Presentation to South Bay Council of Governments
March 8, 2007

What follows is a copy of the presentation I gave to your group on March 8th. This was put together with the assistance of CSULB/METRANS and the charts and statistics were meant to give the audience a high level view of the air cargo industry and it's important in global commerce in general and to Southern California in particular.

While some of the statistics are several years old, they do trend in a direction that makes our point about the role of air cargo, even if it is not the most current data. All of this was from the public domain and none of it was paid research, which would have certainly given us more current data, but would not have changed the real picture.

The book that I held up to the class was one Dr. O'Brien loaned me: called 2006 Los Angeles Trade Numbers: Imports and Exports between Los Angeles and the World (**www.usatradenumbers.com**). We also had Pocket Guide to Transportation 2007 by the US Bureau of Transportation Statistics at www.bts.gov

I thank everyone for their participation and encourage you to email or call me if you ever have any questions, or if there is any way I can be of assistance.

Best wishes,

Jim Powell, President
Transportation Development Group
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jim@logisticstraining.com
jim@dgtraining.com

Understanding Goods Movement and the Supply Chain: Air Cargo

A Workshop for Policy Makers

Reference and Reading List

- **Belman, Dale, Kristen Monaco and Taggert Brooks (2005) Sailors of the Concrete Sea: A Portrait of Truck Drivers' Work and Lives. Lansing: Michigan State University Press.**

Kristen Monaco is on the faculty of CSU Long Beach.

- **Belzer, Michael (2000) Sweatshops on Wheels: Winners and Losers in Trucking Deregulation. Oxford: Oxford University Press.**

Includes useful history of trucking industry in the US. Discussion of deregulation largely focuses on long-haul trucking.

- **Erie, Steven P. (2004) Globalizing L.A.: Trade, Infrastructure, and Regional Development. Stanford: Stanford University press.**

Why LA and Long Beach emerged as centers for world trade and how governance structure of (air)ports differs in the two cities. Recent enough to include discussions of the Alameda Corridor and expansion of LAX.

- **Hugill, Peter J. (1993) World Trade Since 1431: Geography, Technology, and Capitalism. Baltimore: Johns Hopkins University Press.**

Traces the relationship between technology and economy, highlighting the importance of transportation in the development of global powers.

Other Sources

Note from Jim – I will may "tinyurls" out of these… if you haven't used this net tool it's fantastic… check out www.tinyurl.com

1 http://ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/docs/06factsfigures/fig2_7.htm

http://tinyurl.com/2prcca

2 http://www.lawa.org/lax/cargo.cfm

http://tinyurl.com/248n4f

3 http://www.laalmanac.com/transport/tr58.htm

http://tinyurl.com/2jhxqo

4 http://www.laalmanac.com/transport/tr59.htm

http://tinyurl.com/yvvks9

5 http://ops.fhwa.dot.gov/freight/freight_news/FAF/talkingfreight_faf.htm

http://tinyurl.com/3crhhc

6 http://www.lawa.org/lax/cargo.cfm

http://tinyurl.com/248n4f

7 http://www.fhwa.dot.gov/environment/freightaq/appendixc.htm

http://tinyurl.com/2jopzw

8 http://www.bts.gov/publications/americas_freight_transportation_gateways/highlights_of_top_25_freight_gateways_by_shipment_value/los_angeles_international_airport/

http://tinyurl.com/38tjn6

9 http://www.lawa.org/lax/laxframe.html

http://tinyurl.com/2egwh7

10 http://www.awest.com/tools/rates/airfreightrates.jpg

http://tinyurl.com/3xgdbd

11 http://www.boeing.com/commercial/cargo/images/2006_01_01b.jpg

http://tinyurl.com/3aelog

12 http://www.uctc.net/scripts/countdown.pl?400.pdf

http://tinyurl.com/2lm4rc

13 http://www.ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/docs/06factsfigures/pdf/fff2006.pdf

http://tinyurl.com/2kbcgr

14 http://cati.csufresno.edu/cab/PDF/Mason_Role-of-Air-Cargo.pdf

http://tinyurl.com/2wtbc2

Useful websites

www.iata.org
International Air Transport Association

www.cnsc.net
Cargo Network Services Corp., IATA subsidiary in the US that manages the cargo agent program

www.cargofacts.com
Service of the Air Cargo Management Group

www.colography.com/press/2004/whitepapers2.html
http://tinyurl.com/2chbyd

Source of White Papers on transportation industry

www.ism.ws
Institute for Supply Management

www.ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/docs/06factsfigures/pdf/fff2006.pdf
http://tinyurl.com/2kbcgr

