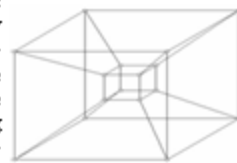


Accuracy, Detail, and Guessing

I use the word **speculation** for this type of analysis. The definition being “the forming of a theory or conjecture without firm evidence.” (Oxford Dictionaries, 2012) Speculation differs from guessing, which does not form any kind of framework for thinking about the problem. We were unsure who would invest, how much, or what industry may visualize an opportunity in this specific geography next to Boeing. Therefore, our analysis focused on the current economic industry matrix (1) which surrounds this piece of undeveloped property. IMPLAN provided much of these data. We triangulated three methods of analysis: Enterprise Network Systems (ENS), the discovery of what industry is not present that could be with Boeing’s ability to provide a market for their goods and services; business-to-business indirect transactions, including regional imports; and association analysis comparing geography of industry location of Charleston Metropolitan Statistical Area (MSA) and King County Washington, home to significant Boeing operations. The temptation is to pile on mountains of detail but, unfortunately, a mound of detail does not make the analysis any more accurate. With these data, we balanced the need for detail with the accuracy of the method to recommend one type of industry as more likely than another (as opposed to one chosen at random).

Enterprise Network Systems

ENS is the analysis of industry (2) that is “not present,” but could be under the right set of circumstances as a result of either available commodities (3) to produce products or customer to supply we have a new customer to supply one PLAN and asked the commodities does Boeing We focused on IMPLAN Source for the data in IMPLAN 3.0, Social Accounts Explorer, Balance Sheet, and Commodity Demand (Use table)(4). We were interested in Regional Absorption (3) (low) and Regional Purchase Coefficient (RPC)(4) (low) and “not present.” High numerical values in the first two categories did not suggest those industries would not further expand -- either from within or outside the region -- to meet new demand, but for ENS we focused primarily on those not present or those with a small presence relative to Boeing’s needs. See Table 1. This analysis did not take into account whether commodities were available to those new businesses that would supply Boeing, the next iteration. Finally, we compared the IMPLAN table of companies to the Bureau of Economic Analysis (BEA) Aircraft Mfg. Use table. The comparison from the top 25 industries of interest yielded: **other/aircraft engine**, carpet, watch clock, fluid power, search detection, adhesive (7), semiconductors (8), plastics, plumbing, and wiring device manufacturing. Note: (Table 1. Imports = 1-RPC)



New Industry Analysis: IMPLAN Social Accounts



Current Knowledge

As a result of an earlier Boeing impact (we did not have to run a separate impact), before Boeing chose Charleston, we knew which industries were present to support a new Boeing assembly plant. In particular, Vought Aircraft and Alenia Aeronautica, both major manufacturers. However, what we did not know was that first impact provided valuable information about indirect impacts and imported indirect commodities that Boeing might use to build the 787 Dreamliner (787).



Regional Imports

Regional analysis of imports allowed us to evaluate what industries may choose to locate or expand based on a significant increase in a local industry (Boeing boasts 5,000+ employees). Our geography is micro in size, therefore “It is generally true that the smaller the economic area, the more dependent that area’s economy is on trade with ‘outside areas.’” (Miller, 2009) In this case, size counts, so we evaluated the region as a whole. Two industries already in the geography are **motor vehicle parts manufacturing** and, surprisingly, **food services and drinking places**. Food Services is a significant industry in the Charleston MSA, generating a substantial import market. Also included are **wholesale trade**, based on location to existing infrastructure (freeway/airport), and **specialized design services** (engineering), a result of the presence of aircraft and automotive industries.



Industry Selection

Based on our method, we selected the final industries for inclusion in an IMPLAN run, which included evaluating the multipliers. We did not want significant variance from a generic portfolio of industries. If such variance existed, we wanted to know why. Our multiplier average was slightly higher than our “generic industry mix” as a result of a higher than average food service multiplier; reasonable, given the characteristics of the region. Prior to running IMPLAN, we were provided with the square footage of the different types of development including light manufacturing and office space. Based on those data, we estimated employment based on employees per square foot for each type of industry from national averages. We then separately estimated construction costs and impacts using Means Construction estimates on a per foot basis. RUN IMPLAN



Rural Developments

We would not recommend this analysis for small clear “field” developments in rural America since the analysis needs an industry base to build from. Instead, considerations might include natural resources (including utilities), visitor opportunities, and larger geographies (multi-county) to develop opportunities for rural geographies.

