SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

Job/Housing Balance and Commuting

- Different Stories by Income Group or Industry Sectors?

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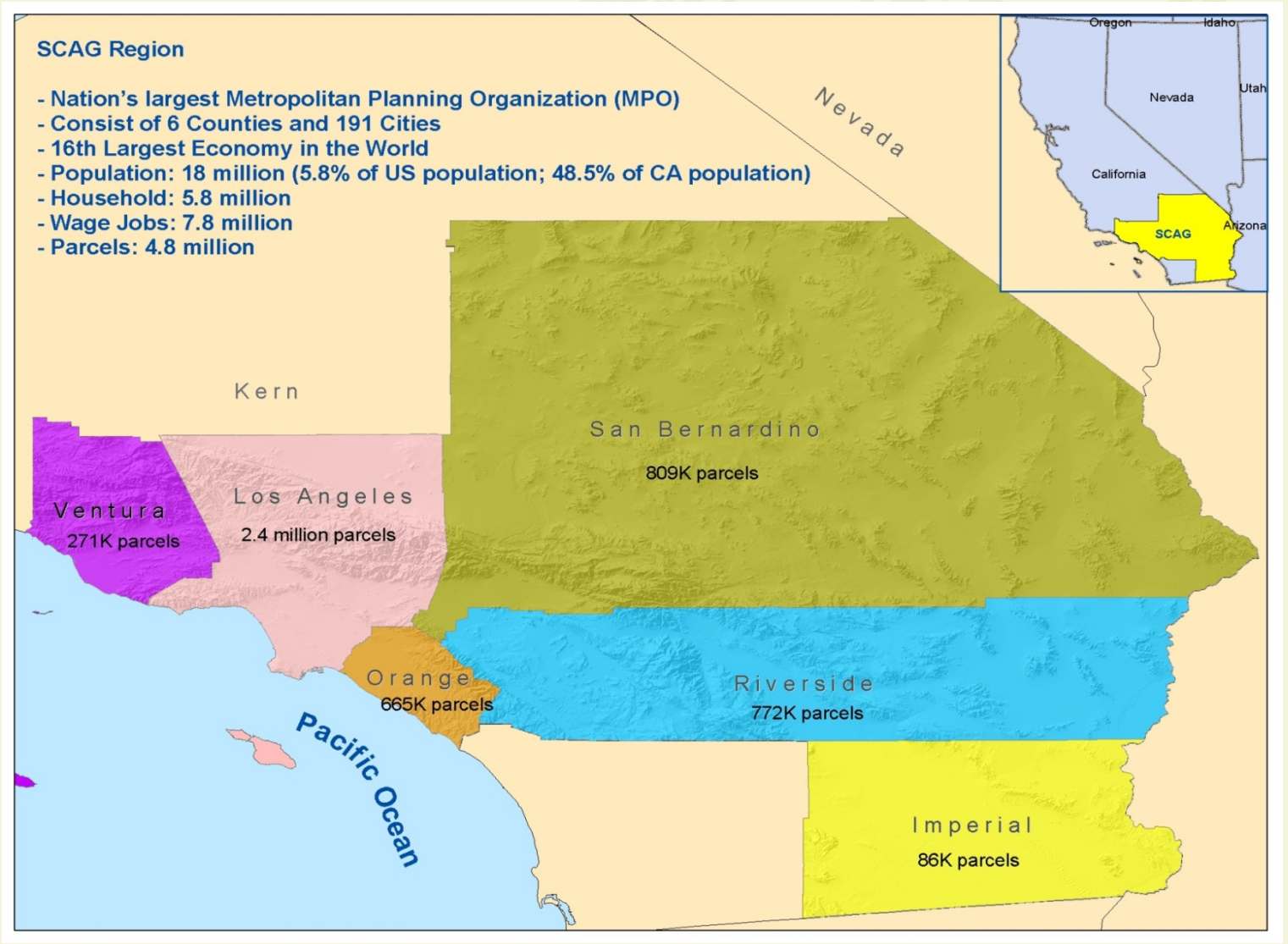
SCAG Region


SCAG Region
- Nation's largest Metropolitan Planning Organization (MPO)
- Consist of 6 Counties and 191 Cities
- 16th Largest Economy in the World
- Population: 18 million (5.8% of US population; 48.5% of CA population)
- Household: 5.8 million
- Wage Jobs: 7.8 million
- Parcels: 4.8 million
Nevada
Oregon
Idaho
Utah
Nevada
California
SCAG
Arizona
Kern
San Bernardino
809K parcels
Ventura
271K parcels
Los Angeles
2.4 million parcels
Orange
665K parcels
Riverside
772K parcels
Imperial
86K parcels
Pacific Ocean

