



THE LONDON GROUP
Realty Advisors, Inc.

*Note: San Diego air cargo market
assessment developed by
Crossborder Business Associates
(market research subcontractor)
and the London Group Realty
Advisors (project manager).*

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**An Assessment of
Regional Air Cargo Trends
& The Proposed San Diego Air Commerce Center
For
San Diego County Taxpayers Association
January 2001**

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& Crossborder Business Associates © 2001**

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EXECUTIVE OVERVIEW

This study was undertaken to address the air cargo market issues that underlie the proposed development of the Brown Field Aviation Park (BFAP), also known as the San Diego Air Commerce Center (SDACC). The intention of this research was to independently explore the trends and locally relevant market drivers that could support the feasibility of the SDACC, particularly given the important need for San Diego to remain a competitive player and expand its position in national and international trade.

The proponents of BFAP/SDACC should be recognized for their leadership in both developing a potential model for redeveloping Brown Field, as well as highlighting the importance of air cargo for San Diego's future economic growth. However, the SDACC business model under review by the City of San Diego should be reconsidered for at least the following reasons:

- It relies on unsupported assumptions of air cargo market capture in its start-up and subsequent phases and is based on air cargo growth projections that are unlikely to occur (based on a comparison of industry forecasts and historical trends). These two issues alone cast the current proposal in doubt as to both its operational and fiscal assumptions.
- The market demand for a major, all-cargo facility in San Diego is not supported by projections for air cargo market capture, and may be better **served by existing, local and non-local airports** including Lindbergh Field, Rodriguez Field in Tijuana and other airports throughout Southern California. Several air facilities, including the former March Air Force Base and proposed future cargo operations at Tijuana's Rodriguez Field (just across the border from Brown Field) are specifically planning to target San Diego's air cargo market for new customers.
- BFAP's citations of national and international air cargo trends ignores a critical factor that over 91% of the products originating in California (by weight) are shipped to destinations within the State (and within trucking distance), moderating regional air cargo growth.
- **San Diego's high-tech industries would be better served by improved access to an internationally-connected, mixed use airport for passengers and cargo**, not an all-cargo facility (as the SDACC is being proposed).
- The project also ignores the fact **that air cargo demand is shifting toward a greater reliance on shipping smaller packages on a more frequent basis. This is a trend (driven, in part, by 'ecommerce' activities) that favors integrated- and express-carriers** whose preference is to be located at mixed-use airports and closer to population centers.

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- Lastly, **the proposed SDACC ignores the very real threat of current and future competition for air cargo at existing airports in Southern California and Tijuana.** These facilities appear to have lower operational costs than the proposed SDACC, and are likely better positioned to attract air cargo carriers. These other options will likely accommodate enough air cargo demand to result in Brown Field handling between 33%-63% less air cargo tonnage than projected by SDACC proponents.

Given the above reasons, we recommend the following:

- That a feasibility study be completed for Brown Field focusing on industrial and commercial development without an air cargo component, the potential profitability of those uses, and the way in which the City of San Diego can better achieve higher lease rates, more employment and positive fiscal impact. Such a study could also determine the potential profitability of an airport business park without the reliance on heavy air cargo.
- That the issue of air cargo be elevated in the deliberation of future airport plans for San Diego; and that new partnerships be explored for additional air cargo capacity with other regional airports – including those elsewhere in Southern California and Tijuana.

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6 Myths About Air Cargo & the Potential for Brown Field

Given the many questions and rumors about air cargo needs in San Diego, a few myths may need to be dispelled prior to reviewing this report:

Myth #1: Air Cargo Capacity in the Region Is Threatened and Won't Be Able to Meet Demand:

Although air cargo capacity at Lindbergh Field potentially will be limited in the future, at least four other Southern California airports (LAX, Ontario, March GlobalPort, and the Southern California Logistics Airport [formerly George AFB]) are planning to either increase their existing capacity, or they currently have – as a recent report developed for LAX states – “almost unlimited airside capacity”¹ for air cargo needs. As described in this report, air cargo capacity in the Southern California region will likely exceed demand through at least 2015.

Myth #2: Los Angeles International Airport is Planning to Limit Air Cargo Traffic, Potentially Impacting San Diego's Air Cargo Needs:

To the contrary, executive management and staff from Los Angeles World Airports (the agency that oversees LAX, Ontario, Van Nuys, and Palmdale airports) confirmed on several occasions that air cargo operations at LAX are actually expected to nearly double in the next fifteen years and no discussions nor plans have been considered that would result in any type of limitation on air cargo². At most, some internal discussions have taken place about significantly increasing air cargo capacity at Ontario International airport (in addition to the existing cargo upgrades that is occurring).

Myth #3: 80% of San Diego's Potential Air Cargo "Leaks" to Other Airports:

This widely discussed assertion is based on a 1996 consultant report to SANDAG that estimated air cargo “leakage” based on San Diego’s proportion of population and air cargo usage to two other regions of California in one year (1994). This extrapolation led the consultant to conclude that 80% of San Diego’s air cargo must leak out of the County. However, during the course of developing this report, no additional supporting data from trucking companies, surveys, or by the companies that actually shipped goods was found to exist. *To the contrary, based on readily available regional and federal data, this study concludes that actual air cargo tonnage “leaking” from the region is 54-72% less than assumed by the proponents of BFAP/SDACC.*

¹ “Air Transportation in the Los Angeles Region”, Landrum & Brown Inc., (June 2000 revised version), p. 42.

² Discussions occurred with a Deputy Executive Director, the Senior Public Information Officer, and the Supervising Transportation Planner in August-September 2000.

Myth #4: San Diego Companies' Proximity to Brown Field Will Make It the Best Choice for Air Cargo Shipments.

A rough calculation of data for Los Angeles International Airport shows that almost 30% of domestic exports leaving through LAX come from outside of the State of California³. Clearly, if products are shipped through LAX from as far away as Alabama, New Mexico and Oregon, it is not proximity that drives the use of that airport. Rather, it is a result of *less expensive options to ship a product more directly to a larger number of destinations that are served by the huge number of airlines using LAX*. Brown Field's utility for San Diego firms will be limited by the low number of origination- and destination-points of the cargo flights that serve it. Unless Brown Field can become a regional mini-hub of cargo and passenger aircraft, it will become a niche, charter-oriented cargo facility.

Myth #5: Rodriguez Field in Tijuana Can Be Ignored:

In reality, Rodriguez Field provides a potentially better opportunity for developing additional air cargo potential in the San Diego-Tijuana region. The airport is already a mixed-use (i.e.: passenger and cargo) facility, allowing for the transportation of “belly cargo” with passenger airlines; its existing runway is already appropriately sized for 747s and large aircraft; and its management – a private consortium that is very familiar with airport and international cargo operations – has already initiated a feasibility study to determine if and how air cargo operations might be expanded. If the feasibility exists for the operators of Rodriguez Field, they will likely pursue development of expanded air cargo facilities independently of whether or not Brown Field moves forward.

Myth #6: It's Not the Tonnage that Counts, It's the Value of the Shipped Goods:

The U.S. Department of Transportation identifies at least three ways of evaluating various modes (i.e.: truck, rail, air, etc.) of transportation: measuring based on the numbers of tons that are moved, measuring based on the value of the shipment, or measuring based on the ton-mile (a volume measurement where the weight of the shipment is multiplied by the distance it's moved). Each of these three methods provides a different picture of the situation. Our report analyzes the prospects for Brown Field based on tonnages to be shipped, since this conforms to the little public data that has so far been issued by the proponents of Brown Field, and it also conforms to data collected on cargo trends at other airports.

³ Calculations by CBA based on US Department of Commerce data (Sept. 2000)

INTRODUCTION

The London Group Realty Advisors, Inc.⁴ has been retained by the San Diego Taxpayers Association to conduct this study reviewing the market opportunity and prospects for the proposed redevelopment of Brown Field into an air cargo facility. Brown Field is located along the I-905 corridor, east of I-805, in San Diego's South County. It has been in existence, first as a military facility, and more recently as a general aviation airport, since 1918.

Currently, Brown Field is a general aviation air facility accommodating approximately 100,000 operations per year of mostly small, private aircraft. A widely-debated proposal will likely be considered by the San Diego City Council in the coming months to lease Brown Field, which is owned by the City of San Diego, to a private developer known as BFAP, to redevelop the approximately 876 acre site into a major regional facility to accommodate large, cargo aircraft.

However, this redevelopment proposal brings with it major 'spillover' impacts or externalities which are likely to affect the South County region. These impacts include a higher level of aircraft noise, more truck traffic to the area and will undoubtedly stimulate some commercial and industrial growth in the area. In fact, the portions of the property that are not proposed to be expanded for the actual air facility will be developed for industrial and commercial uses, serving the facility as well as the region. Surrounding land uses include commercial and industrial, mostly to the south, but also major master planned, principally residential, communities to the west.

From a planning perspective, the goal is to create compatibility between each of these land uses so that together they can achieve a prosperous region while retaining a high quality of life for residents and businesses.

The concern that has been expressed regarding the redevelopment of Brown Field as an air cargo facility is principally focused on the impact that this development will have on the surrounding area. The analytical questions that we have targeted are:

- Is there significant, 'unmet' demand for the proposed air cargo facility to justify these impacts or externalities in the area?
- Or, is there a better approach to providing for the growth of cargo transportation needs in other ways (e.g. air or ground) or at other locations?

The key question becomes: is the tradeoff of these spillovers worth it?

This report addresses these and related questions. The approach we have taken is to analyze the air cargo demand for the region; then, to determine if Brown Field is the best

⁴ Research for this report was prepared in association with Crossborder Business Associates

candidate site to develop an additional air cargo facility to serve the San Diego/Baja region's growing economies.

We have not addressed alternative approaches to the redevelopment of Brown Field, nor have we undertaken a feasibility analysis of the BFAP approach to evaluate the financial profitability of their proposal or the fiscal impact of their proposal to the City of San Diego. We have also approached this project using conservative assumptions of market conditions, and did not speculate on the impact of latent – and unverifiable – market demand.

To undertake this analysis, we have reviewed existing reports on the subject, interviewed key players in the air cargo and logistics industries, and analyzed available components of the developer's proposal for Brown Field. These sources are cited throughout this report. We then conducted original research on the market factors for air cargo in the region. This report summarizes and details the results of our study.

Research for this project was completed in Fall 2000. Conclusions and recommendations are strictly those of The London Group Realty Advisors, Inc. and Crossborder Business Associates. Users of this information should recognize that assumptions and projections contained in this report *will* vary from the actual experience in the market. Therefore, neither The London Group Realty Advisors, Inc., nor Crossborder Business Associates are responsible for the actions taken or any limitations, financial or otherwise, of property owners, investors, lenders, public agencies, operators or tenants.

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CONCLUSIONS

San Diego has the intrinsic geographic position, human resources, and maturing industry clusters to become a leading national and international business center in the twenty-first century, if steps are taken for appropriate infrastructure development, education and public leadership. However, it is necessary to differentiate efforts to increase San Diego's competitive position as a place to live and work from seemingly attractive proposals that do not have sufficient market support to merit the use of public resources.

The proposed creation of a dedicated, major air cargo facility at Brown Field is such an example. As summarized in this section, and detailed in subsequent sections of this report, publicly stated projections for the potential air cargo demand to support a major cargo facility at Brown Field are over estimated. In addition, the proposed facility appears to ignore significant threats of air cargo capacity from existing or potential Southern California and Baja California-based competitors.

