



Economic
Development
RESEARCH GROUP

Linkages of Airports with Local/Regional Economic Development

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*Economic Development Implications of Global Trade, Transport Investments,
Climate Change, Environmental, and Urban and Rural Policies*

Airports Contribution to Economy in 2 New Approaches

- ❖ National Productivity Enhanced by Air Service
- ❖ Local and State Policies to Create Smart Growth Districts by Airports

Boost National Productivity

- ❖ Multi-factor productivity (MFP)
 - Link national and international connectivity through airports to economic productivity
- ❖ Measure the contribution of airports to changes in national economic growth and the overall economic welfare.
 - Focus on how changes in airport system performance leads to broad gains in the U.S. economy that utilize aviation as a tool of business

Estimating Productivity of Commercial Aviation

- ❖ Build a model based on the years 1995, 2000, 2005 and 2010, covering:
 - Airport connectivity factors (from the DB1B database)
 - Regional economic data
 - 2- digit NAICS industries

20 Metro Regions / 25 Domestic Airports Selected for Analysis

Code	Airport/region	Multi-airport regions
SF Bay	<i>San Francisco Bay Area</i>	OAK, SFO, SJC
Chicago	<i>Chicago metropolitan region</i>	ORD, MDW
ATL	Hartsfield-Jackson Atlanta International Airport	
CVG	Cincinnati/Northern Kentucky International Airport	
STL	Lambert-St. Louis International Airport	
PIT	Pittsburgh International Airport	
RDU	Raleigh-Durham International Airport	
DEN	Denver International Airport	
Phoenix	<i>Phoenix metropolitan region</i>	
SLC	Salt Lake City International Airport	
Boston	<i>Boston metropolitan region</i>	BOS, PVD, MHT
PHL	Philadelphia International Airport	
DTW	Detroit Metropolitan Wayne County Airport	
SAN	San Diego International Airport	
PDX	Portland International Airport	
TPA	Tampa International Airport	
MCI	Kansas City International Airport	
TUL	Tulsa International Airport	
SAT	San Antonio International Airport	
BNA	Nashville International Airport	

15 International Airports

Airports		
Amsterdam	Beijing	Copenhagen
Dubai	Frankfurt	Hong Kong
London	Madrid	Munich
Paris	Seoul	Shanghai
Singapore	Rome	Tokyo



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11 Aviation Variables

Aviation Connectivity Variables

Number of Airlines

Domestic Non-Stop Departures

Airline Hubs Served-Domestic

Domestic Non-Stop Destinations

Two or More Daily Non-stop Domestic Flights

Five or More Daily Non-stop Domestic Flights

International Non-Stop Departures

International Non-Stop Destinations

Percent of World GDP Served Non-Stop

Percent of the World GDP Served Daily

Percent of the World GDP Served Two or More Daily



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Analysis Based on 2-digit NAICS

Sectors for MFP Analysis

Manufacturing

Wholesale Trade

Information

Finance & Insurance

Real Estate, Rental & Leasing

Professional Scientific & Technical Services

Management of Companies & Enterprises

Administration & Support Waste Management Services

Art, Entertainment & Recreation

Accommodation & Food Services

Other**

Example of Results – Jobs Added to Economy Based on a 1% Change in Aviation Variable

Jobs	Number of Airlines	Non-Stop Departures (Domestic)	Airline Hubs Served (Domestic)
Direct	90,524	127,870	97,068
Indirect	163,411	117,354	50,409
Induced	146,542	121,906	75,647
TOTAL	400,477	367,130	223,125

Example of Results – Output & Value Added Based on a 1% Change in Aviation Variable

Output	Number of Airlines	Non-Stop Departures (Domestic)	Airline Hubs Served (Domestic)
Direct	\$45,522	\$39,993	\$19,840
Indirect	\$37,805	\$24,071	\$8,907
Induced	\$20,996	\$21,492	\$14,439
TOTAL	\$104,323	\$85,556	\$43,186

