

**SAN DIEGO ASSOCIATION OF  
GOVERNMENTS**

# **CROSS-BORDER EXPRESS AIRPORT MODEL DEVELOPMENT**

Report | September 10, 2019







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## 1.0 INTRODUCTION

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This report describes the development of an air passenger ground access model for the Cross-Border Express (CBX) terminal. The CBX terminal is a unique facility that provides access to Tijuana International Airport from the United States via a pedestrian bridge. The terminal provides a much faster border crossing than is available at either San Ysidro or Otay Mesa, especially for returning passengers. In order to use the facility, each traveler must have a Tijuana Airport boarding pass. The terminal offers parking, rental car services, airline check-in services, duty-free shopping, and dining. It opened in December 2015.

The project team conducted a passenger survey from Monday, April 3, 2016 to Friday April 7, 2016 at Tijuana Airport. The survey collected information from departing passengers who either used the CBX facility or could have used the facility but chose to cross at one of the other border crossings instead. The survey was conducted by bilingual interviewers who approached passengers at departure gates at Tijuana Airport and asked if they were willing to take a brief survey. The survey was conducted using a tablet PC, with integrated mapping software for accurate locational data. For a more complete description of the survey instrument and methodology, see *Specific Travel Destination Modeling Improvement Data Collection Plan*, by RSG, dated February 20, 2017.

RSG collected 837 completed surveys. Surveys include data from Tijuana Airport departing passengers who used CBX, passengers who originated in the United States but who did not use CBX, passengers whose origin was in Mexico, and a limited number of connecting passengers. The data were expanded along the following dimensions:

1. CBX user or not.
2. Destination (Mexico City, Guadalajara, other destination with high CBX use, or other destination with lower CBX use).
3. Time of day of flight departure (5:00 a.m. to 9:00 a.m., 9:00 a.m. to 1:00 p.m., 1:00 p.m. to 5:00 p.m., 5:00 p.m. to 9:00 p.m., 9:00 p.m. to 1:00 a.m., and 1:00 a.m. to 5:00 a.m.).

A total of 239 respondents reported that they used CBX to access Tijuana Airport on their travel day, expanded to 4,912 total average weekday arriving and departing passengers (April 2017). These data were used to develop the CBX Airport Ground Access Model. This report describes the data used to develop the model, the model structure (borrowed from the San Diego Airport Ground Access Model), and the model calibration results.

## 2.0 CBX AIRPORT DATA

The data used to develop the CBX airport model are described below. The 239 records who reported using the CBX facility on their travel day were expanded to match average weekday CBX users from April 2017. After data expansion, all observations with an origin in the United States were geocoded to XY coordinates, and XY coordinates within San Diego County were geocoded to the Series 13 Master Geographic Reference Area (MGRA) dataset. Observations outside San Diego County were geocoded to the closest external station.

Table 1 summarizes all CBX survey respondents (unweighted records and expanded data) by origin and CBX use. The table shows that approximately 55% of departing Tijuana Airport passengers originate in the United States, and of these, approximately 47% use the CBX facility to access Tijuana Airport. The rest of this document focuses on the 4,912 expanded CBX users.

**TABLE 1: CBX AIRPORT SURVEY RESPONDENTS, BY ORIGIN AND CBX USE**

HOW ARRIVED AT AIRPORT	UNWEIGHTED	WEIGHTED	WEIGHTED SHARE
From US, Used CBX	239	4,912	25%
From US, Other Border Crossing	209	5,629	29%
From Mexico	348	8,023	41%
Connecting Flight	39	867	4%
<b>Total</b>	<b>835</b>	<b>19,431</b>	<b>100%</b>

The Airport Ground Access Model segments travelers according to travel purpose, which is a combination of residence status (resident/nonresident), the reported purpose of travel (work/other) and whether the traveler's origin before departing the airport was in San Diego County or not (internal/external). Table 2 summarizes CBX users by travel purpose. Interestingly, 58% of CBX user's have an origin outside of San Diego County. Of the remaining 42%, approximately 81% travel for personal reasons and 19% are business travelers. Approximately 69% are San Diego County residents and 31% are visitors to San Diego County.

**TABLE 2: CBX USERS, BY TRAVEL PURPOSE**

PURPOSE	FREQ.	PERCENT
Resident—Business	281	6%
Resident—Personal	1,107	23%
Visitor—Business	105	2%
Visitor—Personal	546	11%
External	2,873	58%
<b>Total</b>	<b>4,912</b>	<b>100%</b>



Table 3 shows external CBX users sorted by their station of entry into San Diego County. Most CBX users (81%) enter the county using I-5. Thirteen percent of external CBX users enter at I-15, and approximately 8% enter at another external station.

**TABLE 3: EXTERNAL CBX USERS, BY EXTERNAL STATION**

EXTERNAL STATION	PERCENT
I-8	3%
SR78	3%
SR79	1%
Pala Road	1%
I-15	13%
I-5	81%
<b>Total</b>	<b>100%</b>

Table 4 shows CBX users by the size of their travel party by purpose. These data are used in the Airport Model to calculate the number of travel parties from total enplanements. Party size affects the sensitivity to costs (more travelers implies cost sharing) and affects auto occupancy. External travel parties and visitors traveling for business tend to travel in larger travel parties than residents or visitors traveling for personal reasons.