Freight Facts and Figures 2006, publication of FHWA

www.lawa.org/lax/cargo.cfm
LAX's Air Cargo site

http://www.scag.ca.gov/goodsmove/
The SCAG Goods Movement Knowledge Base with links to important planning reports involving goods movement

http://www.joc.com/
The Journal of Commerce online for the latest news in goods movement and trade.

http://www.metrans.org/
The USC and CSULB METRANS website with links to research on goods movement. All reports are available for downloading free of charge.

http://www.uces.csulb.edu/CITT/Home/Home.aspx

The home page for the Center for International Trade and Transportation at CSULB with info on professional development training programs and links to Town Hall webcasts and videos and available White Papers on goods movement related issues.

http://www.bts.gov/

The USDOT's Bureau of Transportation Statistics, including useful data on goods movement.

http://www4.trb.org/trb/homepage.nsf/web/resources

http://tinyurl.com/2zg9fs

The resources page of the Transportation Research Board, with research engines for transportation related reports.

http://www.fhwa.dot.gov/freightplanning/talking.htm

http://tinyurl.com/237vqj

Site for the Federal Highway Administration's free monthly webinar series on freight-related issues. Power point presentations are available for downloading.

Welcome!

Understanding Goods Movement and the Supply Chain

Part II – Focus on Air Cargo

Sponsored by:

South Bay Council of Governments
METRANS Transportation Center
and California State University, Long Beach

Created by and Moderated by Jim Powell, Transportation Development Group, www.logisticstraining.com

(800) 949-4834 | (310) 302-0808

Conference Organizers and Assistants

- These people were directly involved in making this course possible:
  - Jacki Bacharach, Executive Director South Bay Cities Council of Governments
  - Tom, O'Brien Director of Research CSULB Center for Intl. Trade and Transportation
  - Marianne Venieris, Executive Director, CSULB Center for Intl. Trade and Transportation
  - Sandeep Dev, Research Assistant, CSULB Center for Intl. Trade and Transportation

Other Sponsors and Supporters

- We also appreciate the support of the following persons/companies:
  - Los Angeles Air Cargo Association
    - Giulio Battaglini, Director of Sales, North America – Korean Airlines
  - Pacific Air Cargo
    - Ms. Beti Ward, CEO

Other Guests and Participants

- We also appreciate the support of the following persons/companies:
  - We also have other participants

Jim Powell, Transportation Development Group

Jim Powell is President of Transportation Development Group, based in Los Angeles and Seattle. TDG is a logistics consultancy and regulatory compliance training school, that also specializes in online training through their logisticstraining.com website.
He has held executive positions in the logistics industry over the last 30 years and has been directly involved in air cargo operations, sales and logistics information systems development.

Jim was hired by one of the founders of DHL and served as Director of Cargo Operations for DHL's Airline Subsidiary in Hawaii for many years. After that he held regional management and executive positions with Danzas and Skyway Freight Systems. He founded TDG in 1992 and has trained over 10,000 students in international air cargo operations, regulatory compliance and 3rd Party Logistics Sales and Services.

An active member of the Los Angeles Air Cargo Association , he has served on that groups Board of Director for nearly 15 years.
For the last 10 years Jim has served as an instructor for the California State University, Long Beach GLS® program. His class is titled, "The Impact & Importance of Information Systems in the Logistics Industry."

Air Cargo Training Version 1.0

- Actually, this is a Beta Version
  - This is the first class of this kind we have put together.
  - Your feedback is helpful in making it better
  - If there's interest, we can do this again.
  - We can even consider putting it online if there's a value in doing that.

The Three Major Parts of this Program

- (1) This afternoon's training class
  - We'll focus on understanding how the air cargo supply chain is put together and what it does.
    - How does air cargo fit in to the global scheme of things? Is it important? Why?
    - How it works – the "hidden" side of air cargo. Airplanes are only part of the picture.
    - How do local government policies effect global commerce.

