Transit Link Evaluation
for
John Wayne Airport
Air Passengers and Employees

December 2008

PREPARED FOR
ORANGE COUNTY TRANSIT AUTHORITY (OCTA)

OCTA Orange County Transportation Authority

Aviation Planning at the Leading Edge

Ducey & Associates

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INTRODUCTION

Phase I of the Go Local program sponsored this study, which evaluates a potential transit link to connect John Wayne Airport to the existing public transportation infrastructure.

A key initiative of the Orange County Transportation Authority (OCTA) is to increase Metrolink commuter rail service between north and south Orange County, providing fixed-route service every 30 minutes between the Fullerton and Laguna Niguel stations by 2010. To encourage new riders to use the expanded service, OCTA approved the Go Local program in 2006. This program was developed to promote city-initiated transit extensions to Metrolink. The Go Local goal is to support local creativity and planning, and to develop transit-related projects that make the Metrolink service more convenient and accessible. Toward this end, OCTA allocated $3.4 million in Measure M monies for Go Local Phase I for initial feasibility planning. Each city in Orange County was eligible for a $100,000 grant. In Go Local Phase II, OCTA will provide funding of up to $30 million for project design and implementation for the selected concepts.

This report is part of Go Local Phase I. The cities of Newport Beach and Costa Mesa agreed to work together for Go Local Phase I, and to evaluate transit services that have the potential for relieving traffic congestion generated by John Wayne Airport (JWA), which borders both cities.

On average, 27,000 air passengers enplane and deplane scheduled commercial passenger flights each day at JWA. The majority of passengers arrive and depart in low occupancy ground transportation modes such as private cars, rental cars, or taxis. Currently, less than one percent of JWA air passengers use public transportation modes.

Another source of traffic congestion comes from the numerous jobs provided by the airport, and by companies that provide for ancillary services to passengers and the commercial and general aviation communities. As a result, Newport Beach and Costa Mesa are significantly impacted by vehicular traffic related to aviation service at the airport. OCTA's Go Local grant allows the two cities to analyze potential rail or bus transit links into JWA.

OCTA and the respective communities approved the Go Local Agreement in late March 2008. Each city also approved a Cooperative Agreement that outlines their respective responsibilities throughout the Go Local process. Prior to beginning the Go Local study, JWA agreed to actively participate in the study, and cooperated fully throughout the process.

The purpose of the study is to determine the potential adoption of mass transit by air passengers and airport employees.

The purpose of the Go Local grant and the focus of this study are to evaluate transit links into JWA, and to determine to what extent air passengers and employees might adopt mass transit over the use of private transportation modes. To accomplish this objective, it is crucial to understand how passengers move from one mode of transportation to another, and to know what motivates their choice in intermodal connections and transportation links.

It is essential to understand that in this case, air travel is the primary transportation mode and influences all other ground transportation decisions. Air passengers are motivated and driven by very different factors than urban transit commuters. Therefore, the success of an intermodal transit project at JWA will largely depend on the ability to quantify and comprehend the air passenger market in Orange County and the potential it offers for developing airport ground transportation services.

This report evaluates the feasibility of a direct transit connection between JWA and Metrolink or OCTA Bus Rapid Transit (BRT), with the goal of providing a quick and convenient means to move Orange County airport passengers and employees to JWA. The consultant team has analyzed the performance of both rail and bus service alternatives. At the request of the OCTA, two specific bus transit services were evaluated: (1) the City of Irvine I Shuttle, which connects the Tustin Metrolink Station to JWA, and (2) the OCTA Bristol/State College Boulevard Bravo! BRT, a 30-mile route that will begin in Brea and pass by JWA. The I Shuttle is currently in operation. The Bravo! BRT is expected to begin service in 2010. In addition, an express bus connection and light rail were also considered.

REPORT ORGANIZATION

An analysis of various transit alternatives that could provide convenient and direct access to JWA from key Metrolink stations and activity centers is presented in this report. The analysis is based on the air passenger market profile generated from the most recent JWA air passenger survey.

Chapter 1 establishes the existing context in which the study took place and focuses on current conditions at JWA. Chapter 1 includes a discussion of current airport operations, the land uses surrounding the airport, and existing transit services into JWA. This chapter also describes future JWA growth, as permitted by the JWA Settlement Agreement.

Chapter 2 provides an introduction to the integration of transit connections into airports. It also describes the analysis required to forecast ridership and evaluates the capital investment needed to support the construction and operation of new airport transit services. This chapter identifies the airport transit performance at many world airports and the key determinants that encourage air passengers to use specific airport transportation modes.

Chapter 3 analyzes the Orange County air passenger market and JWA employee base, which is the market pool that would provide potential riders for an airport transit link. The market analysis includes demographics, trip purpose, point of origin, existing ground transportation choices, and airport choice factors; all of which influence the roadway traffic generated by JWA.

Chapter 4 includes a more in-depth analysis of three densely concentrated air passenger geographic areas and presents opportunities for relieving ground traffic congestion.

Chapter 5 analyzes three transit alternatives- the I Shuttle, express bus service, and the Bravo! BRT.

Chapter 6 provides an overview of previous rail studies and project alignments.

Chapter 7 assesses the final ridership findings and the resulting recommendations.

Chapter 8 concludes the recommendations from the study.

Chapter 1 - John Wayne Airport (JWA) Background and Existing Conditions

JWA is owned and operated by Orange County and is the County's only commercial service airport. It is centrally located within the County and is situated between the cities of Costa Mesa, Irvine, and Newport Beach. JWA is located 40 miles southeast of Los Angeles International Airport, 22 miles southeast of Long Beach Airport, 45 miles southwest of Ontario International Airport, and almost 90 miles north of San Diego International Airport.

The John Wayne Airport has a passenger cap which limits traffic to 10.3 MAP through January 1, 2011 and then 10.8 MAP thereafter.

JWA is restricted by a passenger cap that currently limits traffic volumes to 10.3 million annual passengers (MAP). It served almost 10 million passengers in 2007.[1] Occupying 500 acres, JWA currently has one main terminal and 14 aircraft gates. JWA has five public parking lots with 7,783 parking spaces, and 610 curbside valet parking spaces. Its main runway, at 5,701 feet, is one of the shortest of any commercial airport in the United States, effectively restricting its commercial use to aircraft no larger than a Boeing 757. Its second runway, at 2,887 feet, is for general aviation traffic only.

1.1 History of the JWA Settlement Agreement

JWA is one of the few airports in the nation that has both noise and operational restrictions. Grandfathered under the federal Airport Noise and Capacity Act (ANCA), JWA currently operates under a court-ordered agreement that restricts commercial air operations and facility expansion.

The 1985 Settlement Agreement established nighttime curfews, special departure procedures, and other operational restrictions that are now prohibited without federal approval. The City of Newport Beach, the County of Orange, and two community groups, Airport Working Group (AWG) and Stop Polluting Our Newport (SPON), entered into the 1985 Settlement Agreement to resolve Federal Court litigation seeking judicial approval of the

[1] The 10 million passengers include both enplaned (outbound) and deplaned (inbound) passengers.

JWA Master Plan. The execution of the 1985 Settlement Agreement required the County to reduce the size of the terminal and to limit the number of parking spaces.

The Agreement also established three classes of commercial aircraft permitted to operate at JWA, restricted the average daily departures, limited the number of passengers to 8.4 million annual passengers (MAP), and maintained the current nighttime curfew in effect at JWA. Execution of the Settlement Agreement allowed JWA to construct the Thomas F. Riley Terminal, which was designed to accommodate 8.4 million annual passengers.

Passenger traffic at JWA has averaged growth of 4.7% per year between 1990 and 2007.

Through September of 2008, passenger traffic has declined 9% over 2007 levels.

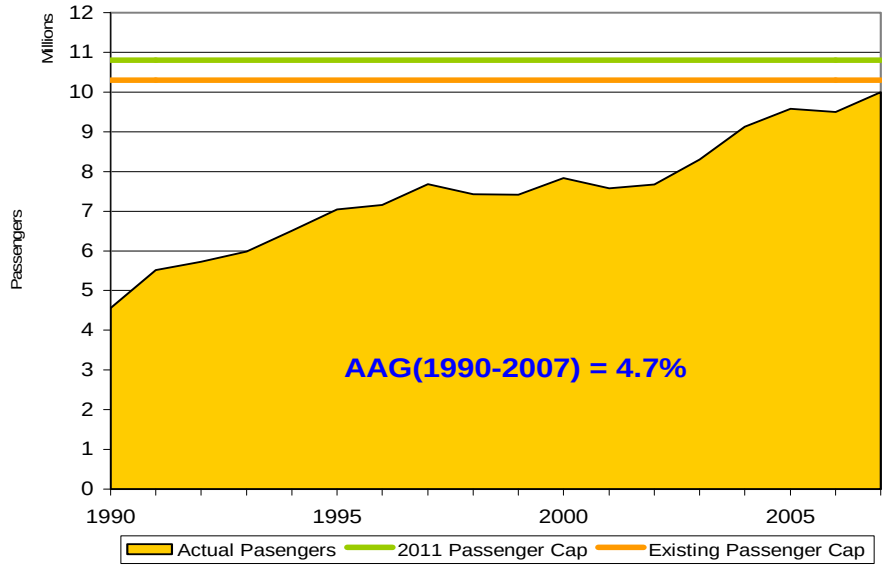
In 2003, the Settlement Agreement was amended with a number of modifications, including an increase in the maximum number of average daily departures and an increase in the maximum number of daily air cargo departures from two to four. The 2003 modifications also included an increase in the passenger limit from 8.4 to 10.3 MAP until January 1, 2011 and to 10.8 MAP on and after January 1, 2011. Flight and service level restrictions remain in effect until January 1, 2016, and provisions related to the curfew remain in effect until at least January 1, 2021. For the purpose of this study, it is assumed that the operational cap of 10.8 MAP will remain in effect after 2015.

Exhibit 1-1 illustrates historical passenger trends which are directly influenced by the 1985 Settlement Agreement and the subsequent 2003 amendments. Growth in passenger traffic has averaged 4.7 percent annually since 1990 although traffic is down nine percent through September 2008 over 2007 levels.

JWA is adding six new gates and over 2,000 additional parking spaces.

The 2003 amendments also eliminated the restrictions on the size of the terminal and the limit on public parking spaces. Once the Settlement Agreement was amended, JWA began its facility improvement program, which calls for the construction of a new multilevel terminal building with six new commercial passenger gates, six new security checkpoints, greater baggage screening capability, new commuter facilities at the north and south ends of the terminal, and over 2,000 new parking spaces.

EXHIBIT 1-1
JWA HISTORICAL PASSENGER TRENDS



Sources: FAA, Terminal Area Forecast & Landrum & Brown analysis

1.2 Surrounding Land Use and Environmental Setting

The area surrounding JWA is mostly urban in character. Extensively developed industrial and commercial land borders the airport to the north, east and west, while lower density residential development and open space is located to the south and southwest. The Upper Newport Bay is located approximately 3,600 feet south of the airport and is an important natural area, providing habitat to many wildlife species. An extensive arterial highway and freeway system surrounds the airport providing access from several locations to the airport.

1.3 JWA Ground Transportation Services

In a 2007 survey, 75% of passengers reported traveling to the airport by car (including rental cars).

Airport passengers use a variety of transit modes to access JWA. The ground transportation options include rental cars, commercial and courtesy shuttles, taxis, the Disneyland® Resort Express, OCTA buses, and the Irvine I shuttle. Most ground transportation services pick up passengers at the JWA Ground Transportation Center (GTC), located on the lower arrival level in the center of the East parking structure. The 2007 JWA Passenger Survey reported that a friend or family member in a

private automobile dropped off 42 percent of the passengers. Eighteen percent drove/parked their cars, 15 percent used rental cars, and nine percent used taxi service.

1.3.1 Rail Transit

In Orange County, commuter and inter-city rail services are provided by the Southern California Regional Rail Authority (Metrolink). Metrolink provides fixed-route rail service operating between established stops and terminals on a scheduled basis. The nearest train stations to JWA are located in Irvine, Santa Ana and Tustin. In June 2008, the City of Irvine began its I Shuttle service from the Tustin Metrolink Station to JWA. The I Shuttle-Route A connects the Tustin Metrolink Station to JWA via Von Karman Avenue.

1.3.2 Bus Transit

OCTA provides the bus transit service throughout Orange County with two of its routes serving JWA. Bus Route 76 serves north Orange County, begins in Huntington Beach, and follows MacArthur Boulevard into JWA. Actual travel time from Huntington Beach to JWA is 55 minutes. The service runs every half hour, seven days a week. Bus Route 212 serves south Orange County, and begins in San Juan Capistrano, following I-405 into Irvine, and arriving at JWA in 65 minutes. However, this service has only two northbound and two southbound operations per day, and there is no weekend service. OCTA buses stop on the arrival level outside of Terminal B.

1.3.3 Express Bus

The Disney® Express Bus provides non-stop transportation service between the local Anaheim hotels/Disney areas and JWA. The service is provided on a fixed schedule in half hour intervals.

1.3.4 Private Airport Shuttles

Private airport shuttles are shared-ride, door-to-door transportation services which charge a predetermined flat fare per passenger or zone. Typically, transportation from the airport

is on-demand, but transportation to the airport requires prior reservations. More than 20 private shuttle companies serve JWA passengers.

1.3.5 Courtesy Shuttles

Door-to-door, shared-ride transportation is provided for customers of hotels and motels. Typically, no fare is charged to the passenger because this transportation service is considered part of the hotel service being provided. Service is provided using minibuses, vans, and station wagons. JWA has over 40 hotel courtesy shuttles servicing air passengers.

1.3.6 Taxis and Limousines

JWA taxi and limousine services provide exclusive and privately operated door-to-door transportation service. Cabs can seat up to five people and vans up to seven. Taxis are on-demand vehicles that are located at the GTC. Fares are metered ($2.95 first 1/4 mile plus $0.65 per additional 1/4 mile, with a $30 wait fee per ½ hour) and calculated according to trip length and travel time. Taxis cabs and vans are always available in the GTC.

Airport limousine services are pre-arranged by reservation, and offer exclusive door-to-door service using luxury vehicles. Over 100 limousine companies provide this service at JWA.

1.3.7 On-Site and Off-Site Parking

Air passengers using their private vehicles to access the airport can park either on-site in the airport's parking structures or off-site at the Main Street Parking facility. The Main Street lot offers the lowest daily parking rate with complimentary shuttle service to and from the terminal every 15 minutes.

1.3.8 On-Site and Off-Site Rental Car Agencies

Rental cars are private automobiles leased by visitors at or near the airport. At JWA, a number of on-site rental car companies are located on the lower arrival level. Car rental pick-up and return is located on the ground level of the GTC. The off-site rental car companies are licensed to pick up passengers from the terminal and shuttle them to their off-site locations.

Ridership estimates are difficult to determine and are normally over estimated.

While the costs for intermodal airport-transit projects vary widely, planning and construction costs are substantial. A key challenge lies in securing the necessary funding to build the project, and a critical component of any funding plan is the ridership estimate. While there are many non-financial reasons to expand transit options (e.g. reduce congestion, environmental factors) projected ridership and the subsequent derived revenues are an important component in the justification of the capital investment. Unfortunately, many airport-transit connections in the United States have not lived up to expected ridership projections, especially when compared to the performance of similar projects around the world. **Table 2-1** presents rail ridership for major airports around the world.

TABLE 2-1
RAIL TRANSPORTATION SHARES AT WORLD AIRPORT LOCATIONS

Airport	Share	Type of Rail
Oslo	39%	High-Speed
Hong Kong	28%	Heavy Rail
Frankfurt	27%	High-Speed/Commuter
Reagan National (Wash. D.C.)	13%	Metro
Atlanta-Hartsfield	10%	Metro
New York JFK	8%	APM to Metro/Commuter Rail
Chicago-Midway	6%	Metro
Boston Logan	6%	Subway
Newark	5%	APM to Commuter Rail
Chicago-O'Hare	5%	Metro/Commuter Rail
St. Louis-Lambert	3%	Metro
Philadelphia	3%	Commuter Rail
Baltimore Washington	3%	Amtrak
Cleveland-Hopkins	2%	Metro
Los Angeles	<1%	Metro

Sources: Transit Cooperative Research Program Reports 62 and 83; ACRP Report 4; IATA Airport Development

At this point, there is no consistent, widely accepted model to accurately forecast ridership for airport transit services. Using an existing urban transportation model is not a reliable measure since the daily commuter market is completely different from the air passenger market. Furthermore, air passenger markets between different airports are inherently different. Some airports serve more visitors than residents. Other airports serve substantial numbers of international travelers. The socio-economic profile can also vary greatly between airports.

Consequently, making assumptions about all air passengers and creating a "one size fits all" ridership model has its shortcomings. Instead, airport and transportation planners must first understand their aviation market—who they are, where passengers come from prior to arriving the airport, how they get to the airport, why they are traveling, who is paying for the trip--and then evaluate specific airport transit project criteria based on that thorough market analysis.

2.1 Airport Access Travel Time

Air passengers put a greater emphasis on time and convenience than money. Air passengers also have above average incomes which place them outside of the typical transit rider profile.

Compared to typical transit commuters, air passengers are more time sensitive and less cost sensitive. Orange County air passengers travel on average five-six times per year, and with such infrequent travel, on-time arrival at the airport is more important to flyers than cost.

Further, the terrorist attacks of September 11, 2001 have led to dramatic changes in the airline/airport industry; in particular the processing through airport security. Over 40 percent of air passengers report they allow more time for air travel now than before 9-11.[2] The net impact is an increased "hassle" factor related to air travel today. Additional airport time provides something of a buffer against unexpected delays and in clearing security. Nonetheless, if passengers are concerned about security delays at the airport, they will be less tolerant of delays due to ground congestion while traveling to the airport.

From the air passenger's perspective, the critical performance parameter for any airport transit system is total travel time; that is, the door-to-door travel time from point of local trip origin (home, business, hotel, etc.) to arrival at the airport ticketing counter or security check-point. The more seamless the process--the fewer mode changes, the more direct the route, the easier the terminal access is from the transit drop-off location-- the more likely air passengers are to forego their private vehicles for public transit. If the process is not seamless, passengers will seek more convenient, reliable ways to get to their flights on-time.

[2] According to ACRP Report 4 "Ground Access to Major Airports by Public Transportation" pg. 39

2.2 Market Segmentation

The air passenger market is not homogeneous, and different market segments have different airport access needs and available options. The most obvious distinction is between visitors to and residents of the local area. The modes available for resident and non-resident trips will generally be different. Residents typically have access to private vehicles and someone who can take them to or pick them up at the airport. Visitors on the other hand may need to rent a car while in the area or may stay at a hotel that provides shuttle service to the airport.

The air passenger market is divided into five or more smaller markets that have distinct profiles.

Within the visitor and resident air passenger market there are also distinct sub-segments, driven by different cost, time, and convenience criteria. Most airport surveys divide passengers into business or leisure travelers, but within these two broad categories there are sub-segments. To be able to evaluate how and why certain air passengers are choosing specific ground transportation modes, this report divides air passengers into five specific trip purpose segments:

- Business (On-Site Meetings)
- Business (Conference/Convention)
- Leisure (Vacation/Pleasure Trip)
- Leisure (Visiting Friends and Relatives)
- Other (School, Personal)

The factors that influence the choice of where to stay (a hotel versus a local residence) as well as the airport egress and access travel options are quite different for visitors in the five categories. Leisure passengers visiting friends and relatives will normally be met and dropped off at the airport. If a relative is visiting, it is unlikely that the host will want them to take a rail or bus service to and from the host residence. This is different for business travelers who have travel costs reimbursed by their employer or client.

Therefore, while all air passengers share travel by airplane in common, their choice of ground transportation to/from the airport can be very different depending on their particular market sub-segment. Resident and visiting travelers have very different mode choices available. The business traveler makes a

Ridership estimates require an in-depth understanding of the current air passenger market segments and available public transit network.

choice based on reimbursement of the travel, leisure travelers choose on the basis of what they can afford, and leisure travelers visiting friends and family have an entirely different set of options open to them.

This report is based on the premise that the most successful air-transit projects are built on an in-depth needs analysis of the specific airport passenger market the project is meant to serve, then evaluating the best airport access mode that meets the specific passenger needs, rather than choosing a particular transit mode based on some other criteria.

As shown in **Table 2-2**, both Tokyo Narita Airport and London Heathrow Airport are good examples of how a specific air passenger market can segment between different ground access modes.

Table 2-2
TRAVELERS CHOICE OF GROUND ACCESS MODES

Airport	High Speed Rail	Moderate-Low Speed Rail	Total Rail Market Share	Total Bus Market Share	Total Public Transit Share
Tokyo Narita 31 MAP	14%	22%	36%	23%	59%
London Heathrow 67 MAP	9%	14%	24%	12%	36%

Sources: TCRP Report 62 (16), CAA Passenger Survey Report 2004 (30)

These airports have created service targeted to specific air passenger market segments. For example, high speed train service is the fastest and most costly way to arrive at the airport. Moderate or low speed rail is slower and will cost less, but won't be impacted by street or freeway traffic congestion. Bus transit is the least expensive, but also the slowest. However, each transit mode meets the needs of a different air passenger market sub-segment.

Since different transit modes speak to different air passenger market sub-sets, the first step is to define the air passenger market for the target airport before evaluating a particular intermodal project. This report is based on the principle that an

accurate, justifiable airport transit ridership estimate cannot be done without first obtaining a detailed, in-depth analysis of the air passenger market that the project is meant to serve.

The resources needed to develop an airport access ridership model depend, in part, on the availability of accurate, detailed air passenger data. Without reliable, current air passenger data, model assumptions about the success or viability of an airport transit system will be questionable.

For the purposes of this report, the project evaluation process is as follows:

- Gather Market Data for Target Airport through an Airport Passenger Survey
  - In this case, the target is JWA
  - Design survey questions to reveal key market characteristics.
  - Emphasize accurate origin/destination information to permit geo-coding.
- Analyze and Understand Market Data
  - Understand the composition of the overall airport market as well as its sub-segments.
  - Create a detailed profile of key passenger segments and define the specific needs of each segment.
  - Establish target geographic markets based on air passenger density concentrations.
  - Understand the drivers of market support of various modes and services.
- Evaluate Airport Transit Services
  - Understand the quality attributes of successful transit project services.
  - Determine the best transit mode based on the specific needs of the target passenger segment.
  - Match modes with markets.
  - Where practical, develop strategies to encourage higher occupancy mode use.

By following this process, the passenger market served by the project will drive the planning process, rather than the process being driven by the choice of specific transit modes of service.

Chapter 3 - JWA Air Passenger Market

A supplemental passenger survey was performed in the summer of 2008 to gather specific data focusing on local passenger trip origin and current modes of ground transportation.