Our research approach is similar to how we would validate market plans for most businesses. We have conducted a thorough review of existing and proprietary market data, evaluated the opinions of professionals working in or knowledgeable of the market under review, and performed a business-oriented market assessment.

Given the great importance that logistics and international trade play in the economy of San Diego, we had expected stronger evidence for development of the proposed San Diego Air Commerce Center (SDACC).

Our research conclusions are summarized, as follows:

1. ***Air cargo⁵ growth projections for the San Diego Air Commerce Center are not only overly optimistic, but unlikely to occur.***

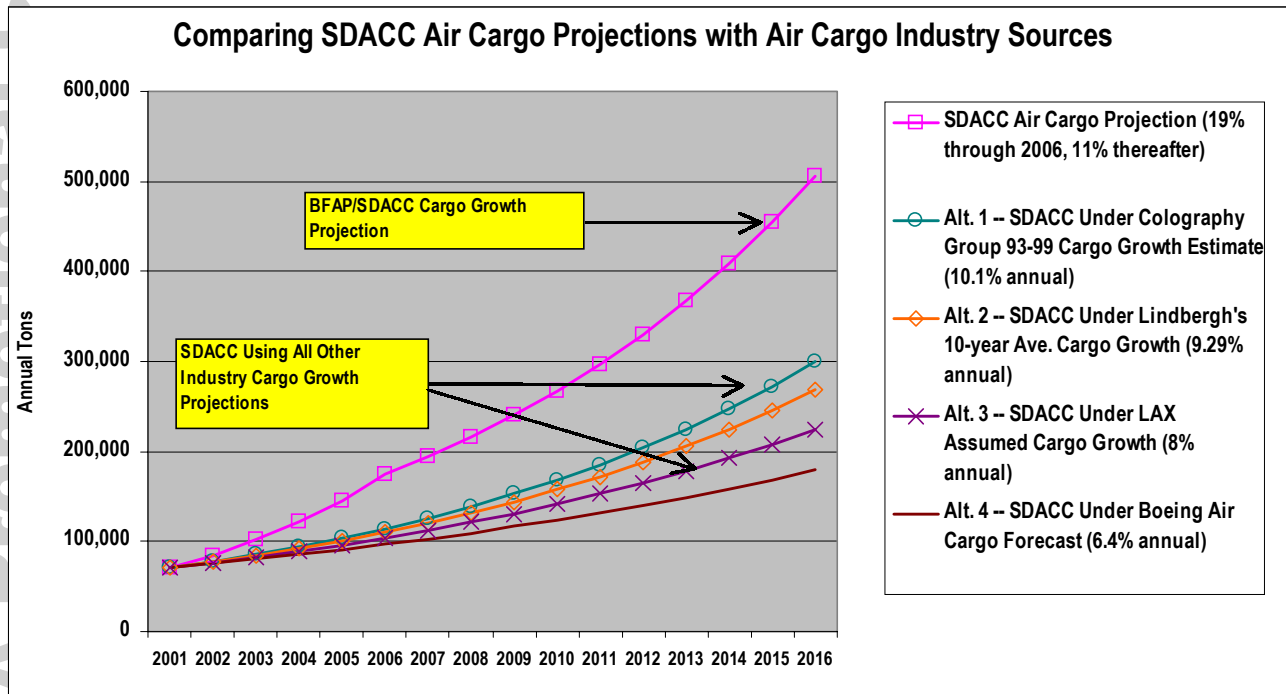
Few public documents are available describing the numbers or methodology used to create air cargo demand projections utilized for the SDACC's business plan. Two references, one from a SANDAG reprinting of SDACC Draft Airport Master Plan figures⁶ and a second from PB Aviation's May 2000 *San Diego Air Commerce Center at Brown Field Airport Master Plan Study*, indicate that 70,000 Tons per Year (TPY) are expected during the facility's first-year, with "more than 14 percent" growth compounded annually⁷.

⁵ Figures used in discussing "freight" or "cargo" in this study refer to the primary goods proposed to be handled at Brown Field. These include larger product shipments, raw materials and components, and some parcel packages. They do not include smaller mail shipments.

⁶ SDACC air cargo projections cited from SANDAG Regional Transportation Plan (April 2000), p. 237

⁷ PB Aviation, Inc., *San Diego Air Commerce Center at Brown Field: Airport Master Plan Study* (May 2000), p. 2-3.

SDACC proponents project that the facility will capture over 506,000 TPY of cargo by the year 2016. Even assuming that the facility will successfully attract 70,785 TPY of cargo during its first year, historical regional cargo data and industry growth estimates are not as optimistic as 14% annual growth. In fact, all industry sources reviewed, including those from Federal Aviation Administration (FAA) projections, Boeing, Los Angeles World Airways (the operator of LAX and Ontario), the Air Transport Association (an industry trade group), and several leading aviation consulting firms, cited average annual growth figures for the North American or US air freight market of between 6%-10%. As seen in the chart below, and discussed in more detail in Table 3 of the Appendix, **this will result in between 200,000-320,000 TPY lower air cargo demand at the proposed SDACC**, even under the optimistic assumption of capturing 70,785 TPY during its first year of operation:



It is impossible to determine if the base, first-year start up figure used by SDACC proponents (70,785 TPY) is a result of proprietary negotiations or is an estimate. It is notable, however, that Sacramento's Mather Airport (formerly Mather AFB) took over four years of operation to reach 78,000 TPY of cargo handling in 1999.

If air cargo tonnages – and, thus, plane landings/takeoffs – are significantly less than has been projected by SDACC (a likely situation given the optimistic figures employed in those projections), severe impacts could occur. Among those impacts would be lower revenues than those projected to be earned from

landing fees and fuel flowage fees, a major source of the Airport's expected revenues⁸.

2. *Regional capacity for air cargo will increase as operators and government agencies from Southern California are already planning or proposing sufficient air cargo capacity within the region.*

One of the arguments made for the development of Brown Field as an air cargo facility is the "need" for additional air cargo capacity in Southern California. The Southern California Association of Governments (SCAG), in fact, projects in their 1998 regional transportation plan that Southern California air cargo demand will be approximately 7.5 million tons/year (TPY) in 2015⁹. However, it is notable that physical planned or potential air cargo capacity in the region should exceed demand:

Airport	Planned/Potential Future Air Cargo Capacity At Existing Airports
Los Angeles International	4.2 million TPY ¹⁰
Ontario International	.80-1.0 million TPY ¹¹
March GlobalPort (formerly March AFB)	1.2 million TPY ¹²
Southern California Logistics Airport (formerly George AFB)	4.0 million TPY* ¹³
Long Beach	.10 million TPY
San Diego International/Lindbergh Field	.15-.26 million TPY ¹⁴
Approximate Planned Capacity	10.4-10.7 million TPY

* Projected capacity at build-out

Much of this planned capacity takes the form of "belly cargo" (cargo capacity within passenger airplanes). However, significant capacity is also planned at the relatively new, dedicated air cargo facilities of March GlobalPort (formerly March Air Force Base) approximately 90 miles from downtown San Diego, and the Southern California Logistics Airport (formerly George Air Force Base) approximately 150 miles from downtown San Diego. Notably, March GlobalPort, considers San Diego a target for its future air cargo service area¹⁵.

⁸ Based on findings within November 1997 memo by Leigh Fisher Associates

⁹ *Air Transportation in the Los Angeles Region*, Los Angeles World Airports (February 2000), p.41

¹⁰ *LAX 2015 Master Plan*, www.lax2015.org

¹¹ Estimate based on 1994-1999 cargo growth rates at Ontario Int'l. Estimate was confirmed as reasonable by public information staff at Ontario International Airport (July, 2000).

¹² March Joint Powers Authority documents (www.marchjpa.com/MIP.html)

¹³ Stirling Airports International (developers of the Southern California Logistics Airport), www.logisticsairport.com. Build-out capacity confirmed in interview with SCLA airport manager, July 2000. Note that the field currently supports two existing 10,000-foot runways, and has land for two 15,000-foot runways. However, as with most facilities, capacity buildout is dependent upon demand.

¹⁴ Based on recent SANDAG airport economic impact study (2000) and Port of San Diego data

¹⁵ March's intention to target San Diego's air cargo market is clear: "March is a superior alternative to serving San Diego's spillover cargo needs...." (www.marchjpa.com/MIP.html)

3. *National and international air cargo trends do not reflect the San Diego and Southern California markets, which depend on truck shipments, not air.*

Despite high projected growth internationally for air cargo, **growth for air freight in Southern California and San Diego specifically is and will be lower than has been stated in SDACC documents, due to San Diego's relative proximity to major consumer markets.** California companies ship more than 95% of products (by value) to West Coast markets. A total of 91% of their products (by value) are shipped within the State.

This proximity (generally less than 1,000 miles) to both end markets and suppliers to California companies **strongly favors the more economical option of shipping by truck rather than air.** According to the US Census Bureau and the Department of Transportation, **products shipped by air are typically limited to those with an average value of \$26/pound, whereas the average value/pound of a product shipped by truck is \$0.35/pound, reflecting the significant economic difference between the two shipping options, and undermining the need for heavy freight operations in the San Diego region.**

4. *Additional local capacity may be unnecessary in the immediate future, although efforts to ensure cost-effective regional air cargo capacity for San Diego's businesses and consumers is important -- whether that capacity is local or not.*

Estimates that 80% of San Diego's potential air cargo "leaks" to other regional airports are not based on solid evidence, but rather a comparison of San Diego's proportion of population-to-air passengers versus the population-to-cargo proportions from the Los Angeles and San Francisco regions. This is an inappropriate comparison because:

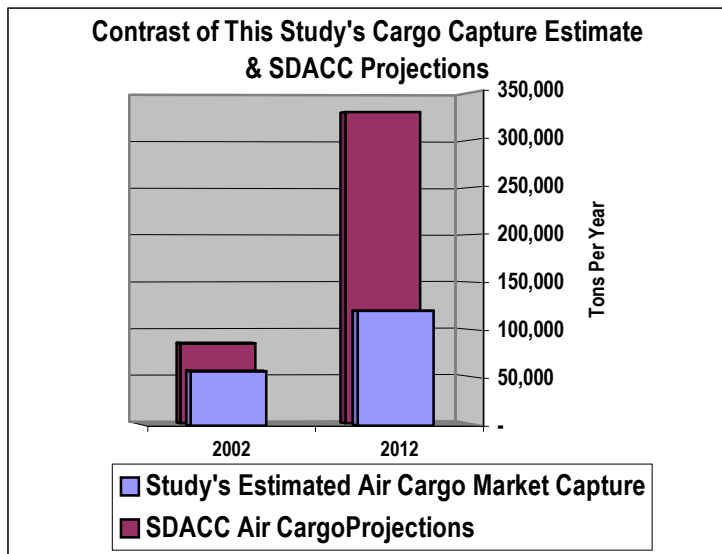
- "Air cargo traffic represents a segment of larger manufacturing, trade and transportation markets"¹⁶ not necessarily correlated with population, especially in service and knowledge worker-oriented economies like San Diego.
- Both San Francisco and Los Angeles are international and West Coast air freight hubs whose air cargo comes from and goes to many other regions throughout the United States. It is likely that this non-regional cargo inflates the proportion of air cargo that appears to come from the Los Angeles and San Francisco regions, resulting in a smaller apparent market share (and higher assumed "leakage" rate) for San Diego.

