3%
Park-N-Fly Minneapolis Airport (Minneapolis)	812	27%
Park-N-Go Airport Parking (Bloomington)	1,195	39%
Team Parking (Saint Paul)	253	8%

Source: CS Analysis of Airport Survey

Table B.19 Transfer vs. Originating Passengers

	Frequency	Percentage
Transferring	25,199	27%
Originating	68,150	73%

Source: CS Analysis of Airport Survey

Table B.20 Airport Parking Area Used

	Frequency	Percentage
No Response / Don't Know	427	5%
Other (Employee parking)	28	0%
Terminal 1-Lindbergh BLUE, RED, GREEN or GOLD Ramp	5,451	65%
Terminal 1-Lindbergh SHORT TERM Parking	270	3%
Terminal 2-Humphrey ORANGE Ramp / VALUE PARKING	1,274	15%
Terminal 2-Humphrey PURPLE Ramp / VALUE PARKING	964	11%

Source: CS Analysis of Airport Survey

Table B.21 Reimbursed for Travel

	Frequency	Percentage
Don't Know	374	1%
No cost	5,934	9%
No response	705	1%
Not reimbursed / paying costs yourself	37,513	55%
Yes, reimbursed in full	21,785	32%
Yes, reimbursed in part	1,839	3%

Source: CS Analysis of Airport Survey

Table B.22 Residents vs. Visitors

	Frequency	Percentage
Resident	24,604	36%
Visitor	43,547	64%

Source: CS Analysis of Airport Survey

Table B.23 Residents Returning

	Frequency	Percentage
Don't Know	81	0%
No	460	2%
No response	162	1%
Yes	23,901	97%

Source: CS Analysis of Airport Survey

Table B.24 Resident's Purpose for Travel

	Frequency	Percentage
Business	7,246	29%
Convention/Conference	303	1%
Military	231	1%
Personal business	339	1%
Travel to or from school	166	1%
Vacation/Pleasure	8,604	35%
Visit friends or relatives	7,399	30%
Volunteer Work	316	1%

Source: CS Analysis of Airport Survey

Table B.25 Resident's Mode for Return

	Frequency	Percentage
Charter bus service	162	1%
Hotel shuttle service	81	0%
Light rail transit	893	4%
Metro bus service	339	1%
Private vehicle	19,293	81%
Rental vehicle	313	1%
Scheduled Out-of-State shuttle service	111	0%
Shared ride service	156	1%
Taxi	2,552	11%

Source: CS Analysis of Airport Survey

Table B.26 Shuttle Services

	Frequency	Percentage
Chippewa Valley Airport Service	111	28%
GO Rochester Direct	81	20%
Skyline shuttle	55	14%
Super Shuttle	156	39%

Source: CS Analysis of Airport Survey

Table B.27 Visitor Frequency

	Frequency	Percentage
0	54,123	58%
1	16,720	18%
2 to 4	14,805	16%
5 to 9	3,937	4%
10+	3,452	4%

Source: CS Analysis of Airport Survey

Table B.28 Visitor Length of Stay

	Frequency	Percentage
1-2 days	56,230	60%
2-4 days	19,922	21%
5-8 days	10,480	11%
9-15 days	4,988	5%
16+ days	1,729	2%

Source: CS Analysis of Airport Survey

Table B.29 Visitor's Purpose for Travel

	Frequency	Percentage
Business	19,359	45%
Convention/Conference	1,930	4%
Military	120	0%
Personal business	1,551	4%
Sporting Event	312	1%
Travel to or from school	382	1%
Vacation/Pleasure	5,725	13%
Visit friends or relatives	13,922	32%
Volunteer Work	81	0%

Source: CS Analysis of Airport Survey