**TABLE 4: CBX USERS, BY PARTY SIZE AND PURPOSE**

PARTY SIZE	RES-BUS	RES-PER	VIS-BUS	VIS-PERS	EXTERNAL
1 Person	78%	40%	27%	51%	30%
2 Persons	22%	33%	24%	47%	36%
3 Persons	0%	15%	15%	0%	17%
4 Persons	0%	6%	34%	0%	6%
5+ Persons	0%	7%	0%	2%	12%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
Average Party Size	1.2	2.1	2.6	1.6	2.5

Table 5 shows CBX users by household income. Unfortunately, this question had a large nonresponse bias, with approximately 40% of CBX users refusing to answer. The responses by income category are a bit lumpy. The table also shows the average household income sorted by purpose, using the midpoint of each range and \$250,000 for the \$200k+ range. Unsurprisingly, visitors traveling for personal reasons have the lowest average income; these travelers are mostly returning home to Mexico. The segment with the highest average income is residents traveling for personal reasons.

**TABLE 5: CBX USERS, BY HOUSEHOLD INCOME**

INCOME	RES-BUS	RES-PER	VIS-BUS	VIS-PERS	EXTERNAL
Less than \$15k	46%	15%	15%	5%	28%
\$15k to \$30k	11%	26%	9%	32%	25%
\$30k to \$60k	0%	12%	67%	55%	26%

INCOME	RES-BUS	RES-PER	VIS-BUS	VIS-PERS	EXTERNAL
\$60k to \$100k	0%	17%	9%	0%	10%
\$100k to \$150k	24%	8%	0%	0%	5%
\$150k to \$200k	0%	7%	0%	8%	2%
\$200k or more	20%	15%	0%	0%	4%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
Average Income	\$31,000	\$57,000	\$41,000	\$17,000	\$23,000

Table 6 summarizes CBX users by the duration of their trip in number of nights away from home. A small share of CBX users are traveling for a day trip. Business travelers tend to travel for shorter duration (approximately 4 nights on average) than nonvisitor travelers (over 6.5 nights on average).

**TABLE 6: CBX USERS, BY TRIP DURATION AND PURPOSE**

NIGHTS	RES-BUS	RES-PER	VIS-BUS	VIS-PERS	EXTERNAL
Day trip	0%	0%	9%	4%	1%
1	28%	0%	9%	3%	4%
2	20%	0%	38%	0%	2%
3	10%	13%	0%	16%	10%
4	0%	23%	0%	0%	7%
5	12%	7%	34%	11%	8%
6	11%	11%	0%	3%	4%
7	4%	11%	3%	26%	22%
8	2%	3%	1%	8%	3%
9	1%	3%	0%	3%	3%
10	2%	5%	1%	6%	7%
11	0%	1%	0%	1%	1%
12	1%	2%	0%	1%	1%
13	0%	1%	0%	1%	1%
14+	10%	20%	4%	18%	27%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
Average	4.6	6.5	4.2	6.7	6.8

Figure 1 shows the distribution of departing CBX passengers by their arrival period at the CBX facility. This distribution was inferred from the departure time for surveyed passengers, assuming passengers arrive at CBX 1.5 hours on average before their flight departure period. The distribution is flat across the day—except for a large spike in the late evening for departing visitors traveling for business (a small segment overall that may be subject to sampling error).





**FIGURE 1: DEPARTING CBX USERS, BY ARRIVAL TIME PERIOD AT CBX**

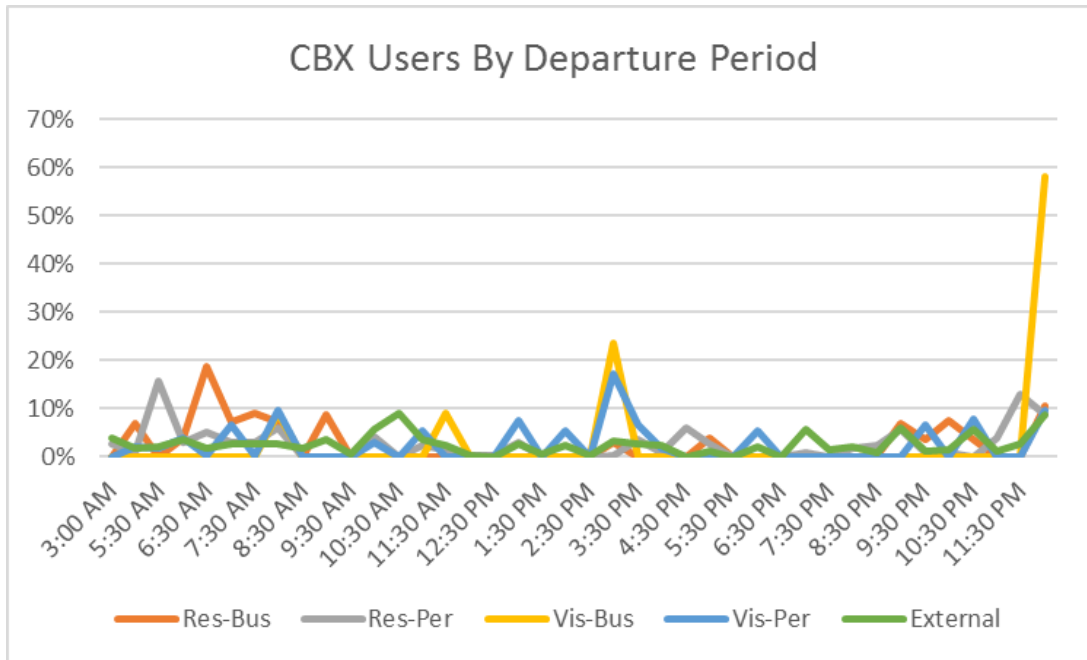


Figure 2 shows the distribution of arriving CBX passengers by their departure period from the CBX facility to a destination in San Diego or an external location in the United States. Since arriving passengers were not surveyed, this distribution was inferred from a profile of arriving seats in April 2017. The distribution was shifted forward by one hour to account for time to travel through the airport, clear customs, retrieve bags, etc.