Use of LED-OnTheMap

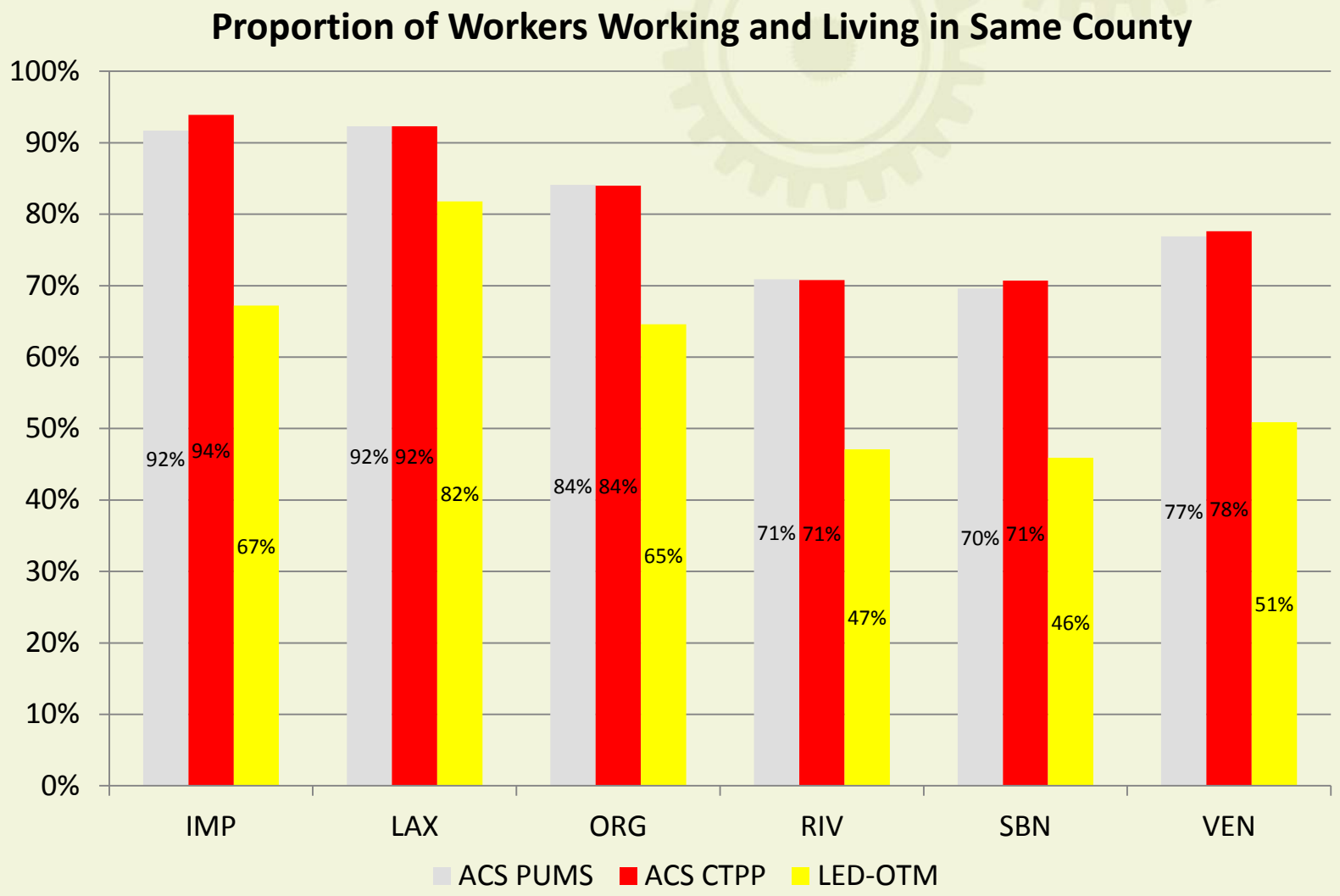
- Reference data for work-trip pattern analysis: comparison between ACS PUMS and LED-OTM