¹⁶ *Characteristics and Changes in Freight Transportation Demand*, Cambridge Systematics, Inc. report prepared for the National Cooperative Highway Research Program (June, 1995), p. 3-28

- Calculations based on data from the US Census Bureau, SANDAG, and CalTrans indicate that only approximately 80,000-110,000 TPY of air cargo currently “leaks” from San Diego, approximately the same amount of freight currently handled by Lindbergh Field and far less (approximately one-quarter to one-half of the amount) than the 240,000-400,000 TPY that the SDACC proponents are relying upon.
- Regardless of the potential market size for inbound and outbound air cargo compatible products in San Diego County, a significant proportion of these products will continue to pass through Lindbergh Field (through combination carriers and express carriers), as well as other non-local airports in other areas of Southern California.

Using these and other sources explained in this report, not only do we conclude that the “80% leakage” figure is dramatically overstated, so is the probable market capture of air cargo by the proposed SDACC facility.

As seen in the chart comparison at right, we estimate that SDACC would likely capture at most an estimated 57,000 TPY of cargo in the first years of operation. This would grow to approximately 120,000 TPY by 2012. These estimated tonnages are alarmingly lower than the projections made by BFAP/SDACC.



This assumes some market capture of Lindbergh Field’s freight, although local and regional cargo capacity will increase in the immediate future at Lindbergh Field (**which can potentially accommodate nearly twice the current air cargo handled¹⁷**), as well as through other Southern California regional airports.

Over the long term, it would appear to be prudent to develop strategic relationships with other existing facilities to ensure that cost-effective and efficient transportation options are available to and from those non-local air cargo options. This may involve infrastructure partnerships, high-speed rail, or dedicated truck

¹⁷ Based on information contained within Lindbergh Field’s Master Plan and interview with Wayne Lindquist, airport consultant and former employee of the Port of San Diego and FedEx.

lanes on Southern California regional roads, among many other innovative options that exist for San Diego's future.

5. *Expecting significant International inbound and outbound shipments at Brown Field as a result of the maquiladora industry in Tijuana is uncertain and perhaps risky.*

Three factors are critical to this conclusion:

- International air cargo in California almost exclusively passes through the International airport hubs of LAX and SFO, two airports that together handle almost 98% of such freight. The traditional hub-and-spoke system from which airports operate favors shipments entering through LAX and being trucked to San Diego (or vice versa).
- Regarding International shipments related to Tijuana, interviews with Mexican officials involved with Tijuana's Rodriguez Field, directly across the border from Brown Field, have revealed that **a draft facility Master Plan for Rodriguez Field is currently under development and may include significant investments in air cargo operations.** Although the cargo component of this Master Plan is still in its initial stages, some sources indicate plans for expanding air cargo capacity initially to approximately 60,000 TPY utilizing the airport's existing 10,000-foot runway.¹⁸ In addition, the Economic Development Council of Tijuana includes development of a major air cargo facility in their 1999-2010 Strategic Economic Development Plan. If such investments occur, direct shipments from Asia or Europe into Tijuana may be feasible, undermining the need for Brown Field. As such, it would be risky to ignore this interesting opportunity to explore a mutually beneficial partnership with Rodriguez.
- In terms of outbound shipments, the maquiladora industry's primary market is with consumers in the United States, a market accessible by trucks and not likely to be shipped as heavy freight (although possibly by express freight, such as is occurring out of Lindbergh Field through Emery Worldwide and similar carriers).

Given these five major observations and analysis, we conclude that it would not be good public policy to proceed with an air cargo facility at Brown Field at this time.

The projections that have been made to support such a facility do not appear to be defensible. In fact, our analysis suggests that once an air cargo facility would be developed and stabilized at Brown Field (over a two to twelve year time span) the tonnage handled at the facility could be between 33%-63% less than projected by SDACC.

¹⁸ Aeroportos Mexicanos del Pacifico presentation, Ralph Nieders (Casey Development, Inc.), with additional information provided directly by Grupo Aeroportuario del Pacifico (operators of Tijuana airport).

RECOMMENDATIONS

Based on our market analysis, the following recommendations must be considered in future evaluations of Brown Field:

- Because market demand for air cargo services – as reflected in publicly available SDACC planning documents – will not meet projections, and, as such, will likely result in less revenues for landing and fuel fees, a policy decision on the future of Brown Field should not rely on these estimates.
- Brown Field should enjoy a strong future based on its strategic location to accommodate industrial and commercial development. We do not believe that the successful implementation of development of the lands surrounding Brown Field has any strategic advantage with Brown Field as a dedicated air cargo facility. The probable, future market opportunity is so strong in San Diego and South County, that this can occur at Brown Field regardless of what type of airport, if any, remains.
- Additional research and analysis of the future regional requirements for all cargo transportation requirements is warranted, including both ground and air cargo. “Leakage” of possible air cargo from San Diego County to other non-local airports is very likely significantly less than assumed by previous estimates, and should not be the basis for market demand projections (as currently suggested by SDACC). It is probable that leakage does currently exist in the amount of 82,000-110,000 TPY. However, these figures are still estimates and require further market analysis. It may be possible to validate the estimated market size of “leaked” air cargo through simple market surveys conducted at the San Clemente and Temecula California Highway Patrol truck weigh stations.
- Local decision-makers need to realistically explore the possibility of providing air cargo capacity for San Diego companies through other Southern California airports or Tijuana’s Rodriguez Field. These alternatives currently have existing or potential air cargo capacity. Such options, however, will require the development of mutual partnerships with the operators of those facilities, as well as perhaps the development of joint infrastructure (such as a cross border cargo terminal in Otay Mesa, or high-speed truck or rail transportation to March GlobalPort, for instance).
- Lastly, it appears that one of the factors supporting the pursuit of the development of Brown Field is the possibility for the City of San Diego to retain a portion of revenues generated by Brown Field for General Fund uses¹⁹. If this is indeed the case, it may be that the City of San Diego should reconsider the proposed development of Brown Field as a major air cargo operation. Instead, the City might

¹⁹ 2020 Regional Transportation Plan, San Diego Association of Governments (April 2000), p. 236

explore the possibility of alternative, and perhaps higher-use, development scenarios.

In light of the above, we recommend that Brown Field not be developed as a dedicated air cargo facility. It is not a prudent investment of public resources and the likelihood of failure is too great. We also urge that the air cargo debate not focus on a specific proposal or location at this time. Rather, a comprehensive evaluation of other alternatives, inside and outside of San Diego County boundaries, should be engaged.

We also recommend that the discussions regarding air cargo be elevated and included in the discussions involving developing a strategic framework for all of San Diego's air transportation needs. Highlighting air cargo issues in the discussion of San Diego's future airport planning will avoid partial solutions, such as that offered by the BFAP proposal, and better reflect the industry's preference for mixed use (e.g. passengers and cargo) facilities.

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AIR CARGO: GENERAL MARKET OVERVIEW

The purpose of this section is to describe the market analysis completed to support the conclusions and recommendations detailed in the previous sections.

Not all products produced or demanded in the San Diego region are “air cargo compatible”. They do not meet the necessary combination of characteristics to make air freight a competitive and cost-effective logistics option. According to the US Department of Transportation’s 1998 study, *U.S. Freight: Economy in Motion*:

In its simplest form, the decision to fly the freight requires that the commodities being shipped either are extremely valuable or time sensitive because this mode is the most costly way to transport goods.²⁰

For domestic goods, trucking is the most cost-effective option in most cases, particularly for shipments within regional end-markets (i.e.: if the final destination is within 500-1,000 miles of the origination). San Diego’s proximity to large, West Coast consumer markets (California, Oregon, Nevada, Arizona, Washington and Texas) makes trucking almost a *de facto* choice for shipping even time-sensitive shipments (1-3 days).

The other factor that needs to be considered when evaluating whether to use air cargo is the ratio of a product’s value to its weight. The higher the ratio, the lower the per-unit cost to ship by air as a percentage of the product’s final price. As such, **the average value of a shipment by truck is only \$0.35/pound. The average value for a product by airfreight is over \$26/pound²¹**. The implications of these valuation differences are:

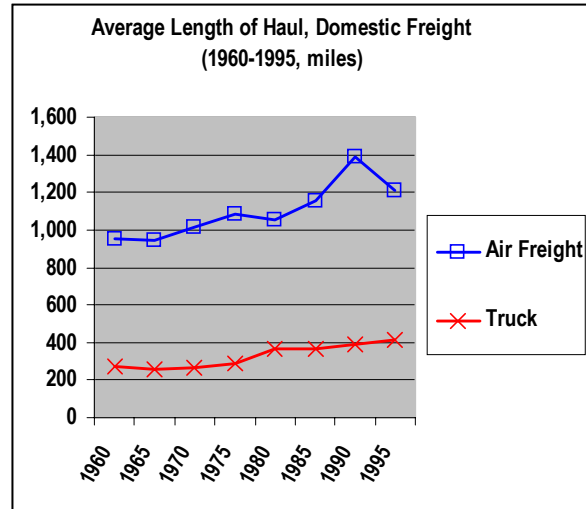
- That only very high value products can be cost-effectively shipped by air (i.e.: products that are valued on average of \$26 per pound);
- Time-definite shipments by truck (a growing service by both trucking and parcel delivery companies) are significantly more cost-effective than airfreight when the hauling distance is only 1-2 days away by road.

In terms of specific commodities, the value-to-weight ratio of air freight means that the principal categories of products shipped by air are limited to high-end pharmaceutical or electronic products, electrical equipment and components, some transportation equipment, and precision instruments and apparatus.

²⁰ *US Freight: Economy in Motion* (1998), p. 48

²¹ *US Freight: Economy in Motion*

Commodity flow survey data from the 1997 US Census Bureau Economic Survey demonstrates that **the distance products are shipped by air within the United States is on average more than 1,380 miles from origination to destination.** As trucking has become more cost-competitive through the years, trucking distances are increasing and air shipments are shifting to the more distant destinations, as shown in the chart at right.