To better understand the JWA passenger market, the consultant team initially evaluated existing data from the JWA Passenger Survey conducted in July 2007 by the Redhill Group. JWA sponsors a biannual passenger survey to measure traveler preferences and customer satisfaction. The 2007 survey included two separate components: an intercept survey conducted at JWA with 570 visitor and resident passengers, and a telephone survey conducted with 1,500 Orange County residents. Of the airport intercept responses, only 206 were residents of Orange County.

The 2007 passenger survey data initially provided the best data for the preliminary analysis of the JWA passenger market. However, one of the limitations of the 2007 survey was that zip code data was provided only for residents of Orange County and was based on their home address. As a result, it was not possible to determine what level of visitor traffic came to JWA from key local activity centers such as the Anaheim/Disneyland resort area, nor could it be determined if residents were traveling from home or a place of work.[3]

In order to collect data targeted to the specific objectives of this study, the cities of Newport Beach and Costa Mesa agreed to sponsor a new airport passenger intercept survey designed to provide a detailed, accurate picture of the JWA passenger market, and to specifically elicit the information necessary to evaluate the viability of JWA transit services.

The following objectives guided the development of the specific survey questions:

- Develop a detailed profile of JWA passengers as a key input to evaluate the potential of mass transit ground access to JWA
- Quantify key passenger segments: Visitor, Resident, Business, Leisure, Visiting Friends and Family

[3] It is important to note that these statements do not infer a deficiency in the 2007 passenger survey but simply that this study had a very different purpose. In fact, in the instances where questions overlapped between surveys a high level of correlation was found.

- Identify key geographic clusters within Orange County through geo-coded passenger trip origins
- Identify which ground transportation mode passengers currently use to travel to JWA (e.g. private car, rental car, taxi, shuttle)
- Understand passengers' airport preferences, choice factors, and propensity to travel from JWA
- Determine general passenger perception and use of mass transit, with an emphasis on rail transit
- Evaluate inter-relational variables of trip time and price as they pertain to potential mode substitution

Published flight schedules were used to yield balanced overall results and minimize any bias.

With the full cooperation of JWA staff, the consultant team conducted the survey at the JWA terminal from June 25 - July 13, 2008. A stratified random sample was used to select respondents for this survey. A stratified sample ensured that the complete mix of air carriers, markets, times of day, and days of week were represented in the survey. Airline schedules published in the *Official Airline Guide* (OAG) were used to guide the survey planning process. **Table 3-1** provides a summary of the distribution of activity for the survey period by airline, day of week, and time of day.

Interview staff intercepted and surveyed 2,500 passengers waiting at the airport departure gates. Passengers were randomly selected by the interviewer to participate in the survey, and only one person per traveling party was asked to complete the survey. The surveys were self-administered by the air passenger, and then checked for completeness by survey staff.

Survey questions focused on the "door-to-airport" trip rather than "in-airport" customer satisfaction, and were designed to draw out detailed data for both Orange County visitors and residents. Critical to the results were questions detailing the exact location of travelers prior to leaving for the airport. This permitted passenger origins to be geo-coded by zip code. The survey questions were also designed to elicit information regarding reasons for airport choice, airport preference, travel behavior, destination, demographic characteristics, perceptions, and use of mass transit. Of the 2,500 completed air passenger

surveys, 2,317 were accurately completed and useable for the study's purpose. The stratified sampling plan was then used to weight the results, to correct for any over sampling within each departure flight strata.

TABLE 3-1
DISTRIBUTION OF WEEKLY SCHEDULED SEATS

	Weekdays			
Airlines	**6am-10am**	**10am-2pm**	**2pm-6pm**	**6pm-10pm**
Alaska	1.8%	1.7%	2.2%	1.8%
American	4.5%	4.3%	3.5%	1.2%
Continental	2.0%	1.0%	1.0%	0.5%
Delta	2.7%	2.4%	2.0%	0.6%
Frontier	0.6%	0.6%	0.6%	0.6%
Northwest	0.5%	0.5%	0.5%	0.0%
Southwest	5.1%	5.6%	5.6%	5.1%
United	3.8%	2.8%	1.3%	1.2%
US Airways	2.6%	2.1%	1.0%	1.8%
Total	**23.6%**	**21.0%**	**17.7%**	**12.8%**

	Weekend				
Airlines	**6am-10am**	**10am-2pm**	**2pm-6pm**	**6pm-10pm**	**Total**
Alaska	0.5%	0.7%	0.9%	0.5%	9.9%
American	1.3%	1.6%	1.3%	0.3%	17.9%
Continental	0.7%	0.2%	0.3%	0.1%	5.9%
Delta	0.9%	1.0%	0.6%	0.2%	10.3%
Frontier	0.2%	0.2%	0.2%	0.2%	3.1%
Northwest	0.2%	0.2%	0.2%	0.0%	2.1%
Southwest	1.5%	2.1%	2.0%	1.7%	28.7%
United	1.2%	0.7%	0.4%	0.3%	11.7%
US Airways	0.9%	0.8%	0.3%	0.6%	10.2%
Total	**7.4%**	**7.5%**	**6.2%**	**3.8%**	**100.0%**

Sources: *Official Airline Guide*; Landrum & Brown analysis

Survey Weighting

A weighting and expansion process was used to adjust the sample to be population-proportional and to expand it to be reflective of the total number of passenger trips made. Survey data was weighted to reflect the known proportions of scheduled departing seats, and actual counts of departing passenger surveys obtained from JWA for the survey period.

Geo-coding

A key objective was to determine the start location of air passengers before they began their trip to the airport. This facilitated visual mapping of travel patterns and concentrations of air passengers within the Orange County area. Survey respondents provided their origin zip code if known. To the

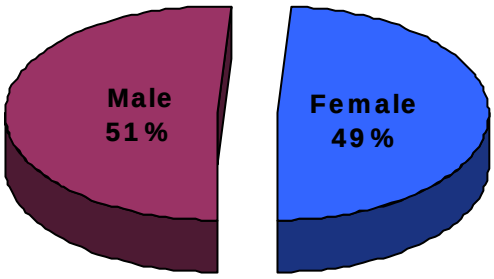
extent that passengers were not familiar with their location of origin, data was derived from city, hotel, street address, and cross streets, which permitted staff to identify the specific zip code.

3.1 Passenger Demographics and Residency

The JWA passenger base is relatively high income with over half of passengers reporting household income of more than $100,000.

Demographic characteristics collected for JWA passengers include gender, age, income and residency. As shown in **Exhibit 3-1**, passengers are almost evenly divided between men and women, 51 percent to 49 percent respectively.

EXHIBIT 3-1
DEMOGRAPHIC CHARACTERISTICS



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

Almost half of JWA passengers (48 percent) are between the ages of 35 and 54. The median age range is 45-54 years. When asked to report their income, JWA passengers most frequently cited an annual household income of $100,000-$125,000, with at least 15 percent of all passengers reporting earnings within that range (see **Table 3-2**). Household income for the JWA passenger market is well above the State median of $57,000 and the U.S. national median of nearly $50,000.[4] Over 51 percent of the total surveyed reported earnings of more than $100,000 per year. The fact that the JWA passenger market is wealthier than the broader population is an important finding as there is typically an inverse relationship between income levels and the desire to use public transit.

[4] State and U.S. medians based on data published in the U.S. Census, 2006 American Community Survey.

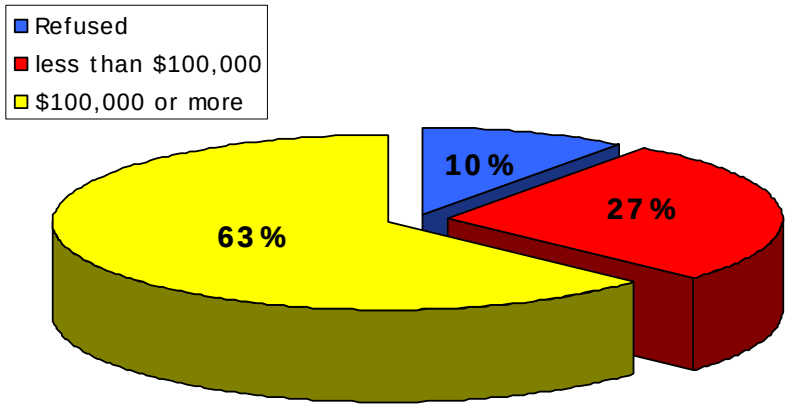
TABLE 3-2
DISTRIBUTION OF AIR PASSENGER HOUSEHOLD INCOME

	Business	Leisure	Total
Under $50,000	5%	14%	10%
$50,000 - 74,999	10%	17%	14%
$75,000 - 99,999	12%	14%	13%
$100,000 - 124,999	17%	14%	15%
$125,000 - 149,999	12%	7%	9%
$150,000 - 174,999	10%	6%	8%
$175,000 - 199,999	6%	3%	4%
$200,000 and over	18%	13%	15%
Refused	10%	13%	12%

Sources: 2008 Air Passenger Survey, Landrum & Brown analysis.

The business base at JWA has particularly high household income levels (see **Exhibit 3-2**). Approximately 63 percent of business travelers reported earning over $100,000 annually and 18 percent reported earning over $200,000 annually.

EXHIBIT 3-2
HOUSEHOLD INCOME - BUSINESS TRAVELERS



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis.

By comparison, the reported passenger income results during the 2006 Passenger Survey at Los Angeles International Airport (LAX) showed only 29 percent of the total passenger market earning more than $100,000 annually. The higher income level at JWA may indicate an opportunity for premium-level airport transit service, and also warrants a more in-depth analysis of the potential to attract a public-private partnership to develop an airport express transit model.

Passengers were found to arrive 1 hour and 45 minutes prior to departure, with visitors typically arriving 20 minutes earlier than residents. The average party size is two passengers, but nearly two-thirds of business passengers travel alone. Business travelers generally make shorter trips than leisure travelers, averaging four days versus 7-8 days for leisure travelers.

A quarter of the passengers do not check bags. Data on baggage is important to an airport transit model. In order to maximize ridership, the service design typically includes a number of air passenger amenities. Very often, a remote satellite terminal is offered in locations that have a high concentration of air passengers, such as a central downtown area. Amenities such as remote ticketing and baggage check-in are often offered, so obtaining data on the number of checked bags is important.

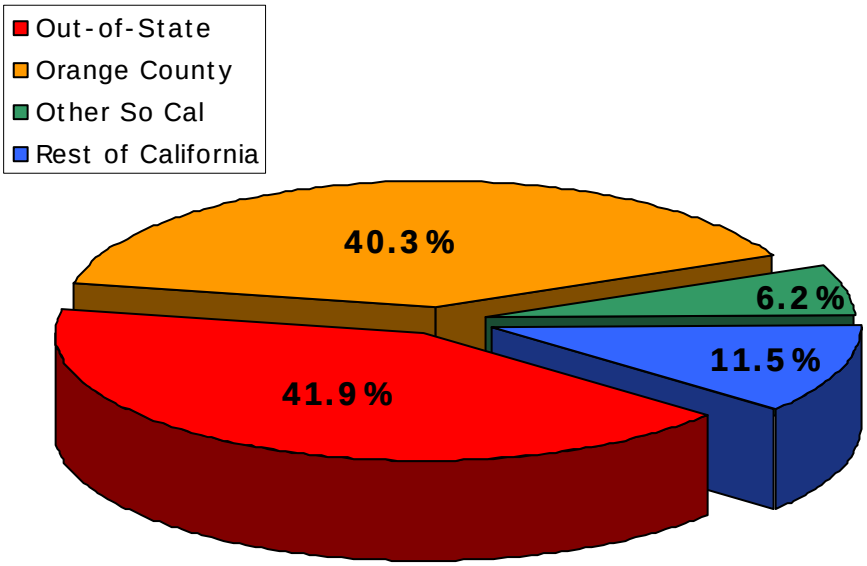
3.2 Residents and Visitors

Over 46% of JWA passengers are residents.

Departing passengers were asked to indicate their home city and zip code (see **Exhibit 3-3**). Those living in the Southern California counties of Orange, Los Angeles, San Bernardino, Riverside, and San Diego were considered residents. All others were classified as visitors. Of the total surveyed, 46.5 percent of JWA passengers were residents. Over 40 percent were residents of Orange County while the additional 6 percent of residents lived in neighboring counties. A little over half (almost 54 percent) of JWA passengers were visitors to the area. Since the survey was done during peak summer travel months, the larger visitor market is not surprising. An air passenger survey conducted during winter months would produce a slightly different mix of visitor and resident passengers. Of the visitors, 11.5 percent were from central or northern California, illustrating the demand for short-haul flights within California.

The survey showed that 40% of air passengers were from Orange County alone, with another 6% from bordering counties.

EXHIBIT 3-3
PASSENGERS' PRIMARY RESIDENCE



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

JWA draws a three percent of its passengers from Los Angeles County residents, and one-third of these were from the City of Long Beach (see **Table 3-3**). Residents of Riverside and San Bernardino Counties made up 2.5 percent of the total. Many of these passengers reported they used JWA because Ontario International Airport did not serve their particular destination. Less than one percent originated from San Diego County.

Los Angeles County accounts for the highest percentage of local resident air passengers outside Orange County.

TABLE 3-3
RESIDENT NON ORANGE COUNTY AIR PASSENGERS

County	City	% Share
LOS ANGELES		3.0%
	Long Beach	1.0%
	Los Angeles	0.3%
	Lakewood	0.2%
RIVERSIDE		1.8%
	Corona	0.5%
	Murrieta	0.3%
	Riverside	0.3%
SAN BERNARDINO		0.7%
SAN DIEGO		0.7%
VENTURA		0.0%
TOTAL		**6.2%**

Sources: 2008 Air Passenger Survey, Landrum & Brown analysis.

3.3 Trip Purpose

To permit a more detailed analysis, trip purpose was divided into five categories:

- Business: Includes trips for business only
- Conference/Convention: Includes attendance specifically for professional/business conferences and conventions
- Vacation/Pleasure trip: Includes only those passengers who state they were traveling on vacation
- Visiting Friends/Relatives: Includes leisure travelers that were specifically meeting family and/or friends
- Other: Includes travel for school, military, health, or other personal business

These categories help to better gauge and predict air passenger decision-making and choices for airport ground access modes. In general, the purpose of a trip will affect how sensitive a traveler is to costs, time constraints, and convenience. A business traveler will typically be less cost-sensitive since the passenger's employer or client is paying the trip expense, and will be more willing to pay a premium price for convenience and reliability.

Business travelers put a premium on time and convenience while leisure travelers are typically more price sensitive.

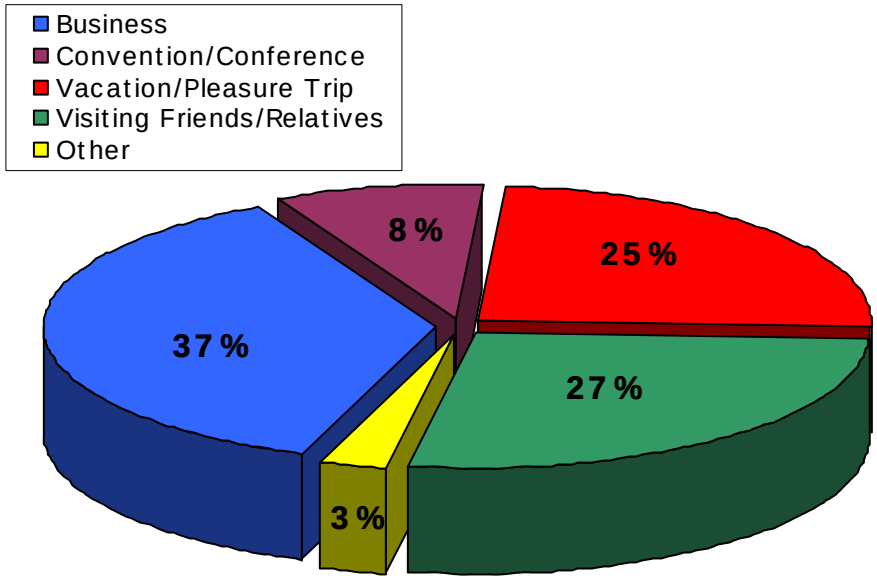
Business travelers often have less flexibility in flight plans as most of their out-of-town meetings are already scheduled, so missing a flight because of traffic congestion is for them a more serious concern. Leisure travelers will be more motivated by cost-savings and economy service, with speed and convenience being lesser concerns. Leisure travelers normally take longer trips and travel in bigger parties, and since the individual traveler personally pays for leisure travel, they are more likely to be price sensitive.

Leisure travelers were also segregated into a sub-group known as passengers visiting family or friends. This group is driven by different motivations that significantly affect the airport access mode these travelers use. Whether grandparents are visiting grandchildren or college roommates are reconnecting, there is a personal and emotional component when these air passengers travel to visit friends or relatives. In general, these passengers

are picked up and dropped off at the airport by their hosts and are less likely to consider public transportation as a real alternative.

During the peak summer travel months, leisure passengers made up 55 percent of the total market (see **Exhibit 3-4**). Over half of leisure travelers (27 percent) were visiting family and friends. Approximately 45 percent of air passengers were traveling for business, of which eight percent were attending professional conferences or conventions.

EXHIBIT 3-4
PASSENGER TRIP PURPOSE



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

3.4 Origins of JWA Passengers

To better understand the county-wide geographic distribution and concentration density of the JWA market, passengers were asked a series of questions regarding their location prior to coming to the airport.

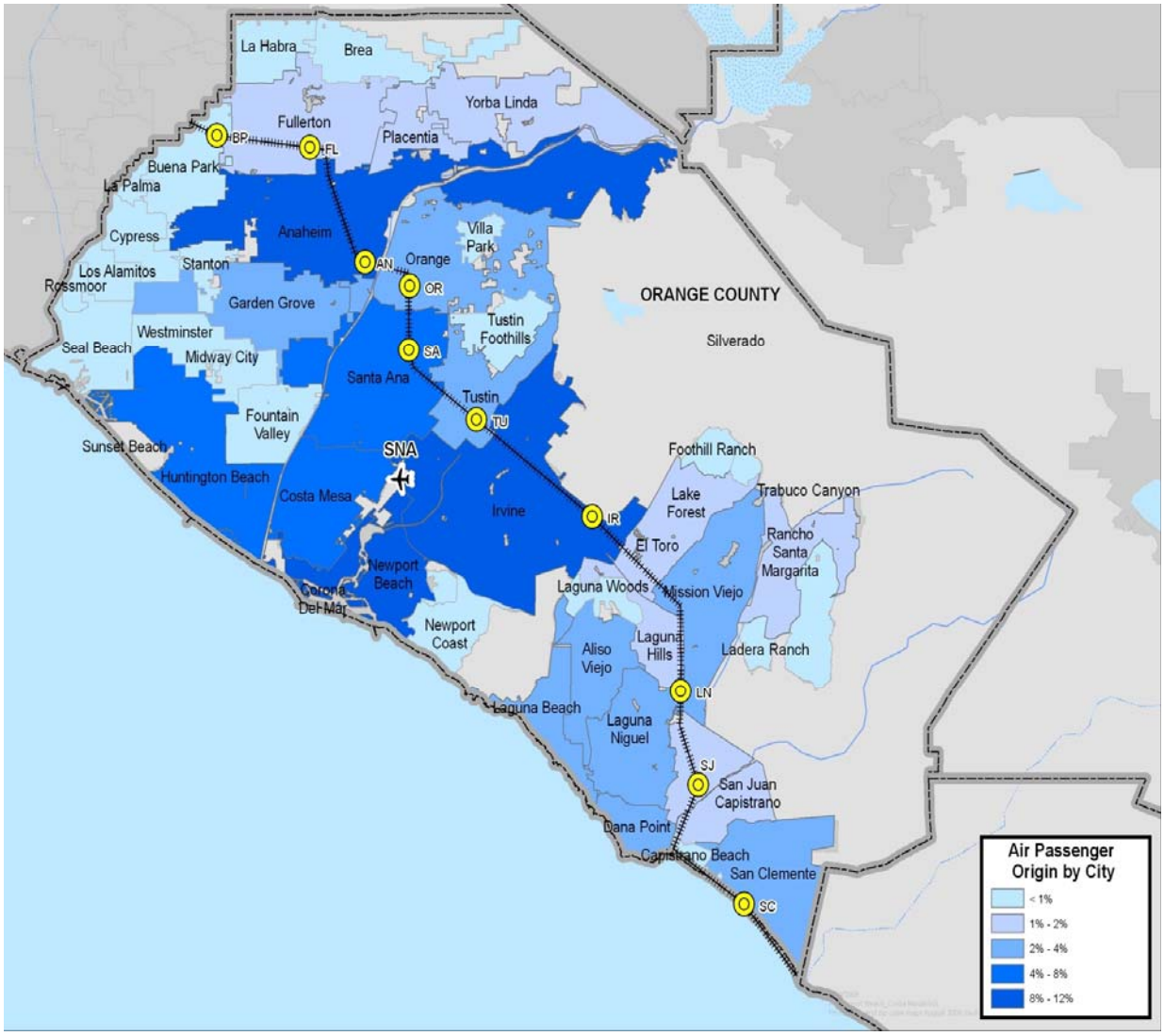
To attract riders, a successful airport transit service must align well with the travel patterns and preferred origin locations of airport passengers. A dense passenger concentration may provide the environment necessary for adequate ridership that is essential for the financial success of a new transit service.

The cities of Anaheim, Irvine, Newport Beach, Costa Mesa, Huntington Beach, and Santa Ana are key trip origin points for JWA passengers.

Passenger origins were first mapped by City. There are 34 incorporated cities in Orange County, as well as larger unincorporated areas such as Sunset Beach, Ladera Ranch, Midway City, and Rossmoor. When mapped by city, air passengers were distributed over a fairly broad area.

However, when passenger origins were mapped to zip code levels, passenger density became very localized and focused in select areas as illustrated in **Exhibit 3-5**. For example, the entire City of Anaheim produces 15.5 percent of total JWA air passengers, but the Anaheim zip code that hosts the Disneyland Resort captures 75 percent of Anaheim air passengers.