**FIGURE 2: ARRIVING CBX USERS, BY DEPARTURE TIME FROM CBX**

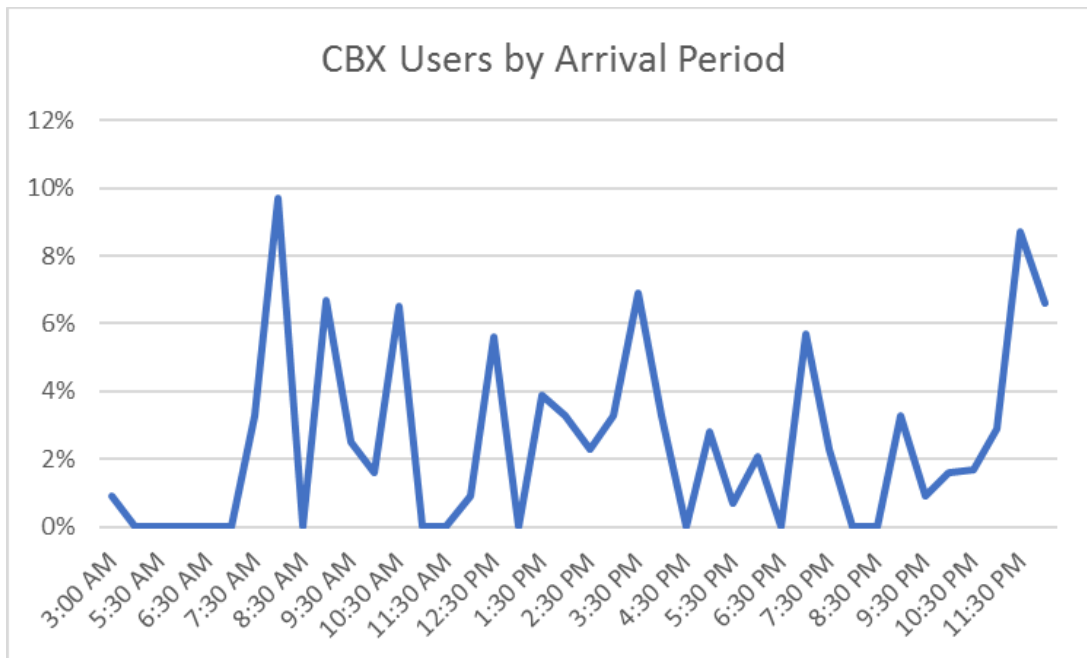
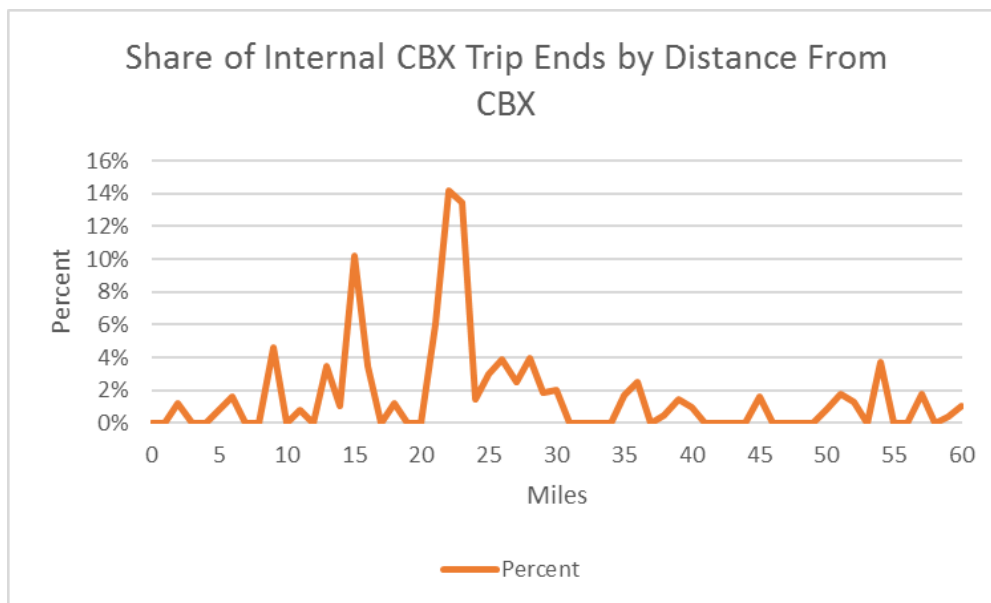


Figure 3 shows a trip-length frequency distribution for trips to the CBX facility from inside San Diego County. This plot is based on 104 geocoded trips. Unfortunately, most respondents were unwilling to provide a street address or nearest intersection and instead provided only a city name.

The large spike in observed origins between 15 and 16 miles from CBX are records where the origin location was reported as Chula Vista without providing a street address (7 out of 104 observations). The large spike in observed origins between 22 and 23 miles are observations that report the origin as San Diego without a street address (17 out of 104 observations). Downtown San Diego is approximately 23 miles from the CBX facility, so there are also many origins between 23 and 24 miles from CBX. The average distance is 25.8 miles.

Since there are so few observations with an actual geocoded address, RSG will calibrate the destination choice model for the origin/destination of departing/arriving CBX travelers to the average distance, and potentially also to pseudo-MSA. Expanded CBX trips by pseudo-MSA are shown in Table 6. A map of the pseudo-MSAs is shown in Figure 5.