CALIFORNIA-LEVEL COMMODITY FLOW SURVEY RESULTS

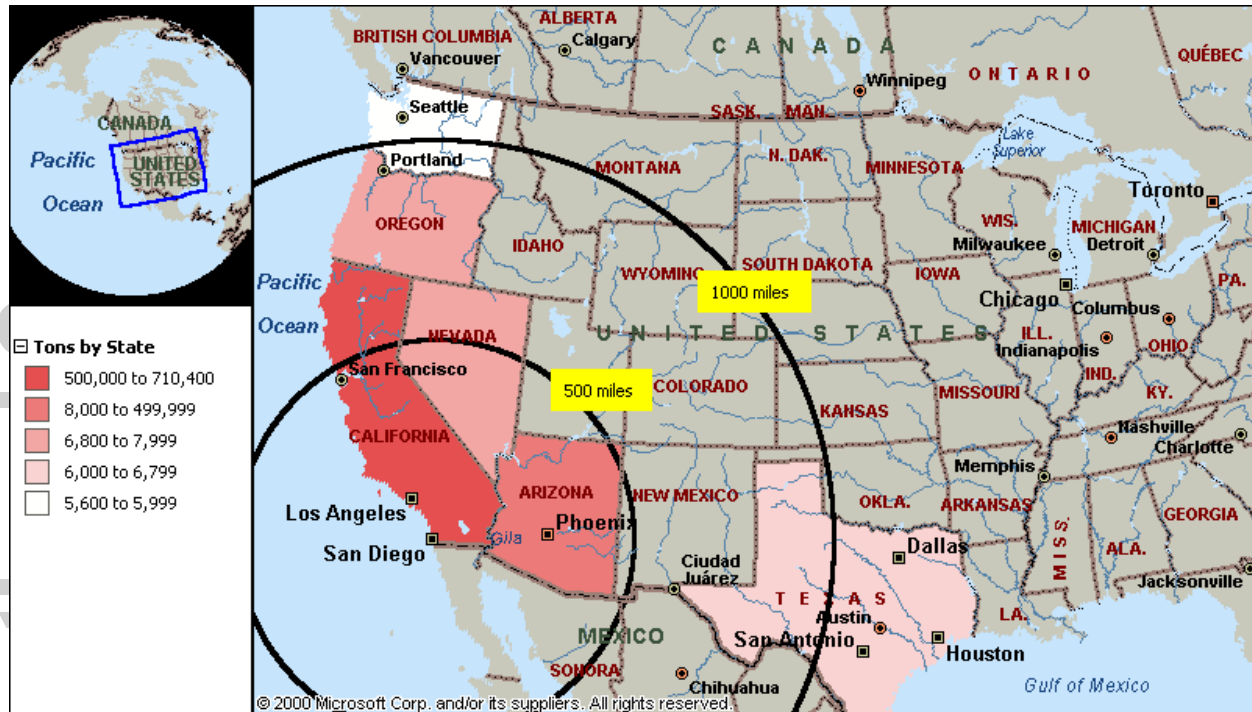
California-level commodity flow survey data from 1997 reveals several notable differences from national level data:

- First, that California-originating shipments rely on parcel delivery services (including a combination of trucking, air, and/or rail for packages under 100 pounds) more than 30% over the national average (16.8% of shipments by value, versus 12.3% nationally). Although a majority of these shipments would go by truck, any air transportation would tend to be completed by integrated, express carriers using hub-and-spoke networks found at mixed-use airports.
- Second, although California-originating products are shipped by air at a slightly higher proportion of time than the national average (5.8% of shipments by value, versus 3.3% nationally), this still **equates to less than .1% of total tons shipped in 1997.** Also, these **California products are shipped further by air than the national average: 1,949 miles per air shipment on average versus 1,380 miles for the national average.** This clearly shows that California products are only shipped by air when the distance to market is very great – a fact supported by survey results demonstrating **the average for-hire truck haul of California products is over 870 miles** (almost twice the average hauling distance of ‘for-hire’ trucking services nationally).

These results imply that California products (including those from San Diego) are shipped primarily by truck or parcel delivery, and are shipped generally within a distance of less than 1,200 miles, the primary market for California originating products.²² The following map graphically demonstrates this point:

²² Analysis of US Census Bureau, 1997 Economic Census *Commodity Flow Survey* results, California data.

California Products' Primary US Markets & Distance from San Diego



Metropolitan-level commodity flow survey data for San Diego further corroborate this finding, with over 95% of San Diego products (by weight) shipped less than 1,000 miles.²³

²³ Analysis of US Census Bureau, 1997 Economic Census *Commodity Flow Survey* results, San Diego MSA data.

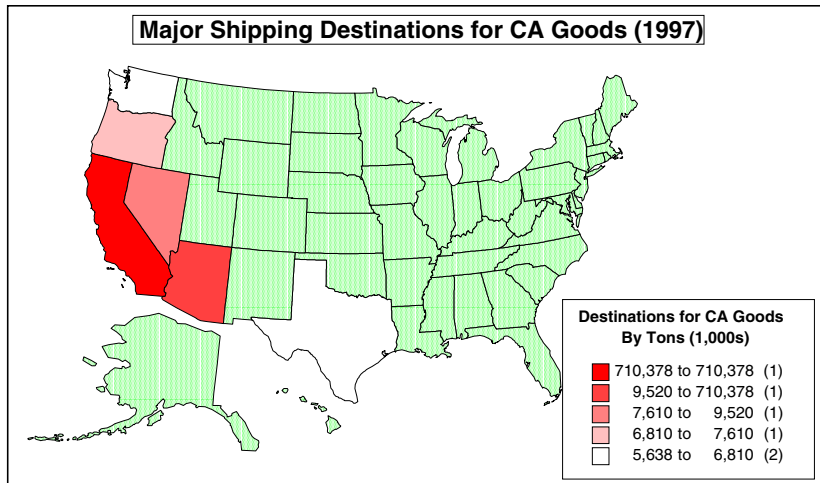
THE SHIPMENT OF GOODS TO & FROM CALIFORNIA

The transportation of cargo is simply the result of a demand for trade between two parties. As such, one means of determining the type of logistics services demanded is to review San Diego's trading partners. We start by examining state-level shipping data from the 1997 Commodity Flow Survey, and then narrow our focus to San Diego metropolitan data as it relates to exports.

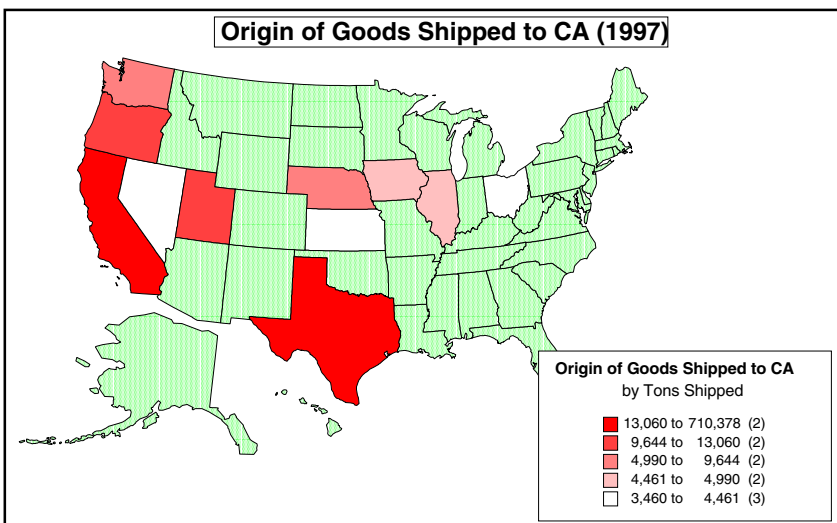
CALIFORNIA'S TRADE WITH THE UNITED STATES

Air cargo shipments tend to occur with either very valuable or very time sensitive commodities that need to be delivered generally more than 1,300 miles. Given this fact, what is the implication for shipments to and from California?

As seen in the map at right, the primary destination for California goods is within the West Coast (California, Arizona, Nevada, Oregon, and Washington), where 95% of products (by weight) are shipped, almost exclusively by truck. **Over 91% of shipments originating in California stay here²⁴. This fact is critical to evaluating the need for outbound regional cargo services.**



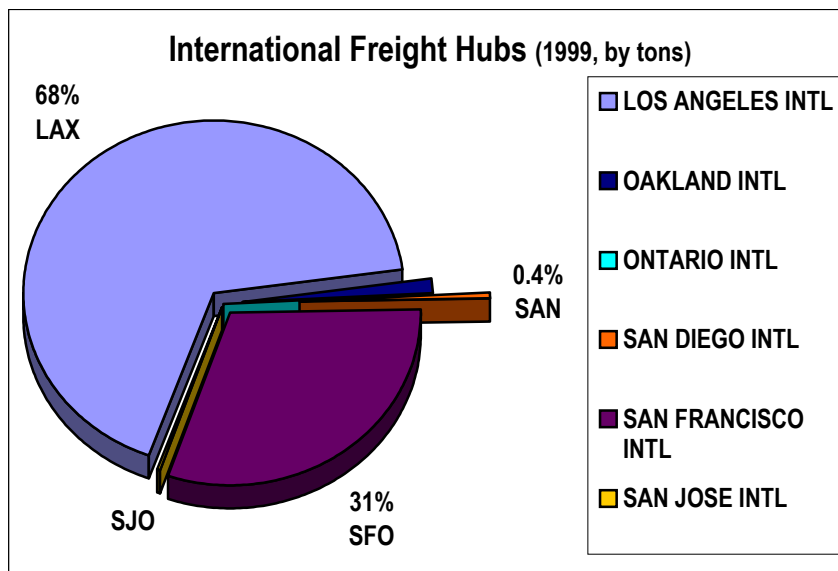
The major origination points for shipments to California are also heavily concentrated on the West Coast. As shown in the map at right, products shipped to an ultimate destination in California come primarily from California, Texas, Utah and Washington, well within expedited trucking distance.



²⁴ Data taken from the 1997 *Commodity Flow Survey*. Figures are generally given by weight of the shipment, rather than value, to remain consistent with other data used in this analysis.

CALIFORNIA'S TRADE WITH THE WORLD

California is the number one exporting state in the United States, with almost \$99 billion in product exports in 1999. Despite the great reliance on exports for California, however, not all major airports have, or need, international air cargo handling capacity. Rather, both international and domestic airfreight tends to rely on the “hub-and-spoke” concept for shipping products long distances. Long-distance and regional flights converge at a few major airports, with regional flights fanning out to medium- and smaller-sized markets. Shippers “need the reliability and frequencies which can only be obtained by major hubs”²⁵, and, as such, “air cargo still tends to follow passengers and is not diverted to smaller, less congested airports.”²⁶



International air cargo demand in California is currently, and clearly, oriented around two primary airport hubs: Los Angeles International Airport (LAX), which processed almost 68% of the international air freight entering or exiting California; and San Francisco International (SFO), which processed almost 31% of such air freight²⁷. The third ranking airport in California, Oakland, handles a significantly smaller share, only 1.4% of the State’s total international airfreight. San Diego’s share of California’s international airfreight is even smaller (and likely to remain so under the hub-and-spoke network system), approximately 0.4% of the total.

LAX and SFO are the gateways through which international airfreight enters and/or leaves California. These two airports are the “hubs” from which the “spokes” of both domestic air

²⁵ F.A.M Hamoen, *Combination Carriers and a Dedicated Air Cargo Hub-And-Spoke Network* (1998), Chapter 6.

²⁶ F.A.M. Hamoen

²⁷ 1999 data provided by the Airports Council International

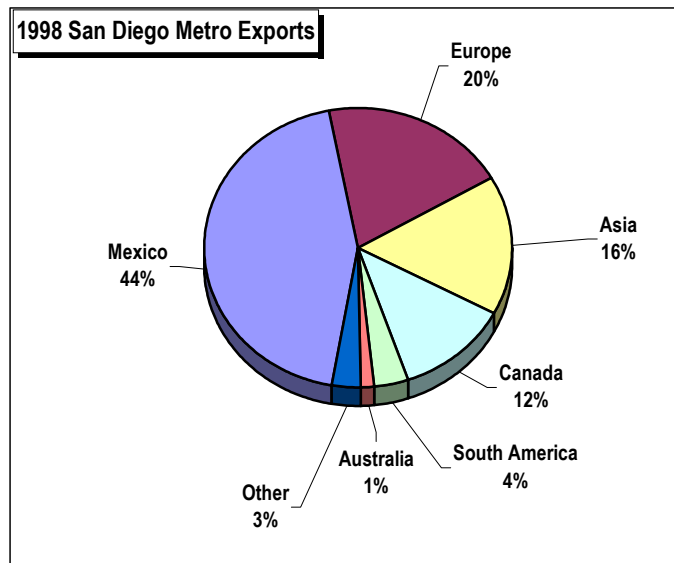
freight providers and surface freight providers (principally, trucks) carry products, with both **LAX and SFO providing several dozens of options for routing shipments to markets all over the world.** In large part this is due to the fact that infrastructure is in place to handle international cargo operations at these facilities. But perhaps most important is the fact that each airport offers a great variety of passenger and cargo carriers with global destinations. In 1998, for instance, there were 119 different airlines using LAX, 90 of which either carried a combination of passengers and cargo, or were all-cargo carriers. This great diversity of shipping options allows freight to travel through these hubs, contributing to lower international shipping costs.