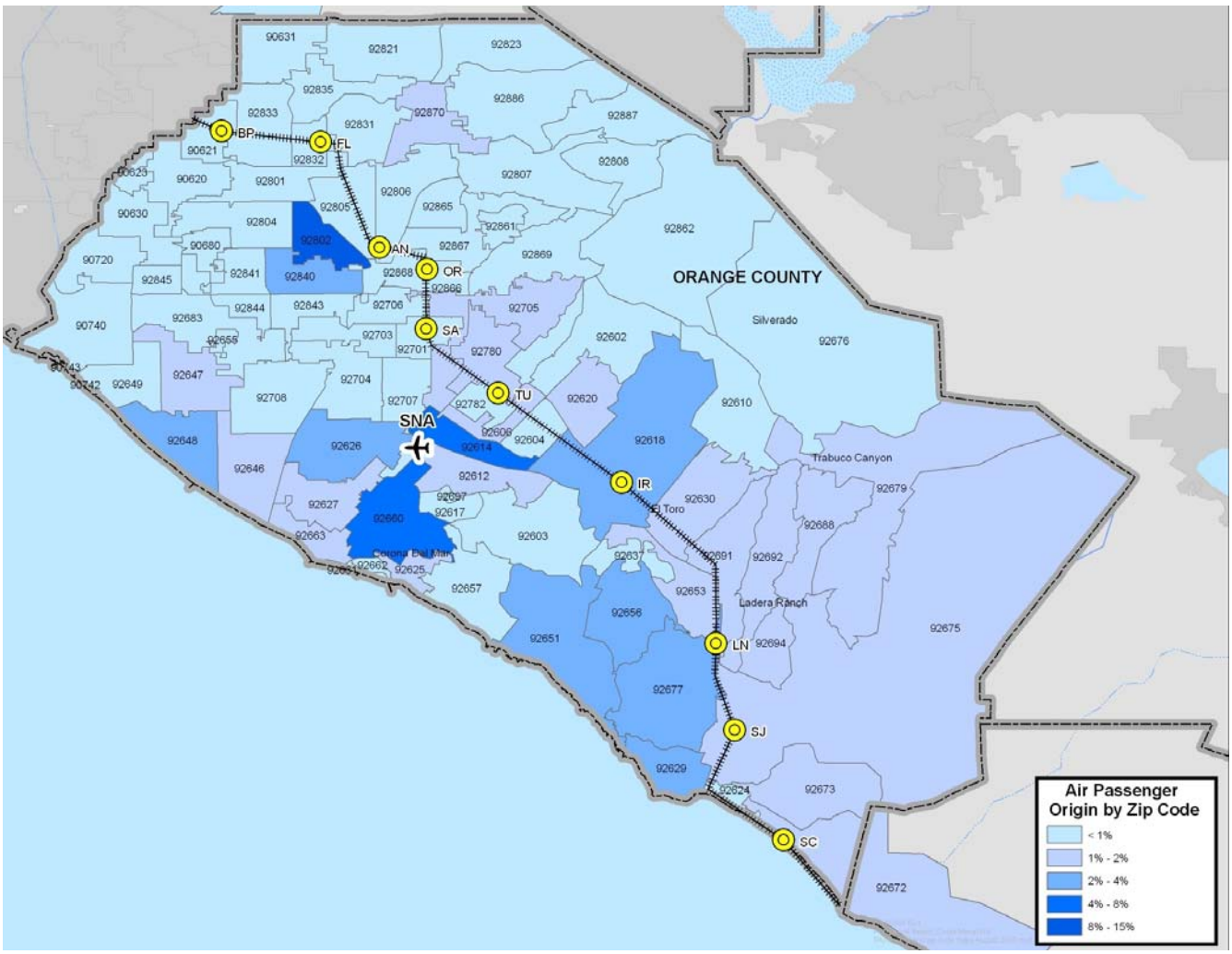
EXHIBIT 3-5
AIR PASSENGER TRIP ORIGIN BY CITY



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

Zip codes with the heaviest concentration of air passengers fall into three distinct geographic regions as illustrated on **Exhibit 3-6**.

EXHIBIT 3-6
AIR PASSENGER TRIP ORIGIN BY ZIP CODE



Sources: 2008 Air Passenger Survey; Landrum & Brown analysis

Nearly 43% of air passengers live in or visit three key market clusters.

The Disney Resort area, the South Coast Metro area, and South Orange County capture almost 43 percent of air travelers, or over four million air passengers annually (see **Table 3-4**). The three areas are better detailed and defined in Chapter 4.

TABLE 3-4
AIR PASSENGER CLUSTERS

CITY	ZIP CODE	% OF PASSENGERS BY ZIP CODE	% OF TOTAL JWA PASSENGERS
Disney Resort Area			14%
Anaheim	92802	11.7%	
Garden Grove	92840	2.2%	
John Wayne Airport/ South Coast Metro			14%
Irvine	92614	4.1%	
Newport Beach	92660	5.9%	
Costa Mesa	92626	3.9%	
South Orange County			14%
Dana Point	92629	2.8%	
San Juan Capistrano	92675	2.0%	
Laguna Niguel	92677	2.4%	
Aliso Viejo	92656	2.2%	
Irvine	92618	2.4%	
Laguna Beach	92651	2.3%	

Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

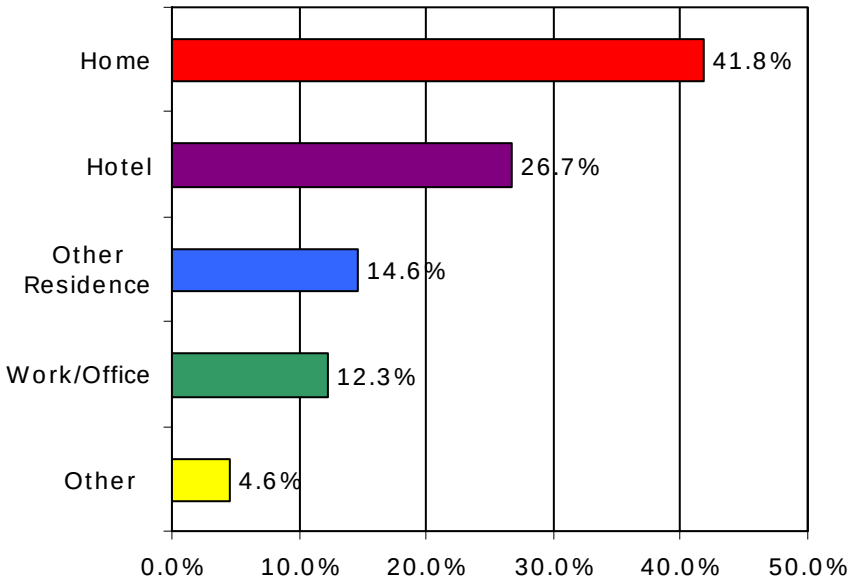
3.5 Airport Access and Traffic Congestion

Ground traffic generated by air travel can have a significant impact on both traffic congestion and air quality. Airport host communities with good ground access will have fewer quality of life impacts. For example, when Frankfurt International Airport connected metro and high speed rail to the airport, passengers accessing the airport by private vehicle dropped by eight percent with a corresponding increase in the rail mode share into the airport. Modal decisions for airport ground access are influenced by the location the air passenger begins their trip to the airport, the actual travel time to the airport, and the variety of modal choices available to the traveler.

More than 85% of residents begin their trip to JWA from home.

More than half of all JWA passengers (56.4 percent) came either from home or another residence (see **Exhibit 3-7**). Furthermore, over 85 percent of residents, both business and leisure travel, began their trip to JWA from home. This may be due to California's west coast location, since traveling eastward means arriving in later time zones, which causes residents to depart earlier in the day when they are more likely to be at home.

EXHIBIT 3-7
PLACE OF AIR PASSENGER TRIP ORIGIN



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

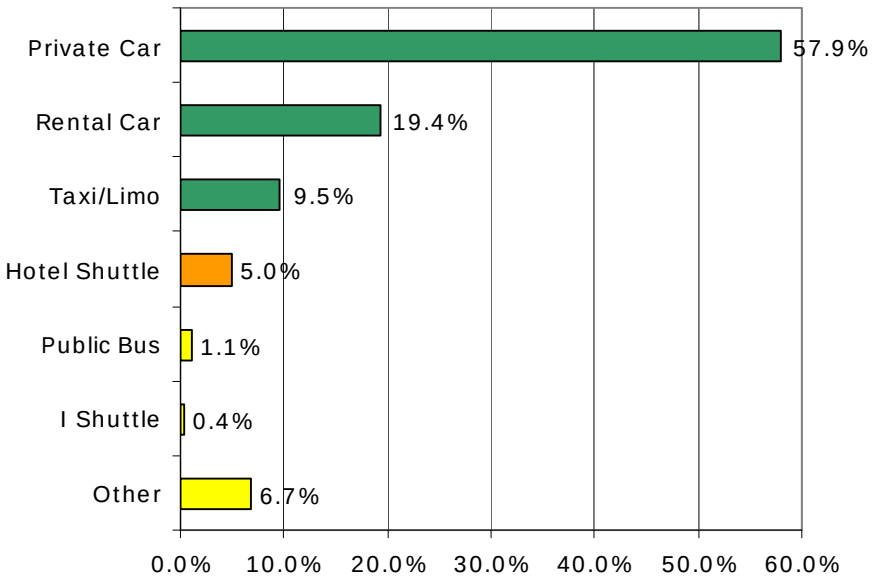
During the summer of 2008, one-third of scheduled airline departures at JWA occurred before 10:30 a.m. Over a quarter of all passengers traveled to JWA from a hotel, which represents half of all visitor travel to JWA. Despite a very robust business market at JWA, only 12 percent of passengers actually travel from work to JWA.

More than three quarters of air passengers arrive at JWA in cars.

Exhibit 3-8 shows the breakdown of how air passengers accessed JWA. By far, the private vehicle is the most common form of ground transportation. More than seven percent of passengers arrive by car – almost 58 percent in privately-owned cars and 19.4 percent in rental cars.

Private cars are the primary mode of ground access to JWA, followed by rental car, and taxi/limo services. Use of public transit is currently limited.

EXHIBIT 3-8
GROUND TRANSPORTATION MODE TO JWA



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

Table 3-5 compares the mode of access for residents and visitors. Eighty-five percent of residents travel to JWA in private automobiles. Over 51 percent are driven to the airport by someone else and dropped off at the airport curb, and 35 percent park at the airport. This is a critical variable driving both traffic congestion and air quality because it means that JWA passengers who are dropped off generate four total vehicle trips, rather than the expected two vehicle trips generated by round trip travel by a passenger that either parks, hires a rental car, or takes for hire transportation such as a taxi. In total, 40 percent of JWA passengers, both residents and visitors, are dropped off at the airport.

Residents are more likely than visitors to use a private vehicle to get to the airport (85 percent compared to 38 percent of visitors). Understandably, visitors are much more likely than residents to take a rental car to the airport (32 percent). A higher percentage of resident business travelers (35 percent) use airport parking lots than resident leisure travelers (seven percent).

TABLE 3-5
AIRPORT ACCESS MODE

Transportation Mode	Total	By Residence		By Trip Purpose	
		Resident	Visitor	Business	Leisure
Private Car	57%	85%	38%	46%	66%
Dropped Off	40%	51%	32%	24%	53%
Parked on Airport Lot	15%	29%	5%	20%	10%
Parked off Airport	3%	6%	2%	2%	4%
Rental Car	19%	0%	32%	26%	14%
Hotel Shuttle	5%	0%	8%	7%	3%
Taxi/Limo	10%	10%	9%	11%	8%
Other	8%	4%	11%	9%	8%

Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

57% of passengers that park at JWA are business travelers.

Passengers using airport lots typically have higher income levels than non-parkers and are less sensitive to cost. This is partially a function of shorter trips for business travelers (usually three-four nights), and the parking expense is paid for by the passenger's employer. Passengers that park are predominantly business travelers (57 percent).

An analysis of the JWA data shows an inverse relationship between income level and the likelihood of substituting mass transit for 'drive-and-park'. Off-airport parkers are more likely to be diverted to public transit than on-airport parkers, but given the survey results, the consultant team believes that only a relatively small portion of passengers (0 – 10 percent) using airport parking may choose to substitute for public transit.

As mentioned earlier, leisure travelers visiting family and friends are more likely to be dropped off, and the survey results support that premise - 65 percent of passengers visiting friends and family were dropped off at the airport in a private vehicle.

3.6 Travel Time from Local Origin to JWA

Travel time to the airport is one of the key choice factors when evaluating ground transportation options.

JWA's central location within Orange County produces relatively short travel times to the airport, which may in part drive the relatively high passenger drop-off rate. One of the main variables of airport transit mode choice is the "door-to-door" travel time from the initial passenger origin. Door-to-door travel time is comprised of three components:

- ***Access time to the main mode of travel to the airport*:** Access time for a passenger's own vehicle is zero since it is on-site already. Access time for public transit to the airport is a function of the travel time to the station and the time waiting for the rail service
- ***Time spent, or in-vehicle time, on the main mode of travel to the airport*:** This includes time spent changing transit modes, such as disembarking rail service and catching a shuttle bus to the airport. If the passenger is driving a private vehicle, there will be no change in mode and in-vehicle time will be less
- ***Egress time between airport drop-off station to the terminal ticketing/check-in area*:** This time is influenced by the air passenger drop-off location and how long it takes to get from that location to airport ticketing or security check-in. Passengers dropped off at the airport terminal curb will have the shortest egress time

The events of September 11, 2001 and the subsequent airport security measures have also influenced air passengers' travel time considerations since there is always a concern whether security check-in will take longer than anticipated.

To get more specific data for travel times, JWA passengers were asked the following series of questions:

What time did you start your trip to the airport today?
[RECORD TIME BELOW]
_____ : _____ [ ] a.m. [ ] p.m.

At what time did you arrive at this airport today?
[RECORD TIME BELOW]
_____ : _____ [ ] a.m. [ ] p.m.

Did you come straight to the airport, or did you stop somewhere along the way?
[ ] Straight – go to question 3 [ ] Stopped [CHECK ONE]

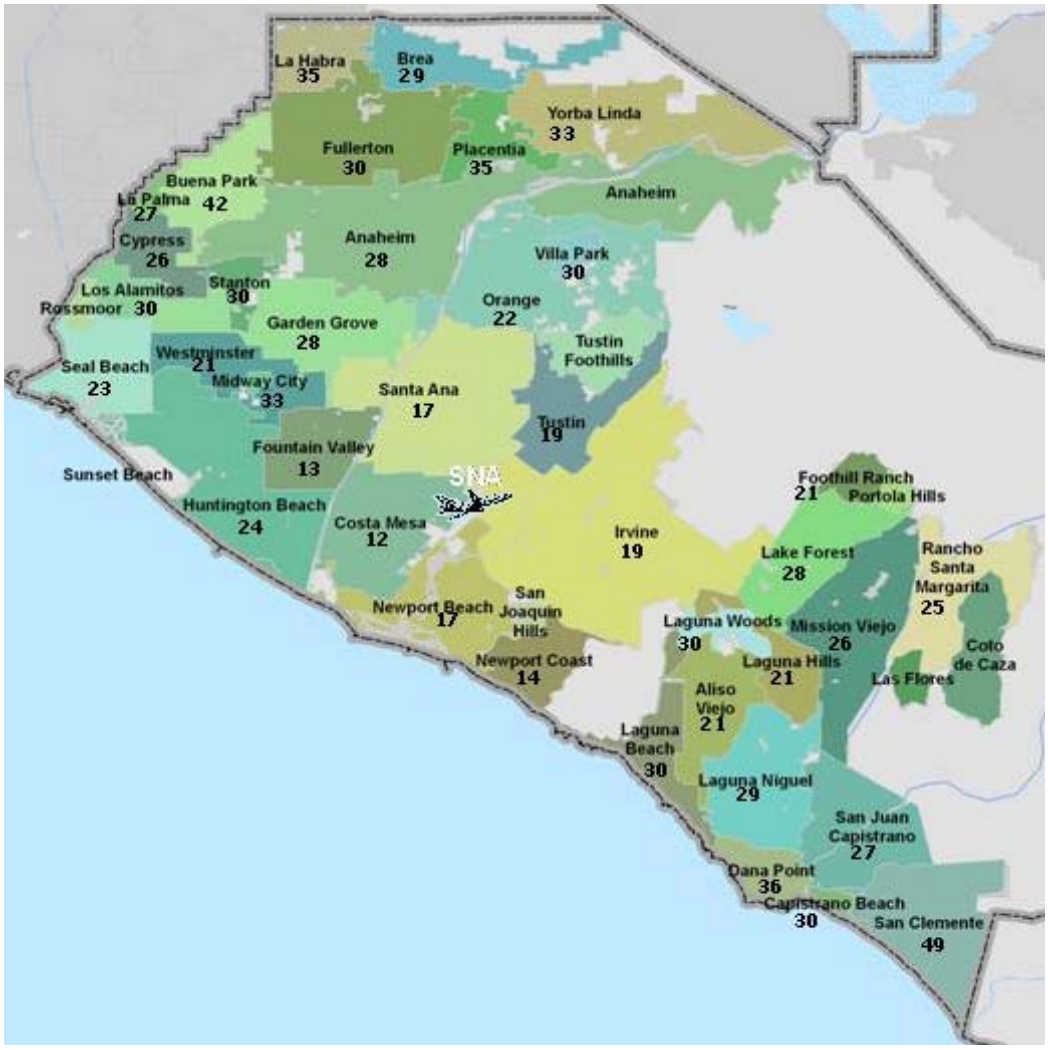
About how many minutes were you doing something other than traveling?
# of minutes _____

These questions elicited more accurate responses regarding access travel time, rather than simply asking "How long did it take to drive to the airport today?"

Within Orange County the average commute time to JWA was 25 minutes.

Exhibit 3-9 shows the resulting average commute times. The overall average passenger travel time, which includes passengers traveling from areas outside of Orange County, was 34 minutes. For passengers originating travel within Orange County, average travel time to JWA was 25 minutes.

EXHIBIT 3-9
REPORTED PASSENGER COMMUTE TIMES
(IN MINUTES)



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis.

According to passengers, average travel times from key cities in Orange County are:

- Anaheim=28 minutes
- Irvine=19 minutes
- Newport Beach=17 minutes
- Costa Mesa=12 minutes
- Huntington Beach=24 minutes
- Santa Ana=17 minutes

There was very little difference in the average time during peak versus non-peak travel times. The consultant team believes this is partially due to the high passenger drop-off rate. Dropping someone at the airport means there is more than one passenger in the vehicle and they can use High Occupancy Vehicle (HOV) lanes throughout the county. Another factor in the south Orange County area is access to toll roads, which don't currently experience traffic congestion, even during peak travel times.

As shown in **Table 3-6**, most cities are within 15 to 20 miles of JWA.

TABLE 3-6
AVERAGE TRAVEL TIMES

Region	City	One Way Mileage	Driving Time (min)
North	Buena Park	19	22 - 35
Northwest	Seal Beach	17	18 - 25
	Westminster	12	13 - 18
West	Huntington Beach	11	15 - 20
Central	Anaheim	14	15 - 30
	Fullerton	18	19 - 35
South	San Clemente	28	28 - 45
	Laguna Niguel	21	21 - 39

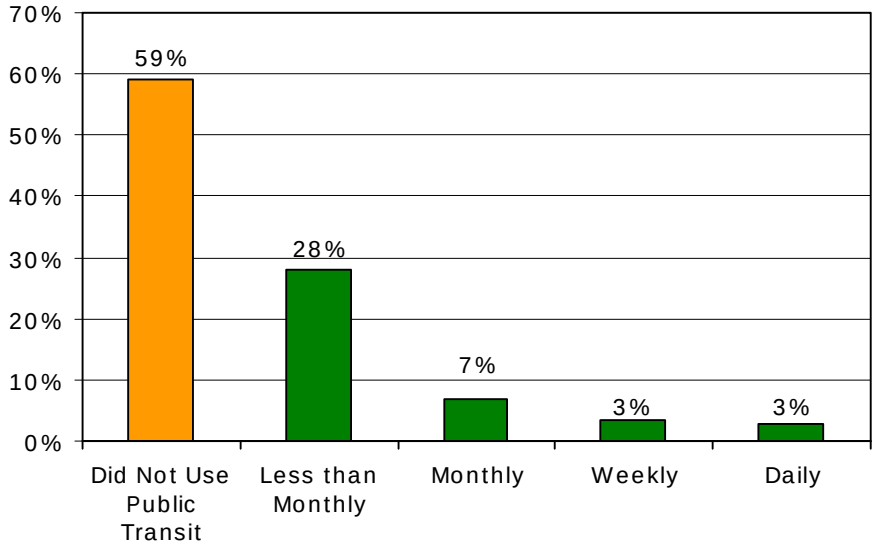
Source: 2008 Air Passenger Survey, Google Maps

3.7 Public Transit Perceptions and Use

40% of passengers surveyed had used public transportation in the last year, with 13% using it regularly.

JWA passengers were asked about their use of public transportation and their general perceptions about service levels and types of mass transit (see **Exhibit 3-10**). Forty percent of JWA passengers had used some form of public transportation in the past year. Almost 15 percent of those surveyed used public transit at least once a month, with a higher proportion of business versus leisure travelers using mass transit in the past year.

EXHIBIT 3-10
USE OF PUBLIC TRANSPORTATION IN THE PAST YEAR



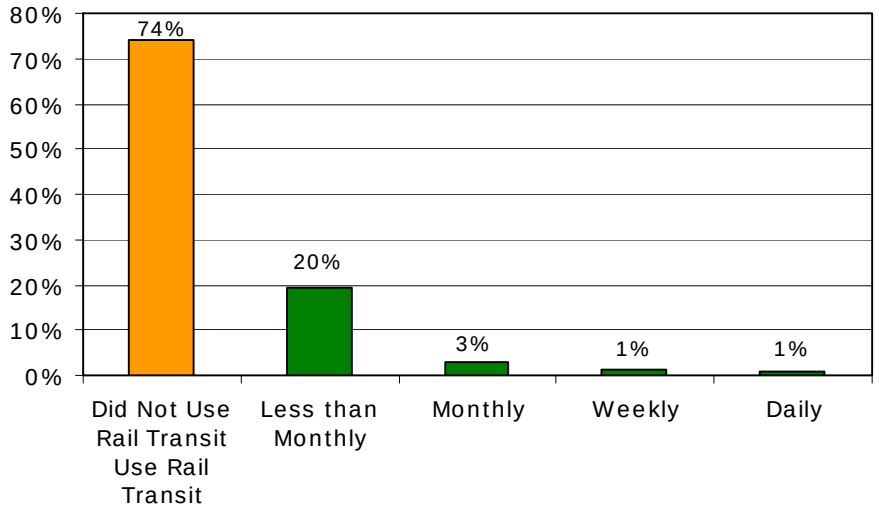
Sources: 2008 Air Passenger Survey; Landrum & Brown analysis

When asked specifically about rail transit, JWA passengers were less familiar with rail than public transit in general, and only five percent of the passengers surveyed used rail at least once a month (see **Exhibit 3-11**).

In general, JWA passenger perception of rail is good. Rail is perceived as a safe mode of public transportation, but there is a perception that switching modes is undesirable (switching from rail to shuttle bus, for example) and that rail travel is too slow.

Only one quarter of those surveyed had used Rail Transit in the last year, and only 5% had used it regularly.

EXHIBIT 3-11
USE OF RAIL TRANSPORTATION IN THE PAST YEAR



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

3.8 Modal Choices – Cost versus Trip Time

Passengers were asked if faced with equal trip time and the same cost for a private vehicle versus rail service to the airport, which would they choose (Scenario 3 in **Table 3-7**). Two thirds said they would take their private vehicle.