ACS PUMS	Workplace								
		IMP	LAX	ORG	RIV	SBN	VEN	Outside SCAG	Outside CA	Residence Total
Residence	IMP	91.7%	0.3%	0.1%	2.0%	0.3%	0.0%	2.7%	2.9%	100.0%
	LAX	0.0%	92.3%	4.2%	0.4%	1.3%	0.8%	0.6%	0.4%	100.0%
	ORG	0.0%	12.2%	84.1%	1.1%	0.9%	0.0%	1.3%	0.4%	100.0%
	RIV	0.0%	5.8%	7.7%	70.9%	10.5%	0.0%	4.5%	0.5%	100.0%
	SBN	0.0%	15.9%	4.5%	8.4%	69.6%	0.1%	0.8%	0.6%	100.0%
	VEN	0.0%	18.2%	0.4%	0.1%	0.1%	76.9%	3.8%	0.5%	100.0%
	Outside SCAG	1.4%	41.3%	32.8%	12.7%	5.6%	6.1%			100.0%
	Outside CA	3.5%	54.1%	17.1%	6.2%	15.2%	3.8%			100.0%
	Workplace Total	0.7%	57.5%	19.2%	8.8%	9.2%	4.2%	1.3%	0.5%	100.0%

Use of LED-OnTheMap

LED-OTM		Workplace								
		IMP	LAX	ORG	RIV	SBN	VEN	Outside SCAG	Outside CA	Residence Total
Residence	IMP	67.2%	6.3%	2.4%	6.5%	2.2%	0.4%	10.9%	4.0%	100.0%
	LAX	0.1%	81.8%	7.5%	1.5%	2.5%	1.4%	4.6%	0.7%	100.0%
	ORG	0.1%	23.0%	64.6%	2.6%	2.7%	0.6%	5.8%	0.6%	100.0%
	RIV	0.6%	14.0%	13.5%	47.1%	12.9%	0.6%	10.3%	1.0%	100.0%
	SBN	0.3%	26.1%	9.8%	10.2%	45.9%	0.7%	6.1%	1.0%	100.0%
	VEN	0.1%	31.9%	4.3%	1.1%	1.5%	50.9%	9.7%	0.5%	100.0%
	Outside SCAG	1.1%	49.1%	23.8%	10.7%	9.3%	6.1%			100.0%
	Outside CA	5.5%	46.6%	18.8%	10.7%	11.9%	6.5%			100.0%
	Workplace Total	0.9%	58.6%	20.3%	8.2%	8.6%	4.0%	5.9%	0.8%	100.0%

Use of LED-OnTheMap



Use of LED-OnTheMap

- Reference data for small area employment analysis

County	SCAG	IMP	LAX	ORG	RIV	SBN	VEN
EDD BM11/CES	6,669,100	53,900	3,799,600	1,371,300	548,800	595,900	299,600
QCEW11	6,764,664	56,496	3,883,063	1,371,588	557,963	597,095	298,459
REA11(total)	9,513,789	69,931	5,476,450	1,897,610	818,130	832,273	419,395
REA11(WS)	7,176,753	56,810	4,096,635	1,464,868	590,804	648,627	319,009
LED11-OTM	7,174,832	62,505	4,179,206	1,447,768	581,470	616,687	287,196
InfoGroup Emp11	7,337,294	56,966	4,162,083	1,482,453	644,156	651,927	339,709
Worker/ACS 07-11	8,068,904	58,017	4,501,382	1,441,313	868,898	815,102	384,192

Purpose of Study

- This analysis tests whether job/worker balance impacts on workers' commuting time.
- Geographic level of the study is Tier1/TAZ.

Data

- Commuting Time: Commuting time data is from the result of the SCAG 2012 Regional Transportation Plan (RTP) travel demand model.
- Job and Worker: Number of jobs and workers data are from the 2011 LED-OTM
- Socio-economic Status: The socio-economic data are from the SCAG 2012 RTP SED dataset.

Variables

- Dependent Variable
- ave_time: a weighted average of commuting time in each T1/TAZ by residence.
- (zone-to-zone average commuting time) x (number of workers by zone-to-zone) / (workers by residence)

Variables - Balance Factors

- jwr: a job-worker ratio. If the ratio is closed to 1, job and worker are well balanced.
- 1-(absolute value (jobs by residence-jobs by workplace))/(jobs by residence-jobs by workplace)
- p_same: the proportion of workers who live and work in same zone.
- rich_r: a dummy variable. If jobs in residence are larger than those in workplace in a zone rich_r is 1. Reference is rich_w.

Variables - SES

- Socio-economic Status
- hhinc: median household income
- p_car0: the proportion of households without car
- p_mf: the proportion of households living in multi-family housing

Variables - Zone Characteristics

- area: area of the residence zone
- dist: distance to employment centers. The employment centers are defined by the Giuliano-small method.
- type: dummy variables which are combination of job density and worker density. For example, type12 means job density by residence is in the first quintile and job density in workplace is in the second quintile. Whole SCAG region is categorized into 16 groups by the combination. The type11 is the reference.