SAN DIEGO METROPOLITAN AREA EXPORTS

San Diego metropolitan exports (e.g. international trade) were estimated in 1998 to be valued at approximately \$8.59 billion worth of merchandise. This is a 10% increase over 1997 figures. Notably, the majority of San Diego trade is with only a handful of global regions, with **over 92% of the region's metropolitan exports going to just these four regions: Mexico (44%), Europe (20%), Asia (16%) and Canada (12%).**

Looking a little closer at the specific nations with which San Diego has export ties, **Mexico outranks the second-nearest export destination (Canada) by more than three times.**

Still, the combined San Diego export trade to even Canada is significant compared to the other primary export countries: Japan, United Kingdom, Netherlands, Germany, France, and South Korea. As shown in the following chart, over two-thirds of San Diego's exports went to four countries: Mexico, Canada, Japan and the UK:



San Diego Metropolitan Area Exports (1998)

Rank	Country/Region	1998 Metro Exports (US\$1000)	% of Total	Cumulative %
1	Mexico	3,794,241	44.16%	44.16%
2	Canada	1,025,461	11.94%	56.10%
3	Japan	474,888	5.53%	61.63%
4	United Kingdom	390,923	4.55%	66.18%
5	Other Europe	385,238	4.48%	70.66%
6	Netherlands	266,291	3.10%	73.76%
7	Germany	245,274	2.85%	76.61%
8	France	220,901	2.57%	79.18%
9	Other Asia	216,864	2.52%	81.71%
10	S. Korea	154,179	1.79%	83.50%
11	Brazil	134,066	1.56%	85.06%
12	Hong Kong	131,225	1.53%	86.59%
13	Taiwan	130,588	1.52%	88.11%
14	Other S. America	122,786	1.43%	89.54%
15	Australia	117,156	1.36%	90.90%

The implications for air cargo demand is that any logistics solution for San Diego exporting companies must provide the optimal way to reach International destinations for our primary export markets. **In the case of Mexico, the destination for over 41% of San Diego's exports each year since at least 1993 (the first year metropolitan export statistics were provided), air cargo options are unnecessary** given very good ground transportation options and the fact that many of these exports are destined for Northwest Mexico. As with domestic shipments, ground transportation options are much cheaper than air cargo for both standard shipping and expedited (e.g. two to three day) shipping for both Mexico and Canada. This fact is reflected by the Census Bureau's 1997 Commodity Flow Survey, which estimated that *US exports shipped by air cargo to Canada were less than 0.3% of total tons shipped and less than 0.1% of total tons shipped to Mexico.*²⁸

Other destinations in Europe and Asia, however, require access to appropriate logistics offerings for the products being shipped. In some cases this may mean marine or ocean freight, airfreight, or a combination of various transportation modes (e.g. trucking with air, trucking with ocean freight, etc.). As long as San Diego has access to reasonably priced International shipping options, there is some question whether the actual International shipper needs to be located in San Diego. Perhaps alternative solutions, such as high-speed rail access to non-local ports or other air cargo facilities, or the pursuit of a cross border air

²⁸ US Census Bureau, 1997 Economic Census/Commodity Flow Survey. Export Shipment Characteristics by Country of Destination 1997 (Table 4).

cargo terminal between Rodriguez Field (Tijuana) and Otay Mesa might be more effective at meeting regional cargo needs than a dedicated air cargo operation at Brown Field.

The main air option existing in the region for San Diego’s air shippers is LAX. However, Southern California offers many options (some better than others) for air cargo shipments. According to Airports Council International (ACI), Los Angeles International is the second-largest air cargo airport in the United States, and the third largest in the world. Ontario International comes in as the 21st largest air cargo airport in the US, and San Diego follows as the 41st largest operation in the US. Other California airports with cargo operations (with Southern California airports highlighted) include:

World Rank	US Rank	Airport	Tons (US) 1999	% Change from 1998
3	2	LOS ANGELES, CA (LAX)	2,151,625.7	4.9
22	12	SAN FRANCISCO, CA (SFO)	930,954.1	9.4
26	14	OAKLAND, CA (OAK)	754,582.8	-3.9
39	21	ONTARIO, CA (ONT)	487,905.5	7.8
89	40	SAN JOSE, CA (SJC)	143,315.5	7.5
92	41	SAN DIEGO, CA (SAN)	140,686.5	4.4
106	48	SACRAMENTO, CA (MHR)	106,685.0	75.4
132	60	SACRAMENTO, CA (SMF)	66,845.7	-14.9
164	71	LONG BEACH, CA (LGB)	45,337.6	8.6
165	72	BURBANK, CA (BUR)	45,182.2	5.6
241	96	SANTA ANA, CA (SNA)	18,214.4	-0.3

San Diego companies have at least six Southern California options within approximately 150 miles of downtown San Diego for shipping product by air (including March GlobalPort). In addition, shippers to Mexico may have additional options south of the border at Rodriguez Field **if** that airport’s management decides to invest in upgraded cargo facilities.

PROSPECTS FOR SAN DIEGO'S MARKET & CARGO "LEAKAGE"

There is no doubt that a market exists in San Diego for air cargo services. That market already exists and is growing (as evidenced through Lindbergh Field's 9% per year average growth in freight tonnages [excluding mail]). The key question is whether market demand can support the development of a dedicated air cargo facility in the Southern-most part of the County. To address this, we examined three critical components of SDACC's core market assumptions:

- The growth in manufacturing industries in San Diego that would demand air cargo services,
- the assumed 80% leakage of existing cargo shipments to other non-local airports (as referred to by SDACC documents and a 1996 SANDAG study), and
- the prospects for cargo related to Tijuana's maquiladora industry.

MANUFACTURING GROWTH IN SAN DIEGO

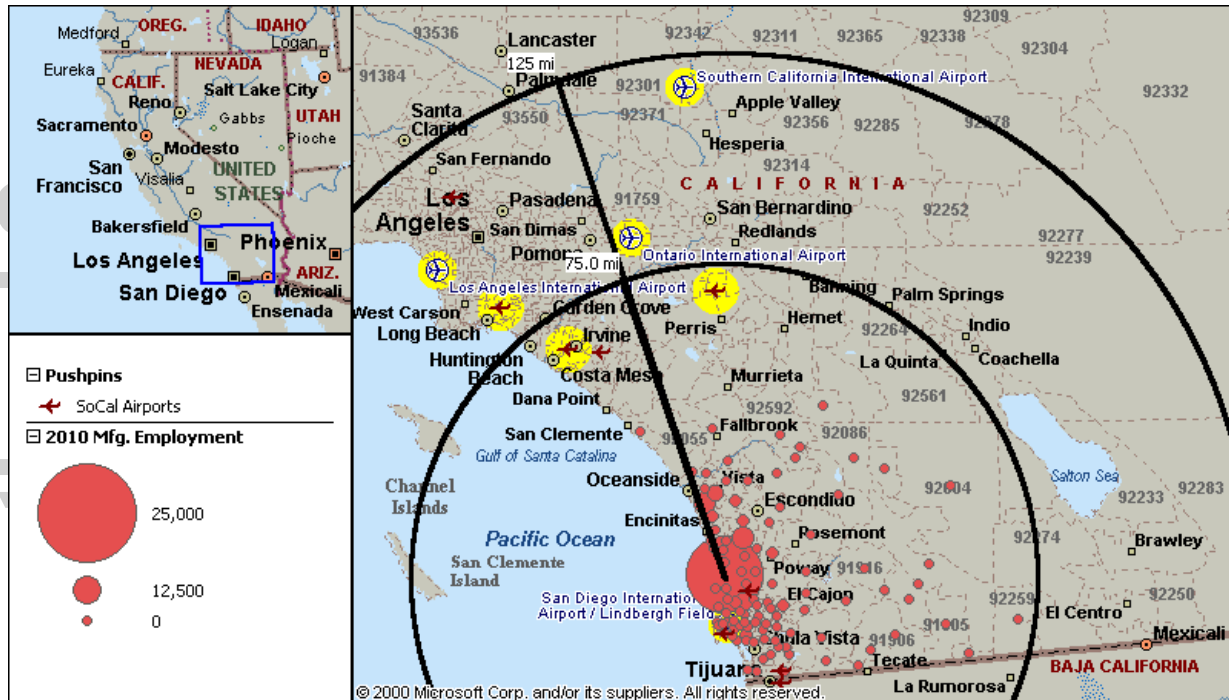
San Diego's manufacturing industries²⁹ (increasingly technology-related) are cited as a probable market for the proposed SDACC facility. According to SANDAG forecasts, the growth of the region's technology industry clusters and manufacturing activities is not currently expected to be adjacent to Brown Field. As shown in the following map, SANDAG manufacturing employment data for the year 2010 clearly predicts that San Diego's manufacturing employment will for the most part be concentrated more than 20 miles away from Brown Field. A significant proportion, in fact, will be more than forty miles north of Brown Field (although, it should be noted, relatively close to the existing Lindbergh Field).



²⁹ The location of manufacturing facilities is critical to the feasibility of cargo operations, given that a primary source of freight cargo demand (not necessarily mail or express cargo) is manufacturing industries, according to research performed by the Colography Group (www.colography.com).

Distance of Manufacturing Industries from Brown Field, 2010

In fact, based on this same manufacturing employment data for 2010, strong concentrations of San Diego’s future manufacturing base will be located between 75-125 miles from at least six other Southern California airports with cargo capacity as shown in the following map:



2010 San Diego Regional Manufacturing Concentrations & Distance to Southern California Airports

It is likely that much of the manufacturing inputs and outputs needed by the region’s industries will be relatively close to airports competing with Brown Field for cargo including Lindbergh Field, John Wayne/Santa Ana, and March GlobalPort.

“LEAKAGE” & CAPTURE OF SAN DIEGO’S AIR CARGO

An often-quoted figure used to justify the development of the proposed SDACC facility at Brown Field is that “80 percent of San Diego’s airfreight potential is being shipped (leaked) through other southern California airports”³⁰. The validity of this assumption is based upon several false premises:

- First, the 1996 SANDAG report looked at three regions in California – San Diego, Los Angeles/Southern California, and the Bay Area – and compared the proportion of each region’s population with the airfreight handled by each region. San Diego was cited as having 11% of the three regions’ population, but only 2.2% of the regions’ airfreight. Therefore (it was concluded) 80% of San Diego’s air cargo (or about 240,000-400,000 TPY according to the analysis) must be “leaking” to other airports.

This proportional analysis, however, does not take into account that the two primary airport hubs in the Los Angeles/Southern California and Bay Area (e.g. LAX and SFO) are major transit points for airfreight passing in transit through their hub-and-spoke network. This upwardly distorts the amount of perceived regional air cargo. More critically, although population has some correlation with air cargo, it does not necessarily **drive** the generation of cargo. Rather, industry employment tends to be a primary driver of both inbound and outbound cargo shipments. In either case, the “leakage” figure is likely lower than assumed.

