



2016 2040 RTP SCS

AIRPORT GROUND ACCESS ANALYSIS

Development and Use of Air Passenger Trip Tables in SCAG's 2016 Regional Transportation Plan

Pat Coleman, AECOM
Steve Greene, HNTB
Ryan Hall, SCAG

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Overview

- Study Purpose
- Methodology
- Forecasts
- What's this used for?

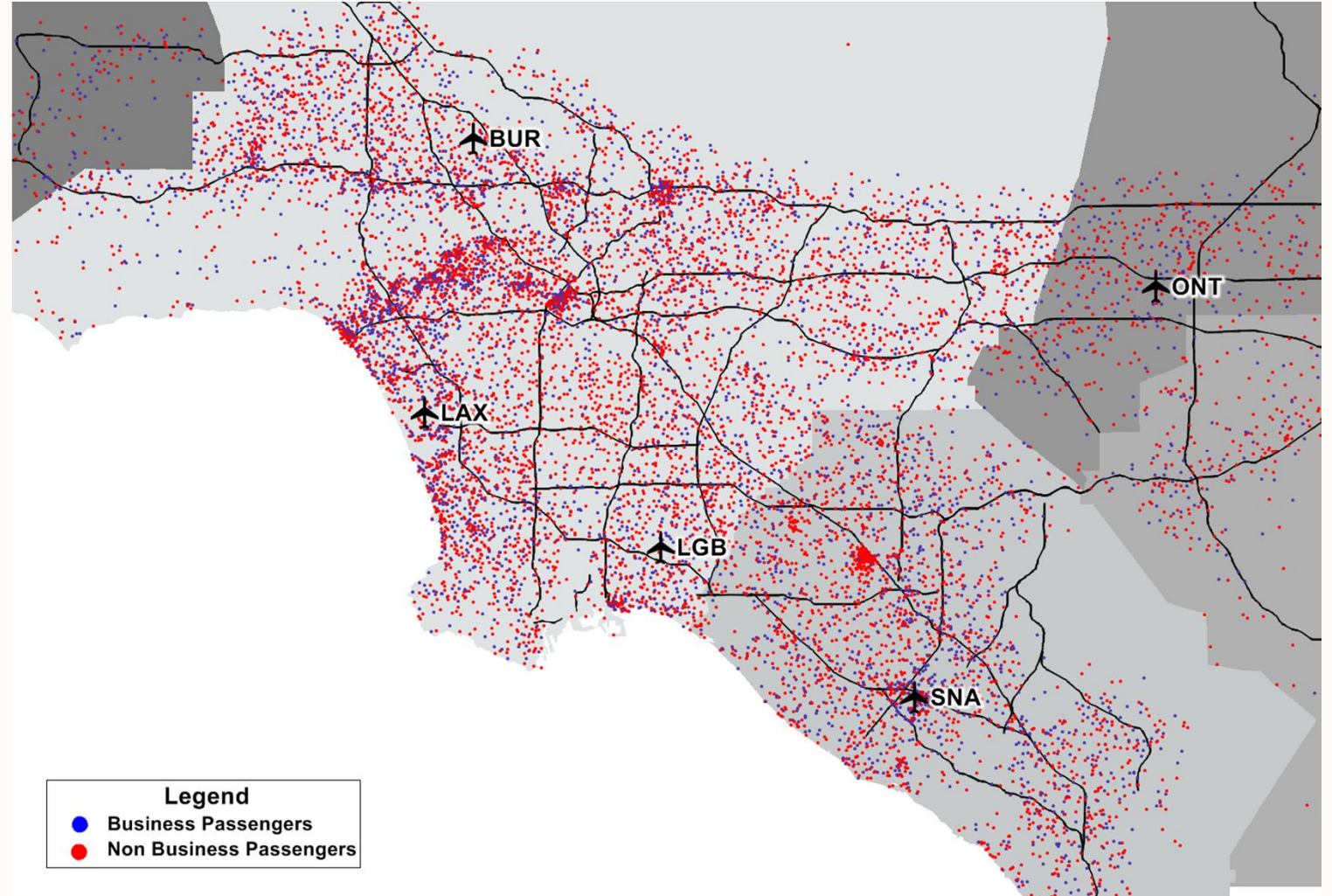


Study Purpose

- Generate base year (2012) Air Passenger Person Trip Tables to support the Southern California Association of Governments (SCAG) Regional Transportation Plan
- End Product are person trip tables from zone of origin to airports in SCAG region using “typical” four purposes (in TransCAD P-A format):
 - resident business
 - resident non-business
 - visitor business
 - visitor non-business.
- 7 existing airports with scheduled service
 - Burbank Airport (BUR)
 - Imperial County Airport (IPL)
 - Los Angeles International Airport (LAX)
 - Long Beach Airport (LGB)
 - Ontario International Airport (ONT)
 - Palm Springs International Airport (PSP)
 - John Wayne Airport (SNA)

Generate Air Passenger Trip Tables

- Trip Generation
- Trip Distribution
- Mode of Arrival
- Generate Trip Tables



Trip Generation

- Develop rates for four purposes (resident business, resident non-business, non-resident business, non-resident non-business)
- Correlation analysis using survey data
 - 2011 LAX Passenger Survey
 - 2010 BUR Passenger Survey
 - 2012 Intervistas Passenger Survey of SOCAL airports
- Four correlation models for each purpose based on SCAG Socioeconomic Data (SED)

Trip Generation

Correlations:

- Residential Business: High Income Workers
- Residential Non Business: Income Weighted Population
- Visitor Business: Professional Employment
 - CBD
 - Non CBD
- Visitor Non Business: Hospitality Employment
 - Ventura, San Bernardino, Coachella, Imperial Districts
 - Rest of the Region

Trip Generation

Correlation Equations:

- Residential Business: $Pax = 0.0096 \times High\ Income\ Workers$
- Residential Non Business: $Pax = 0.0012 \times Inc.\ Weighted\ Population$
- Visitor Business:
 - CBD: $Pax = 0.0106 \times Professional\ Employment$
 - Non CBD: $Pax = 0.0104 \times Professional\ Employment$
- Visitor Non Business:
 - Ventura, San Bernrd., Coachella, Imperial: $Pax = 0.0048 \times Hospitality\ Emp.$
 - Rest: $Pax = 0.0344 \times Hospitality\ Employment$

Trip Generation

Adjustment Factors to Match Survey Totals:

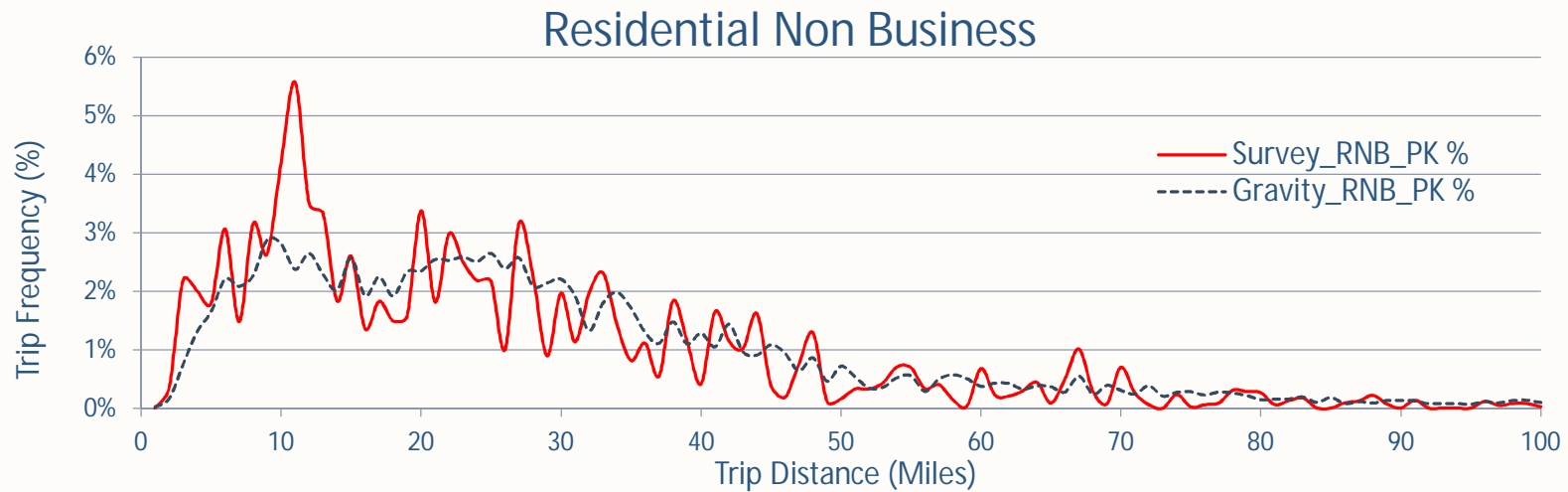
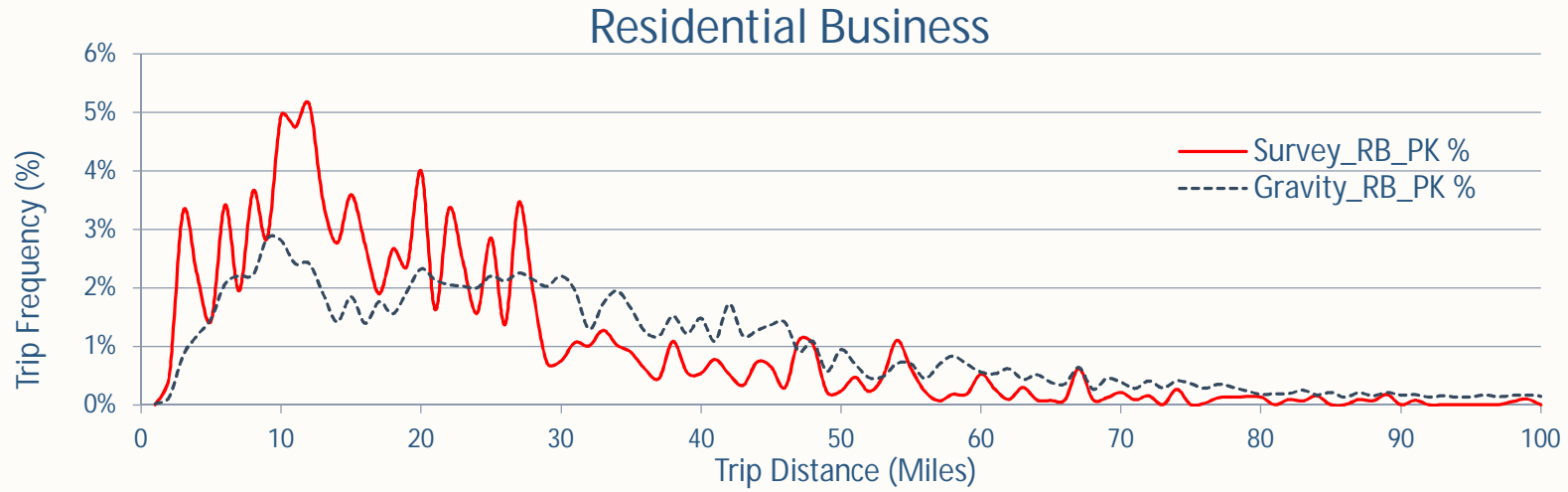
- Based on the Intervistas survey, a total of 100,580 daily passengers are estimated to arrive at 7 airports: LAX, BUR, LGB, SNA, ONT, PSP, IPL
- This total was matched by applying adjustment factors to the correlation equations.
 - Factor of 1.59 for the Los Angeles County
 - Factor of 1.17 for the rest of the region

Factored Trips	RESBUS	RESNONBUS	VISBUS	VISNONBUS	Total
Los Angeles County	11,591	21,426	10,527	18,946	62,490
Rest	7,065	13,060	6,417	11,548	38,090
Total	18,656	34,486	16,943	30,494	100,580

Trip Distribution

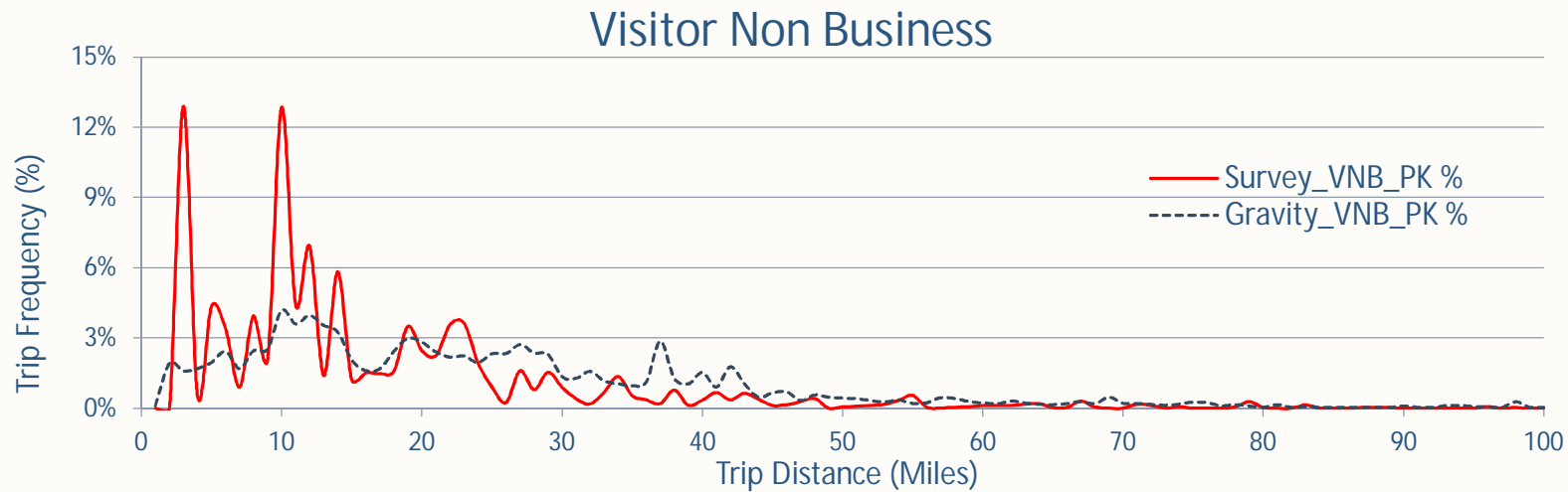
- Develop trip length distributions based on observed trips from LAX and BUR surveys
- Adjust to study area districts using K factors when needed sensible. (K-factors are used to model individual zonal/sub-regional variation not otherwise accounted for in the gravity model)
- District to Airport trip comparisons