Value Added	Number of Airlines	Non-Stop Departures (Domestic)	Airline Hubs Served (Domestic)
Direct	\$12,568	\$16,493	\$11,871
Indirect	\$16,614	\$11,616	\$4,715
Induced	\$11,897	\$9,896	\$6,141
TOTAL	\$41,078	\$38,006	\$22,727

Example of Results – Jobs by Sector Based on a 1% Change in Aviation Variable

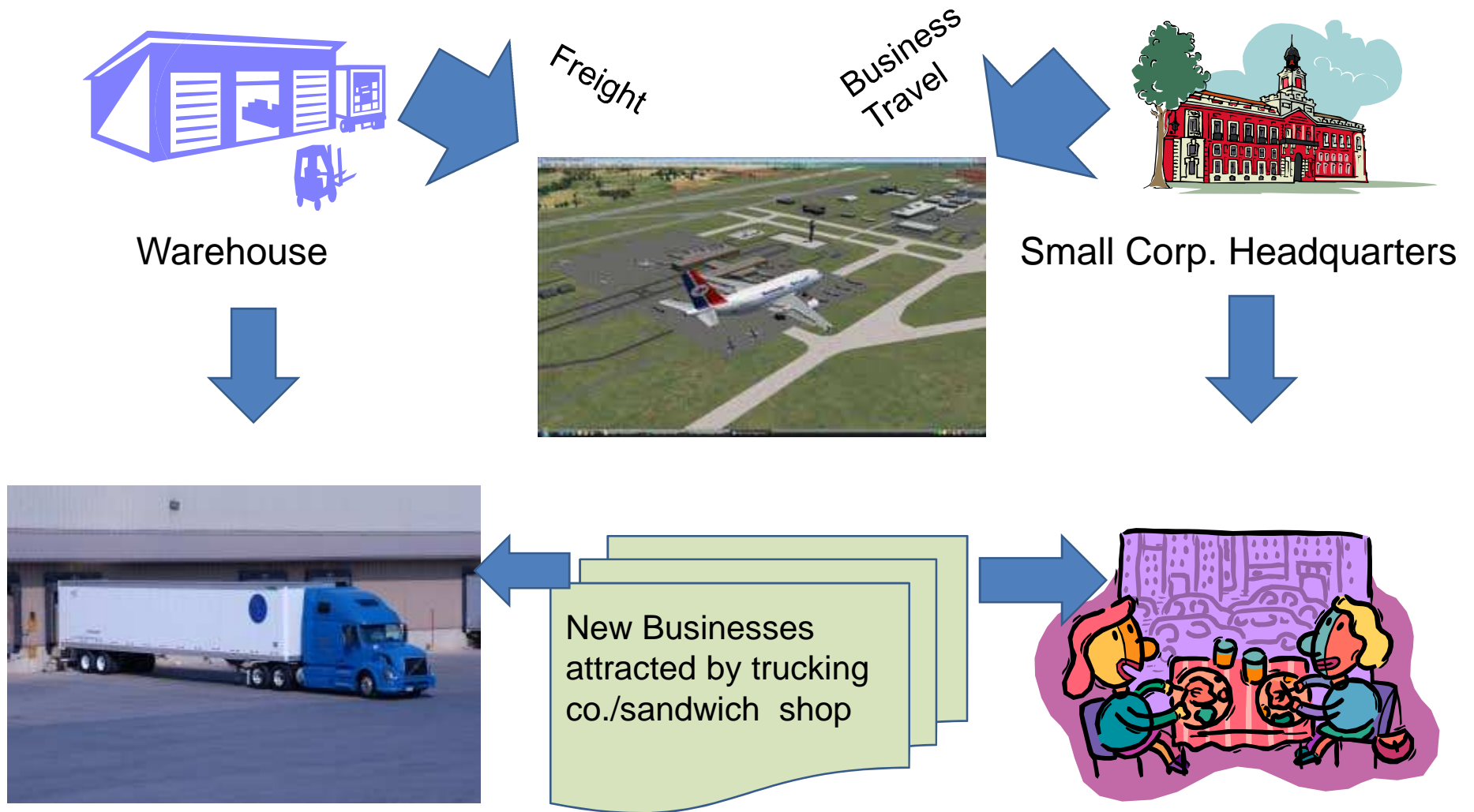
Industry- Direct	Number of Airlines	Domestic Non-Stop Departures	Airline Hubs Served-Domestic
Manufacturing	80,271	43,335	-
Wholesale Trade	10,253	12,256	-
Information	-	-	4,749
Finance & Insurance	-	38,427	57,440
Real Estate, Rental & Leasing	-	7,085	-
Professional Scientific & Technical Services	-	15,436	30,618
Management of Companies & Enterprises	-	-	1,962
Administration & Support Waste Management Services	-	9,232	-
Art, Entertainment & Recreation	-	-	2,300
Accommodation & Food Services	-	104	-
Other**	-	1,994	-
TOTAL DIRECT	90,524	127,870	97,068
Indirect & Induced			
Manufacturing	295,819	159,701	-
Wholesale Trade	14,134	16,895	-
Information	-	-	44,231
Finance & Insurance	-	25,854	38,647
Real Estate, Rental & Leasing	-	10,359	-
Professional Scientific & Technical Services	-	18,929	37,546
Management of Companies & Enterprises	-	-	4,147
Admin. Support Waste Management Services	-	5,844	-
Art, Entertainment & Recreation	-	-	1,486
Accommodation & Food Services	-	58	-
Other**	-	1,618	-
TOTAL INDIRECT & INDUCED	309,953	239,260	126,056
TOTAL	400,477	367,130	223,125