**FIGURE 3: TRIP LENGTH FREQUENCY DISTRIBUTION OF INTERNAL TRIP ORIGINS TO CBX**



**FIGURE 4: INTERNAL TRIP ORIGINS, BY PSEUDO-MSA**

PSEUDO-MSA	DESCRIPTION	FREQ.	PERCENT
1	Central	469	23%
2	North City	389	19%
3	South Suburban	254	12%
4	East Suburban	507	25%
5	North County West	195	10%
6	North County East	137	7%
7	East County	87	4%
<b>Total</b>	--	<b>2,039</b>	<b>100%</b>



**FIGURE 5: SANDAG PSEUDO-MSA SYSTEM**

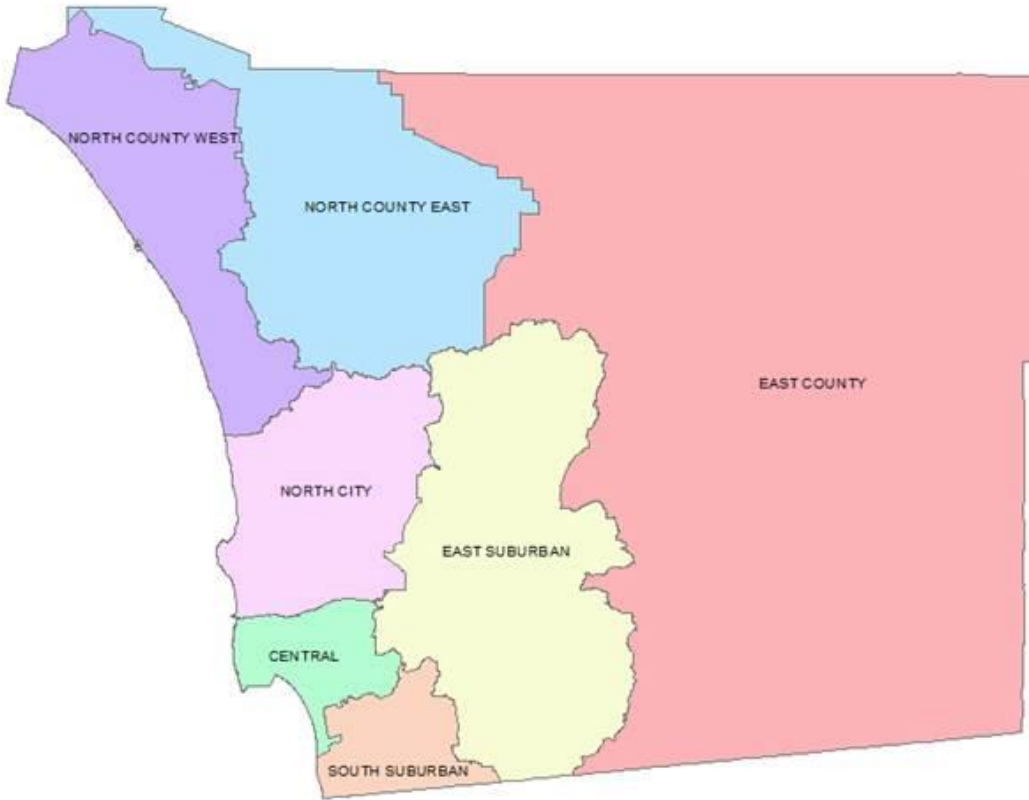


Table 7 shows the number of CBX users by access mode and purpose, and Table 8 shows the frequency distribution. The largest mode share is curbside pick-up/drop-off, with 45% of all respondents. Another 13% of respondents report being dropped off by family/friend who also accompanied them into the CBX terminal (e.g., use short-term parking). Another 14% of respondents report parking a car on site, while another 14% report using a taxi/Transportation Network Company (TNC). A total of 6% of respondents used transit to get to the CBX facility, and only 3% used a rental car. Interestingly, most transit users are external trips to the airport.

**TABLE 7: CBX USERS, BY ACCESS MODE AND PURPOSE**

ACCESS MODE	RES-BUS	RES-PER	VIS-BUS	VIS-PERS	EXTERNAL	TOTAL
On-site Parking	97	142	--	--	469	708
Off-site Parking	--	25	--	--	83	108
Pickup/Drop-off (in terminal)	37	29	--	99	468	633
Pickup/Drop-off (at curb)	70	635	15	229	1,270	2,219
Rental Car	24	-	35	98	--	157
Taxi/TNC	41	243	55	111	255	704
Shuttle/Vanpool	--	--	--	10	55	65
Transit	11	34	--	--	274	319

**Total      281                  1,107                  105                  546                  2,873                  4,912**

**TABLE 8: SHARE OF CBX USERS, BY ACCESS MODE AND PURPOSE**

ACCESS MODE	RES-BUS	RES-PER	VIS-BUS	VIS-PERS	EXTERNAL	TOTAL
On-site Parking	35%	13%	0%	0%	16%	14%
Off-site Parking	0%	2%	0%	0%	3%	2%
Pickup/Drop-off (in terminal)	13%	3%	0%	18%	16%	13%
Pickup/Drop-off (at curb)	25%	57%	15%	42%	44%	45%
Rental Car	9%	0%	33%	18%	0%	3%
Taxi/TNC	14%	22%	52%	20%	9%	14%
Shuttle/Vanpool	0%	0%	0%	2%	2%	1%
Transit	4%	3%	0%	0%	10%	6%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Table 9 shows transit trips sorted by CBX mode of access. A total of 66% of transit users were dropped off at the boarding stop before riding transit to CBX.