Trip Distribution



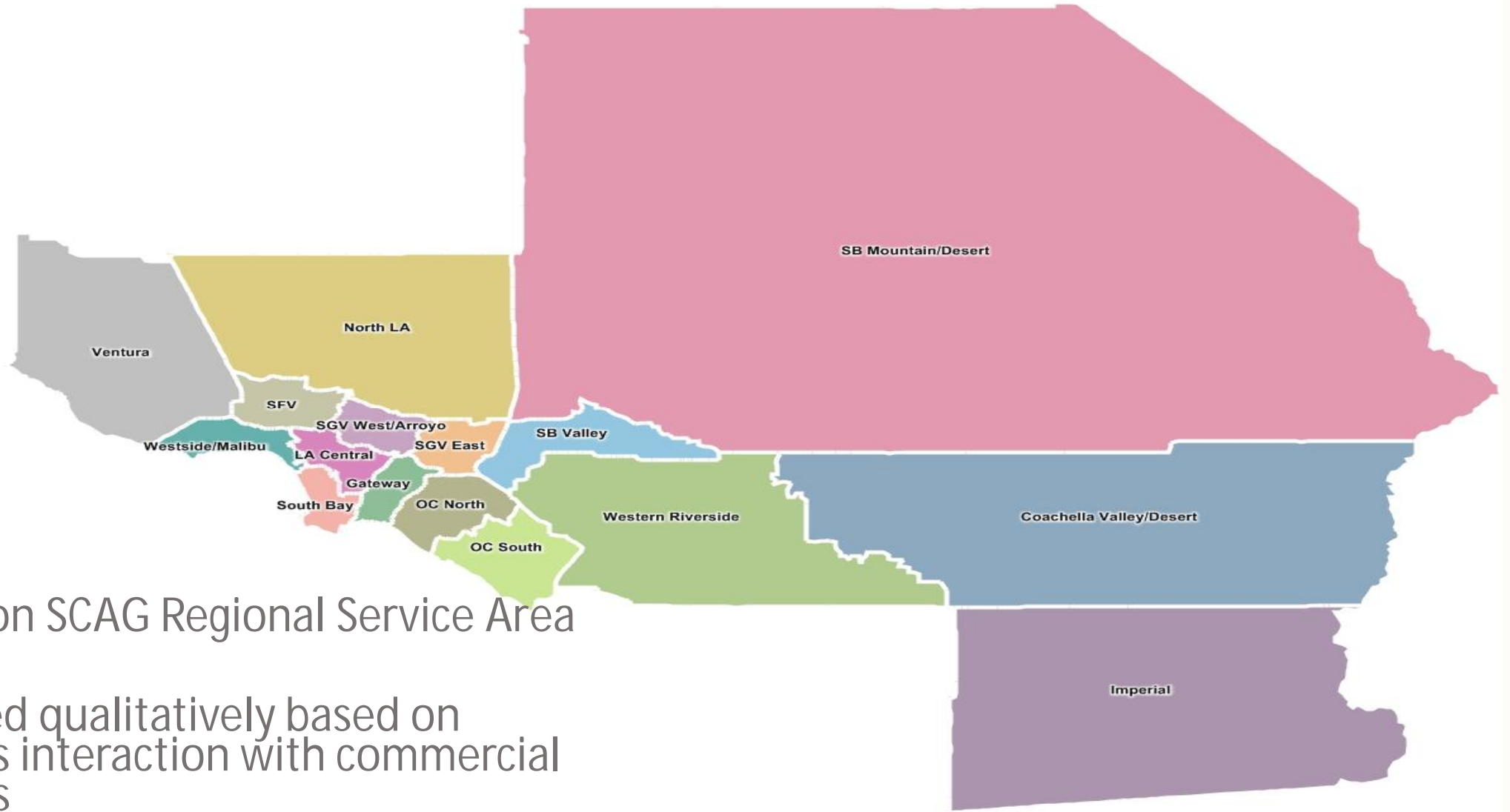
* LAX + BUR Survey Vs Gravity Model output for all airports.

Trip Distribution



- Visitor trips are longer compared to the survey. This will be addressed in the next step, however it should be noted that the survey only includes BUR and LAX, whereas the Gravity Model is for 7 airports.

Trip Distribution - Sub Regions for Aviation Forecast



- Based on SCAG Regional Service Area (RSA)
- Grouped qualitatively based on region's interaction with commercial airports

Trip Distribution

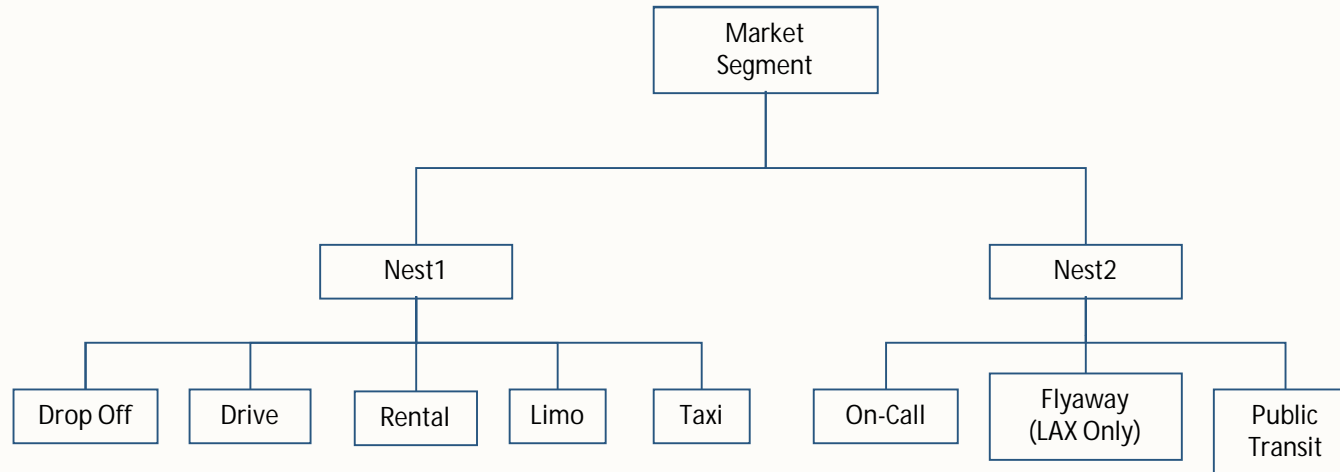
Sub Region	Inter Vista Survey								Gravity Model Outputs							
	LAX	BUR	LGB	IPL	SNA	PSP	ONT	Total	LAX	BUR	LGB	IPL	SNA	PSP	ONT	Total
Ventura	2,033	343	104	0	78	0	13	2,570	2,512	408	124	0	96	0	11	3,151
North LA	3,468	240	135	0	132	30	105	4,111	3,961	266	145	0	142	11	86	4,611
SFV	8,785	478	280	0	306	0	164	10,014	8,846	511	275	0	301	0	120	10,052
Westside/Malibu	3,233	182	178	0	139	0	96	3,829	4,523	257	229	0	178	0	142	5,329
SGV West/Arroyo	7,226	500	336	0	382	0	191	8,635	7,001	604	330	0	379	0	143	8,457
LA Central	10,962	635	491	0	501	0	247	12,836	11,475	651	495	0	500	0	226	13,346
South Bay	7,636	352	356	0	349	0	154	8,848	7,203	281	323	0	318	0	96	8,221
Gateway	7,465	352	361	0	401	0	171	8,750	5,990	354	320	0	340	0	102	7,106
SGV East	4,312	266	211	0	268	234	178	5,468	4,207	312	218	0	294	181	158	5,370
OC North	5,619	986	707	0	5,413	194	479	13,397	5,054	752	685	0	4,771	61	465	11,788
OC South	3,238	601	412	0	3,707	44	365	8,367	3,262	492	435	0	4,036	15	321	8,561
SB Mountain/Desert	2,439	466	248	0	332	576	1,885	5,946	490	108	51	0	75	84	352	1,160
SB Valley	337	82	30	0	98	180	516	1,243	1,812	460	164	0	559	378	2,312	5,685
Western Riverside	2,783	387	294	0	375	864	1,466	6,168	2,984	398	336	0	452	667	1,352	6,189
Coachella Valley	0	0	0	3	0	350	30	383	0	0	0	0	0	1,066	156	1,221
Imperial	0	0	0	15	0	0	0	15	0	0	0	333	0	0	0	333
Total	69,536	5,871	4,143	18	12,481	2,471	6,060	100,580	69,319	5,853	4,130	333	12,442	2,464	6,041	100,582