Airports Role in a Smart Growth Strategy

❖ California example:

- Integrate airports into Regional Sustainable Community Strategies (SCS) and Regional Transportation Plans (RTP)
- Small Commercial Airports, Relievers and General Aviation facilities
- Demonstrate the potential for greater integration of airports into regional smart growth strategies and multimodal transportation planning

How Agglomeration Works



Basic Approach

Area Summary 2012 Airport-1

Businesses	479
Jobs	5,791
Population	1,380

1. Identify Smart Growth Area
2. Estimate current employment and densities
3. Site Visits: Windshield surveys and meeting with economic development planners/chambers, etc...
4. Key findings from visits and interviews:
 - a) Identify developable parcels
 - b) Identify land areas that will not be redeveloped
 - c) Estimate FARs and compare to legally allowed site densities
 - d) To determine the net effect of the land use change, assume that *direct effect* of the smart growth policy would be limited to employment redistribution. That is, for all scenarios, total California employment (by NAICS code) is held constant.



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ESRI Project Area Employment Estimate

	average	jobs
Total	621	5,791
Ag		1
Mining		47
Utilities		103
Construction		273
Manufacturing		397
Wholesale		192
Retail		1,602
Transportation & Warehousing		358
Information		176
Finance, Insurance, real estate		559
Professional & tech services		475
Management & administration		238
Education & health care		404
Arts, Entertainment & recreation		106
Accommodations		34
Food service & drinking		447
Other services		291
Public administration		88

Employment by Industry Converted into Building Type

Building type	Employment by Building Type	Sq. Ft. per Employee	Sq, Ft. by Building Type	FAR	Acerage
Retail Commercial	2,481	500	1,240,000	0.25	114
Light Industrial	1,197	1000	1,197,000	0.4	69
Office, Bus. Park & General Commercial	1,858	400	743,000	0.8	21
Hotel	34	n/a			4
Warehouse	222	1000	222,000	0.35	15
Vacant					3
Residential					178
Golf Course					93
Roadways and Public Spaces					124
Total	5,791		3,402,000		621

FAR is estimate based on site visit;

Sq Ft per employee is based on NAIOP

Acreage devoted to Roadways & Public Spaces are estimated from site visit

Jobs in Smart Growth District



New jobs from Increased densities – 10,177 by land use and industry sector



Job growth projected in California, 2013-2040 by industry sector (Moody's.com)