TABLE 3-7
HYPOTHETICAL MODAL CHOICE MATRIX

Group	Trip Choices	Scenario 1	Scenario 2	Scenario 3
Overall	Car	51.3%	47.5%	65.2%
	Train	48.7%	52.5%	34.8%
Business	Car	55.4%	51.6%	63.0%
	Train	44.6%	48.4%	37.0%
Leisure	Car	47.9%	44.0%	67.1%
	Train	52.1%	56.0%	32.9%

Note: Scenario 1, compares Car at 40 min and $10 to Train at 60 min and $2
Note: Scenario 2, compares Car at 40 min and $10 to Train at 50 min and $5
Note: Scenario 3, compares Car at 40 min and $10 to Train at 40 min and $10

Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

Passengers were also asked to evaluate a situation where the car trip time stayed at 40 minutes and $10, versus a scenario where the same trip via transit was extended to 60 minutes but the cost

lowered to $2 (Scenario 1), versus a scenario where the transit time was extended to 50 minutes but at a cost of $5 (Scenario 2).

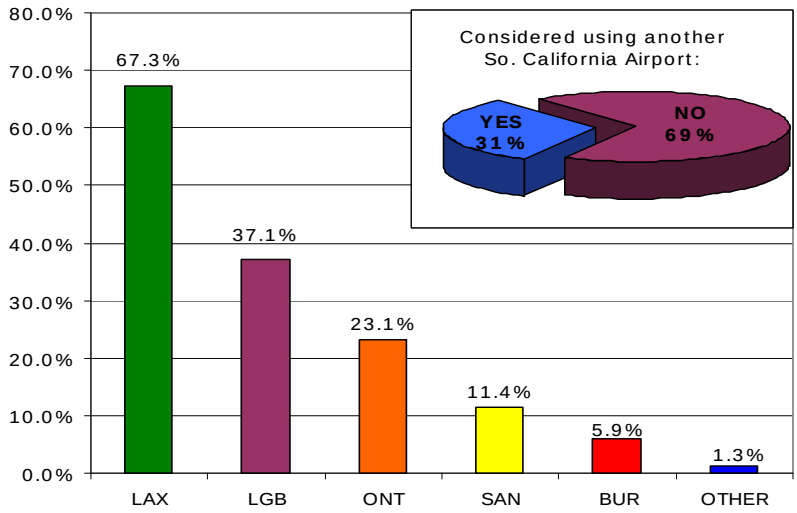
Both scenarios where transit was cheaper than the car increased hypothetical transit adoption rates. The more notable finding was that the transit adoption rate was higher under the higher-cost/lower transit time Scenario 2 versus Scenario 1. The results of these questions give more support to the opinion that air travelers place greater priority on convenience and time than on cost savings, especially when the costs are small in comparison to the airfare. Additionally, leisure travelers seem to be the most likely group to substitute public transit for a private vehicle.

3.9 Airport Choice Factors and Alternate Airports

Almost a third of passengers considered flying into another So Cal airport, primarily LAX.

Of JWA passengers surveyed, 31 percent considered using an airport other than John Wayne (see **Exhibit 3-12**). LAX is the primary airport considered as an alternative to JWA.

EXHIBIT 3-12
ALTERNATE AIRPORT CONSIDERED

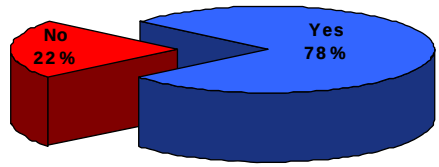


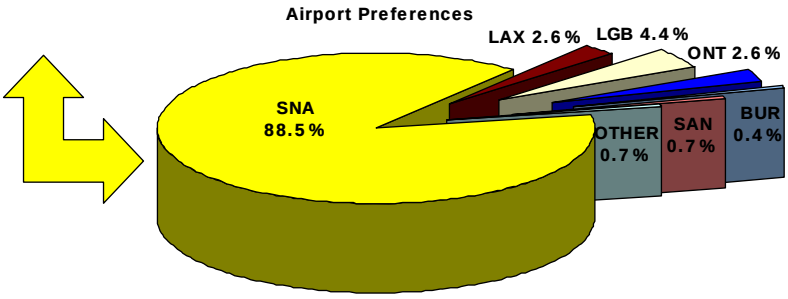
Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

Over three quarters of passengers stated an airport preference when traveling from or to Orange County. Of those, almost 90 percent stated a preference for using JWA over other Southern California airports (**see Exhibit 3-13**).

Nearly 90% of passengers stating an airport preference chose JWA over other So. Cal airports.

EXHIBIT 3-13
AIRPORT PREFERENCES





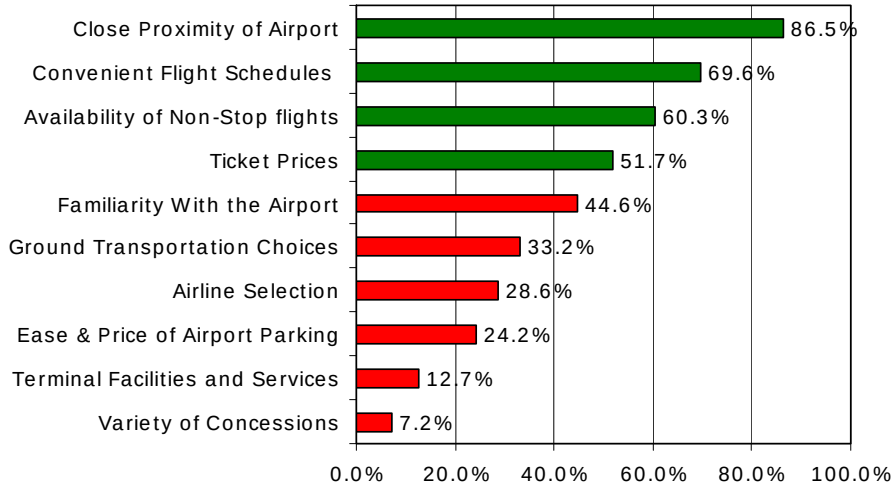
Sources: 2008 Air Passenger Survey, Landrum & Brown analysis.

Passengers were asked what factors influenced their decision to travel from JWA. Passengers generally choose to travel from a given airport based on four key factors: (1) frequency of air service, (2) markets served, (3) airfares, and (4) location of local trip origin to the airport. These factors were also the most highly ranked by JWA passengers. Notably, the close proximity of passenger origin to JWA was cited as the most important factor (**see Exhibit 3-14**).

However, there are factors that can drive airport regionalization in Southern California. Assuming the air service variables of frequency, market, and price are all equal; passengers will choose the closest airport. In order for passengers to choose to fly from an airport that requires longer travel time, a trade off must occur whereby the extended ground transportation time is compensated either through lower price or better air service.

Consistent with other airport surveys, price was <u>not</u> the most influential choice factor. Convenience, through proximity and airline schedules, topped the list.

EXHIBIT 3-14
FACTORS INFLUENCING PASSENGERS CHOOSING JWA



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis.

JWA passengers were asked what factors would influence their decision to fly from either Ontario or San Bernardino airports (shown on **Exhibit 3-15**). It is nearly 46 miles to the Ontario Airport and almost 60 miles to San Bernardino Airport from JWA.

Based on survey responses, price was the primary determinant in modifying airport choice (**see Exhibit 3-16**). It is important to note that mass transit services, particularly rapid transit services, have the potential to facilitate regionalization by reducing access trip travel times.

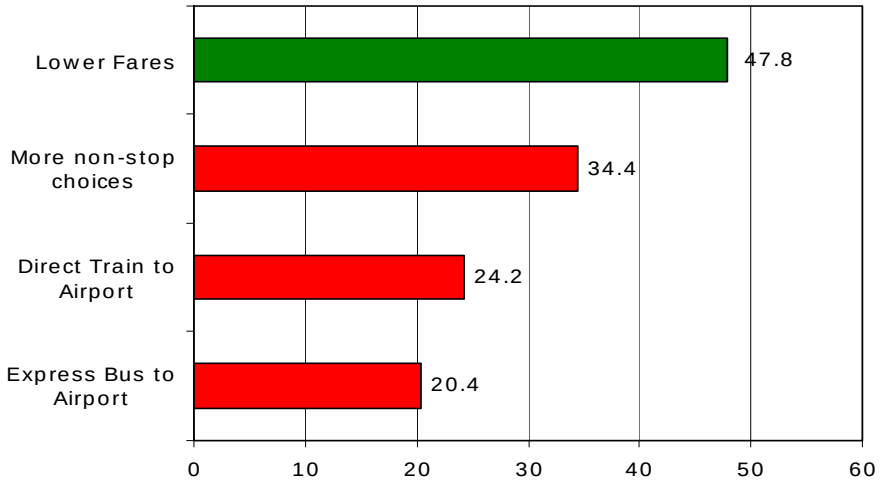
However, regionalization cannot occur without attractive air service and fares that cause a shift in demand. Airfares are also one component of the overall cost of a passenger's overall door-to-door trip and there are other cost incentives that may encourage passengers to travel to a more distant airport (such as discounted parking).

EXHIBIT 3-15
ALTERNATE AIRPORTS

Sources: Google Maps

EXHIBIT 3-16
WHAT WOULD INFLUENCE YOUR DECISION TO FLY FROM EITHER ONTARIO OR SAN BERARDINO AIRPORTS?

Lower fares are a key driver in passenger decisions to travel further to a neighboring airport.



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

Chapter 4 – Air Passenger Concentrations

Three dense market clusters account for over 42% of air passengers from JWA.

When JWA passenger origins were mapped by zip code, three areas of dense passenger concentration became evident:

- Anaheim-Garden Grove Disney Resort
- John Wayne Airport – South Coast Metro
- South Orange County

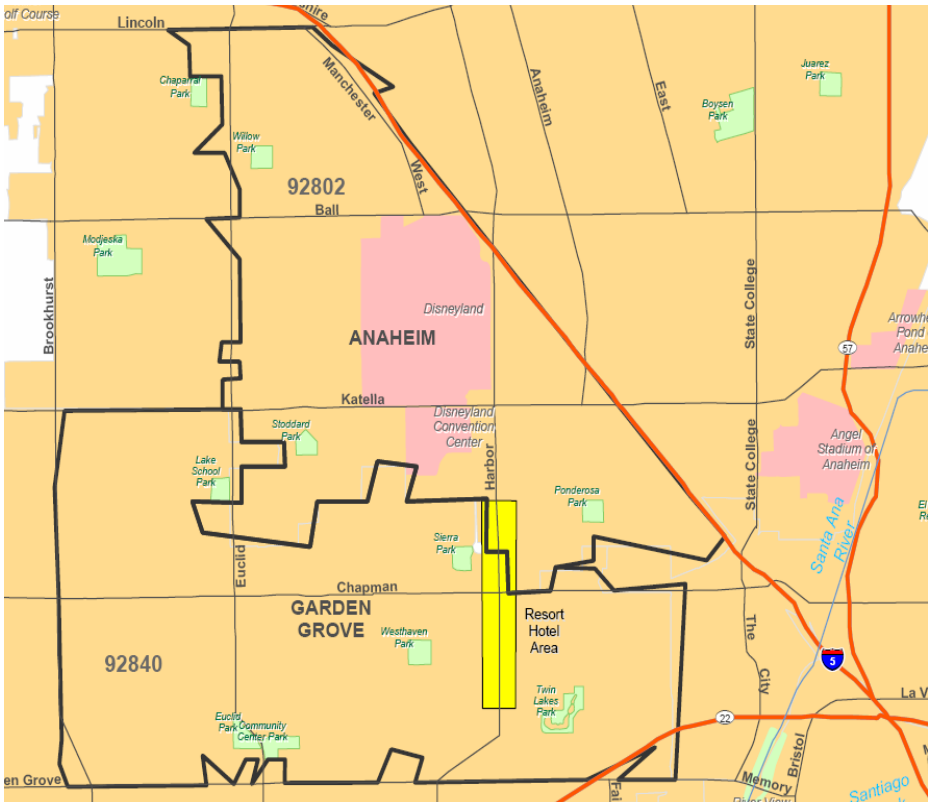
Each of these areas attracts over a million air passengers per year, and collectively they account for over 42 percent of all JWA air passengers. Different market sub-segments drive the dense concentrations in each area. The Anaheim-Garden Grove Resort area draws almost exclusively visitors who are either on vacation or attending a convention.

The JWA - South Coast Metro area draws more visitors, with business travels outnumbering leisure travelers. Residents make up the majority of JWA passengers from South Orange County, with the exception of Laguna Beach, which has a large tourism base. Because of the varying market demographics and the different factors that motivate specific passenger sub-segments, each area presents unique opportunities to introduce successful airport public transit service.

4.1 Anaheim – Garden Grove Disney Resort

The Anaheim – Garden Grove Disney Resort area is shown on **Exhibit 4-1**. Anaheim (zip code 92802) hosts the Anaheim Disney Resort. Garden Grove (zip code 92840) is immediately adjacent to the Disney attractions. During peak summer travel season, the Anaheim – Garden Grove Resort area attracts almost 14 percent of total JWA air travelers. These passengers are almost exclusively visitors (95 percent).

EXHIBIT 4-1
ANAHEIM – GARDEN GROVE DISNEY RESORT MAP



Source: Peggy Ducey & Associates

The majority of air passenger visitors to Anaheim and Garden Grove are either vacationers or convention goers.

The Anaheim Disney Resort is a 1,078-acre international vacation destination that includes the Disneyland Theme Parks, Downtown Disney, other entertainment venues, as well as numerous hotels and motels. The Anaheim Convention Center, also located here, hosted more than a million visitors last year attending professional/business conferences and conventions. The vast majority of air passenger visitors to the Anaheim – Garden Grove Resort area are either leisure travelers on vacation (39 percent) or business travelers attending a conference or convention (38 percent).

The City of Garden Grove (92840) had the foresight to develop a number of large hotels close to the Disney tourist attractions. The 92840 zip code hosts the Hilton Garden Inn, the Crown Plaza Resort, the Embassy Suites, and the Sheraton Hotel, all of which are located within three miles of Disneyland. Garden Grove had a more diverse mix of air travelers, with convention

travelers comprising 30 percent, vacation travelers 27 percent, business travelers 29 percent, and passengers visiting friends and family accounting for 14 percent.

The Anaheim Resort Transit transports over 3 million passengers per year between hotels and Disneyland.

Vacation and convention travelers rely heavily on resort and hotel services. The Disney Resort has its own area transit service. Begun in May 2002, Anaheim Resort Transit (ART) takes visitors and employees throughout the Anaheim and Garden Grove resort area, as well as the Crystal Cathedral, the Block of Orange Entertainment Center, Angel Stadium, and the Anaheim Metrolink Station. Anaheim Transportation Network, a non-profit agency, manages the ART system and retains Coach USA as the system operator. Once ART was established, local hotels/motels no longer needed to operate their own shuttle service into Disneyland, thereby relieving considerable vehicle congestion. ART transports three million passengers annually between 52 local hotels and the Disneyland Resort entertainment complex.

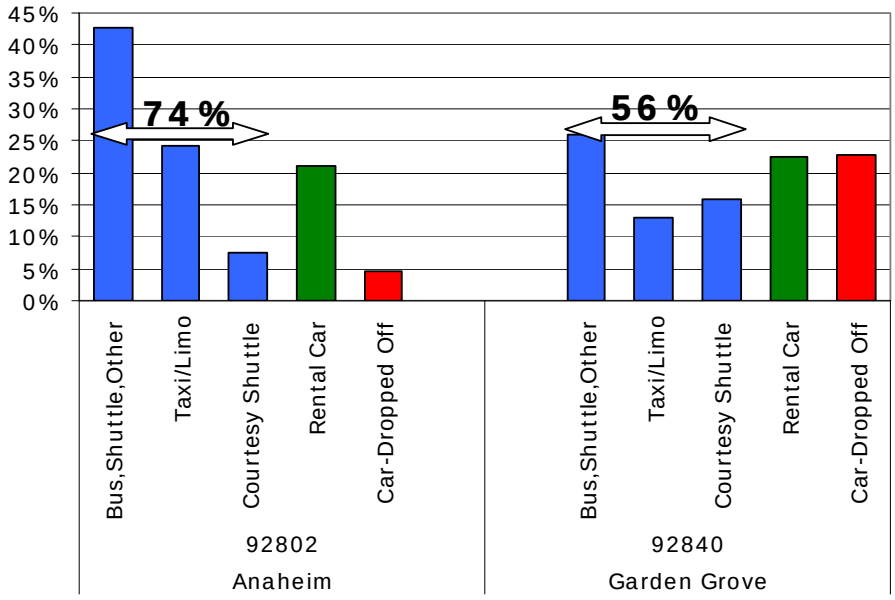
Because of ART's extensive transit system within the resort area and to other destinations, the majority of JWA travelers to this area do not rent private vehicles. Only about 22 percent of the passengers surveyed rented cars. To travel to/from JWA, the overwhelming majority of passengers from Anaheim (74 percent) and Garden Grove (56 percent) use taxi, limousine, bus, or shuttle services (see **Exhibit 4-2**). This indicates a fairly large group of air passengers that are not only willing to consider transit services, but are already using bus and shuttle services to access JWA.

Almost 43 percent of passengers chose private shuttle service, such as Super Shuttle, or to a much lesser extent, the Disney Express Bus operated by Gray Line. Both services pick up airport passengers at their hotels and drop them curbside at the airport terminal. There is no mode change and the direct door-to-door service means passengers will arrive at JWA airport with very little confusion. As of today, air passengers are more often using smaller private shuttles into JWA, rather than higher occupancy express bus service. This may be a function of cost, since the Disney Express Bus is $5 more per person than the

The target markets for the Anaheim/Garden Grove Disney Resort Area are visitors on vacation or attending a convention.

private shuttle services. Passengers using these transit modes may be more amenable to higher-occupancy transit services if priced right with convenient service offerings.

EXHIBIT 4-2
GROUND TRANSPORTATION MODE BY ZIP CODE



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

Table 4-1 summarizes the costs of the transit services between Anaheim and JWA.

TABLE 4-1
TRANSIT SERVICE BETWEEN ANAHEIM AND JWA

Transit Mode	Approximate rates to & from Anaheim
Private Shuttle- Prime Time, Super Shuttle	$10 per person/one way
Disneyland Express Bus	$15 per person/one way, $13 per child ages 3-11
Taxi	$35 per car/van load/one way, rates are metered
Limousine Service	$95 per group/one way

Sources: John Wayne Airport, Gray Line, Super Shuttle

For this area of dense passenger concentration, the target market is visitors either on vacation or attending a business convention. Both market segments are less likely to rent a car, and opt for the ART system for travel within the Resort. This means almost 650,000 passengers per year are using a third-party airport

transit service. High occupancy express bus or larger shuttles could be successful if the route passes through the resort hotel developments and if the cost is kept to under $10 per person.

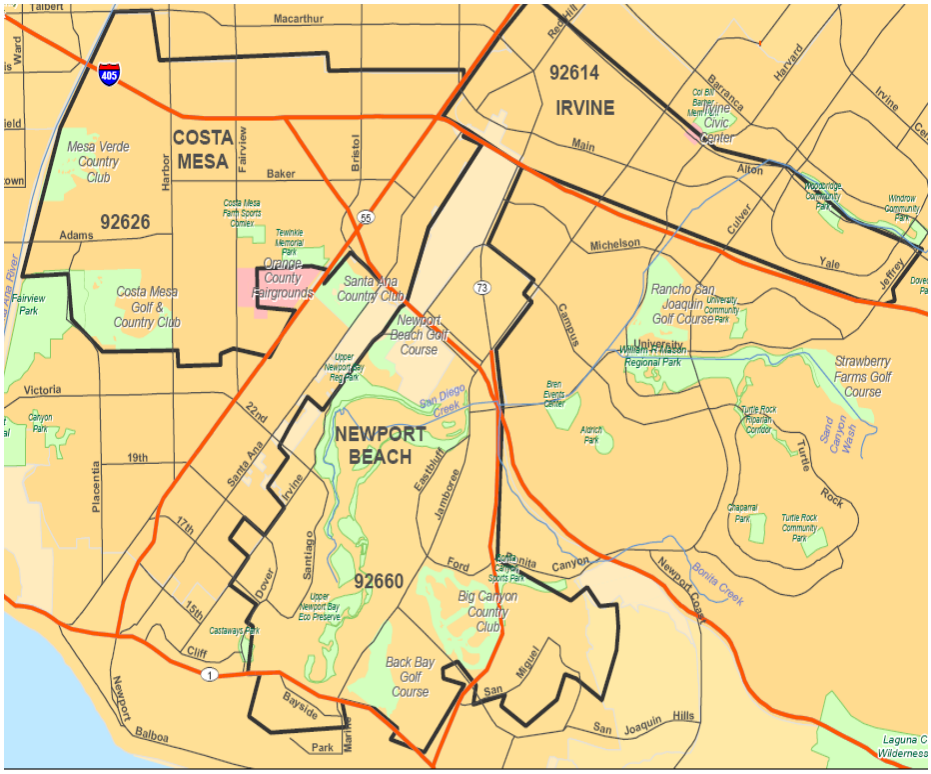
4.2 JWA /South Coast Metro

Over 35 hotels and vibrant business districts surround the airport in the three zip codes making up the JWA/ South Coast Metro Area.

The JWA/South Coast Metro area (see **Exhibit 4-3**) includes the three zip codes immediately surrounding JWA:

- Newport Beach - 92660
- Costa Mesa - 92626
- Irvine – 92614

EXHIBIT 4-3
JOHN WAYNE AIRPORT/SOUTH COAST METRO MAP

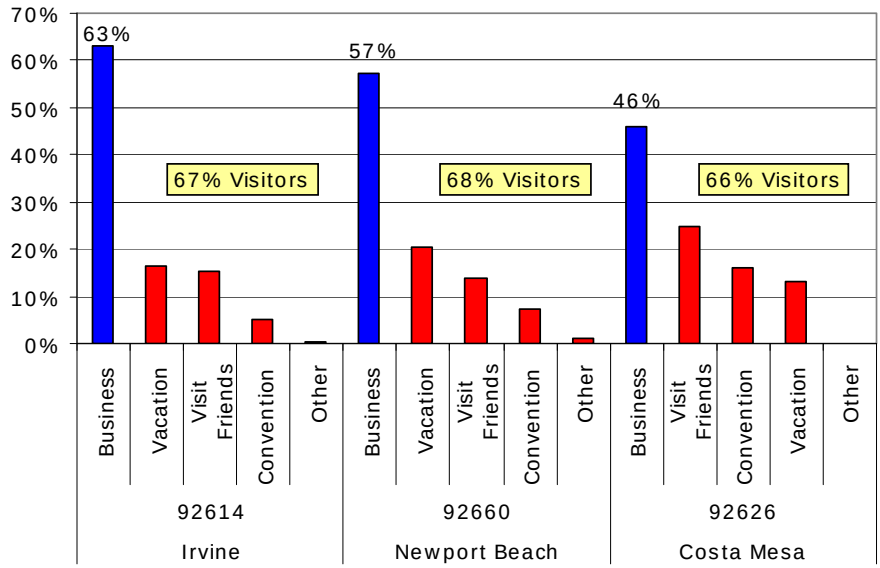


Source: Peggy Ducey & Associates

These zip codes attract 14.1 percent of JWA passengers during peak travel season, equating to about 1.3 million air passengers per year. All three zip codes have a similar visitor-resident distribution- two-thirds are visitors and one-third are residents. Business is the predominant reason for air travel, ranging from 46 to 63 percent within the respective zip codes (see **Exhibit 4-4**).