Trip Distribution

Sub Region	Gravity Model Vs Inter Vista Ratios							Total
	LAX	BUR	LGB	IPL	SNA	PSP	ONT	
Ventura	1.24	1.19	-	-	-	-	-	1.24
North LA	1.14	1.11	-	-	-	-	-	1.14
SFV	1.01	1.07	0.98	-	0.98	-	-	1.01
Westside/Malibu	1.40	1.41	1.29	-	-	-	-	1.40
SGV West/Arroyo	0.97	1.21	0.98	-	0.99	-	-	0.97
LA Central	1.05	1.02	1.01	-	1.00	-	0.91	1.05
South Bay	0.94	0.80	0.91	-	0.91	-	-	0.94
Gateway	0.80	1.01	0.89	-	0.85	-	-	0.80
SGV East	0.98	1.17	1.03	-	1.10	0.77	-	0.98
OC North	0.90	0.76	0.97	-	0.88	-	0.97	0.90
OC South	1.01	0.82	1.06	-	1.09	-	0.88	1.01
SB Mountain/Desert	0.20	0.23	0.20	-	0.23	0.15	0.19	0.20
SB Valley	5.38	5.64	-	-	5.69	2.10	4.48	5.38
Western Riverside	1.07	1.03	1.14	-	1.21	0.77	0.92	1.07
Coachella Valley	-	-	-	-	-	3.05	-	-
Imperial	-	-	-	-	-	-	-	-
Total	1.00	1.00	1.00	-	1.00	1.00	1.00	1.00

Mode of Arrival

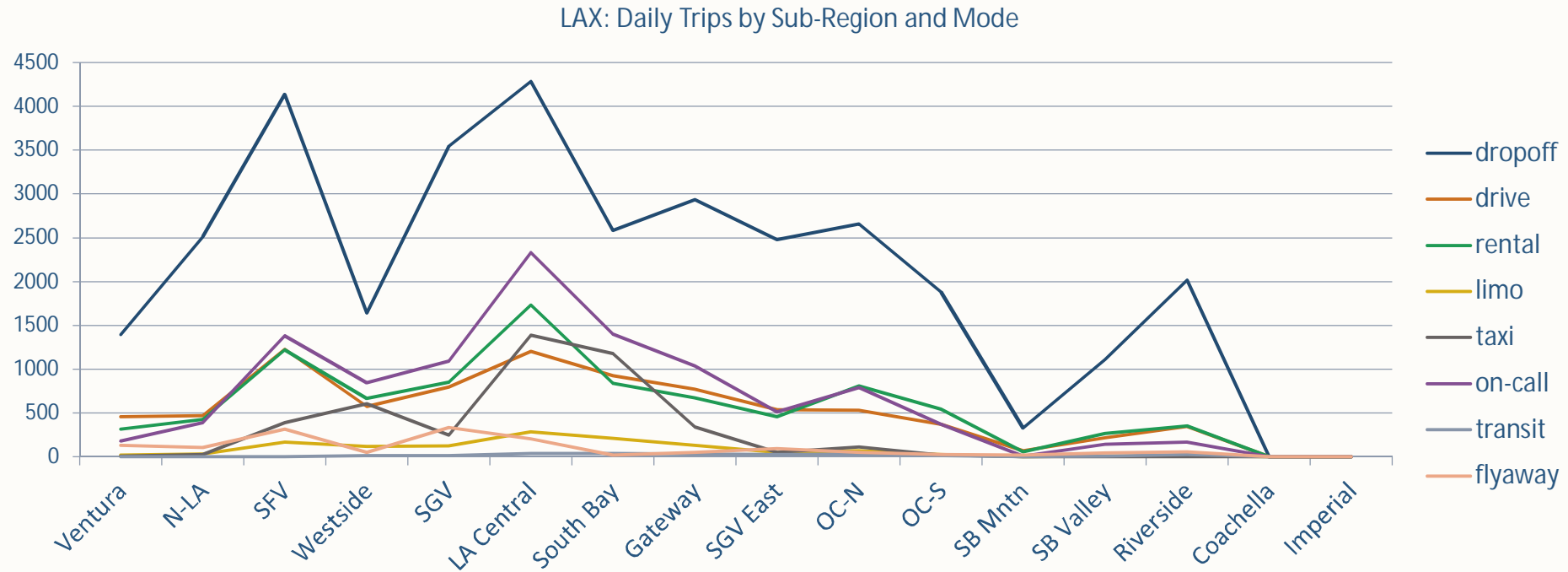
- Use two existing sets of models
 - LAX for LAX
 - BUR for all other airports (assuming similar access characteristics)
- Model structure



Mode of Arrival - LAX

LAX District	Total Airport Trips		Trips by Mode							
	Intervistas Total	APM Total	dropoff	drive	rental	limo	taxi	on-call	transit	flyaway
Ventura	2033	2512	1396	457	316	19	11	180	4	129
N-LA	3468	3961	2511	468	425	32	28	388	1	108
SFV	8785	8846	4134	1227	1221	171	393	1380	4	315
Westside	3233	4523	1638	578	667	119	607	846	16	51
SGV	7226	7012	3545	795	854	125	251	1093	15	334
LA Central	10962	11464	4282	1202	1733	286	1391	2328	37	205
South Bay	7636	7207	2584	924	839	212	1180	1402	42	23
Gateway	7465	5982	2932	772	675	132	343	1039	34	54
SGV East	4312	4207	2478	538	456	50	52	511	27	96
OC-N	5619	5054	2657	535	807	68	111	793	33	49
OC-S	3238	3262	1881	372	543	27	22	375	14	28
SB Mntn	2439	490	327	73	57	1	0	12	0	21
SB Valley	337	1812	1111	219	268	9	4	142	10	49
Riverside	2783	2984	2015	347	352	10	3	172	24	60
Coachella	0	0	0	0	0	0	0	0	0	0
Imperial	0	0	0	0	0	0	0	0	0	0
Total	69,536	69,315	33,492	8,507	9,214	1,262	4,396	10,660	262	1,521