**TABLE 9: TRANSIT TRIPS TO CBX, BY TRANSIT ACCESS MODE**

TRANSIT ACCESS	FREQ.	PERCENT
Walk	46	14%
Drove and Parked	36	11%
Dropped Off	210	66%
Other	26	8%
<b>Total</b>	<b>319</b>	<b>100%</b>

Table 10 shows transit trips to CBX by mode of egress. At total of 63% of transit trips can walk to the CBX facility from their final alighting stop; the rest get a ride of some kind (20% use taxi and 15% use a TNC).

**TABLE 10: TRANSIT TRIPS TO CBX, BY TRANSIT EGRESS MODE**

TRANSIT EGRESS MODE	FREQ.	PERCENT
Walk	200	63%
Taxi	62	20%
Uber, Lyft, etc.	47	15%
Other	10	3%
<b>Total</b>	<b>319</b>	<b>100%</b>

Table 11 shows CBX users by whether they used SR-125 to access CBX. Over 1,000 CBX users (27%) report using the SR-125 toll road to access the CBX facility.

**TABLE 11: CBX USERS, BY WHETHER THEY USED SR-125 TO ACCESS CBX**

USED SR-125	FREQ.	PERCENT
Yes	1,014	27%



No	2,679	73%
<b>Total</b>	<b>3,693</b>	<b>100%</b>

## 3.0 CBX MODEL DESIGN

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The CBX airport ground access model is based on the San Diego Airport model originally developed from 2009 to 2012 as part of the SANDAG activity-based model system.<sup>1</sup> The airport ground access model is a disaggregate microsimulation treatment of air passengers. It explicitly represents the duration of stay or trip to accurately represent costs associated with various parking and modal options. The model considers the full set of modes consistent with resident travel models. It also includes a special mode of access model that considers the use of rental car, taxi/TNC, curbside versus accompanied pick-up/drop-off, and on-site versus remote parking. Total demand for airport-related travel is based on exogenous inputs of enplanements and transferring passengers. The model flow and inputs are shown in Figure 6 and described in detail in the following sections.

### 3.1 AIRPORT MODEL TRAVEL DIMENSIONS

#### Airport Model Trip Purposes

The airport model includes five trip purposes and codes these based on the resident status of air passengers and the purpose of air travel:

1. **Resident Business:** Business travel made by San Diego County residents.
2. **Resident Personal:** Personal travel made by San Diego County residents.
3. **Visitor Business:** Business travel made by visitors to San Diego County.
4. **Visitor Personal:** Personal travel made by visitors to San Diego County.
5. **External:** Travel of all types made by residents of neighboring counties.

#### Airport Model Treatment of Time

Every trip is allocated to a half-hour period consistent with the resident travel demand model treatment of time. Travel skims are consistent with resident travel demand models; five sets of skims for early AM, AM peak, Midday, PM Peak, and Evening.

#### Airport Model Treatment of Space

Every trip end in San Diego County is allocated either to an internal MGRA (purposes 1 through 4) or to an external station (External purpose).

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<sup>1</sup> For documentation on the San Diego Airport Model, there are three relevant documents developed by PB Americas, Inc. for San Diego Association of Governments: 1) Activity-Based Travel Model Specifications: Coordinated Travel – Regional Activity Based Modeling Platform (CT-RAMP), dated April 2009; 2) Activity-Based Travel Model Estimation: Coordinated Travel – Regional Activity Based Modeling Platform (CT-RAMP) for San Diego County, dated December 2012; and 3) Activity-Based Travel Model Calibration/Validation: Coordinated Travel – Regional Activity Based Modeling Platform (CT-RAMP) for San Diego County, dated December 2012.



## Airport Model Inputs

The model system requires the following exogenously specified inputs (three additional datasets are required in addition to the data currently input to the resident activity-based models):

- **CBX Enplanement Forecast:** The total number of yearly enplanements, without counting transferring passengers, at CBX, the number of yearly transferring passengers (should be zero), and an annualization factor to convert the yearly enplanements to a daily estimate.
- **Traveler Characteristics Distributions:** Several distributions of traveler characteristics are assumed to be fixed but can be changed by the analyst to determine their effects on the results:
  - The distribution of travelers, by purpose (Table 2).
  - The distribution of travelers, by purpose and household income (Table 5).
  - The distribution of travelers, by purpose and travel party size (Table 4).
  - The distribution of travelers, by purpose and trip duration (Table 6).
  - The distribution of travelers, by purpose, direction (arriving versus departing), and time period departing for airport (Figure 1 and Figure 2).
- **MGRA Data:** The population and employment (by type) in each MGRA, parking cost and supply, etc. This data provides sensitivity to land-use forecasts in San Diego County. These are the same datasets as are used in the resident activity-based model.
- **TAP Skim Data:** Transit network level-of-service between each transit access point (transit stop). This provides sensitivity to transit network supply and cost. These are the same datasets as are used in the resident activity-based model.
- **TAZ Skim Data:** Auto network level-of-services between each transportation analysis zone. This provides sensitivity to auto network supply and cost. These are the same datasets as are used in the resident activity-based model.

## Airport Model Description

This section describes the model system briefly, followed by a more in-depth discussion of each model component.