It is not unusual for air passengers to remain in the immediate airport region. For these three zip codes in particular, there are over 35 hotels and a number of vibrant business and activity centers that attract both business and leisure travelers.

EXHIBIT 4-4
TRIP PURPOSE BY ZIP CODE



Sources: 2008 Air Passenger Survey, Landrum & Brown analysis.

The JWA/ South Coast Metro area is a mix of dense commerce, business and residential areas.

Newport Beach (zip code 92660) hosts a number of large hotels both near the airport and closer to the beach. Major hotels include the Marriott at Fashion Island, the Hyatt Newporter, and the Island Hotel (formerly the Four Seasons). Newport's main business center is located at Newport Center, and surrounds Fashion Island shopping center.

Costa Mesa (zip code 92626) hosts South Coast Metro, which is the area around Bristol Street and Sunflower Avenue. South Coast Metro is a mix of land uses including high density residential apartments, the Orange County Performing Arts Center, several high and mid-rise office buildings, movie theaters, restaurants, and South Coast Plaza (a regional shopping center that attracts 24 million visitors annually). There are a number of major hotels along Bristol Boulevard that cater to both business and leisure travelers.

Irvine (zip code 92614) hosts the Irvine Business Complex (IBC), a 2,800-acre mixed-use development that currently has over 6,000 businesses employing over 80,000 people. There are also currently over 4,000 dwelling units in the IBC, with more residential development expected in the future. There are eight major hotels with 2,500 rooms located within a half mile of JWA, and 25 hotels within a five-mile radius.

Approximately 81% of residents in this area access the airport by private car, and 70% are dropped off.

As mentioned earlier, one-third of JWA passengers from these three zip codes are residents. In general, 81 percent access the airport by private vehicle. Approximately 30 percent park at the airport and 70 percent are dropped off. While this is a large percentage of drop-off passengers, changing airport access choice to public transport for residents living in these zip codes would be extremely difficult. Most of these air travelers live within five miles of the airport, and the travel time and convenience differential between using a private vehicle and public transit would be so extreme that it is unlikely these local resident travelers would be amenable to other airport access modes. Vehicle trips associated with these resident travelers could potentially be halved by encouraging them to park their vehicles at the airport. In order to increase airport transit use for these zip codes, the focus needs to be on visitors to these zip codes, not residents.

Visitors make up about two-thirds of air passengers from these three zip codes. Of those, 72 percent are traveling for business purposes. Most are traveling simply for true business calls and meetings, while a small percentage (10 percent) are traveling for professional/business conferences. Of the three zip codes, Costa Mesa caters to more visiting convention travelers at 22 percent, as compared to 10 percent for Newport Beach and only two percent for Irvine.

The vast majority of visitors, whether traveling for business or leisure, are staying at local hotels. Of these visitors, about 51 percent get to/from JWA by taxi/limo or courtesy hotel shuttle, while another 39 percent rent cars (see **Table 4-2**). When tracking airport access mode for all survey passengers in the complete mix of passenger segments, the largest proportion

(40 percent) are dropped off at the airport. Rental car passengers are the second highest airport transportation mode, followed by hotel shuttles.

TABLE 4-2
SOUTH COAST METRO HOTEL PASSENGERS – TRANSPORTATION MODE

City	Car-Dropped Off	Rental Car	Hotel Shuttles	Taxi/Limo	Other
Irvine	8%	35%	39%	14%	4%
Costa Mesa	5%	41%	47%	7%	0%
Newport Beach	8%	40%	37%	14%	0%

Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

All of the major hotels in the area have shuttle services and all but one are free to guests.

When the consultant team analyzed the airport transit mode for visiting passengers only, the transit mode mix shifts. Between 35 to 43 percent rent cars, and a large proportion (17 to 28 percent) are dropped off, which is probably reflective of leisure travelers visiting family and friends. Those visitors using hotel courtesy shuttles, taxis, and limos account for 29 to 39 percent of all visiting passengers. About two-thirds of these visitors are originating at one of the local hotels. **Table 4-3** lists the seventeen largest hotels near JWA.

TABLE 4-3
LARGE HOTELS IN JWA/SOUTH COAST METRO AREA

Hotels	Shuttle	Hours of Operation	Cost
COSTA MESA (92626)			
Hilton Orange County/Costa Mesa	yes	every half hour	comp
Holiday Inn Costa Mesa- Orange County Airport	yes	on request	comp
Residence Inn Costa Mesa Newport Beach	yes	on request	comp
The Westin South Coast Plaza	yes	on request	comp
Wyndham Hotel Orange County	yes	on request	comp
NEWPORT BEACH (92660)			
Newport Beach Marriott Hotel & Spa	yes	every half hour	comp
Fairmont Newport Beach	yes	on request	comp
Hyatt Regency Newport Beach	yes	every hour	comp
Island Hotel Newport Beach	yes	on request	$20
Marriott - Newport Beach	yes	every hour	comp
IRVINE (92614)			
Atrium Hotel	yes	on request	comp
Courtyard by Marriott - Irvine Hotel	yes	every half hour	comp
Crowne Plaza - Orange County	yes	every half hour	comp
Embassy Suites Irvine	yes	every half hour	comp
Hyatt Regency Irvine	yes	every half hour	comp
Marriott - Irvine	yes	every half hour	comp
Residence Inn John Wayne Airport	yes	on request	comp

Sources: Individual Hotel Information

All of these large hotels offer airport shuttle service. Half of them route their shuttles through the airport every half hour, whether passengers are waiting or not. Since the purpose of this study is to evaluate ways to reduce traffic congestion and increase air quality, if one shuttle service could be coordinated for all the local hotels, it would significantly reduce vehicles trips.

Exhibit 4-5 shows a potential shuttle route, between three to five miles long, that would connect 15 hotels to the airport and consolidate individual shuttle services.

EXHIBIT 4-5
HOTEL ROUTE NEAR JWA

Sources: Google Maps

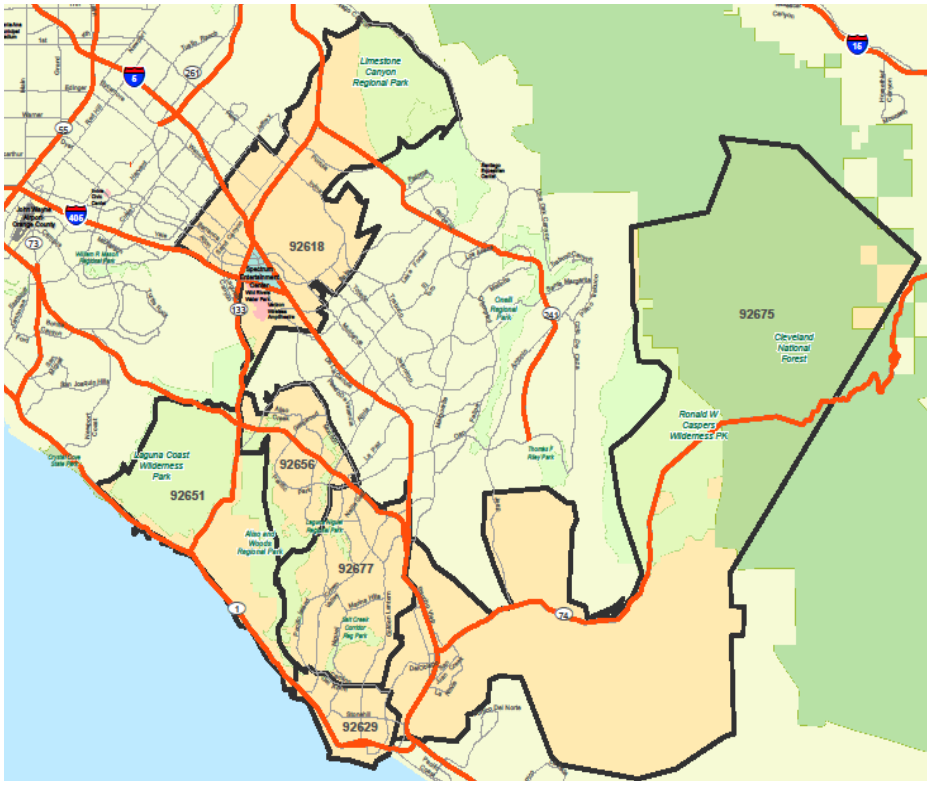
The South Orange County area is a mix of visitor heavy tourist spots as well as dense residential areas.

4.3 South Orange County

The South Orange County area (see **Exhibit 4-6**) includes six zip codes:

- Irvine - 92618
- Dana Point - 92629
- Laguna Beach - 92651
- Aliso Viejo - 92656
- San Juan Capistrano - 92675
- Laguna Niguel - 92677

EXHIBIT 4-6
SOUTH ORANGE COUNTY AREA MAP

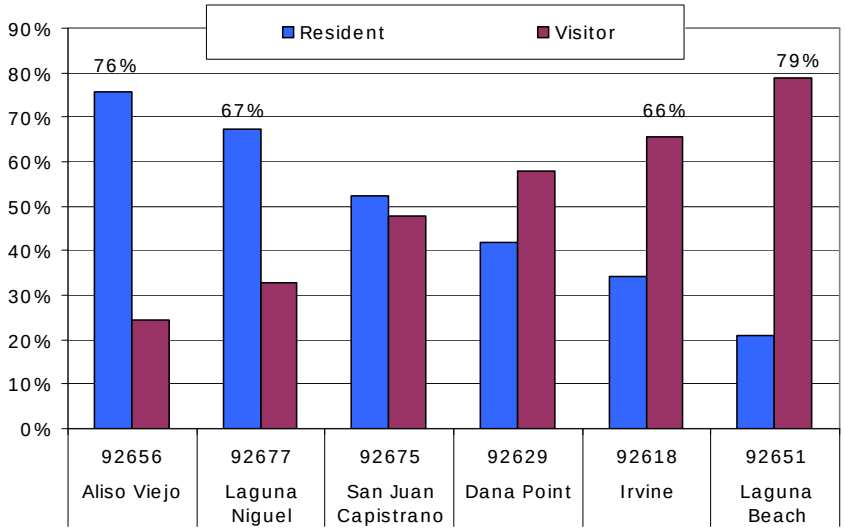


Sources: Peggy Ducey & Associates.

These zip codes attract 14.1 percent of JWA passengers during the peak travel season, equating to about 1.3 million air passengers per year. From the resident-visitor split we observe that this area has a broad split between the resident base in Aliso Viejo and the visitor base in Laguna Beach.

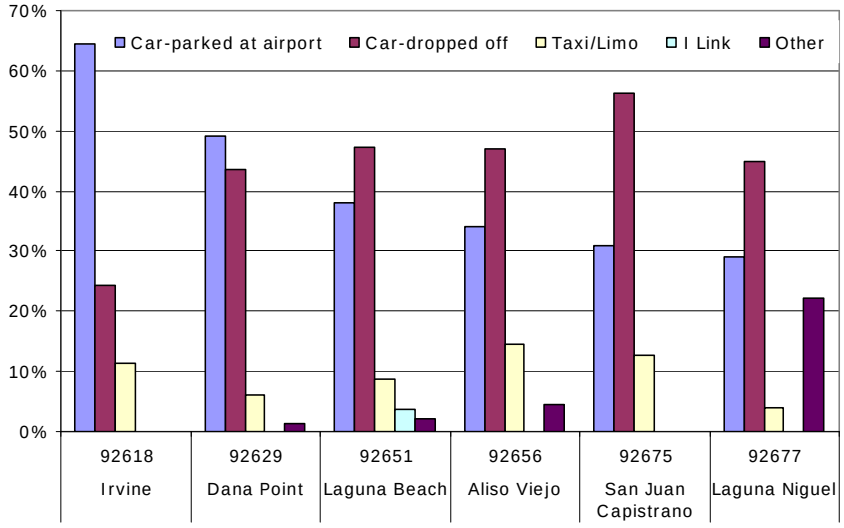
Airport access mode is reflective of the passenger mix for each zip code. Laguna Niguel, Aliso Viejo, and San Juan Capistrano have more residents than visitors, which is reflected in the high drop-off rate and cars parked at the airport (see **Exhibits 4-7** and **4-8**).

EXHIBIT 4-7
RESIDENT/VISITOR SPLIT BY ZIP CODE



Sources: 2008 Air Passenger Survey; Landrum & Brown analysis

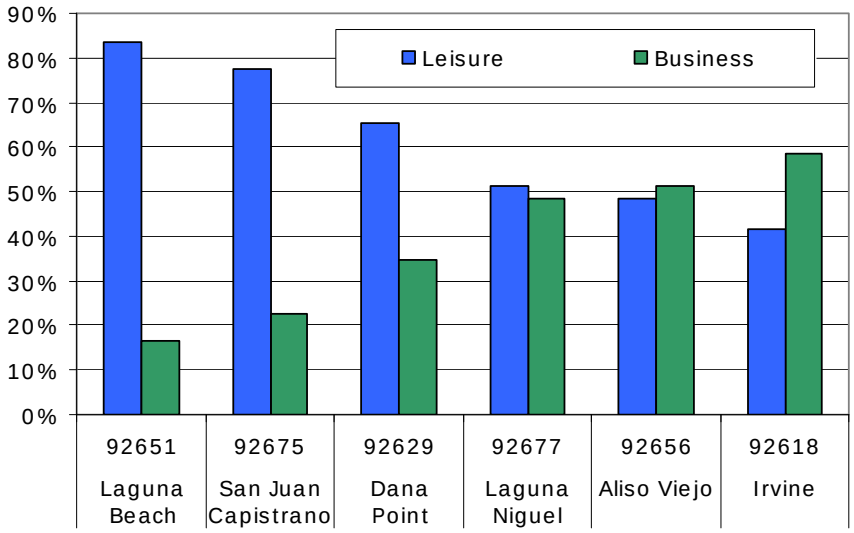
EXHIBIT 4-8
RESIDENTS-AIRPORT ACCESS MODE



Sources: 2008 Air Passenger Survey; Landrum & Brown analysis

The specific purpose of the trip varies significantly among these zip codes and does not support an area wide profile. The notable observations are a vacation traveler base of 67 percent in Laguna Beach, and a 45 to 58 percent business traveler base in the zip codes in Aliso Viejo, Laguna Niguel and Irvine as illustrated in **Exhibit 4-9**.

EXHIBIT 4-9
BUSINESS/LEISURE SPLIT BY ZIP CODE



Sources: 2008 Air Passenger Survey, Landrum & Brown Analysis

The target markets for this area are visiting vacationers and resident business travelers.

The mix of leisure versus business travelers also varies between zip codes. The coastal areas of Dana Point, Laguna Beach, and San Juan Capistrano have a much larger percentage of leisure travelers. These three zip codes have more resort and vacation hotels and advertise their communities as visitor destinations.

The target market for the South Orange County area is a mix of visiting vacationers to Laguna Beach, Dana Point and San Juan Capistrano, as well as resident business travelers from South Orange County zip codes.

Chapter 5 - Evaluation of Transit Options to John Wayne Airport (JWA)

Three transit link options will be discussed. A link to rail to/from JWA is already in place via the Tustin I Shuttle Bus service which started in June 2008.

OCTA asked that both the Irvine Business Complex shuttle service and the State College Boulevard/Bristol BRT service be considered as they relate to specifically addressing JWA air passenger and employee ground transit needs. Express bus and light rail service were also considered.

5.1 Bus Connection from Metrolink Station

The three Metrolink stations closest to the airport (Irvine, Tustin, and Santa Ana) were investigated as the terminus for a transit connection between Metrolink and JWA.

Irvine Metrolink Station: The Irvine station, located at 15215 Barranca Parkway, is accessible from Alton Parkway at the Santa Ana Freeway (I-5). It has an on-site restaurant, 630 parking spaces and is the second most heavily used station in Orange County. To meet the growing parking demand and anticipated future growth, Irvine and OCTA have constructed a new 1,500 space parking structure. Passenger amenities include public phones, bike racks, restrooms, a waiting room area, and a restaurant.

Tustin Metrolink Station: Located at 2975 Edinger Avenue, it is accessible from Jamboree Boulevard at the Santa Ana (I-5) Freeway. Built in 2002, the Tustin train station is one of the newest of Orange County's eleven train stations. The station currently has over 300 parking spaces and the city of Tustin is working with OCTA to design and construct an 800-space parking structure that would be completed by 2011.

Santa Ana Metrolink Station: Known as the Santa Ana Regional Transportation Center (SARTC), it is located at 1000 East Santa Ana Boulevard and accessible from Santa Ana Boulevard at the Santa Ana (I-5) Freeway. This station has an on-site café, 375 parking spaces, and is the third busiest in the county. This station also serves as a hub for the Orange County Transportation Authority bus system.

Hours of operation and frequency of service are critical for successful bus transit. (This is especially true for service to air passengers).

In comparing the three sites, they differ in two main areas: available parking and distance from JWA. Parking at Tustin and Irvine are fairly limited at this point but expansion is either in planning or under construction. While the shuttle service between a Metrolink station and JWA is not expected to attract parking patrons – the expectation being that airport-bound patrons will park at other Metrolink stations – in actuality there may be some air passengers who will drive to the Metrolink station with JWA shuttle service and then go to the airport. This will cut into parking spaces for local commuters using that station or overall availability.

As mentioned earlier, air passengers are more time sensitive than cost sensitive, so total travel time for any JWA transit service will be a critical factor. To test travel time, several driving trips were taken between each station and JWA in both peak and off-peak hours. The test travel was assumed to be "express service", so the routes did not include any intermediate stops. The routes selected are as follows:

1. **Irvine Station-to-JWA** - Route was Barranca Parkway to Laguna Freeway South to I-405 North. Exit at MacArthur Boulevard, then west to JWA.
2. **Tustin Station-to-JWA** - Edinger Avenue south to Jamboree Road, then north on Barranca Parkway to Von Karman Avenue west. Turn north on Michelson Drive into JWA.
3. **Santa Ana Station-to-JWA** - Take East Santa Ana Boulevard to I-5 South, then the Costa Mesa Freeway South to MacArthur Boulevard south to JWA.

The resulting point-to-point travel time averages are summarized in **Table 5-1**.

The Tustin Metrolink is the closest to John Wayne Airport.

TABLE 5-1
TRAVEL TIMES BETWEEN CANDIDATE STATIONS AND JWA

Station	Station-to-Airport (Miles)	Peak Travel (Minutes)	Off-Peak Travel (Minutes)
Irvine	9.3	22	15
Tustin	5.3	14	13
Santa Ana	7.7	22	15

Source: Peggy Ducey & Associates

The routes from both the Irvine and Santa Ana stations to JWA use freeways. These freeway connections make use of long connecting ramps at relatively high speeds so that even during rush hours their travel times are not more than 22 minutes. Surface streets were considered for the Santa Ana route, but in all cases streets were slower than the freeway route (I-5 to I-55 to MacArthur Blvd.). The Tustin route is the same one as the Irvine I Shuttle and uses only surface streets, but assumed to be point-to-point, with no intermediate stops. Tustin has the shortest mileage and shortest travel time, which equates to faster airport travel time, a key criteria for airport passengers.

There are two alternative transit connections between the local rail service and JWA: (1) Airport Shuttle Connecting to Local Rail Service and (2) the City of Irvine I Shuttle. Both are discussed below.

Airport Shuttle Connecting to Local Rail Service

The first airport transit service that was reviewed is airport shuttle service that connects to local rail service. An example of this type of service is in the Washington D.C. area for Dulles International Airport and Baltimore Airport. Metrorail is the region's rail system, providing access to downtown Washington, D.C. and other destinations. However, Metrorail does not extend into either airport, and air passengers can take express bus service from the closest rail stations into the airport.

While many U.S. airports have airport shuttle/rail transit service, in general this type of service does not produce high ridership. Reviewing ridership performance for eleven U.S. airports with express airport shuttle service to rail transit,

Boston-Logan Airport (5.7 percent) and Oakland Airport (4.1 percent) have the highest proportion of passengers using the express shuttle bus connections to rail access. At the other nine airports, one percent or fewer passengers use the airport shuttle to rail service. If the shuttle service is multi-stop rather than express, only San Francisco Airport (four percent) reports more than one percent of riders using the service.

The City of Irvine I Shuttle

In March 2008, the City of Irvine began operating the I Shuttle, a shuttle service for the IBC. The purpose of the I Shuttle is to enhance mobility in the IBC mixed-use development and to complement regional bus and rail service by directly connecting to the Tustin Metrolink Station. The service has three different routes.

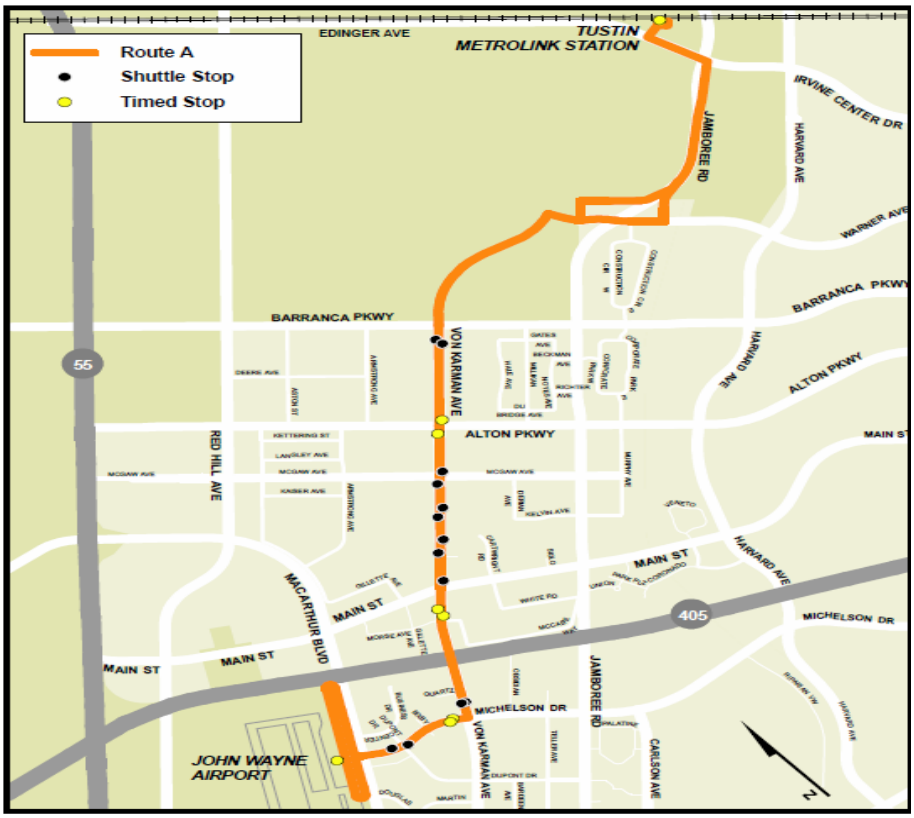
- **Route A** connects the Tustin Metrolink Station to JWA via Von Karman Avenue (see **Exhibit 5-1**).
- **Route B** connects the Tustin Metrolink Station to the heart of the IBC via Jamboree Road and Michelson Drive.
- **Route C** is a midday service in the busiest section of the IBC.