Mode of arrival - LAX

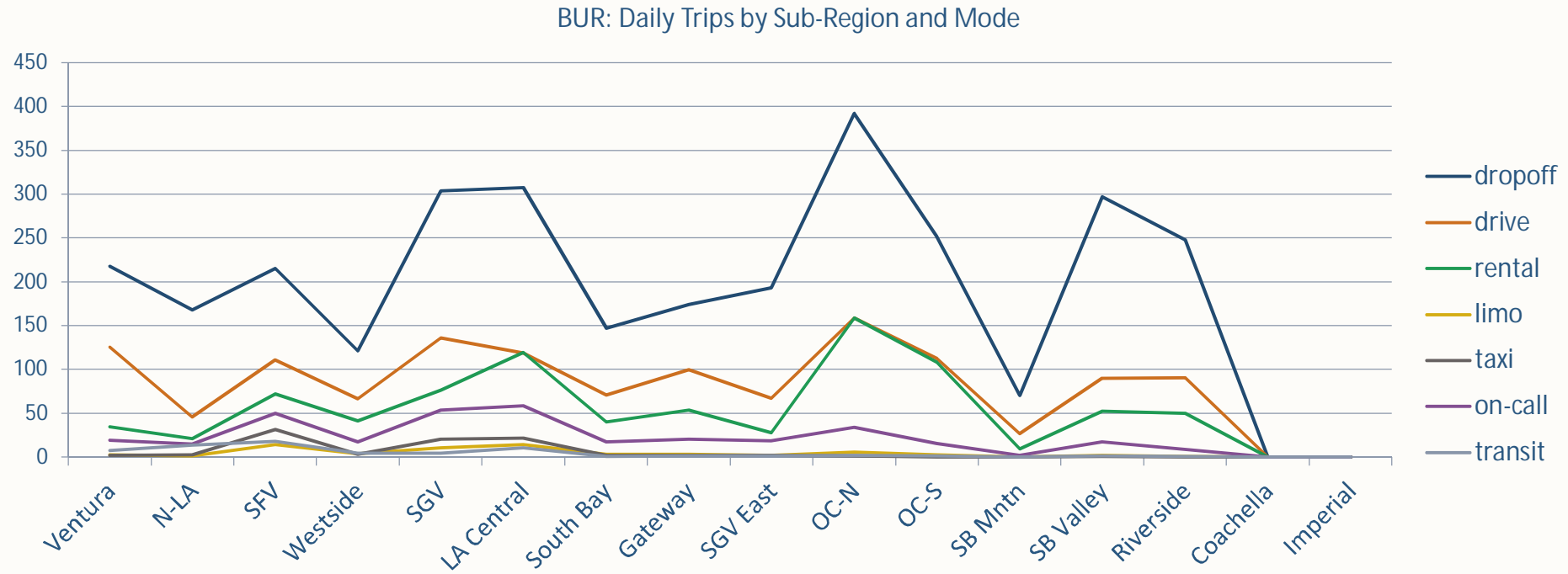


- Mode of Arrivals for LAX are different from other airports, as it based on the calibrated LAX Air Passenger Model (APM). For the other airports, calibrated BUR APM was used.

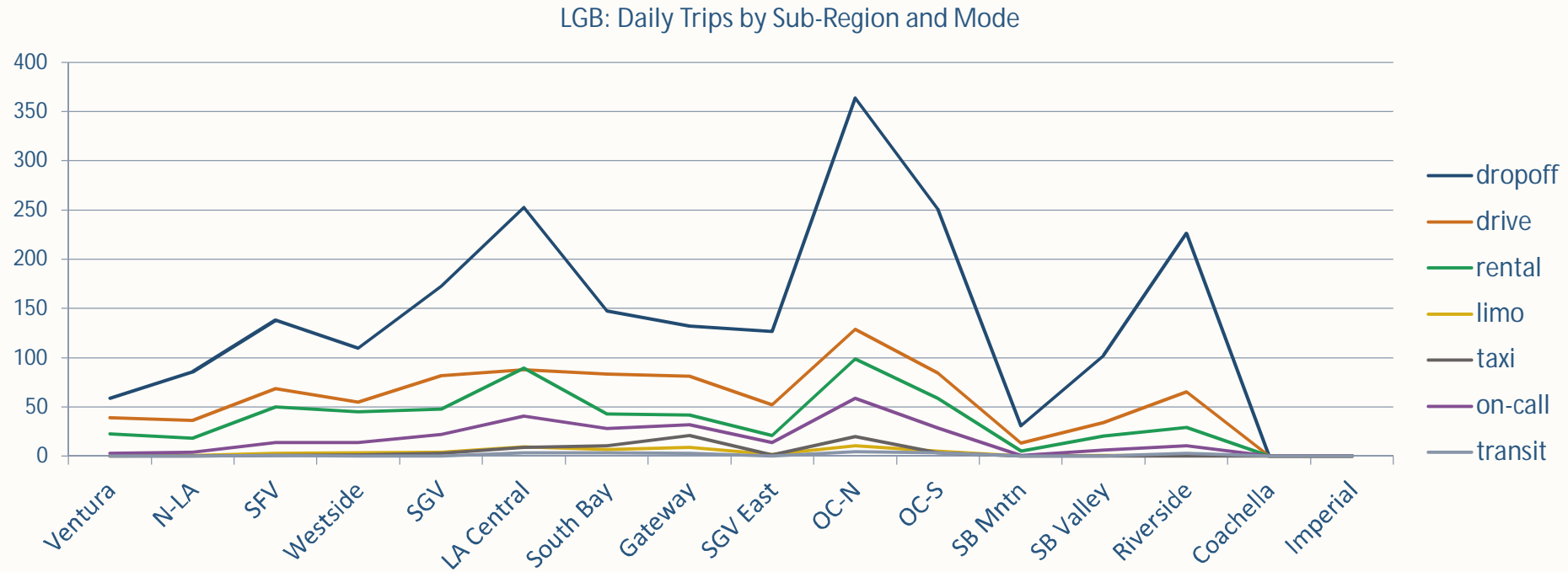
Mode of arrival – Burbank (BUR)

BUR District	Total Airport Trips		Trips by Mode							
	Intervistas Total	APM Total	dropoff	drive	rental	limo	taxi	on-call	transit	flyaway
Ventura	343	408	217	125	34	2	2	19	8	
N-LA	240	266	168	45	21	1	2	15	13	
SFV	478	511	215	111	72	14	31	50	18	
Westside	182	257	121	66	41	4	3	17	4	
SGV	500	604	303	136	76	10	20	54	4	
LA Central	635	650	307	118	120	14	22	58	10	
South Bay	352	281	147	70	40	3	2	18	1	
Gateway	352	354	174	100	53	3	2	20	1	
SGV East	266	312	193	67	28	2	2	19	1	
OC-N	986	752	392	159	159	5	1	34	2	
OC-S	601	492	252	112	108	2	0	15	1	
SB Mntn	466	108	70	26	9	0	0	2	0	
SB Valley	82	460	297	90	52	2	0	17	1	
Riverside	387	398	248	90	50	1	0	9	1	
Coachella	0	0	0	0	0	0	0	0	0	
Imperial	0	0	0	0	0	0	0	0	0	
Total	5,871	5,853	3,105	1,316	864	66	89	346	66	