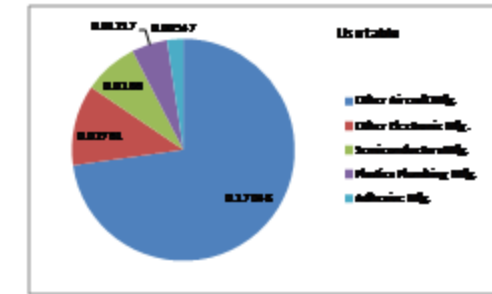


Table 3

IMPLAN	Multiplier	Code	Industry Name	Category Rank	Final Rank	
Category Industry Not Present Avg Multiplier					1.55	163
286	1.61	336	Aircraft engine and engine parts mfg	0.12196	#1	
82	1.25	314	Carpet and rug mills	0.00708		
256	1.58	345	Watch clock and other measuring	0.00938		
195	1.74	333	Fluid power cylinder and actuator mfg	0.00501		
247	1.64	334	Search detection and navigation instr	0.07819		
269	1.47	335	Wiring device mfg	0.00549		
Category Local Industry Under Represented Avg Multiplier					1.58	
238	1.42	334	Broadcast and wireless communications	0.01359		
198	1.49	332	Metal valve mfg	0.01013		
370	1.58	541	Specialized design services	0.00512	#5	
Category Industry Imports Avg Multiplier					1.59	
283	1.53	283	Motor vehicle parts mfg	\$411,599,941	#2	
413	1.68	413	Food services and drinking places	\$333,488,192	#6	
225	1.43	225	Other engine equipment mfg	\$275,882,568		
276	1.28	276	Automobile mfg	\$237,525,116		
278	1.38	278	Heavy duty truck mfg	\$182,604,089		
351	1.6	351	Telecommunications	\$147,770,318		
286	1.61	286	Other aircraft parts	\$141,287,620		
129	1.49	129	Artificial and synthetic fibers	\$135,828,010		
171	1.89	171	Steel product mfg from purchased steel	\$130,279,926		
369	1.98	369	Architectural eng and related services	\$129,344,584		
319	1.6	319	Wholesale trade businesses	\$127,370,714	#3	
126	1.57	126	Other basic organic chemical mfg	\$123,566,920		
Category King County Businesses Avg Multiplier					1.68	
70	1.5	312	Beverage and tobacco product mfg	57		
103	1.73	321	Wood product mfg	59		
114	1.83	323	Printing and related support activities	233	#7	
126	1.47	325	Chemical mfg	76		
127	1.45	326	Plastics and rubber products mfg	58		
169	1.77	327	Nonmetallic mineral product mfg	106		
202	1.6	332	Fabricated metal product mfg	317	#4	
205	1.45	333	Machinery mfg	121		
236	1.53	334	Computer and electronic product mfg	170		
247	1.64	335	Electrical equipment and appliance mfg	45		
283	1.53	336	Transportation equipment mfg	157		
301	1.72	337	Furniture and related product mfg	123		
Average Analysis					1.58	
					1.63	

Code	Description	Gross Absorption	Gross Inputs	RPC	Regional Absorption	Regional Imports
3000	Total Commodity Demand	71.58%	\$377,407,616 NA		6.97%	\$36,729,376
3286	Other aircraft parts and	21.31%	\$112,345,154	3.39%	0.72%	\$3,808,921
3285	Aircraft engines and	21.05%	\$110,959,572	0.52%	0.11%	\$581,277
3249	Search, detection, and	10.06%	\$53,056,995	0.00%	0.00%	\$2,211
3238	Broadcast and wireless	2.34%	\$12,338,144	0.01%	0.00%	\$901
3381	Management of	1.99%	\$10,511,767	45.23%	0.90%	\$4,754,037
3243	Semiconductor and related	1.54%	\$8,129,519	0.02%	0.00%	\$1,358
3256	Watches, clocks, and	1.48%	\$7,796,915	0.11%	0.00%	\$8,432
3319	Wholesale trade	1.18%	\$6,242,305	74.30%	0.88%	\$4,637,765
3170	Iron and steel and	1.00%	\$6,258,641	69.56%	0.69%	\$3,657,653
3283	Motor vehicle parts	0.79%	\$4,181,661	11.50%	0.09%	\$480,728

Description	Top Imports
Motor vehicle parts manufacturing	\$ 411,599,941
Aircraft manufacturing	\$ 340,678,194
Food services and drinking places	\$ 333,488,192
Other engine equipment manufacturing	\$ 275,882,568
Construction of other new nonresidential structures	\$ 266,833,104
Wholesale trade businesses	\$ 127,370,714

End Notes

- 1) Here we are referring to the Use matrix as “a square with the labels of industries and commodities identical” (Miller, 2009).
- 2) Industries consist of businesses’ products, goods, and services.
- 3) Commodities are goods and services.
- 4) The Use table details the dollar value of goods and services purchased by each industry to use in their production process. A column is a single industry, the rows are the commodities, and the units are dollars.
- 5) The Absorption table is a coefficient form of the Use table derived by dividing each element of the Use table by respective industry’s total dollar output. An industry will use a number of commodities to produce its products. The Absorption table shows the proportions of each commodity it uses. Each column is an industry’s production function. A production function shows the proportions of commodities used to produce one dollar of output.
- 6) The RPC represents the proportion of local demand purchased from local producers.
- 7) Charleston has a history of adhesive manufacturing.
- 8) NOT Likely.

****Customer Feedback**

We included a customer feedback loop in this analysis. The customer land development design required a certain mix for the development, which we provided to the customer along with our method. ***No changes were made to the plan.***

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