The Tustin I Shuttle takes about 20 minutes to make the trip between the airport and the station with 10 on-demand stops.

Airport passengers can access JWA by taking Metrolink rail service to the Tustin Metrolink station, then changing to the I Shuttle (Route A) that connects directly into JWA. The Shuttle service meets the morning and afternoon Metrolink train and provides 30-minute midday service. Weekday service starts at 5:30 a.m. and ends at 7:00 p.m. There is no weekend service. Shuttle Route A is 5.2 miles long and has 10 scheduled stops between the Tustin Metrolink Station and JWA. Total travel time is 20 minutes. The shuttles hold 20 passengers and serves both commuter passengers and air passengers. However, the shuttles are not specially designed to accommodate air passengers as there are no baggage areas on the shuttle.

With a shorter average time and a newly initiated shuttle service to JWA, the best choice in evaluating a JWA-Metrolink station connection is the Tustin Station. There are a number of service characteristics that are necessary for a successful bus and van transportation service to an airport. The consultant team evaluated these characteristics as related to the I Shuttle service.

EXHIBIT 5-1
MAP OF TUSTIN I SHUTTLE ROUTE



Source: Peggy Ducey & Associates

Both the hours of operation and frequency of service are critical success factors for bus transit. Early morning, late evening, and weekend service are important, as is frequency of service. A minimum of 30-minute headways is recommended. The I Shuttle hours of operation are not optimal for serving JWA passengers. The first shuttle leaves the Tustin station at 5:30 am arriving at JWA at 5:55 a.m. JWA's first morning flights begin boarding between 6:00 and 6:30 a.m., and are scheduled to leave the gate by 6:45 a.m., so passengers scheduled for the first departures would not be able to use the shuttle service.

In fact, given the time requirements for security check-in procedures, I Shuttle users would be limited to those flights departing after 7:30 a.m. The last I Shuttle service leaves JWA at 6:57 p.m., so passengers arriving after 6:30 p.m. cannot use the Shuttle services. Furthermore, the I Shuttle does not operate on weekends at all, so passengers departing or arriving on

Saturdays or Sundays would not have the option of using the shuttle service. The service frequency throughout the day is at the minimum necessary headways to attract passengers.

Air passengers are most concerned about travel time, and transferring between different transportation modes (e.g. transferring from rail to shuttle service) increases travel time to the airport. Missing a shuttle connection or time lost waiting for connecting service just increases total trip travel time. Because air passengers value reliable travel time, taking more than one mode of transit to the airport is less attractive than being picked up and dropped off directly.

Travel time is almost doubled when choosing rail /shuttle connecting service to the airport.

When using the I Shuttle to Metrolink, air passengers could make up to three modal changes- transit from residence or other origin to the closest Metrolink Station; travel on Metrolink to Tustin; and travel on I Shuttle to JWA. As shown in **Table 5-2,** travel time is almost doubled when using Metrolink and the I Shuttle, as compared to driving time. The I Shuttle drops air passengers on the lower level curbside immediately adjacent to the baggage claim area and escalators to the upper ticketing area, so this presents a more attractive service than drop offs at remote locations.

TABLE 5-2
TRAVEL TIME COMPARISON-RAIL WITH SHUTTLE BUS VERSUS CAR

City	One-Way Mileage	Train Departs	Train Arrives at Tustin	Transfer to I Shuttle	Arrive at JWA	Total Travel Time Minutes	Driving Time Minutes
San Clemente	28	7:02 AM	7:33 AM	7:33 AM	7:53 AM	51	28 - 45
Laguna Niguel	21	7:55 AM	8:10 AM	8:10 AM	8:30 AM	35	21 - 39
Anaheim	14	4:35 PM	4:50 PM	4:50 PM	5:10 PM	35	15 - 30
Fullerton	18	7:19 AM	7:42 AM	7:42 AM	8:02 AM	43	19 - 35
Buena Park	19	2:52 PM	3:22 PM	3:22 PM	3:42 PM	50	22 - 35

Source: Peggy Ducey & Associates

Twice the travel time will require an attractive cost savings for passengers in order to attract riders.

In summary, the Tustin I Shuttle option of utilizing existing rail with the new shuttle bus service from Tustin to JWA is viable to a small group of air passengers and employees. The analysis of the air passenger survey provided a profile of passengers that shows a preference for cars but a willingness to use rail and bus services if the cost and convenience are adequate. When using

the I Shuttle, the time will most certainly increase for travelers and employees but the cost savings will vary. Yet, there appears to be a small market that will be attracted to this option.

5.2 Express Bus Connection

Express bus/shuttle services, with either no or limited station stops, are the most attractive to air passengers. Again, this is a function of faster travel time. The I Shuttle has 10 station stops each way, creating longer total travel times. The OCTA rapid transit express bus routes will have up to 20 stops but will cover more territory (up to 30 miles). The number of stops each rider will experience will be a matter of trip origin, be it home or business location.

The time and distance that passengers are required to travel between the airport terminal and the transit boarding area are important considerations. A single airport terminal building such as the one at JWA allows for a higher level of service since there is only one airport stop, than does an airport with multiple terminals or bus stops. Bus or shuttle services that drop off at curbside immediately adjacent to airport ticket counters, and that pick up passengers next to baggage-claim areas are more attractive to air passengers than those that require extensive walking. The I Shuttle drops air passengers on the lower level, curbside immediately adjacent to baggage claim area and escalators to the upper ticketing area, so this presents a more attractive service than drop off at a remote location.

5.3 Bravo! Bus Rapid Transit

Bravo! will speed up transit routes with synchronized traffic lights along the bus routes.

OCTA's regional BRT project between Brea and Irvine will provide daily high-frequency limited-stop bus service. This new service is designed to reduce travel times and improve the on-time reliability for users in highly concentrated commuter corridors within Orange County. OCTA is implementing three of these BRT routes between 2009 and 2010:

- Harbor Boulevard Bravo! Corridor
- Westminster/17th Street Bravo! Corridor
- Bristol/State College Boulevard Bravo! Corridor

Bravo! buses will only offer weekday service but with longer hours of operation from approximately 5 a.m. to 8 p.m. Traffic signals are to be synchronized to increase traffic flow through the corridors and will allow Bravo! buses to use less total travel time.

The Bristol/State College Boulevard Bravo! Corridor is the third of these three BRT projects. This BRT route will run from the Brea Mall and connect major transportation centers along the busy corridor of State College and Bristol to JWA and on to the Irvine Transportation Center. This 30-mile bus route is expected to begin service in late 2010. The initiation of this BRT route will provide additional bus access to JWA from concentrated areas of Anaheim, Garden Grove and Fullerton.

The Bravo! BRT service will provide high frequency bus service with the addition of 37 new buses to OCTA's inventory.

The new BRT service along Bristol/State College Boulevard will be operated with up to 37 new CNG buses that will be branded with the Bravo! Insignia. These buses will only operate during weekdays from 5 a.m. to 8 p.m. and the headways should be only 10 to 15 minutes apart.

This is a marked improvement over the 30-minute headways for the Tustin I shuttle. This will be more desirable for employees and air passengers on their way to the airport.

The drop off location at JWA will need to be at or very close to curbside at the terminal to attract riders.

Total travel time for the entire route has not yet been calculated, but given the recent travel time calculations for the Harbor Boulevard BRT, estimated travel time for the State College Route is probably 55 to 65 minutes into JWA. The travel time alone makes this an unlikely choice for most transit passengers that are connecting from the furthest points of Brea or Fullerton.

The time and distance that passengers are required to travel between the airport terminal and the transit boarding area are important considerations. The exact location of the BRT drop-off has not yet been determined, but regardless, it will greatly increase the likely acceptance of this new mode of transportation to the JWA for local passengers and employees if the drop off is curbside and at the terminal doors.

5.4 Light Rail Connection from Metrolink Station

Light Rail does not appear to be a viable option for purpose of creating a link between JWA and metrolink.

It became evident that the financial feasibility of a light rail connection from any nearby Metrolink station to the airport would be difficult to justify. With the estimated cost in the billions of dollars and the relatively small passenger base out of JWA when compared with OCTA's and Metrolink's total yearly passenger ridership, the demand just does not exist to justify a large scale capital project for the scope of this study. A light rail link would operate in essentially the same way as the I shuttle in terms of logistics. The estimated ridership would not vary much with the substitution of a light rail for bus service to the airport, but the required revenue generations would be many times greater.

Due to the mutual agreement of the consultants comprising this team, an in depth assessment and evaluation of light rail was not warranted. A light rail for the purpose of transporting air passengers and daily commuters along a short 5 to 10 mile path near JWA would require substantial subsidies from local and federal agencies to be able to operate. Since this is not a viable option within the current scope of this study no further discussion is included.

Chapter 6 – Rail Alignments between Irvine and John Wayne Airport (JWA)

The Scope of Work calls for a review of previous rail alignment studies between JWA and Irvine to determine if any of these alignments might be suitable for a future Metrolink connection. In 1999, OCTA completed The Urban Rail: Detailed Conceptual Engineering Study, which included Milestone 4, Final Set of Urban Rail Alternatives. The report described four alternatives for an urban rail project: a no-build alternative, the Locally Preferred Strategy (LPS), and two lower cost alternatives. The report also included evaluation of connections from the urban rail line into JWA.

6.1 History

OCTA began its urban rail planning efforts in 1990 when voters approved the Measure M Traffic Improvement and Growth Management Plan which included $340 million for an advanced rail transit project. In June 1997, a Major Investment Study (MIS) outlined a multi-modal, 20-year plan known as the Locally Preferred Strategy (LPS). The LPS included increased bus and Metrolink service, as well as further analysis of a 28-mile urban rail segment between the Fullerton and Irvine Transportation Centers. A total of forty-four (44) alignment alternatives and nine technology/mode options were evaluated before the final LPS was approved. While the entire LPS runs from Fullerton to Irvine, for the purposes of this Go Local Report we will only evaluate the Irvine to JWA alignment.

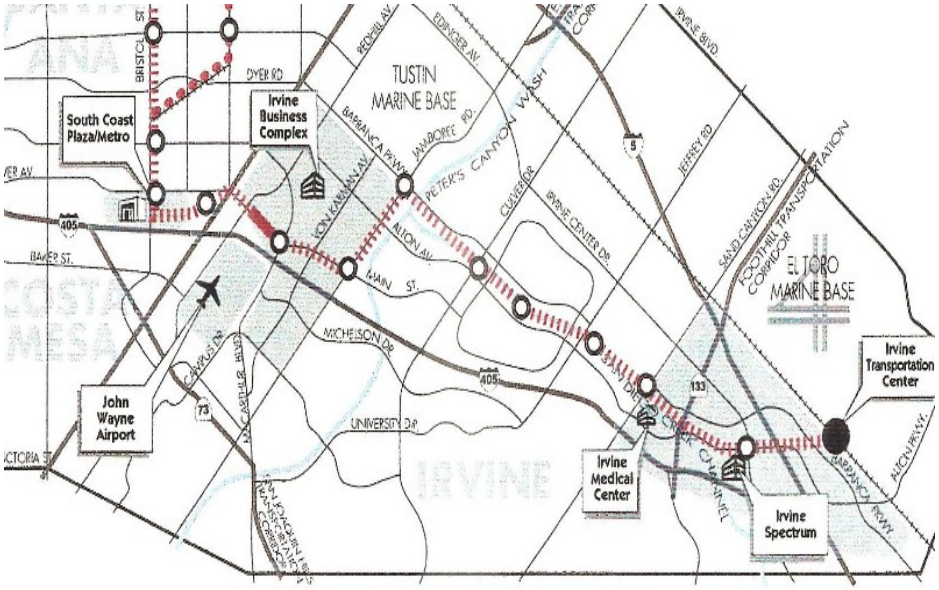
6.2 The LPS Alternative

Exhibit 6.1 shows the LPS Preferred Alternative, which is a fully-elevated 27.7 mile, 26 station rail system from Fullerton to Irvine. The estimated capital cost was $1.86 billion (1998 dollars). Preliminary ridership estimates were 62,000 riders per day by 2020, of which 1,500 per day were airport users. The LPS alignment between Irvine and JWA follows the San Diego Creek Flood Control Channel through the Woodbridge area. There are nine station stops:

- Alton Parkway/Irvine Center
- Barranca/San Canyon
- Barranca/Jamboree
- Irvine Transportation Station
- Main/Jamboree
- Main/MacArthur-JWA
- San Diego Creek/Jeffrey
- San Diego Creek/Yale
- San Diego Creek/Culver

The LPS, as well as the lower cost alternatives, all pass through a JWA safety zone between Red Hill Avenue and Skypark. In this safety zone, all rail must be at grade to allow for a clear flight path.

EXHIBIT 6-1
LOCALLY PREFERRED STRATEGY ALIGNMENT



Source: The Urban Rail: Detailed Conceptual Engineering Study, Milestone 4, Final Set of Urban Rail Alternatives, 1999

Lower Cost Alternative 1

Lower Cost Alternative 1 (LCA1) is a less expensive, 26.6 mile rail system, 96 percent at grade and four percent elevated, from Fullerton to Irvine. This alternative uses a different alignment between Irvine and JWA than the LPS. From the Main Street/JWA area, the alignment passes beneath the SR-55. The rail station serving JWA is located at Main and Skypark, just north of the JWA Main Street parking lot. After leaving the

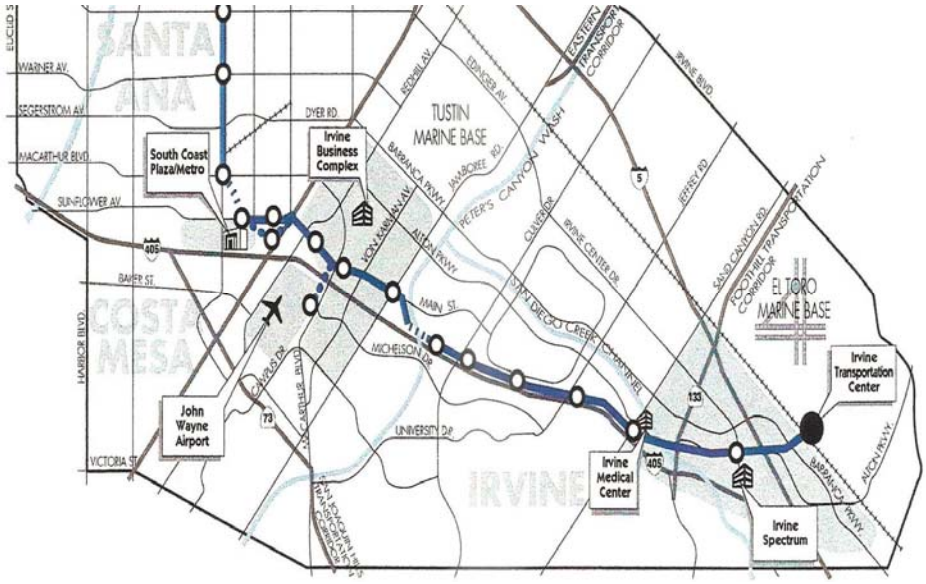
JWA/IBC area, the alignment uses an Edison easement that runs along the north side of the I-405 Freeway, and is at grade or in a shallow trench at the same profile as the I-405 Freeway.

The alignment leaves the Edison Easement at Sand Canyon Avenue, following Alton over the San Diego Creek Channel. The route allows the system to serve the Irvine Medical Center, the Irvine Spectrum, and the Irvine Transportation Center. This proposed alignment has eleven station stops:

- Alton Parkway/Irvine Center
- Irvine Transportation Station
- I-405/ Sand Canyon
- I-405/Jeffrey
- I-405/Yale
- I-405/Culver
- I-405/Harvard
- Main/Jamboree
- Main/MacArthur
- Main/Skypark
- John Wayne Airport

LCA1 (**Exhibit 6-2**) is the only route that includes analysis of direct airport rail service, a light rail extension from the main rail system into JWA. The airport connection bridges over the I-405 Freeway from Main Street on elevated structures and stops at a proposed airport station that straddles the airport access driveways. The preliminary cost estimate for this airport link was $86 million (1998 dollars).

EXHIBIT 6-2
LOWER COST ALTERNATIVE 1



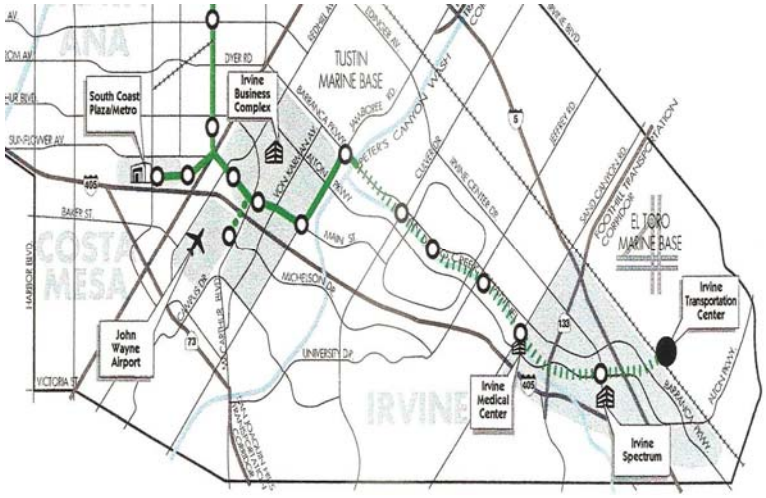
Source: The Urban Rail: Detailed Conceptual Engineering Study, Milestone 4, Final Set of Urban Rail Alternatives, 1999

Lower Cost Alternative 2

Lower Cost Alternative 2 (LCA2) is a combination of the LPS and Alternate 1 alignments (see **Exhibit 6-3**). From SR-55 to Jamboree, it follows the Alternative 1 alignment, passing beneath the SR-55 and through the JWA flight safety zone. The JWA rail station is north of the Main Street parking lot. From Main/Jamboree, it follows the LPS alignment, running at grade to Barranca and then transitioning to an elevated configuration that is required within the San Diego Creek channel. Between Jamboree/Barranca and the Irvine Transportation Center, the LCA2 follows the same alignment and profile as the LPS Alternative and serves the same set of stations. The eleven station stops are:

- Irvine Transportation Station
- Alton Parkway/Irvine Center
- Barranca/ Sand Canyon
- San Diego Creek/Jeffrey
- San Diego Creek /Yale
- San Diego Creek /Culver
- Jamboree/Barranca
- Main/Jamboree
- Main/MacArthur
- John Wayne Airport
- Main/Skypark

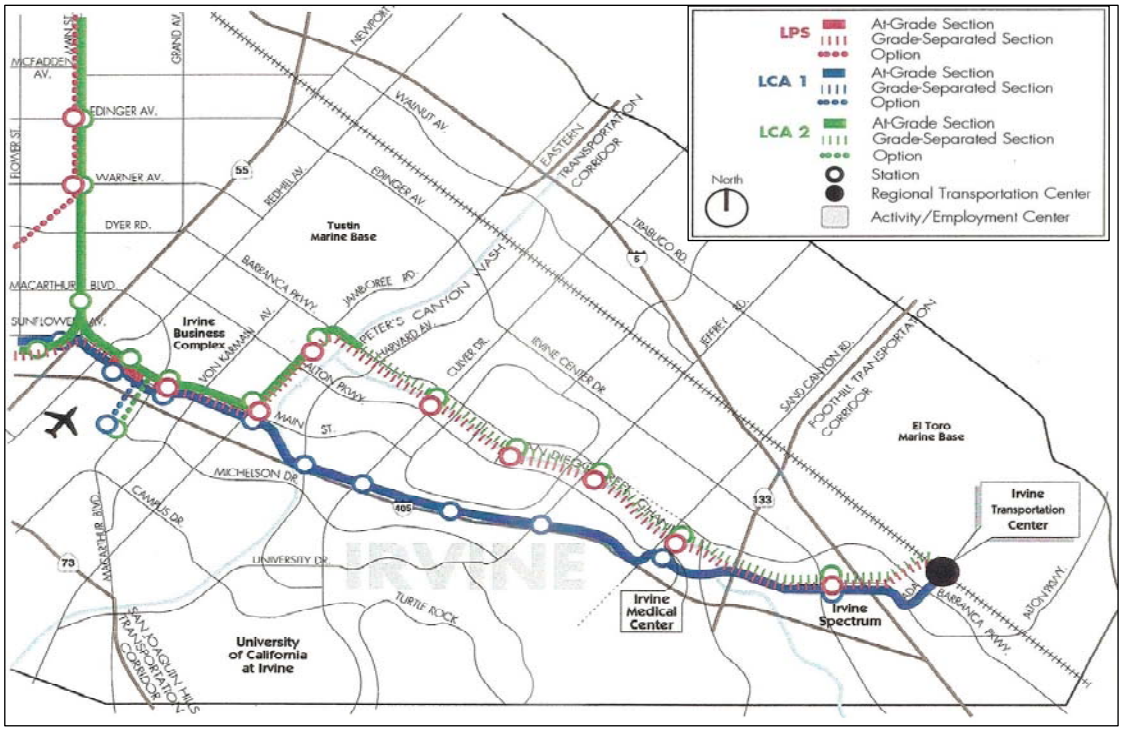
EXHIBIT 6-3
LOWER COST ALTERNATIVE 2



Source: The Urban Rail: Detailed Conceptual Engineering Study, Milestone 4, Final Set of Urban Rail Alternatives, 1999

For comparison purposes, **Exhibit 6-4** shows all three proposed alignments between Irvine and JWA on one map.

EXHIBIT 6-4
LPS, LCA1, AND LCA2 ALIGNMENTS



Source: The Urban Rail: Detailed Conceptual Engineering Study, Milestone 4, Final Set of Urban Rail Alternatives, 1999.

None of the alternatives have direct rail service into JWA. All of these alternatives require some transit extension from the main rail line into JWA, which means air passengers must disembark from the train and board another transit mode that takes them directly into the airport. The advantage of direct airport rail service is that passengers do not have to change to another transit system.

Passengers may find using rail service more attractive if their final destination is within walking distance of the station and less attractive (and less convenient) if they must transfer to a second mode (e.g., a bus or taxicab) to travel to or from the station. The need for rail passengers to wait for and transfer to a second mode may provide a travel time advantage for door-to-door services.