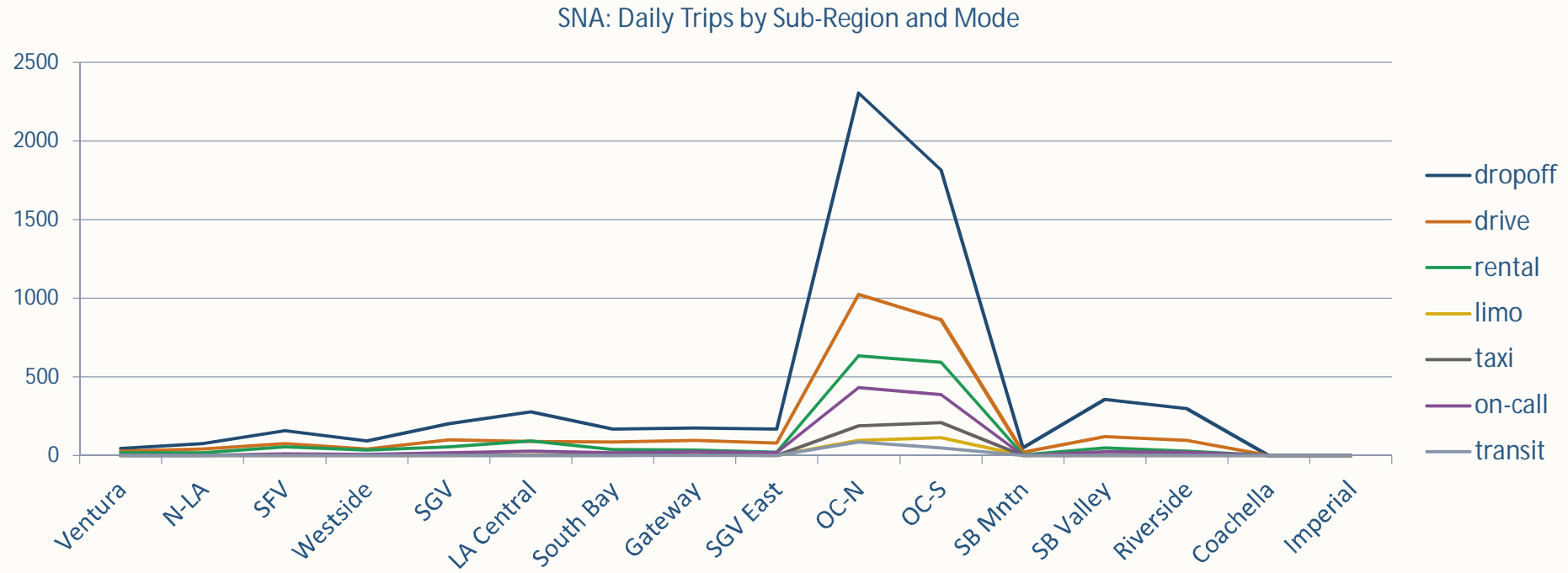
Mode of Arrival - Burbank



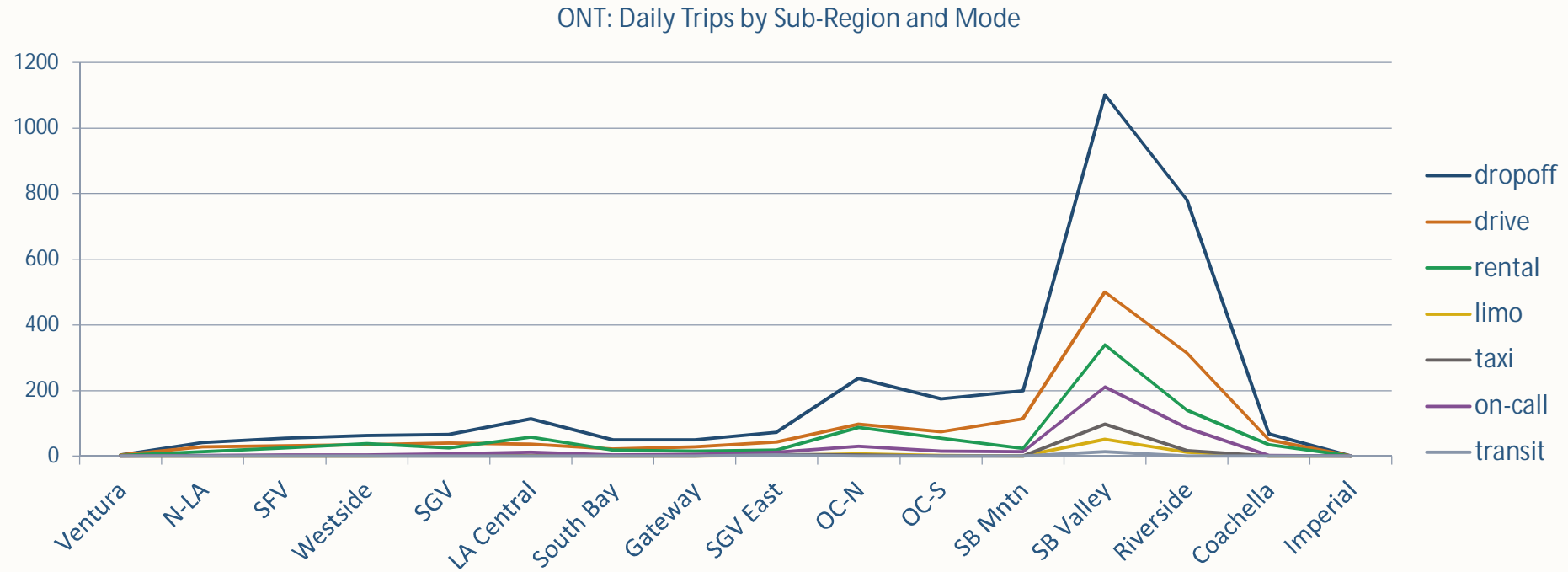
Mode of Arrival – Long Beach (LGB)