1. **Trip Enumeration and Attribution:** A total number of airport trips is created by dividing the input total enplanements (minus transferring passengers) by an annualization factor. The result are divided by an average travel party size to convert passengers to travel parties. A list of travel parties are created based on this number, and choices are made for each travel party to determine the following characteristics:
  - Travel purpose.
  - Party size.
  - Duration of trip.
  - Household income.
  - Trip direction (it is assumed that 50% of the daily enplanements are arriving passengers and 50% are departing passengers).

- Departure time for airport.

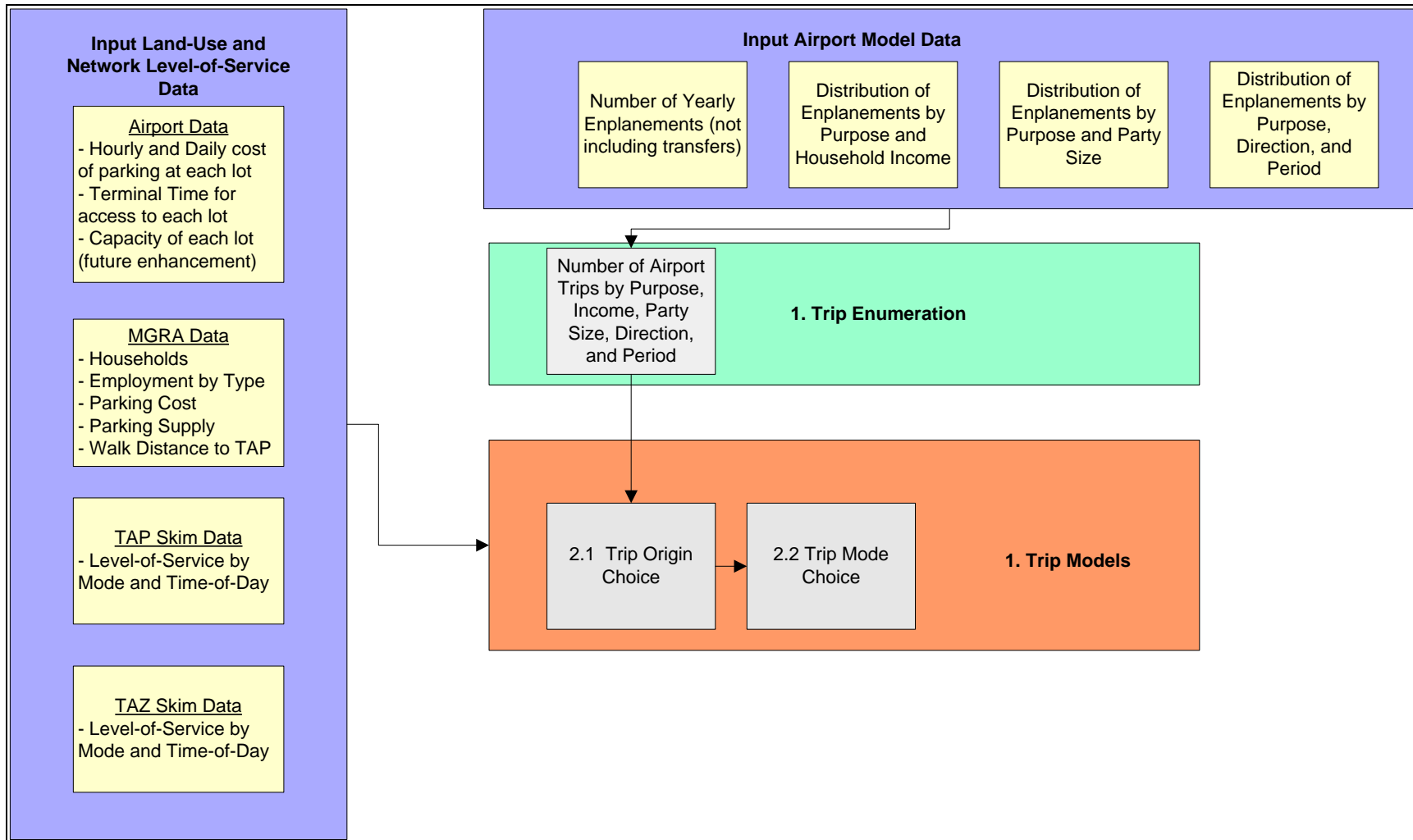
## 2. Trip Models

- 2.1. **Trip origin:** Each travel party is assigned an origin and destination MGRA or external station.
- 2.2. **Trip mode:** Each travel party is assigned a trip mode and an arrival mode. Trip modes are consistent with resident model mode codes. Arrival modes are used to determine the mode of access/egress at the airport. Arrival modes have the following choices:
  - 2.2.1. Park on-site
  - 2.2.2. Park at an off-site lot operated by the airport (not currently an option at CBX)
  - 2.2.3. Park at a private off-site lot
  - 2.2.4. Pickup/drop-off, where the passenger is accompanied into the terminal (implying short-term parking)
  - 2.2.5. Pickup/drop-off curbside
  - 2.2.6. Rental car
  - 2.2.7. Taxi/TNC
  - 2.2.8. Shuttle/Vanpool
  - 2.2.9. Transit





FIGURE 6: AIRPORT MODEL FLOWCHART



### 3.2 ESTIMATED/ASSERTED MODEL PARAMETERS

This section describes the parameters that were estimated or asserted in the airport trip models. These parameters are found in the AirportDestinationChoice.xls and AirportModeChoice.xls Utility Expression Calculator (UEC) spreadsheets.