In terms of service directly to JWA, LCA1 had a preliminary concept for a rail connection that requires a stub line from the Main Street rail station into the JWA. For the LPS and LCA2 alignments, other airport access options were studied, and include connections by shuttle service, moving sidewalks, and the proposed Irvine Guideway. All of these options will tend to discourage air passengers to use the urban rail system to travel to the airport.

6.3 Analysis

OCTA's question regarding rail alignments to JWA focuses on whether the alignments are the appropriate routes. The consultant team assumes that this refers to whether the proposed alignments and station locations are actually located in areas of dense air passenger concentrations and whether they attract enough air passengers to ensure the JWA connection is financially viable.

To be sure, it is critical that airport-rail systems serve the areas of greatest air passenger densities, especially since once a fixed guideway is built, the route cannot be changed. Based on the results of the JWA passenger survey, both Irvine/South Orange County and the JWA/South Coast Metro areas have dense air

passenger concentrations. Irvine is a critical station node simply because southern Orange County attracts 14 percent of JWA air passengers.

The JWA/South Coast Metro also attracts significant air passengers, especially visitors using the hotels in the IBC and South Coast Plaza area, nearly 235,000 per year. So from an air passenger perspective, a rail alignment that begins at the Irvine Transportation Center, travels through the IBC and along Main Street where a number of hotels are located, and then extends past JWA into the South Coast Metro area, which also host major hotels, is an appropriate route to consider.

However, air passengers are not motivated to use airport rail service simply because a station stop serves their community. Air passengers will choose rail over the convenience of using a private vehicle if there is a significant travel time advantage or if some other major benefit not available when using a private vehicle. In general, the most successful airport-rail connections serve areas where ground traffic is so congested that travel by rail is much quicker and more reliable than travel by private vehicle on surface streets.

By far the most important factor in determining whether airport-rail service will attract a significant modal share is difference between the travel times. If automobile travel times are significantly higher than the rail travel times, then air passengers will be more likely to choose this airport access mode. The consequence if the process is not seamless (if there are too many obstacles to getting to or from the rail link), is that passengers will forego the rail service for private vehicles.

From the passenger's perspective, the critical performance parameter for any air-rail system is the total travel time from the point of local trip origin (home, business, hotel, etc.) to arrival at the airport terminal ticketing counter. The advantage of rail is that travel times are not impacted by accidents or unexpected congestion on freeways or surface streets. **Table 6-1** compares the top performing airport-rail links in the world.

TABLE 6-1
COMPARISONS OF LINE-HAUL TIME, BY MODE AND DISTANCE

World City	Rail Mode Share	Car Travel Time (min)	Rail Travel Time (min)	Miles to Airport
Oslo	43%	50	19	30
Narita	36%	90	55	42
Zurich	34%	20	10	8
Munich	31%	35	10	18
Frankfurt	27%	20	12	6
Stansted	27%	70	40	34
Amsterdam	25%	30	17	9
Hong Kong	24%	35	23	21
Gatwick	20%	80	30	28
Charles de Gaulle	20%	45	35	15
Brussels	16%	20	14	10
Heathrow Express	11%	45	15	15

Source: TRB Report 62, Improving Public Transportation Access to Large Airport

The data reveal that it is the comparative travel time on a door-to-door basis that seems to influence choice. A comparison of actual travel time for air passengers is a critical evaluation criterion. For purposes of this study, rather than using an engineering model to estimate surface street travel times, we had air passengers report their actual travel time in a way that permitted a more accurate representation of surface street/freeway travel times.

Based on this data, it would be very difficult to attract a significant number of air passengers onto an airport rail system. For Orange County passengers, the consultant team has already noted that freeway and surface street travel times to JWA are faster than Metrolink rail travel. Reported average travel times between Irvine and JWA are only 19 minutes. For rail service to be successful between Irvine and JWA there would need to be significant travel time savings or other significant advantages as compared to private vehicles to attract air passengers to an airport rail system.

OCTA cannot simply evaluate a proposed route as it relates to air passenger densities. There are other rail service characteristics that critically influence airport transit ridership. Airport rail service is either *dedicated* or *shared* service.

Dedicated service is designed to exclusively serve the needs of the airline passenger. It uses vehicles designed to accommodate checked baggage, and usually run point to point with limited or

no station stops. A key characteristic of a dedicated-service strategy is the ability to provide minimized travel times between the airport and the central passenger collection point.

With shared service, airline passengers use the same service as other public transportation passengers. Most shared service provides relatively slow speeds. No specialized vehicle is used to accommodate the air travelers' need for extra baggage space, and service that is primarily designed for the commuters with frequent station stops, which lengthen the trip travel time significantly.

OCTA's urban rail system was proposed as a shared system, rather than a dedicated service. Given that shared service deteriorates trip travel time, this would create a disincentive for air passengers to use the rail service. A way to address this concern is to build appropriate infrastructure into the system that allow for airport express service along the commuter service route. This type of system is more fully described in the Case Study at the end of the chapter.

It cannot be emphasized enough that the location of air-rail stations is critical to the rail system's ability and viability to attract airport-bound riders. Two different station sittings are necessary: airside and landside locations. *Destination* or *airside stations* are located at airports and are sometimes referred to as destination stations. *Origin* or *landside stations* are located away from airports at dense population and business centers and are sometimes called origin stations.

An airside station must be strategically situated to make the rail to air transition as seamless as possible while still safeguarding the air terminal against security breaches. A number of operational and physical features enhance an airside rail connection.

Location is critical. The station should be within convenient walking distance of the airport terminal, avoiding the need to transport passengers to the terminal via shuttle bus, people mover, or taxi. The more transfers a passenger must make, the less seamless the travel path is and the more likely they will forego rail travel. Ideally, the station should be within

300-500 feet of the air terminal building and have a minimal need to change levels, climb stairs or use elevators and escalators to reach the plane. Through walkways eliminate the need to cross roadways, and excellent signage and directions to the air terminal ensures that the traveler reaches the flight gate quickly and easily.

All three OCTA alignments require passengers to disembark from the train and change to another transit mode. The goal is to make the transition between air and rail modes as convenient and seamless as possible. The time and effort it takes to disembark from the train and arrive at the departing flight gate should be quick and easy to maneuver; otherwise, the time advantage of using rail is negated.

Landside stations are located away from airports and act as "feeder" hubs from population and business centers. These stations are multi-modal ground transportation terminals, and can be operated as satellite airport terminals, and are best located in areas which have a large population and/or business density and the proper demographics to generate the passenger volumes necessary to support the air-rail operation.

Demographically, this centralized location should serve a large community that has the disposable income available to fly frequently, and have businesses with employees who travel frequently or with products that require air transportation. These include high-tech, bio-medical and other businesses that require quick delivery times to remain competitive. Appropriately, the Irvine Transportation Center has all of these considerations.

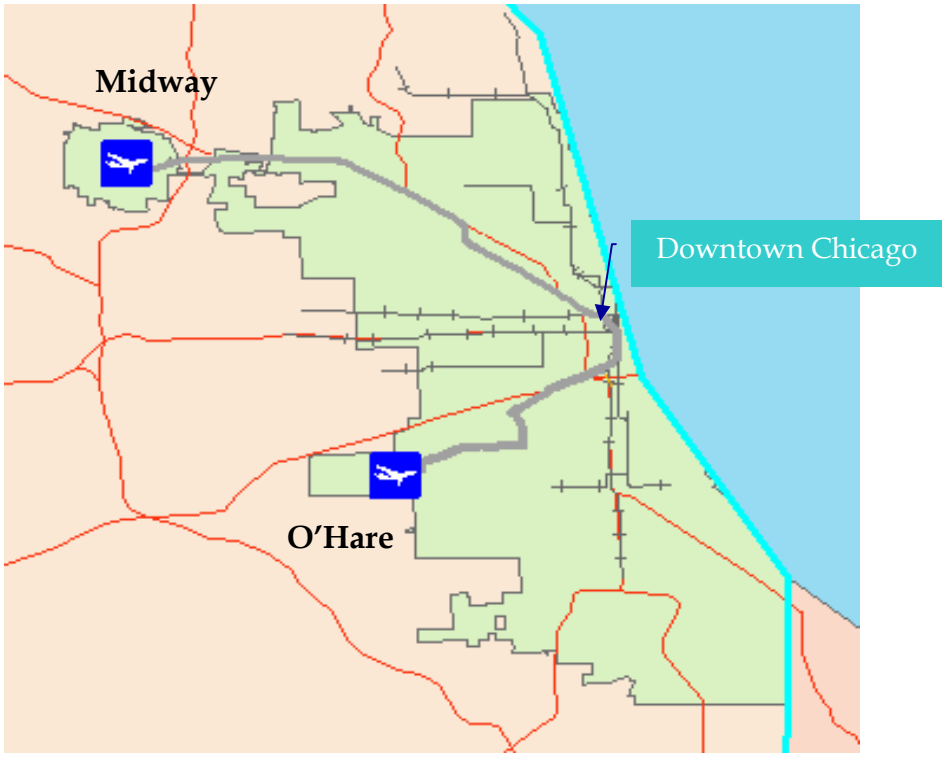
Under an air-rail integration model, satellite check-in terminals are multimodal ground transportation centers (GTCs) that operate as "airports without runways." At these stations, passengers can enjoy all of the services and benefits of checking into an airport such as ticket purchases, baggage checking, issuance of boarding passes, assignment of and completion of some or all of security screening procedures. Depending on the configuration of the airport satellite terminal, security check-in processes could range from an initial review of travel documents and passenger identification to a full final personal/carry-on baggage screening. From an operational perspective, remote

check-in of airline passengers is a relatively simple operation; many passengers do it now through Internet check-in. Remote check-in with baggage presents a more complex operation, especially from a security standpoint, but it is a critical feature that will positively impact air passenger ridership on air-rail connections. Passengers would be able to travel "hands-free," which becomes more critical for those travelers who have small children, are disabled or have carry-on luggage that needs to be transported during the transition.

6.4 Case Study: Chicago Airport Express

The City of Chicago is taking an innovative approach to air-rail integration by planning an airport express service using its existing metro rail lines that already link to O'Hare and Midway airports (see **Exhibit 6-5**). To decrease airport travel time, increase travel reliability, and reduce traffic congestion, the Chicago Airport Express will link downtown to both airports via a non-stop express train. The estimated cost for the entire system, including rolling stock, is $950 million.

EXHIBIT 6-5
CHICAGO AIRPORT EXPRESS ROUTE



Currently, Chicago travelers must allocate as much as two hours to drive to the airport, and even more during rush hours. An Airport Express trip to O'Hare will take about 28 minutes, as compared to 45 to 50 minutes via the current Chicago Transit Authority (CTA) metro system, and about 18 minutes to Midway, as compared to 30 minutes by the CTA metro train today. The Express service would run every 15 minutes, and fares would be in the range of $10 to $15.

To accommodate the non-stop express service on the same tracks as the CTA metro rail lines, additional passing tracks will be built in the right-of-way allow for passing on the outside of the existing tracks to enable express trains to overtake CTA metro trains while they are stopped at interim stations. Based on computerized simulations, the passing system is expected to have a 96 percent reliability rate.

Midway Airport Express: Trains will use existing Orange Line tracks with special new passing tracks at key locations. Service features are:

- Under 30-minute one-way travel time
- Every 15 minutes in both directions
- 5 AM to 10 PM, seven days a week

EXHIBIT 6-6
BYPASS TRACKS ON MIDWAY EXPRESS

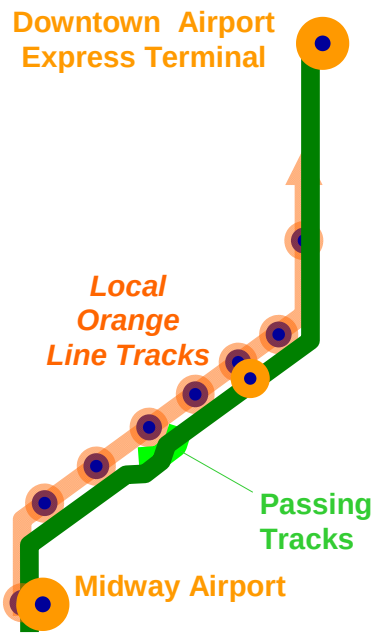
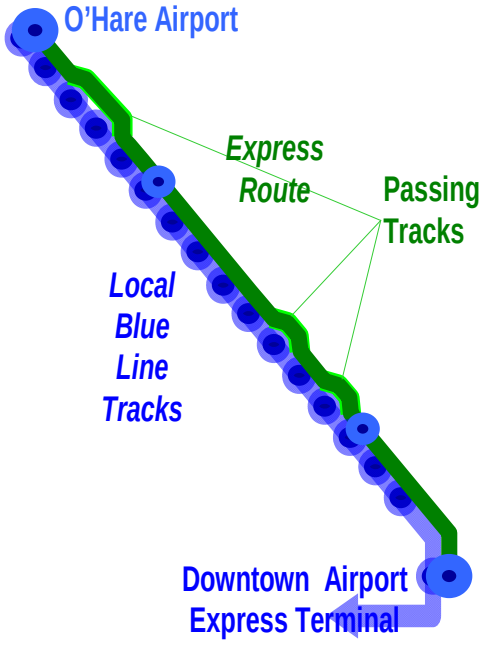


EXHIBIT 6-7
BYPASS TRACKS ON O'HARE EXPRESS



O'Hare Airport Express: Express trains will use existing CTA Blue Line tracks with special new passing tracks at key locations. Service features are:

- Under 30-minute one-way travel time
- Every 15 minutes in both directions
- 5 AM to 10 PM, seven days a week

A downtown remote airport terminal is being planned, with a hotel above the station and food court and retail amenities in the station (see **Exhibit 6-8**). Airport services would include air passenger check-in and baggage handling. Baggage would continue to be screened at the airport, similar to the Frankfurt Airport model. Outbound passengers would check baggage at the downtown terminal and then pick them up at their destination airport. The luggage would be transported to the airport on the same trains as passengers and be off-loaded at the airport station for screening. Inbound passengers could have their luggage checked through to downtown Chicago. The baggage facility downtown would operate like a left-luggage room at which bags would be held for pickup.

EXHIBIT 6-8
DOWNTOWN CHICAGO REMOTE AIRPORT TERMINAL

The train will be operated in six-car segments, or four passenger cars and two baggage cars per train. Chicago also has explored the feasibility of leasing train space to consolidated delivery firms such as FedEx, DHL, or UPS, instead of running delivery trucks to the airport. Plans also call for more comfortable trains. Express cars would have upholstered seats, conference compartments, baggage racks and a vending area. Seat-back video screens would display airline flight status when traveling from the city center to the airport and information on hotels and attractions when traveling towards downtown.

6.5 Summary

The proposed alignments between Irvine and JWA are appropriate routes that would serve key air passenger concentrations. However, the service attributes of the proposed rail system would provide a number of disincentives that would adversely impact ridership unless the infrastructure were augmented and the service developed to specifically address the needs of air travelers including faster travel times.

Chapter 7 - Ridership Estimation Findings and Summary

7.1 Introduction

The passenger survey and employee data was used to develop the estimate of transit ridership

The scope of this study is focused on using the data generated from an Air Passenger Survey conducted in July 2008 and geographic employee data provided by the JWA in 2007 to project ridership on either a Metrolink connection or a rapid transit bus route to the airport. The ridership estimate of interest on these proposed routes is limited to the air passengers and employees at JWA. The intent is to project how much these passengers and employees will likely contribute to the overall ridership.

Survey data will vary between events; therefore, this survey was conducted in a manner as to minimize bias and the need for significant weighting of responses. The survey produced over 2,300 complete surveys, which yields a margin of error of +/-two percent within a 95 percent confidence interval. The survey data provides an overall profile of the typical passenger at the airport and allows for a stratification of profile components that were analyzed at the city and zip code levels. At this level of detail the interpreted data gives a logical and realistic position, as it pertains to transit choice, of the passengers traveling to and from specific zip code regions within Orange County.

A typical transportation model was not available or compatible with the scope and data available for this study. Traditional models are normally region specific and focus on overall traffic demand and the contributions of each modal component. Models also normally rely on existing historical data for comparison. The main drivers in our study are the level of passenger activity and employment at the airport and the fares and availability of public transportation in the study area. Although an existing model was not used, the basic 4-step principles of determining trip generation (how many trips), trip distribution (where to), modal choice (what transportation method), and trip path (what route) were still applied in this process.

7.2 Market Definition

The first step in the ridership estimation process was to define and determine the air passenger and employee market. The air passenger market was defined as those who originated or ended their travel at JWA (i.e. connecting air passengers were excluded). The employee market was also limited to those who live and commute to JWA, from an Orange County zip code. The airport provided only a list of zip codes of badged employees; no other employee data was provided due to security issues. The market pool is now limited to only those passengers and employees who have trip ends within Orange County and would have feasible access to the bus or rail routes in the study.

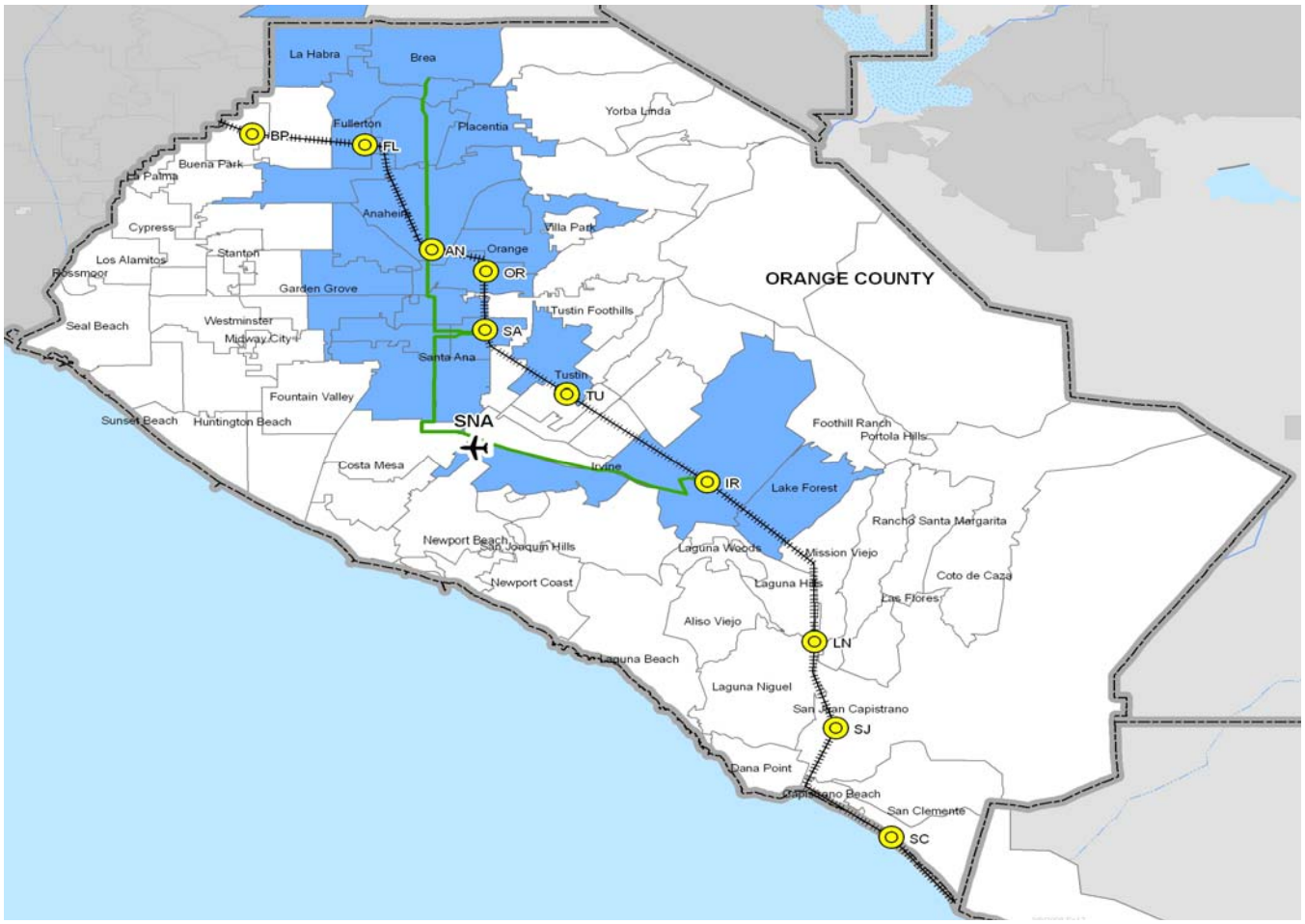
Analysis of the survey data provided profiles of the residents and visitors, as well as a market share of the annual air passenger activity. Each zip code was assigned a yearly and daily passenger count based on that market share. This allows each zip code to be analyzed further by profile components and make respective individual contributions to the ridership estimate. The key components of each zip code are the propensity to use public transit, transportation mode to the airport, and utility values placed on time and money in relation to mode choice. (i.e. Would you take the train and travel 10 minutes longer to save $5?)

The air passengers and employees have two choices within this study; Bravo! BRT service from Brea to Irvine and the new City of Irvine I Shuttle which operates as an extension of the existing Metrolink rail line from the Tustin Metrolink station to JWA. These two transit routes each have an associated market or pool of potential passengers and employees and are treated as unique and separate markets.

To make realistic comparisons between zip code origins and specific zip code centroids within Orange County, a matrix of distances, travel times and available transit fares was generated for all zip codes to Metrolink stations, BRT stops and JWA. Headway distances were gathered using observations from the air passenger survey, Google Maps, and calculated from arc lengths between two geographic coordinate pairs for

comparison. Travel times for headways were gathered by using Google Maps after adjusting each suggested path to conform to specified routes to each location, and were also compared to the stated commute times from air passenger survey responses. Fares for all available ground trip segments were gathered from the OCTA and Metrolink websites and monthly fares were computed based on an average 40 trip ends per month for employees. Monthly fares were not used for air passengers since they travel an average of five times or less per year. **Exhibit 7-1** shows the geographic market area from which the BRT service would most likely draw JWA air passengers given its planned alignment. This area accounts for approximately 30 percent of JWA passenger origins and 40 percent of JWA Orange County employees.