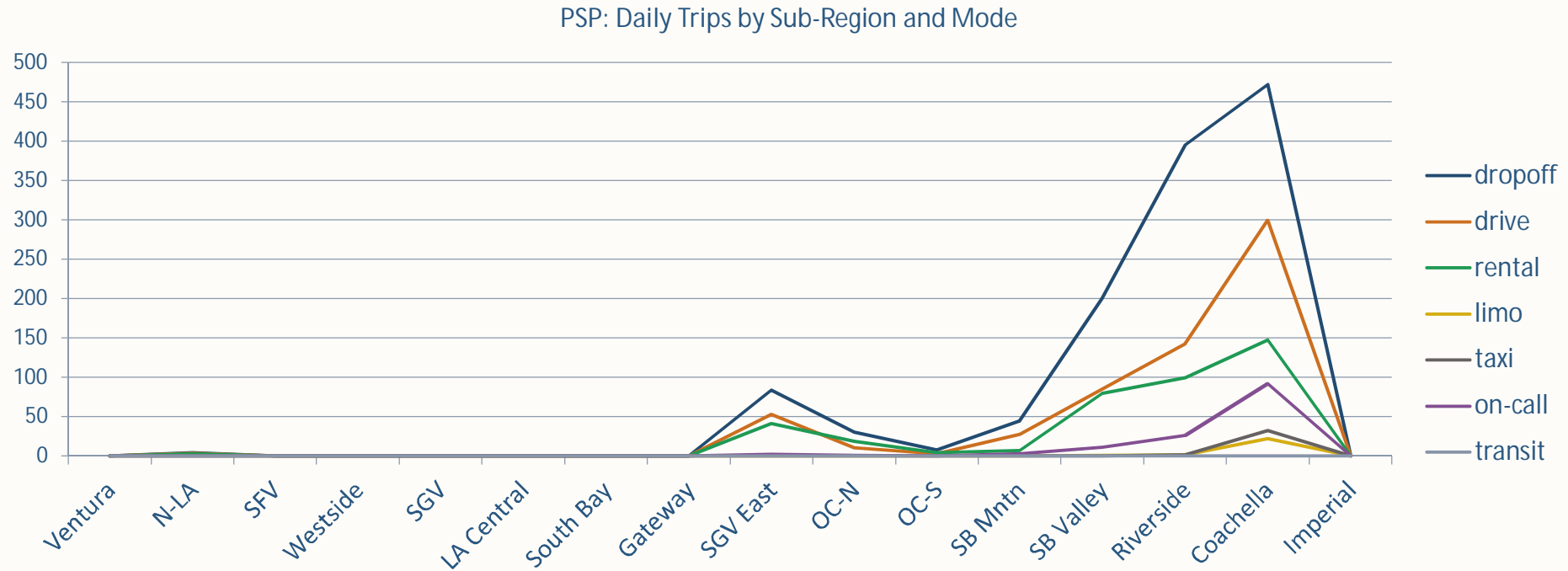
Mode of Arrival – John Wayne (SNA)



Mode of Arrival – Ontario (ONT)

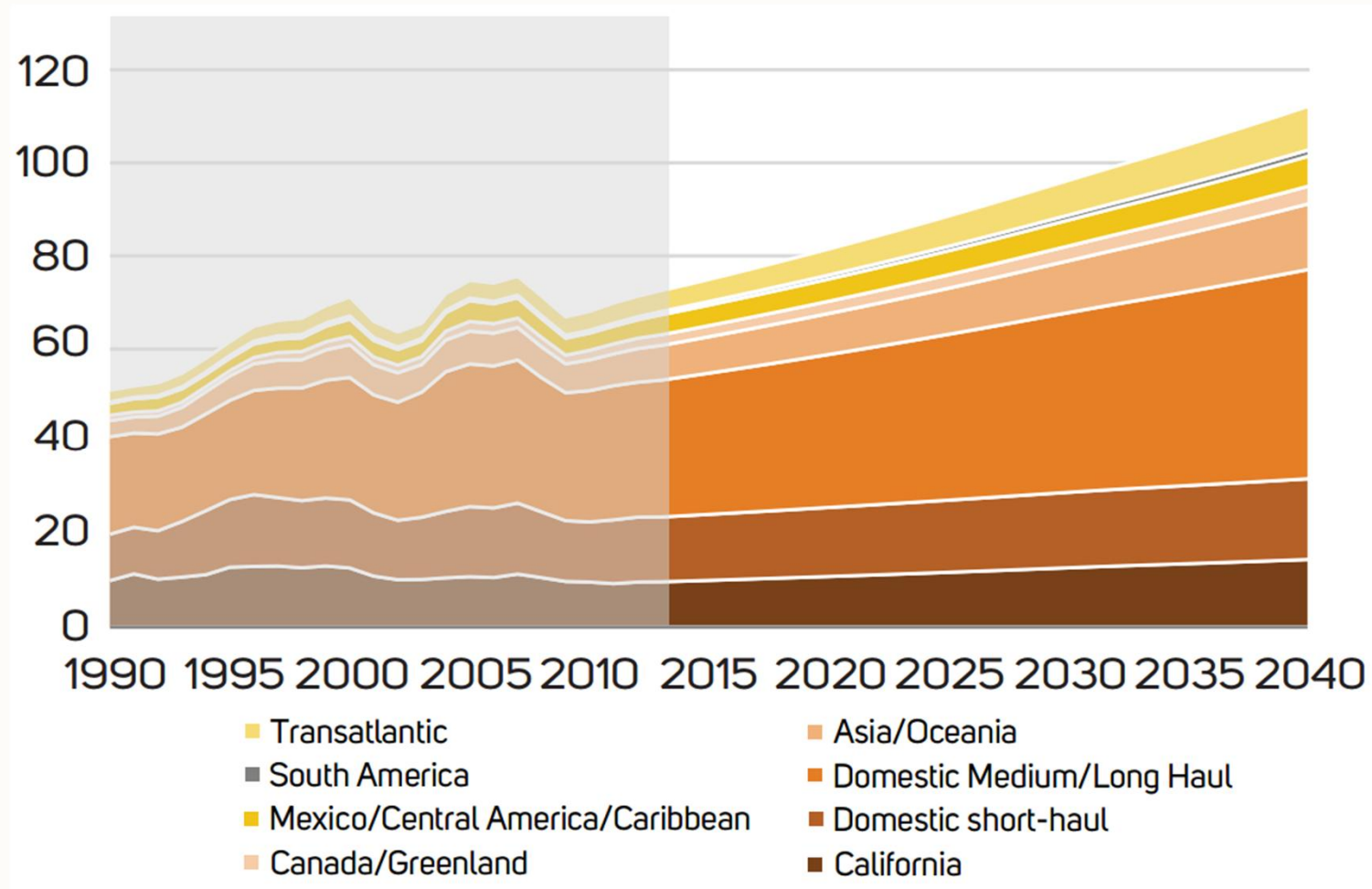


Mode of Arrival – Palm Springs (PSP)