Estimated multinomial logit destination choice model coefficients from the San Diego Airport Model are in Table 12. These parameters were estimated using the San Diego Airport Model data and borrowed for the CBX model. Note that for the resident purpose models, total households is the base category, while for visitors, hotel rooms is the base category (these variables generate and attract the most trips to/from the airport). The external purpose is not shown, as external airport parties are generated or attracted to one of the external stations according to the distribution in Table 3.

**TABLE 12: AIRPORT DESTINATION CHOICE MODEL COEFFICIENTS**

VARIABLE	PURPOSE			
	Resident-Business	Resident-Personal	Visitor-Business	Visitor-Personal
Distance	0.0316	-0.0037	0.0696	0.0142
Log(Distance)	-0.4921	-0.2379	-0.8965	-0.3639
Distance2	-0.0005		-0.0009	-0.0003
Size Term Parameters				
Households	<b>1.0000</b>	<b>1.0000</b>	0.007	0.020
Hotel Employment			<b>1.000</b>	<b>1.000</b>
Office Employment	0.013	0.001	0.010	
Military Employment	0.007	0.032	0.004	
Amusement Employment			0.098	0.263
Government Employment			0.040	
(All) Other Employment	0.015	0.018	0.007	0.003

Airport mode choice model coefficients are shown in Table 13. The airport mode choice model uses the same transit path-finding and logsum calculations as the resident models. The parameters below are used to calculate value-of-time for each airport party for use in the transit utility calculations and to calculate airport main mode and access mode. Cost coefficients were derived from calculating half of the wage rate for each income range (dividing the average income in each bin by 2,080 hours/year and multiplying by 0.5). Shown are cost coefficients for personal travelers. This assumes that cost sensitivity for business travelers is 50% of personal travelers (the cost coefficients are multiplied by 0.5 in the UEC for airport parties with business purpose).

**TABLE 13: AIRPORT MODE CHOICE MODEL COEFFICIENTS**

VARIABLE	COEFFICIENT	RATIO TO IVT/ VALUE-OF-TIME
In-vehicle Time	-0.025	1.0
Walk Time	-0.05	2.0
Wait Time	-0.05	2.0
Cost (income < \$15k)	-0.0083	\$1.80
Cost (income (\$15-30k))	-0.0028	\$5.41
Cost (income \$30-60k)	-0.0014	\$10.82
Cost (income \$60-100k)	-0.0008	\$19.23
Cost (income \$100-150k)	-0.0005	\$30.05
Cost (income \$150-200k)	-0.0004	\$42.07
Cost (income \$200k+)	-0.0002	\$60.10

The airport model also makes assumptions about the cost, walk time, and wait time for ground access modes. In some cases these are based on observed data collected during development of the San Diego Airport Model (for example, auto rental cost). In some cases these are based on observed data (CBX on-site and off-site parking costs, scaled to \$2010). These times and costs are shown in Table 14.

**TABLE 14: AIRPORT GROUND ACCESS MODE TIME AND COST ASSUMPTIONS**

MODE	COST (\$)/TIME (MIN)
Initial Cost (first 1/10th mile) for Taxi (\$)	\$2.20
Cost Per Mile for Taxi (\$)	\$2.30
Cost per Mile Shuttle (\$)	Same as auto operating cost
Cost Per Day Rental Car (\$)	\$40.00
Terminal Parking Cost Per Hour (\$)	\$4.00
Terminal Parking Cost Per Day (\$) - converted 2017 to 2010	\$17.80
Private Off-site Parking Cost Per Day (\$) - Used Delta Truck Parking at \$10/day Converted to 2010	\$8.90
Terminal Parking Walk Time (min)	5.00
CBX Off-Site In-Vehicle Time (min)	0.00
PVT Off-Site Walk Time (min)	2.00
PVT Off-Site Wait Time (min)	5.00
PVT Off-Site In-Vehicle Time (min)	10.00
Time to Rental Car Center (min)	5.00
Time to Walk to Rental Car Shuttle (min)	3.00
Time to Wait for Rental Car Shuttle (min)	7.50

## 4.0 MODEL CALIBRATION

The new CBX airport model was calibrated to match the travel behavior in the survey data described in Chapter 2.0. The model was adjusted to match trip lengths and access mode by purpose.

Figure 7 compares trip lengths of internal trip origins to the CBX terminal. The model distribution generally follows the survey. Average trips lengths are very similar as well - 26.2 miles in the model compared to 25.7 miles in the observed data. Note that the model is compensating for the lumpiness in the observed data with a smoother distribution, therefore, doesn't get the peak exactly right but more importantly matches the average trip length. The calibration process adjusted constants in different distance bins by four purpose categories: resident business, resident personal, visitor personal, and visitor business.