Perhaps a better way to estimate local “leakage” of air cargo to and from other airports can be demonstrated by the following:

- According to both the US Census Bureau’s Commodity Flow Survey results for California, and a recent study by UC Berkeley’s Institute of Transportation Studies, only approximately 0.1% by weight of California goods is shipped via air freight. Although another 0.4% of California goods by weight are handled by “parcel” companies, researchers estimate that only between 0.135% and 0.224% of all trucked freight includes airfreight³¹.
- Further, SANDAG’s April 2000 Regional Transportation Plan includes estimates that approximately 53.9-57.8 million tons of goods will be transported by trucks into and out of the San Diego County boundaries³². The lower range is based on a California state model for goods movement (the California Intermodal

³⁰ Quotation from PB Aviation’s Airport Master Plan Study for SDACC at Brown Field (May 2000) referencing the 1996 SANDAG report, “Market Demand and Opportunities Study for Air Transportation in the San Diego Region”.

³¹ *The Role of Air Cargo in California’s Goods Movement*, H.S. Jacob Tsao, UC Berkeley Institute of Transportation Studies (Sept. 1998), p. 46.

³² 2020 Regional Transportation Plan, SANDAG (April 2000), p. 218

Transportation Management System or ITMS), the higher range for the same model (ITMS) adjusted for higher goods movement related to NAFTA and trade with Mexico. This same source also projects that between 59.6-67.4 million tons of goods will be transported by trucks across the County boundaries by the year 2012. In our estimates, we will assume the higher, NAFTA-impacted model to be optimistic (see Table 4 in the Reference section for more details).

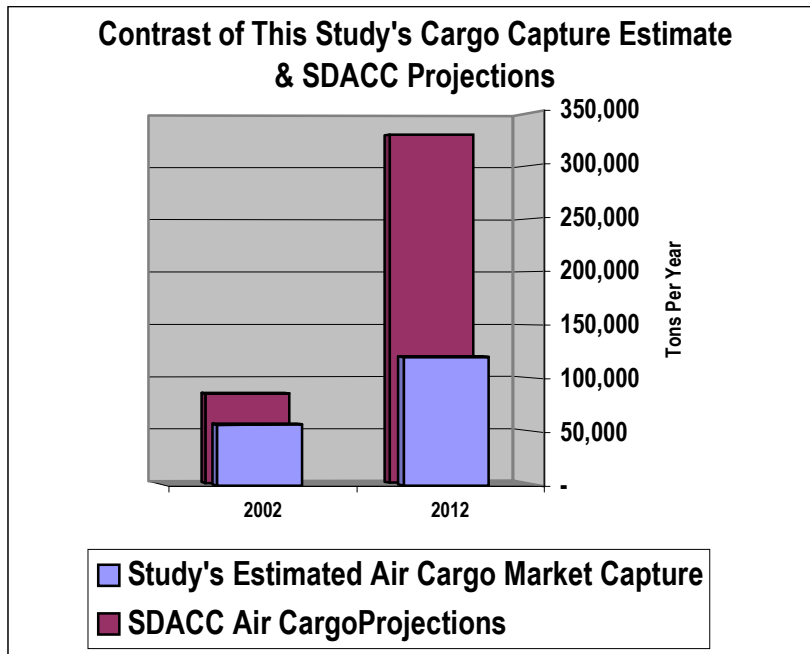
- Lastly, CalTrans data also demonstrates that approximately 95% of truck traffic entering/leaving the County uses the north/south arteries of Interstate 5 and Interstate 15.

These three criteria allow us to provide the following estimate of air cargo for products that are currently using airports outside of San Diego County:

"Leakage" of SD Air Cargo to SoCal Airports	Low Range		High Range	
	Likely % of Trucked Goods With Air Cargo	2002 (53.9 million TPY)	2002 - NAFTA (57.8 million TPY)	2012 (59.6 million TPY)
0.10%	51,205	54,910	56,620	64,030
0.15%	76,808	82,365	84,930	96,045
0.20%	102,410	109,820	113,240	128,060
0.25%	128,013	137,275	141,550	160,075
0.30%	153,615	164,730	169,860	192,090

Our assumed lower/upper bound of “leaking” air cargo for the year 2002 is 82,000-110,000 TPY, and 128,000-160,000 TPY for 2012. These reflect both the above factors, as well as our belief that increased supplies of air cargo services (at both Lindbergh and other Southern California airports) will continue to attract goods from central and northern parts of San Diego.

In terms of possible capture of air cargo goods by SDACC, we estimate that up to 33% of the potentially “leaking” goods might be captured by air cargo services offered out of Brown Field, as well as up to 15% of Lindbergh’s current cargo might be captured in the short term. The estimated market size of air cargo products by SDACC is demonstrated in the following charts and tables. **Given 15% initial capture of freight goods from Lindbergh Field (moving to 20% by 2012), as well as 33% capture of goods that would have “leaked” out of the region (both optimistic assumptions), SDACC has projected that they would be handling approximately 84,000 TPY by 2002 (a 27,000 TPY shortfall). By 2012, SDACC indicates plans of handling up to 330,000 TPY. However, our estimate is only 120,200 TPY (almost a 210,000 TPY difference).**



Estimated Market Capture of SDACC in 2002 and 2012

	Lower Bound	Higher Bound
SDACC Air Cargo Market Capture Estimate	2002	2002
from Lindbergh Field	20,400	20,775
"Leaked" Cargo	27,060	36,300
Total SDACC Cargo	47,460	57,075
	Lower Bound	Higher Bound
SDACC Air Cargo Market Capture Estimate	2012	2012
from Lindbergh Field	62,300	67,400
"Leaked" Cargo	42,240	52,800
Total SDACC Cargo	104,540	120,200

Estimate assumes high impact of NAFTA for trucked goods in County (57.8 million TPY goods in 2002 being trucked across County boundaries, 67.4 million TPY of goods in 2012); relatively high percentage (0.15-0.20%) of goods being trucked might be compatible as air cargo; that 95% of trucked goods in San Diego County travel along the north/south corridors of I-5 and I-15, and thus might potentially be in transit to a non-local airport; and that over time Brown Field will increase its capture of potential cargo in the region.

We also made the following assumptions in our estimate:

-
- That integrated express carriers (like FedEx and Emery) will continue their preference for being sited at mixed-use facilities, especially Lindbergh Field, which is more central to San Diego County’s population than Brown Field.
 - That even if Brown Field is established, some cargo operations will continue to occur at Lindbergh Field, based on both published statements of the Port of San Diego (and in their Master Plan) as well as the fact that passenger airlines currently carry, and will increase, revenue-generating cargo services.
 - That for economic and logistical considerations, some air cargo will continue to use other Southern California markets (i.e.: other airports may still offer better and more-economical connections for certain domestic and international destinations). However, we also assume that some cargo that is trucked to and from San Diego County and other Southern California airports could be diverted to Brown Field.
 - That Tijuana’s Rodriguez Field will not be upgraded to provide air cargo services oriented toward Baja California’s maquiladora industry (a relatively unlikely occurrence, given recent statements from the airport’s owners).

More specific to Lindbergh Field is the question of whether capacity still exists for air cargo. Present estimates are that Lindbergh Field services approximately ten integrated or all-cargo flights per day, and that Lindbergh Field’s Master Plan projects that approximately 18 flights per day of cargo services could be accommodated, reflecting that capacity does currently exist locally.

Notably, the June 22, 2000 Agenda Sheet³³ from the San Diego Unified Port District meeting relating to Lindbergh’s Master Plan states:

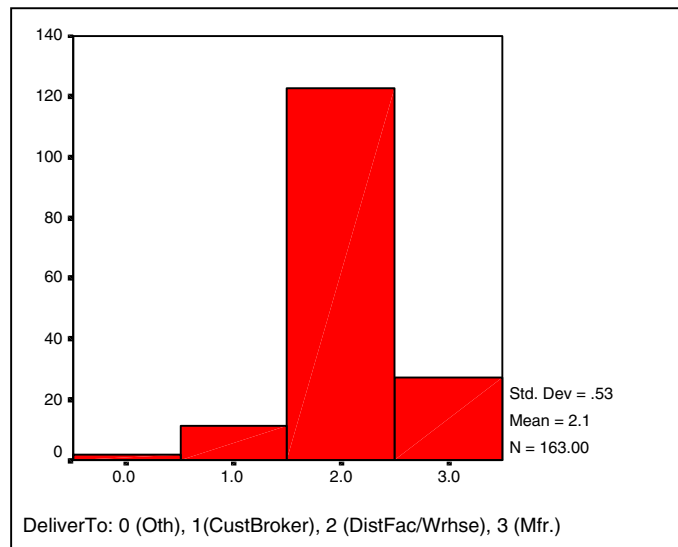
“The majority of SDIA’s daily 300+ flights are passenger aircraft. Cargo operations at SDIA are a small percentage of overall flights and are primarily mail, belly cargo in passenger aircraft, and small package/overnight cargo. The cargo operations proposed by the San Diego Air Commerce Center at Brown Field would enhance the region’s air cargo service but is **not anticipated to divert the present types of cargo operations from SDIA to Brown Field and would also not substantially alleviate congestion at Lindberg Field.**”

³³ Port of San Diego Agenda Sheet item #20 dated June 22, 2000. Response to public comments through Public Outreach Program, as stated in Attachment 2 (“Summary of Public Outreach Process”).

THE QUESTION OF RODRIGUEZ FIELD AND TIJUANA'S MAQUILADORAS

Another market opportunity cited as supporting the air cargo operations at Brown Field is the immense shipping of cargo by truck through the Otay Mesa Port of Entry (California's largest commercial border crossing, handling over 50,000 trucks per month). While it is true that approximately \$1.2 billion worth of products is currently shipped through Otay Mesa each month (imports plus exports), it is important to recognize that this trade is focused on the maquiladora industry. Southbound maquiladora industry shipments through Otay Mesa are from US, Asia and a small but growing number of European sources. Most of these inbound products are shipped either by truck (US products) or by sea (Asia), with some high-value Asian components shipped by air. Current international air cargo shipments that ultimately pass through Otay Mesa into Baja California use the great number of shipping options (through passenger/combination and all-cargo carriers) available through LAX. Brown Field will not capture a significant amount of this market given the many other options available to Asian shippers.

Northbound shipments are almost exclusively destined for US domestic markets. According to proprietary surveys compiled for shipments trucked through Otay Mesa, 81.7% were en route to either distribution warehouses or customs brokers (as shown by the two right-hand bars in the adjacent chart). Another 16.5% were en route to manufacturing facilities, leaving only approximately 2% for "other" locations³⁴ that might include regional airports.



An important potential competitor to Brown Field is Tijuana's own Rodriguez Field. Rodriguez (operated under a private concession since October of 1999) is developing a draft Master Plan that is expected to be completed by 2001. According to interviews with staff from Grupo Aeroportuario del Pacífico³⁵, as well as newspaper accounts, this draft Master Plan will include plans to develop air cargo improvements at the airport. Their goal will likely be to attract International and domestic air cargo shipments to support Baja California's maquiladora industry, one of the same markets that will be targeted by Brown Field. **Business and community leaders in Tijuana, in fact, have included the development of a major cargo operation at Rodriguez Field as one of their priority**

³⁴ Surveys performed by Crossborder Business Associates of 164 trucks going northbound through Otay Mesa in October of 1999.