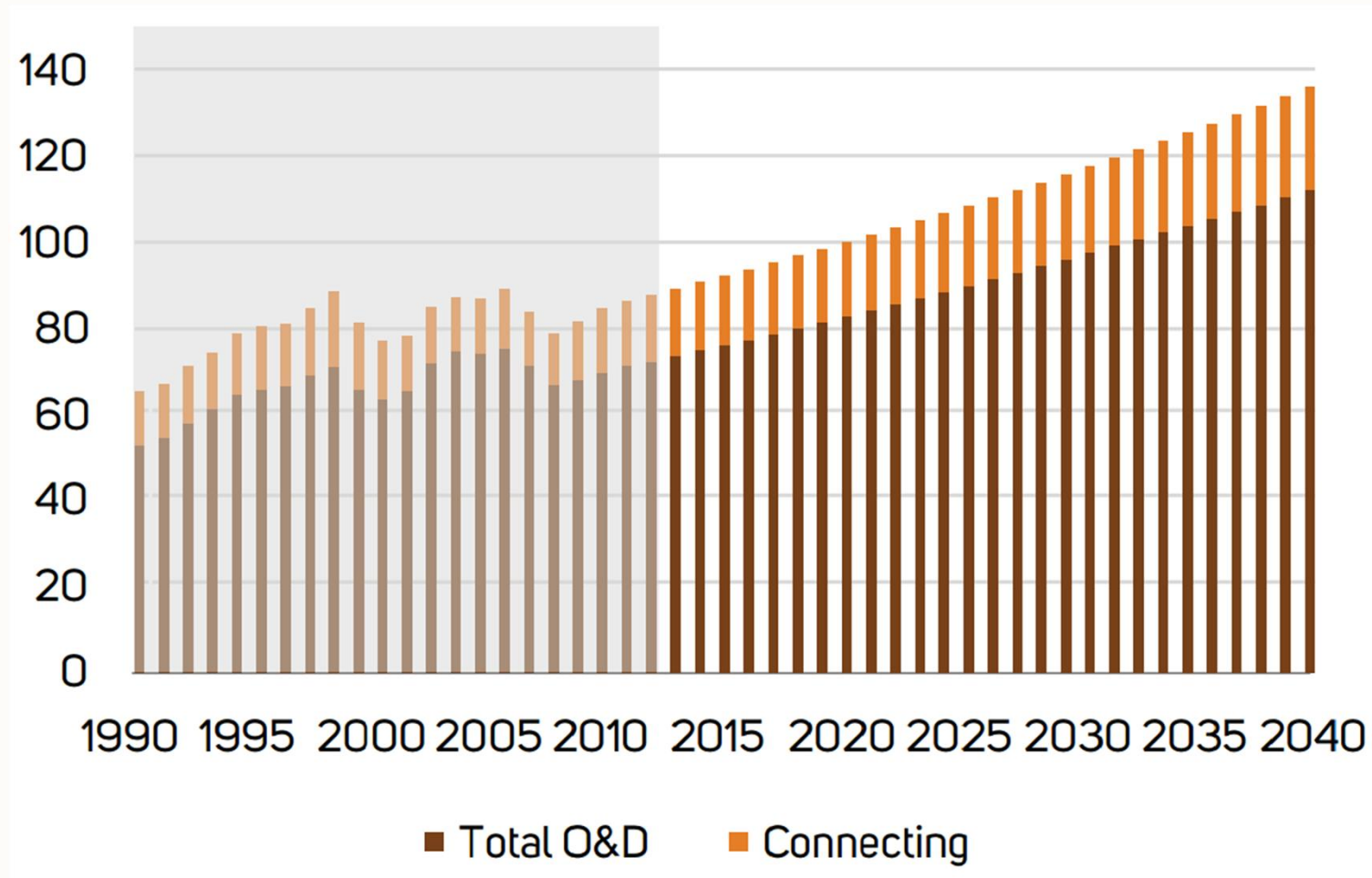
2040 Air Passenger Forecast

Forecast O&D Passenger Demand



2040 Air Passenger Forecast

Forecast Total Enplaned and Deplaned Passengers



2040 Air Passenger Forecast

2040 AIR PASSENGER FORECAST

Airport Specific Demand, Million Annual Passengers (MAP)

Midpoint of 2040 Total
Regional Aviation Demand:

136.2 MAP



What's all this for?

Airport Ground Access Considerations

Assignment of air passenger trips to SCAG's networks

- Currently, more than 200,000 daily arriving/departing air passengers
 - 2040 forecast: 330,000 daily passengers
- Low ground access transit share:
 - LAX: 3%
 - BUR: 1%
 - Others: <1%
- Half of all airport trips are pick up/drop off
 - Each accounts for two ground trips each

Airport Ground Access – Analysis

Conversion of air passenger trips to vehicle trips

MODE OF ARRIVAL	1 DEPARTING AIR PASSENGER TRIP GENERATES ¹ :	
	TO AIRPORT	FROM AIRPORT
Drop-off	1 HOV ² trip	1 SOV ³ trip
Drive self	1 SOV trip ⁴	—
Rental car	1 SOV trip	—
Limousine	1 HOV trip	1 SOV trip
Taxi	1 HOV trip	—
On-call (Shuttle)	Fraction of HOV trip	—
Transit	1 person trip	—
FlyAway	1 person trip	—

¹Arriving air passenger trip generates the same number of trips, but “to airport” and “from airport” are reversed.

²High occupancy vehicle

³Single occupancy vehicle; some drop-off return trips could be HOV trips if more than one person drops off a passenger.

⁴Some “drive self” trips will be HOV trips if more than one passenger is traveling together.

Airport Ground Access – Regional Strategies

- Support the regionalization of air travel demand
- Continue to support regional and inter-regional projects that facilitate airport ground access (e.g., HST, High Desert Corridor)
- Support ongoing local planning efforts by airport operators, CTCs and local jurisdictions
- Encourage the development and use of transit access to the region's airports
- Encourage the use of modes with high average vehicle occupancy (AVO)
- Discourage the use of modes that require “deadhead” trips to/from airports

Airport Ground Access – LAX Strategies

- LAX 2016 RTP/SCS Projects:
 - Ground Access Program: LAX Train; ITFs; CONRAC; Central terminal area improvements; and connection with the under-construction Metro Crenshaw Line
 - New Crenshaw/Green Line station at 96th/Aviation
 - Automated People Mover
- LAX Strategies include:
 - Support construction of Automated People Mover (APM) with connection to Metro Crenshaw Line
 - Support construction of CONRAC facility and ITFs to reduce private vehicles and shuttles in the Central Terminal Area
 - Support expansion of FlyAway service to new markets
 - Support ability of ride-hailing services to pick up passengers, to reduce deadhead trips in the central terminal area.

Airport Ground Access – Burbank (BUR) Strategies

- BUR 2016 RTP/SCS Projects:
 - Increased Metrolink service system wide
 - Metro Red Line extension from North Hollywood to BUR
 - New east-west BRT service from Orange Line/North Hollywood to Pasadena
- BUR Strategies include:
 - Construct new Metrolink Station on Antelope Valley Line
 - Support increased Metrolink service to stations on Ventura and Antelope Valley Lines
 - Support recommendations of recent Ground Transportation and Land Use Study:
 - Improve transit connections to North Hollywood Red/Orange Line Station
 - Improve transit connection to Pasadena and Glendale
 - Support the development of a HST station on Hollywood Way to provide convenient access between the station and the airport

Airport Ground Access – Ontario (ONT) Strategies

- ONT 2016 RTP/SCS Projects:
 - New Rancho Cucamonga Metrolink to ONT rail connection
 - Numerous local freeway interchange, arterial and grade separation improvements
- ONT Strategies include:
 - Support recommendations of SANBAG Ontario Airport Rail Access Study to initiate transit connection to Metrolink and build transit market
 - Continue analysis of transit options in upcoming SCAG Inter-County Transit and Rail Study
 - Support development of intermodal transportation center
 - Explore possibility of direct access from future I-10 Express Lanes
 - Consider focus on tourist charters that can attract passengers and use high-capacity vehicles for ground access
 - Continue improvements to highways and arterials



Thank you!

Learn more by visiting www.scag.ca.gov.

SCAG Staff Contact: Ryan N. Hall, hall@scag.ca.gov, 213-236-1935