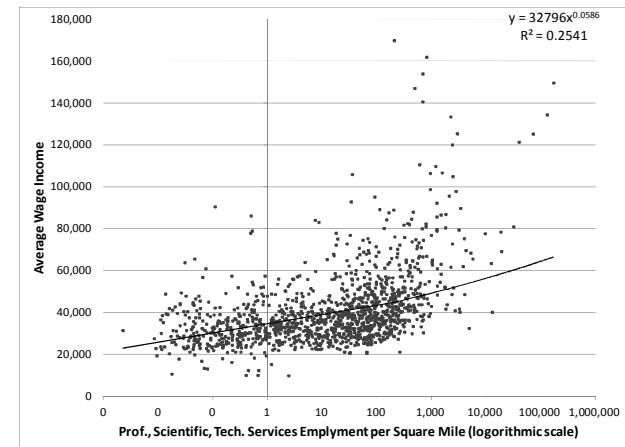
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Calculations

- ❖ Developed elasticities to predict % change in zip code average wage income based on a 1 percent change in sector-specific employment density (jobs per square mile)
- ❖ Applied TREDIS to measure benefits from savings in distance to airports & economic impacts driven by changes in income

Log-linear Regression for
Professional, Scientific &
Tech. Services



Estimated Impacts of Agglomeration

NAICS Sector and Name	Total Impacts to California			
	Jobs	Output	Value Added	Income
11 Agriculture, Forestry, Fishing, and Hunting	6	0.90	0.44	0.33
21 Mining, Quarrying, and Oil and Gas Extraction	2	0.73	0.40	0.12
22 Utilities	1	1.35	0.65	0.21
23 Construction	11	1.91	1.14	1.00
31-33 Manufacturing	43	41.28	12.46	5.89
42 Wholesale Trade	25	6.01	4.43	2.55
44-45 Retail Trade	91	9.74	7.28	4.64
48-49 Transportation and Warehousing	34	6.23	3.40	2.68
51 Information	14	5.46	3.22	1.79
52 Finance and Insurance	39	9.24	5.28	2.72
53 Real Estate and Rental and Leasing	68	20.43	15.61	2.34
54 Professional, Scientific, and Technical Services	253	65.55	47.78	38.80
55 Management of Companies and Enterprises	14	4.12	2.57	2.23
56 Administrative and Support and Waste Management and Remediation Services	428	52.14	35.68	30.17
61 Educational Services	12	0.82	0.54	0.48
62 Health Care and Social Assistance	56	5.73	3.85	3.38
71 Arts, Entertainment, and Recreation	13	1.12	0.76	0.48
72 Accommodation and Food Services	75	6.94	4.02	2.71
81 Other Services [except Public Administration]	32	2.42	1.61	1.41
92 Public Administration	7	0.82	0.79	0.68
Total	1,225	242.94	151.90	104.61

Total Economic Impacts to California (2040)

Airport	Employment	Output (Million Dollars)	Value Added (Million Dollars)	Income (Million Dollars)
Airport 1	1,225	\$242.94	\$151.90	\$104.61
Airport 2	855	\$294.49	\$130.48	\$78.22
Airport 3	2,009	\$584.68	\$285.58	\$178.75
Airport 4	921	\$211.00	\$121.26	\$80.04

Future Analysis and Application of this Study

Primary audiences are airport staff, regional planners, private developers, businesses and local and regional economic development officials. Some specific possible applications of this study include:

- **Airport managers**, who could use the case studies to develop a development plan for their airport based on the experience of other similar airports in the State. Evaluate opportunities for partnering with policy makers & economic development professionals to leverage the value of the airport area within their communities
- **Economic development professionals**, who could use the case study methodology to promote development opportunities for existing firms that may want to relocate or expand or prospective businesses that are looking for a location.
- **Aviation users**, such as the Aircraft Owners and Pilots Association or the National Business Aviation Association, who could apply the study's findings to help communicate how airside activity leverages the value of airport land



Upshot Of All This

We are not in our grandparents paradigm for airports and economic development



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Thank You

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