³⁵ Interviews conducted in June of 2000 by Crossborder Business Associates

infrastructure projects in the 1999-2010 Strategic Economic Development Plan, created by the Tijuana Economic Development Council³⁶.

An additional cross border “threat” to Brown Field’s capture of inbound materials passing through the Los Angeles region may also be the planned expansion of the Port of Ensenada, which is already periodically accepting shipments of components used by the maquiladora industry.

Interestingly, Rodriguez Field may present an innovative opportunity for San Diego to further develop a closer and mutually beneficial relationship with Baja California, perhaps one that reflects this region’s strategically important economic connection with Tijuana through creation of a joint air cargo facility. Currently, the South County Economic Development Council has been cautiously promoting the development of a cross border passenger terminal with Rodriguez Field. This concept could certainly be explored, as well, for international air cargo services that would serve both Baja California and San Diego. The operators of Rodriguez Field have, in fact, already initiated research into this very opportunity. **Given that Rodriguez has an existing 10,000-foot runway (3,077 meters), as well as land for a second runway of greater length, this prospect could potentially build upon the economic strengths and needs of both the Tijuana and San Diego communities.**

36 Plan Estrategico de Desarrollo Economico de Tijuana, 1999-2010, Consejo de Desarrollo Economico de Tijuana.

APPENDIX

CBA Promotional Copy

ADDITIONAL RESEARCH DETAILS & REFERENCES

Table 1: International Freight Shipped Through Primary Hubs

The following table demonstrates International freight (total enplaned and deplaned) at major California airports in 1999. The data is self-reported by the members of the Airports Council International and its members (16 of which are in State).

The data demonstrates the overwhelming role that both Los Angeles and San Francisco have in terms of California's and the West Coast's position in international trade: approximately 98% of international air freight passes through these two airports. Since most international air freight is processed through specialized facilities (with US Customs operations, for instance), it is expected that most air freight will continue to travel through primary hubs, from which it is then sent through regional air carriers, trucks, and rail to its ultimate destination.

Int'l Air Freight Hubs (1999 ACI data, tons)		% of total
LOS ANGELES INTL	932,506.1	67.3%
OAKLAND INTL	19,586.8	1.4%
ONTARIO INTL	11.0	0.0%
SAN DIEGO INTL	5,123.4	0.4%
SAN FRANCISCO INTL	425,044.7	30.7%
SAN JOSE INTL	4,212.8	0.3%
Total	1,386,484.7	

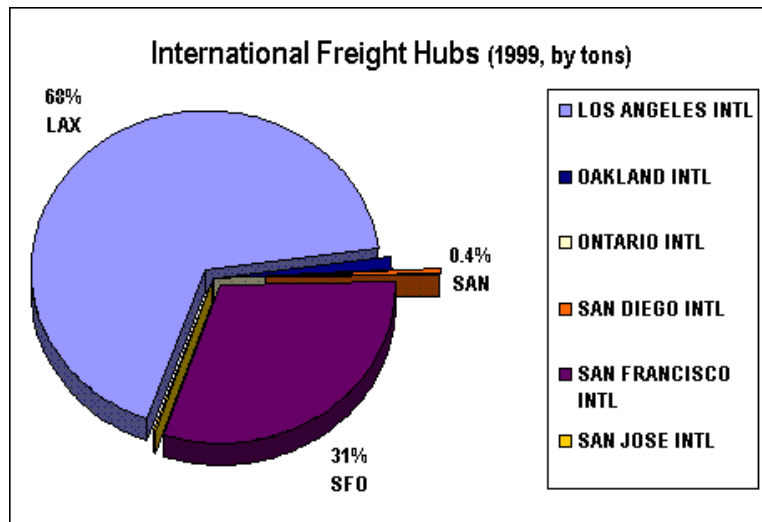


Table 2: Average Length of Haul, Domestic Freight (source: US Department of Transportation)

The following table summarizes the average distances that domestic US freight has been hauled by either truck or air (air-only or combination air-truck), as determined by the US Census Bureau and the US Department of Transportation through annual surveys. The information reported here shows the average shipping distance in miles for the five-year periods of 1960-1995. Clearly, **trucking has become more competitive, and the average length of haul for trucking has increased**, since deregulations in the 1980s and 1990s.

Also, the 1997 US Commodity Flow Survey (CFS) shows an increase in the average distance hauled for air shipments to 1,380 miles, **reflecting the fact that airfreight is increasingly used for only the most-distance or the most time-sensitive longer shipments.**

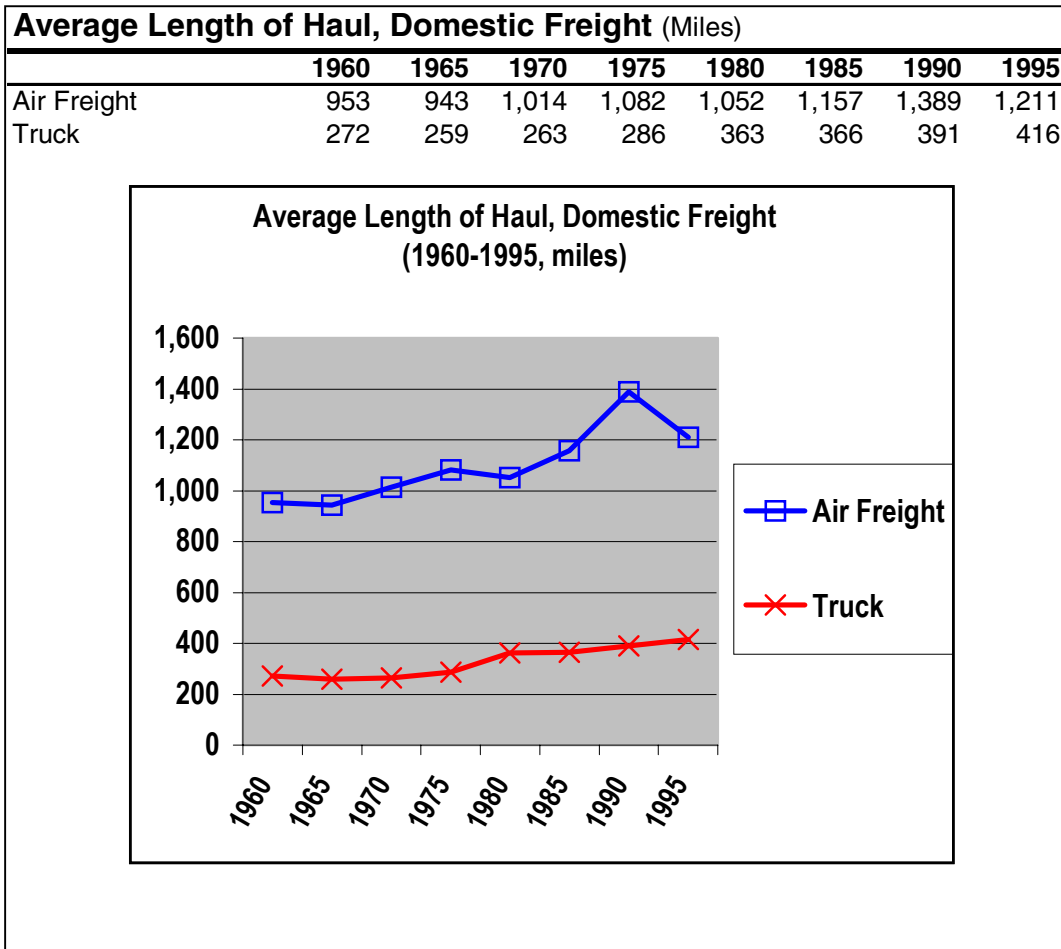


Table 3: Projected Annual Tonnage of Cargo Through Brown Field Under Various Growth Assumptions

The following table depicts several growth assumptions for air cargo at Brown Field, all using the expected base first-year-tonnage assumed by SDACC (an optimistic assumption). These growth factors were applied to the SDACC data to provide a point of comparison for possible air cargo capture rates at Brown Field. These growth assumptions are explained as follows:

1. **SDACC Assumed Growth:** SDACC Master Plan tonnage data for 2001, 2006, and 2016 (which works out to be approximately a 19.7% growth rate for 2001-2006, then declining to approximately 11.2% annually).
2. **Alternative 1:** An eight-year annual growth estimate developed by cargo consultants The Colography Group (Atlanta), which is based on annual growth of shipped units. Note that even this optimistic 10.1% annual growth rate falls approximately 200,000 TPY short of the 2016 air cargo growth figure projected by SDACC.
3. **Alternative 2:** During the past ten years, Lindbergh Field has had an annual cargo/freight growth rate (not including mail) of approximately 9.29%. Assuming that this rate of growth would apply to Brown Field as well, despite its reliance on all-cargo flights, **projected air cargo is still 230,000 TPY less than the figures cited by SDACC.**
4. **Alternative 3:** The Los Angeles World Airways group (the operator of LAX, Ontario, and other Southern California airports) projects that air cargo is likely to grow “almost” 8% annually in Southern California during the 20 years. If this growth rate were applied to the assumed start-up cargo tonnages of the SDACC, there would be **a shortfall in tonnage projected of over 275,000 TPY.**
5. **Alternative 4:** In their 1998-1999 World Air Cargo Forecast, Boeing estimates that “long-term air cargo growth is expected to average 6.4% per year”³⁷. Applying this annual growth factor to the assumed SDACC start-up capacity results in approximately 180,000 TPY. **This is more than a 326,000 TPY difference from the projected 2016 SDACC tonnage projection.**

³⁷ Boeing, *World Air Cargo Forecast: Significant World Airline Trends* (www.boeing.com, retrieved July, 2000).

Year	SDACC Air Cargo Projection (19% through 2006, 11% thereafter)	Alt. 1 -- SDACC Under Colography Group 93-99 Cargo Growth Estimate (10.1% annual)	Alt. 2 -- SDACC Under Lindbergh's 10-year Ave. Cargo Growth (9.29% annual)	Alt. 3 -- SDACC Under LAX Assumed Cargo Growth (8% annual)	Alt. 4 -- SDACC Under Boeing Air Cargo Forecast (6.4% annual)
2001	70,785.0	70,785.0	70,785.0	70,785.0	70,785.0
2002	84,758.0	77,934.3	77,359.2	76,447.8	75,315.2
2003	101,489.2	85,805.6	84,544.0	82,563.6	80,135.4
2004	121,523.1	94,472.0	92,396.1	89,168.7	85,264.1
2005	145,511.8	104,013.7	100,977.4	96,302.2	90,721.0
2006	174,298.0	114,519.1	110,355.8	104,006.4	96,527.1
2007	193,906.5	126,085.5	120,605.2	112,326.9	102,704.9
2008	215,721.0	138,820.1	131,806.4	121,313.1	109,278.0
2009	239,989.6	152,841.0	144,048.1	131,018.1	116,271.8
2010	266,988.5	168,277.9	157,426.6	141,499.5	123,713.2
2011	297,024.7	185,274.0	172,047.7	152,819.5	131,630.8
2012	330,439.9	203,986.6	188,026.8	165,045.1	140,055.2
2013	367,614.4	224,589.3	205,489.9	178,248.7	149,018.7
2014	408,971.0	247,272.8	224,574.9	192,508.6	158,555.9
2015	454,980.3	272,247.4	245,432.5	207,909.3	168,703.5
2016	506,165.6	299,744.4	268,227.2	224,542.0	179,500.5