**FIGURE 7: TRIP LENGTH FREQUENCY DISTRIBUTION OF INTERNAL TRIP ORIGINS TO CBX**

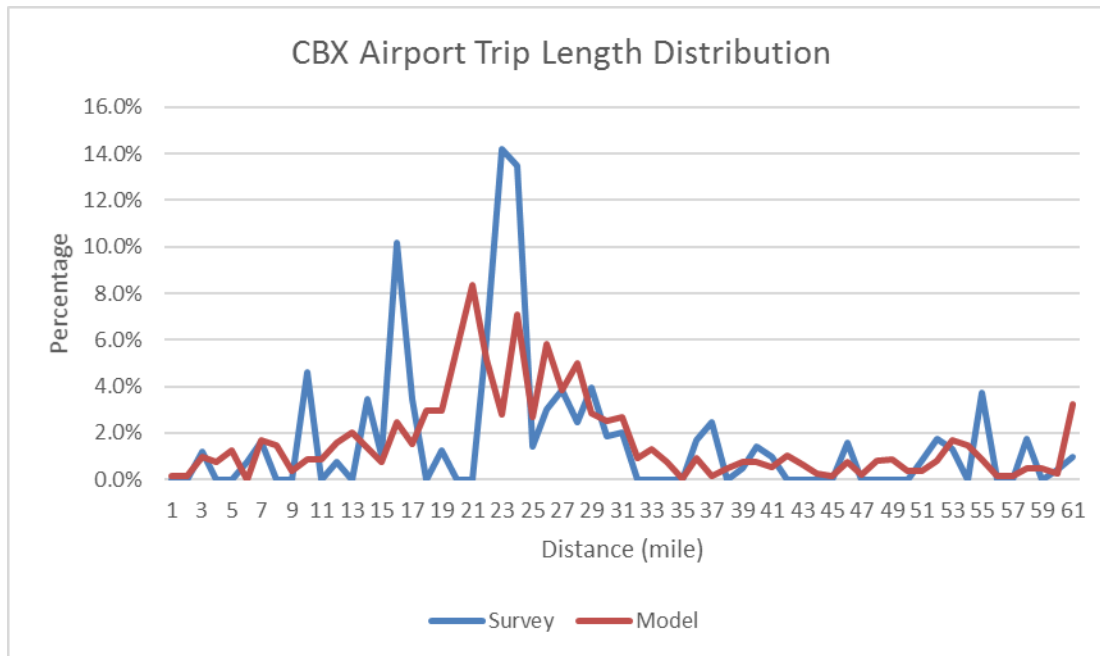


TABLE 15 AND

TABLE 16 SUMMARIZE NUMBER OF TRIPS TO THE CBX TERMINAL BY ACCESS MODE AND PURPOSE IN THE SURVEY AND THE MODEL RESPECTIVELY. THE TRIP SHARES ARE SHOWN IN



**TABLE 17 AND**

Table 18. Trips that use parking (on-site or off-site private) to get to the CBX terminal compare well with the survey. The model trips by two popular access modes, pickup/drop-off at curb and in terminal are slightly overestimated and trips by taxi/TNC are underestimated. Overall, the summaries show reasonable match of model trips with the survey data. The calibration process adjusted alternative specific constants for arrival mode in five purpose categories: resident business, resident personal, visitor personal, visitor business, and external.

**TABLE 15: CBX USERS, BY ACCESS MODE AND PURPOSE - SURVEY**

ACCESS MODE	RES-BUS	RES-PER	VIS-BUS	VIS-PERS	EXTERNAL	TOTAL
On-site Parking	97	142	--	--	469	708
Off-site Parking	--	25	--	--	83	108
Pickup/Drop-off (in terminal)	37	29	--	99	468	633
Pickup/Drop-off (at curb)	70	635	15	229	1,270	2,219
Rental Car	24	-	35	98	--	157
Taxi/TNC	41	243	55	111	255	704
Shuttle/Vanpool	--	--	--	10	55	65
Transit	11	34	--	--	274	319
<b>Total</b>	<b>281</b>	<b>1,107</b>	<b>105</b>	<b>546</b>	<b>2,873</b>	<b>4,912</b>

**TABLE 16: CBX USERS, BY ACCESS MODE AND PURPOSE - MODEL**

ACCESS MODE	RES-BUS	RES-PER	VIS-BUS	VIS-PERS	EXTERNAL	TOTAL
On-site Parking	48	117	-	-	532	697
Off-site Parking	-	7	-	-	90	97
Pickup/Drop-off (in terminal)	4	2	-	58	785	849
Pickup/Drop-off (at curb)	80	635	26	138	1,797	2,676
Rental Car	-	-	64	59	-	123
Taxi/TNC	20	211	38	63	-	332
Shuttle/Vanpool	12	38	-	-	76	126
Transit	-	-	-	-	-	-
<b>Total</b>	<b>164</b>	<b>1,010</b>	<b>128</b>	<b>318</b>	<b>3,280</b>	<b>4,900</b>

**TABLE 17: SHARE OF CBX USERS, BY ACCESS MODE AND PURPOSE - SURVEY**

ACCESS MODE	RES-BUS	RES-PER	VIS-BUS	VIS-PERS	EXTERNAL	TOTAL
On-site Parking	35%	13%	0%	0%	16%	14%
Off-site Parking	0%	2%	0%	0%	3%	2%
Pickup/Drop-off (in terminal)	13%	3%	0%	18%	16%	13%
Pickup/Drop-off (at curb)	25%	57%	15%	42%	44%	45%
Rental Car	9%	0%	33%	18%	0%	3%
Taxi/TNC	14%	22%	52%	20%	9%	14%
Shuttle/Vanpool	0%	0%	0%	2%	2%	1%
Transit	4%	3%	0%	0%	10%	6%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**TABLE 18: SHARE OF CBX USERS, BY ACCESS MODE AND PURPOSE - MODEL**

ACCESS MODE	RES-BUS	RES-PER	VIS-BUS	VIS-PERS	EXTERNAL	TOTAL
On-site Parking	29%	12%	0%	0%	16%	14%
Off-site Parking	0%	1%	0%	0%	3%	2%
Pickup/Drop-off (in terminal)	2%	0%	0%	18%	24%	17%
Pickup/Drop-off (at curb)	49%	63%	20%	43%	55%	55%
Rental Car	0%	0%	50%	19%	0%	3%
Taxi/TNC	12%	21%	30%	20%	0%	7%
Shuttle/Vanpool	7%	4%	0%	0%	2%	3%
Transit	0%	0%	0%	0%	0%	0%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>











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