Descriptive Statistics

		Dependent Variable	Balance Factor		Neighborhood Socio-economic Status				
type	Freq	ave_time	jwr	p_same	hhinc	p_car0	p_mf	area	dist
Total	3797	27.670	0.518	0.026	50,679	0	0.311	6.758	16,045
11	512	41.790	0.496	0.027	60,584	0	0.088	45.244	54,285
12	116	32.514	0.669	0.031	60,476	0	0.177	2.738	40,333
13	42	26.725	0.298	0.048	44,102	0	0.231	2.154	17,165
14	71	17.043	0.088	0.055	47,258	0	0.379	0.933	2,864
21	205	32.874	0.251	0.019	72,837	0	0.090	1.495	19,968
22	396	30.565	0.629	0.025	60,983	0	0.186	1.198	20,954
23	199	27.841	0.834	0.031	55,079	0	0.247	0.948	12,537
24	216	23.284	0.443	0.040	46,499	0	0.395	0.719	7,010
31	80	29.173	0.137	0.014	62,068	0	0.139	0.589	9,105
32	431	26.534	0.392	0.019	53,110	0	0.216	0.607	7,581
33	317	24.459	0.786	0.023	47,182	0	0.335	0.563	8,032
34	193	22.825	0.721	0.034	45,476	0	0.442	0.516	7,658
41	39	21.523	0.088	0.014	48,386	0	0.238	0.290	4,352
42	348	22.251	0.258	0.019	37,987	0	0.408	0.329	3,930
43	318	22.444	0.520	0.023	36,515	0	0.537	0.328	3,892
44	314	20.708	0.726	0.033	34,376	0	0.744	0.256	1,055

Descriptive Statistics

		Dependent Variable	Balance Factor		Neighborhood Socio-economic Status				
type	Freq	ave_time	jwr	p_same	hhinc	p_car0	p_mf	area	dist
Total	3797	27.670	0.518	0.026	50,679	0	0.311	6.758	16,045
More Job	1033	25.551	0.597	0.038	48,272	0	0.371	7.211	18,501
More Worker	2764	28.462	0.489	0.022	51,579	0	0.288	6.589	15,127

Regression Result

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
# of Observation	3,797		3,797		3,797		3,797		3,797		3,797	
Adjusted R-Square	0.290		0.297		0.295		0.416		0.413		0.416	
Dependent Variable	ave_time		ave_time		ave_time		ave_time		ave_time		ave_time	
Variables	Beta	P	Beta	P	Beta	P	Beta	P	Beta	P	Beta	P
Intercept	32.387	***	31.177	***	30.170	***	43.031	***	44.834	***	42.952	***
jwr					0.576		-0.190				-0.209	
p_same			-20.885	**			-8.146				-8.479	
rich_r			1.838	***	2.203	***	2.425	***			2.433	***
hhinc	32.387	***	-3.127	***	-3.102	***	-7.872	***	-8.004	***	-7.826	***
p_car0	-3.281	***	-24.623	***	-25.092	***	-22.748	***	-22.294	***	-22.743	***
p_mf	-25.750	***	-6.841	***	-6.952	***	1.565				1.583	
area	-7.411	***	59.307	***	59.136	***	55.425	***	55.063	***	55.346	***
dist	59.186	***	5.941	***	5.638	***					0.119	
type12							-5.417	***	-6.595	***	-5.397	***
type13							-11.771	***	-13.624	***	-11.715	***
type14							-19.915	***	-21.578	***	-19.849	***
type21							-6.300	***	-5.654	***	-6.278	***
type22							-8.817	***	-8.353	***	-8.782	***
type23							-10.123	***	-11.282	***	-10.065	***
type24							-14.124	***	-15.700	***	-14.060	***
type31							-10.516	***	-9.756	***	-10.481	***
type32							-13.667	***	-12.890	***	-13.620	***
type33							-15.762	***	-15.061	***	-15.706	***
type34							-14.931	***	-16.229	***	-14.866	***
type41							-18.859	***	-17.966	***	-18.814	***
type42							-17.990	***	-16.933	***	-17.939	***
type43							-17.746	***	-16.584	***	-17.690	***
type44							-17.598	***	-17.313	***	-17.530	***

Conclusion

- It is obvious that neighborhood attributes affect commuting times (confirmed by all 5 models).
- If more workers work in same zone, commuting time is getting shorter (Model 2).
- In the zones where job density and worker density are the lowest, commuting time is longest.
- However, job-worker ratio does not affect commuting times.

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