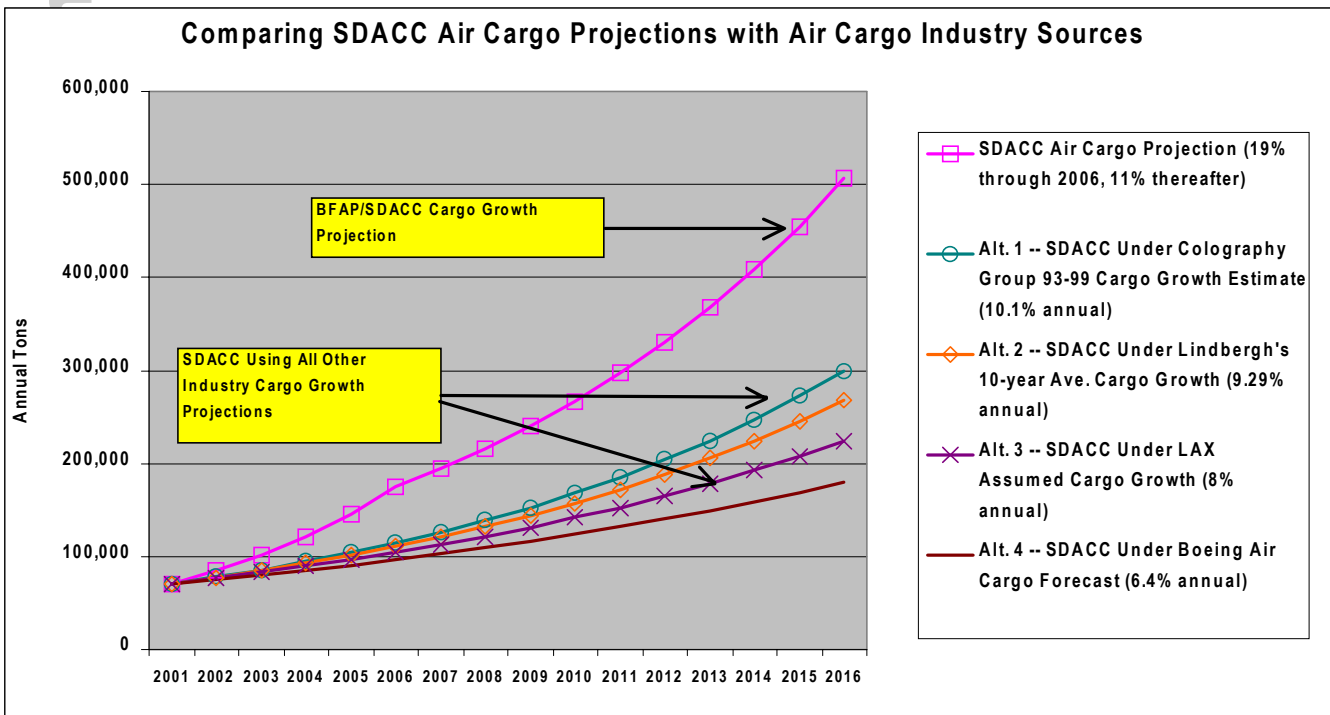


Table 4: Estimated Goods Movement By Truck Across San Diego County Boundaries

SANDAG’s April 2000 Regional Transportation Plan includes estimated movements of goods by truck into and out of San Diego County by tonnage. Two models were employed for these estimates: the California Intermodal Transportation Management System (ITMS) model, and the ITMS model, adjusted to reflect greater truck movements caused by NAFTA. In attempting to estimate the amount of air cargo compatible goods (e.g. have a high value-to-weight ratio) that are moving into and out of San Diego County (e.g. “leakage”), we started with the ITMS-NAFTA model (for years 2002 and 2012).

We combined this data with two other estimates: first, that approximately 95% of truck movements go north/south (and thus possibly to non-San Diego airports); second, that between 0.10%-0.30% of goods shipped by truck potentially would be shipped by air (based on Commodity Flow Survey estimates). We choose a moderately optimistic range of 0.15%-0.20% as the more likely scenario, as indicated in the following table:

"Leakage" of SD Air Cargo to SoCal Airports	Low Range		High Range	
	Likely % of Trucked Goods With Air Cargo	2002 (53.9 million TPY)	2002 - NAFTA (57.8 million TPY)	2012 (59.6 million TPY)
0.10%	51,205	54,910	56,620	64,030
0.15%	76,808	82,365	84,930	96,045
0.20%	102,410	109,820	113,240	128,060
0.25%	128,013	137,275	141,550	160,075
0.30%	153,615	164,730	169,860	192,090

Capture of "Leaked Goods" By Brown Field	Likely % of Trucked Goods With Air Cargo	2002 (53.9 million TPY)	2002 - NAFTA (57.8 million TPY)	2012 (59.6 million TPY)	2012 - NAFTA (67.4 million TPY)
	0.10%	16,898	18,120	18,685	21,130
0.15%	25,346	27,180	28,027	31,695	
0.20%	33,795	36,241	37,369	42,260	
0.25%	42,244	45,301	46,712	52,825	
0.30%	50,693	54,361	56,054	63,390	

We conclude that approximately 82,000-110,000 TPY of goods would likely “leak” into or out of San Diego County in 2002. We also keep SDACC estimates³⁸ that Brown Field could potentially “capture” approximately one-third of this “leakage”, to result in an estimated Brown Field capture of approximately 27,000-36,000 TPY of “leaked” air cargo in 2002, and 42,000-53,000 TPY in 2012.

³⁸ PB Aviation, Airport Master Plan Study: San Diego Air Commerce Center at Brown Field (May 2000), p. 2-2

Table 5: Lindbergh Field Freight-Only Projections

Based on Port of San Diego reported historical 5- and 10-year average growth rate of freight enplaned/deplaned at Lindbergh, 8.63% and 9.29% growth rate respectively, starting with the last year for which freight data was available (1999), calculations used to estimate regional market size in 2002 and 2012 employed the more conservative 8.63% growth rate projections.

Year	5YrAv-Freight (tons)	10YrAv-Freight (tons)
1999	106,270.60	106,270.60
2000	115,439.03	116,140.56
2001	125,398.46	126,927.20
2002	136,217.14	138,715.66
2003	147,969.19	151,598.98
2004	160,735.14	165,678.85
2005	174,602.47	181,066.40
2006	189,666.19	197,883.07
2007	206,029.52	216,261.61
2008	223,804.59	236,347.07
2009	243,113.20	258,297.98
2010	264,087.64	282,287.59
2011	286,871.64	308,505.27
2012	311,621.32	337,157.92
2013	338,506.25	368,471.71
2014	367,710.67	402,693.80
2015	399,434.69	440,094.29
2016	433,895.67	480,968.37
2017	471,329.76	525,638.67
2018	511,993.44	574,457.75
2019	556,165.36	627,810.94
2020	604,148.19	686,119.35

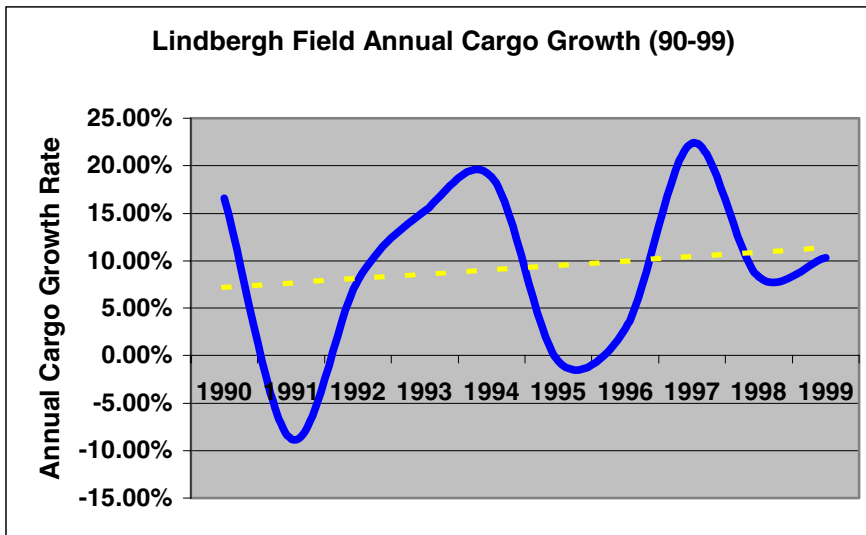
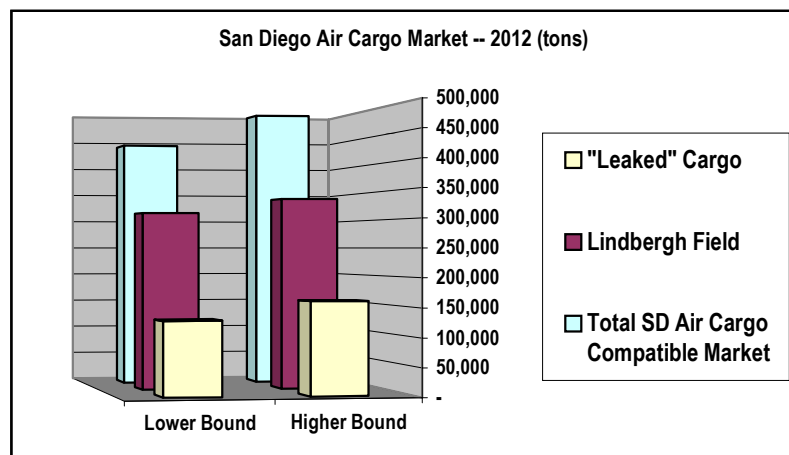
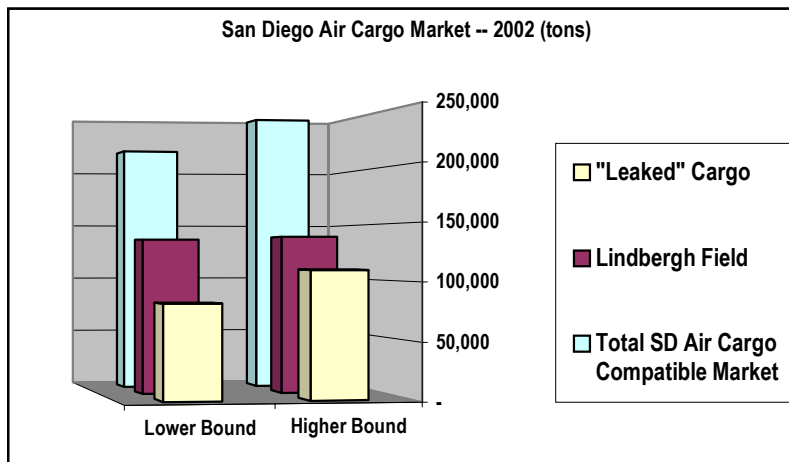


Table 6: Estimated Total Air Cargo Compatible Shipments Market, Lower and Higher Bounds (2002 and 2012)

Lindbergh Field data based on projections from actual freight carried at airport; “leakage” estimated from SANDAG reported trucked goods movement and 1997 Commodity Flow Survey data:

	Lower Bound	Higher Bound
Total Regional Air Cargo Estimate	2002	2002
Lindbergh Field	136,000	138,500
"Leaked" Cargo	82,000	110,000
Total SD Air Cargo Compatible Market	218,000	248,500
	Lower Bound	Higher Bound
Total Regional Air Cargo Estimate	2012	2012
Lindbergh Field	311,500	337,000
"Leaked" Cargo	128,000	160,000
Total SD Air Cargo Compatible Market	439,500	497,000



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