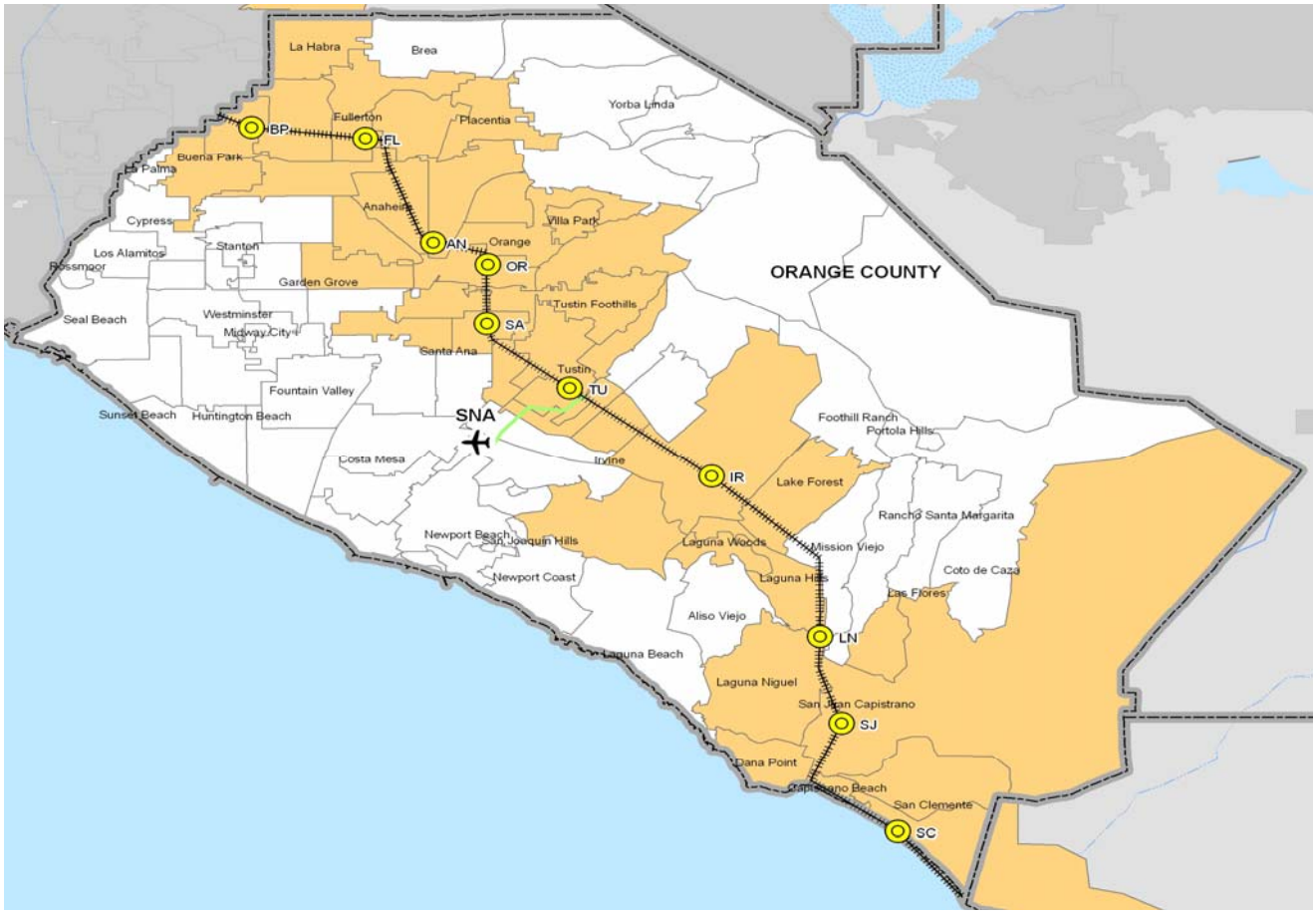
EXHIBIT 7-1
BRT Bus Route Geographic Catchment Area



Sources: OCTA, Landrum & Brown analysis

Exhibit 7-2 shows the Orange County regions that were included as likely ridership zip codes for the Rail market. Metrolink, on a geographic basis, has a broader market than the analyzed BRT route and covers approximately 50 percent of air passenger origins. Notably, however, the employee base is about the same at 40 percent due to the concentration of JWA employees to the west and north of JWA. There are many zip codes that are in both the BRT and Rail markets but their contributions were adjusted and accounted for in the final Airport Transit Corridor.

EXHIBIT 7-2
METROLINK RAIL GEOGRAPHIC CATCHMENT AREA



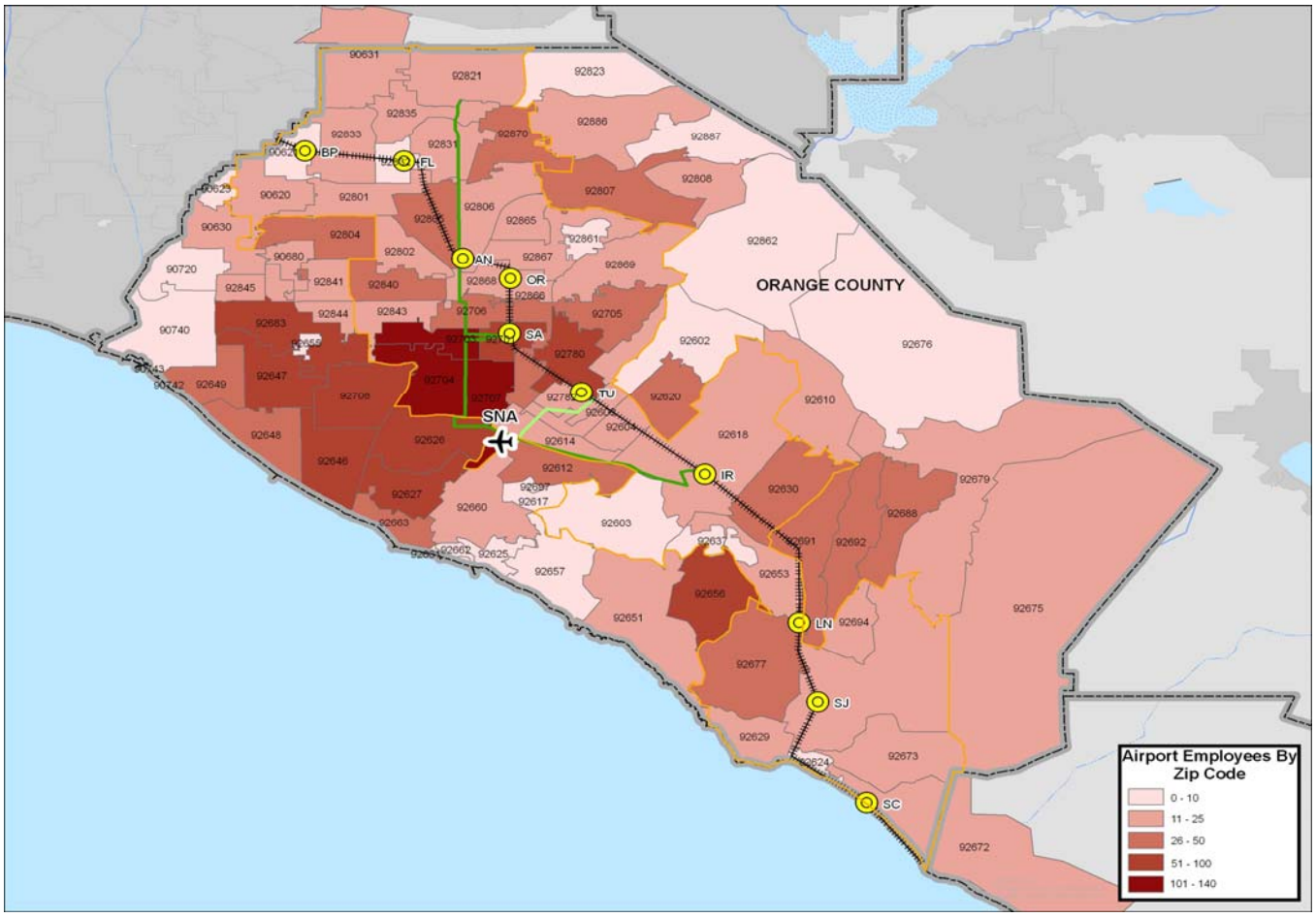
Source: Landrum & Brown analysis

The BRT market and the Rail market were initially based on the assumption that five miles would be the furthest a rider would drive or be driven to the nearest likely BRT stop or nearest Metrolink Station.

The second assumption required that the distance to the transit stop had to be shorter than the distance to JWA. A ratio of 2:1 was preferred, and an individual assessment was made on those zip codes that were nearly the same distance to either a transit stop or the airport. After completing these comparisons for each market area, the pool of riders was determined to be the cumulative sum of the assigned number of passengers and employees by zip code in each market. The steps thus far have defined the study area and the BRT and rail market pools. Next, the pools were filtered into the final markets by using observed stated transit preferences of each travel segment within the market.

Exhibit 7-3 shows the Airport Transit Corridor as an orange boundary which represents the combined geographic area of the BRT and Metrolink market for JWA. This map also contains the distribution of JWA employees which clearly shows that both the BRT and Metrolink are well sited to serve some of the very high density JWA employee areas, in particular, in the Santa Ana area.

EXHIBIT 7-3
JWA EMPLOYEES CATCHMENT ZONE



Source: Landrum & Brown analysis

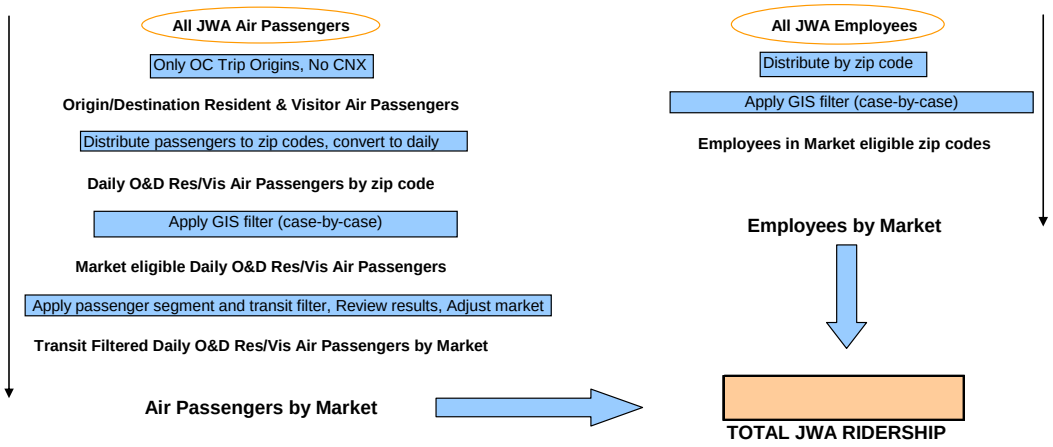
JWA employees are good candidates for adopting mass transportation into the airport. They fit the demographics more closely as they are price sensitive and can more easily adjust to timing issues and modal changes. Additionally, employees will more than likely use mass transit more frequently than air passengers and will gain greater cost savings as a result. Nonetheless, the design will still need to take into consideration that neither air passengers nor employees will accept long delays and service interruptions.

7.3 Market Analysis

Once the geographic market area for transit into JWA had been established air passengers were differentiated into six passenger groups (Resident Business, Resident Visiting Friends & Family, Resident Leisure, Visitor Business, Visitor Visiting Friends & Family, and Visitor Leisure). A second segmentation was made with each passenger group divided into the nine modes of ground transportation from the survey in order to create a segmentation that would reflect the transit preferences of the specific passenger groups. The analysis was controlled at a higher level by questions in the survey related to the likelihood of using mass transit to access JWA in the future. The set of multipliers in the matrix was applied to the distribution of air passengers in each market segment to derive an estimate of air passenger ridership. A total number for potential ridership was produced for each market by adding the potential employee share. **Exhibit 7-4** illustrates the process flow for developing the ridership estimate.

Employees at JWA were not part of the survey effort so no data related to their likelihood of adopting mass transit was available. Benchmarks were used in order to derive reasonable estimates of employee transit ridership. A recent study published by the Transportation Research Board in 2008 found that airports served primarily by bus captured a 2-5 percent share of the employee market. Transit adoption rates for cities in Orange County published in the 2006 U.S. Census American Factfinder were also reviewed. County-wide an estimated three percent of Orange County residents use public transportation to get to work. In Santa Ana, which comprises the largest base of JWA employees, work related public transportation use is almost one percent.

EXHIBIT 7-4
RIDERSHIP DETERMINATION PROCESS



Source: Landrum & Brown analysis

For purposes of our analysis, the employee range was assumed to valid at no more than a general public transit share of 2–5 percent. This was used for the starting ridership range for employees and was allowed to grow to 4–10 percent for the future year's high estimates in the years 2015 and 2030. The growth is assumed to be moderately conservative due to increased willingness and adoption with long term familiarity and the continuing effects of road congestion. **Table 7-1** presents the ridership estimate under the current airport constraints of 10.0 MAP and future constraint of 10.8 MAP for future periods on/after January 1, 2011.

Table 7-1
RIDERSHIP ESTIMATE

	10.0 MAP			10.8 MAP		
	Passengers	Employees	Total	Passengers	Employees	Total
Daily Ridership						
Low Case	450	40	490	490	80	570
Base Case	1,220	100	1,320	1,310	190	1,500
High Case	1,820	240	2,060	1,960	480	2,440
% of Total Base						
Low Case	1.6%	0.8%	1.5%	1.8%	1.6%	1.8%
Base Case	4.5%	2.0%	4.1%	4.8%	4.0%	4.7%
High Case	6.6%	5.0%	6.4%	7.2%	10.0%	7.6%

Sources: 2008 Air Passenger Survey, Landrum & Brown analysis

The low and high case for the air passenger ridership estimates were based on the larger geographic area served by rail. The low case was refined by only those passengers responding that they were "highly likely" to use mass transit to access JWA while the high case included those passengers who said they were both "likely" and "highly likely" to use mass transit to access JWA. The base case was based on the smaller geographic area served by the BRT line and included those passengers stating they were both "likely" and "highly likely" to use mass transit to access JWA. These adjustments in market and category selection were performed to provide low and high-high ends to the possible range while still conforming to a reasonable range in comparison to similar public transit market shares.

The employee case values were calculated using ranges described earlier being applied to the representative pool of Orange County JWA employees.

Chapter 8 - Conclusions and Recommendations

The airport-transit analysis and recommendations in this report are based on a detailed, in-depth evaluation of the JWA air passenger market. It is the premise of this report that an accurate, justifiable evaluation of any airport transit project cannot be done without first obtaining a precise picture of the air passenger market that the project is meant to serve. Forecasting ridership for airport-transit services is particularly important since the financial viability of the system hinges on passenger usage. Yet, you cannot accurately forecast ridership until you know specifically who the riders will be.

8.1 Findings

Since the critical performance parameter for any airport transit system is total travel time, a key evaluation criterion is average passenger travel time from origin location to the airport. By far the most important factor in determining whether airport-rail service will attract a significant number of air passengers is the difference between the travel times. Air passengers will choose rail or transit service over the convenience of using a private vehicle if there is a significant travel time advantage. In general, the most successful airport-rail connections serve areas where ground traffic is so congested that travel by transit is much quicker and more reliable than travel by private vehicle.

For this study, JWA passengers originating travel within Orange County averaged 25 minutes travel time to JWA. Average travel times from key cities in Orange County ranged from 12 minutes from Costa Mesa to 28 minutes from Anaheim. When we compared these actual travel times to projected travel times by rail/shuttle service such as the I Shuttle or by express bus, such as the BRT, travel times almost doubled. So from the standpoint of time savings, travel by private vehicle will be much faster than the proposed BRT or shuttle services, and will not attract significant air passengers traveling to JWA.

This report also noted that while travel time is critical, operational and service characteristics of airport transit services can greatly influence whether air passengers will use the service.

In other words, while travel time may be increased if air passengers use the I Shuttle or BRT, other amenities that focus on the air passenger's needs may attract more transit riders.

The JWA passenger survey data revealed that air travelers place greater priority on convenience and time than on cost savings, especially when the costs are small in comparison to the airfare. If the JWA transit service characteristics were modified to allow for express service into JWA to be provided, with few or no intermediate stops, this would reduce the total trip travel time. Also, hours of operation would need to be expanded to cover the hours of JWA's operations, and weekend service would be critical to the success of a JWA transit connection.

However, these operational changes require more service hours and therefore higher operating costs. It has been shown that the most successful airport-transit services have an aggressive, targeted marketing plan that ensures that airport passengers are fully aware of the public transit options available to them. If the I Shuttle and future BRT are to attract airport passengers, there must not only be changes to the service parameters, but also an active, ongoing marketing campaign to publicize the service.

While the focus of the Go Local process is to evaluate Metrolink-transit connections, the ultimate goal is to reduce traffic congestion and increase air quality. During the analysis of the air passenger market, the consultant team identified a number of key areas to address traffic congestion around JWA. A critical finding was not simply the number of JWA passengers visiting the Disney Resort, but their transit-oriented decisions. Rather than renting private vehicles, the majority of these visitors are already using some form of transit to get to and from the airport. Since 56 to 73 percent of JWA passengers are already using private shuttle services, the Disney Express Bus, Taxis and Limos to get to and from the Disney Resort area, then substituting high-quality, fast and reliable public or private high-occupancy airport transit service will not be very different from their current airport access travel behavior. Focusing marketing

efforts, including competitive pricing, on higher occupancy transportation vehicles could significantly impact traffic congestion at JWA.

Another significant finding was the number of hotel courtesy shuttles that access JWA from the surrounding cities of Irvine, Newport Beach, and Costa Mesa. Over 40 shuttle services pick up and drop off hotel guests are JWA every day. Some of these services provide airport transport every half hour, whether there are passengers waiting or not. The City of Anaheim began the Anaheim Resort Transit (ART) because most of the local hotels had separate shuttle service into Disneyland, creating significant traffic congestion. Consolidating various hotel shuttle services into one system has reduced traffic congestion considerably. The JWA host cities may experience similar benefits if they were to coordinate the shuttle services of the closest JWA hotels, and create one shuttle service route that serves all the local hotels.

The analysis and mapping of JWA employees' home zip codes revealed that the most densely concentrated employee clusters are focused in cities such as Santa Ana and Costa Mesa which are already among the most transit oriented areas in the county. Furthermore, the alignment of the future BRT service is very appropriate to serve a large portion of these JWA employees. And since employees will be more concerned about cost versus time savings, the potential for targeted marketing or initiatives specifically focused on JWA employees is a viable means to reduce traffic congestion in a relatively cost effective way as the routes are either already in place or coming on line.

The report's conclusions support the fact that while JWA is a major ground transportation trip generator, the analysis of JWA's specific passenger market leads to the conclusion that a significant investment in a dedicated airport transit link will not be cost-efficient. However, the report has identified a pool of passengers that potentially will use the existing or planned transportation services to access JWA if the services are better tailored to the needs of airport passengers and the marketing of the services is targeted and focused.

8.2 Recommendations

Based on this analysis, it is recommended that the cities of Newport Beach and Costa Mesa do not pursue additional study on light rail or other transit connections into JWA. The consultant team does not believe there is a great enough demand from JWA passengers to use public transit to cover the necessary capital and operating costs of an airport link.

It is further recommended that if OCTA wants to increase ridership by airport passengers and employees on their two existing airport connection projects- the I Shuttle and the Bravo! BRT, then operational changes be evaluated, but only within the context of a continuing, targeted marketing campaign that exposes air passengers to the benefits of using airport transit services. Without a focused, dedicated marketing effort to generate knowledge and interest from JWA air passengers in these transit services, it will not matter how much the operational characteristics are changed. These transit services will not attract a significant modal share of JWA air passengers.

Finally, the key issue for most communities that host airports is ground traffic congestion. During the process of this study, the consultant team identified ways to reduce traffic around JWA. Specifically, consolidating the more than 40 hotel shuttles that serve JWA or focusing marketing efforts on higher occupancy forms of transportation from the Disney Resort area could have a significant impact on the traffic congestion and air quality that Newport Beach and Costa Mesa residents are subjected to.

8.3 Go Local Program Criteria

Orange County Transportation Authority (OCTA) adopted 12 criteria to evaluate proposed project concepts for advancement into Step Two of the Go Local Program:

1. Local Jurisdiction Funding Commitments
2. Proven Ability to Attract Other Financial Partners
3. Proximity to Jobs and Population Centers
4. Regional Benefits

5. Ease and Simplicity of Connections
6. Cost-Effectiveness
7. Traffic Congestion Relief
8. Right-of-Way Availability
9. Sound Long-Term Operating Plan
10. Compatible and Approved Land Use
11. Project Readiness
12. Safe and Modern Technologies

Go Local Criterion 1 – Local Jurisdiction Funding Commitments

Neither the cities of Newport Beach and Costa Mesa will contribute local funding specifically for a transit connection into JWA.

Go Local Criterion 2 - Proven Ability to Attract Other Financial Partners

Given the ridership estimates and the limited passenger market that may use a transit connection into JWA, it is highly unlikely a JWA transit project would attract private-sector financial partners.

Go Local Criterion 3 – Proximity to Jobs and Population Centers

JWA is a major generator of jobs for Orange County. We believe that the proposed BRT and I Shuttle can serve some of the transit needs for employees who work at or around JWA. However, unless the service characteristics of the JWA transit connections are changed to better accommodate the needs of airport passengers, we do not believe the connections will attract a significant number of air passengers.

Go Local Criterion 4 – Regional Benefits

Since only 6 percent of JWA's total air passengers originate from other Southern California counties, it is unlikely that a JWA transit connection would provide any significant regional benefits to air passengers outside of Orange County.

Go Local Criterion 5 – Ease and Simplicity of Connections

As explained previously, it is critical that air passenger transit projects have a seamless travel process. The fewer mode changes, the more direct the route, the easier the terminal access is from the transit drop-off location, the more likely air passengers are to forego their private vehicles for public transit. If the process is not seamless, passengers will seek more convenient, reliable ways to get to their flights on-time. All three transit projects that were studied require passengers to change transit modes, lose time because of numerous station stops, and two of the three projects do not have direct airport terminal access. All of these factors create difficult, rather than the simple connections needed to attract air passengers.

Go Local Criterion 6 – Cost Effectiveness

Given the ridership estimate and the fact that the three different transit projects do not operate in a way that meets air passenger needs, we do not believe a new transit link into JWA would be cost effective.

Go Local Criterion 7 – Traffic Congestion Relief

Given the findings of the JWA passenger survey and the ridership estimates, we do not believe there would be a significant reduction in traffic congestion from a transit link into JWA. However, we have made a number of recommendations in the report that could relieve traffic congestion in the airport area.

Go Local Criterion 8 – Right-of-Way Availability

Since we are not recommending a new transit service into JWA, right-of-way acquisition is not necessary.

Go Local Criterion 9 – Sound Long-Term Operating Plan

Since we are not recommending a new transit service into JWA, no long term operating plan is required.

Go Local Criterion 10 – Compatible and Approved Land Use

Since we are not recommending a new transit service into JWA, compatible land use is not an issue.

Go Local Criterion 11 – Project Readiness

If the City of Irvine chooses to incorporate some of the recommendations we have made to enhance the I Shuttle service to better meet the needs of airport passengers, then this could be done relatively since the Shuttle service is already in operation.

Go Local Criterion 12 – Safe and Modern Technologies

Not applicable to the report recommendations.