The Three Major Parts of this Program

- (2) Meet some of the participants at the evening "mixer"
  - Though the cooperation and generous support of the Los Angeles Air Cargo Association you'll get a chance to meet some of the people behind the air cargo industry in Southern California.

The Three Major Parts of this Program

- (3) Tour of a 747 Freighter Aircraft and Pacific Air Cargo Operations and Warehouse
  - This is where it all comes together. At airports across the country, in the middle of the night, millions of pounds of cargo are loaded an unloaded in a very brief window of time.
  - This is a first hand look at just one night time cargo operation and all that goes into it.

Aviation is a very precise business

Aviation is a very precise business

Timing is very important

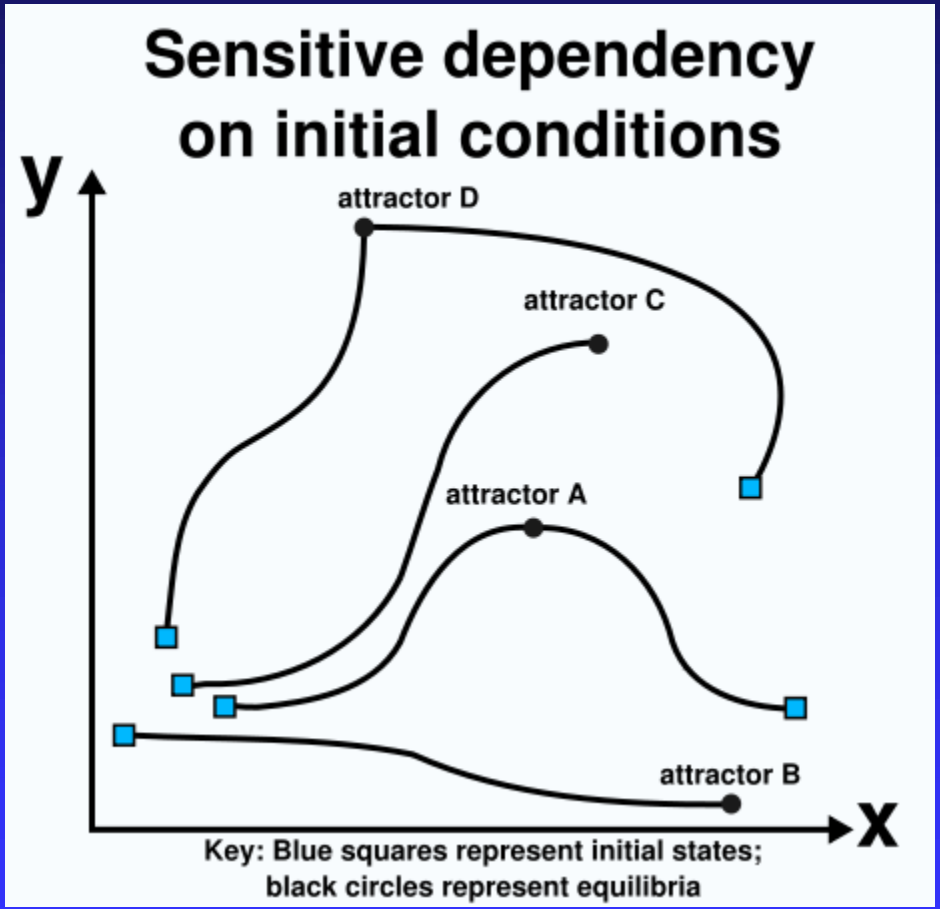
We need to be fast, but not cut corners…

The Air Cargo Butterfly Effect

- Huh?
  - Have you heard of the Butterfly Effect?
    - James Gleick wrote about it in his book “Chaos”

The Air Cargo Butterfly Effect

- We can explain it with this simple diagram.



Just a simple shipment…

- You're sitting on a runway in Pago Pago (trivia question – what country is that?) the Captain says "oops we've got a mechanical, we have to return to the gate…"
- You later find out that the aircraft cannot leave tonight, so everyone is deplaned awaiting the part.
- The airline maintenance dept does not have the part and so one is ordered from a supplier in Southern California.

Just a simple shipment…

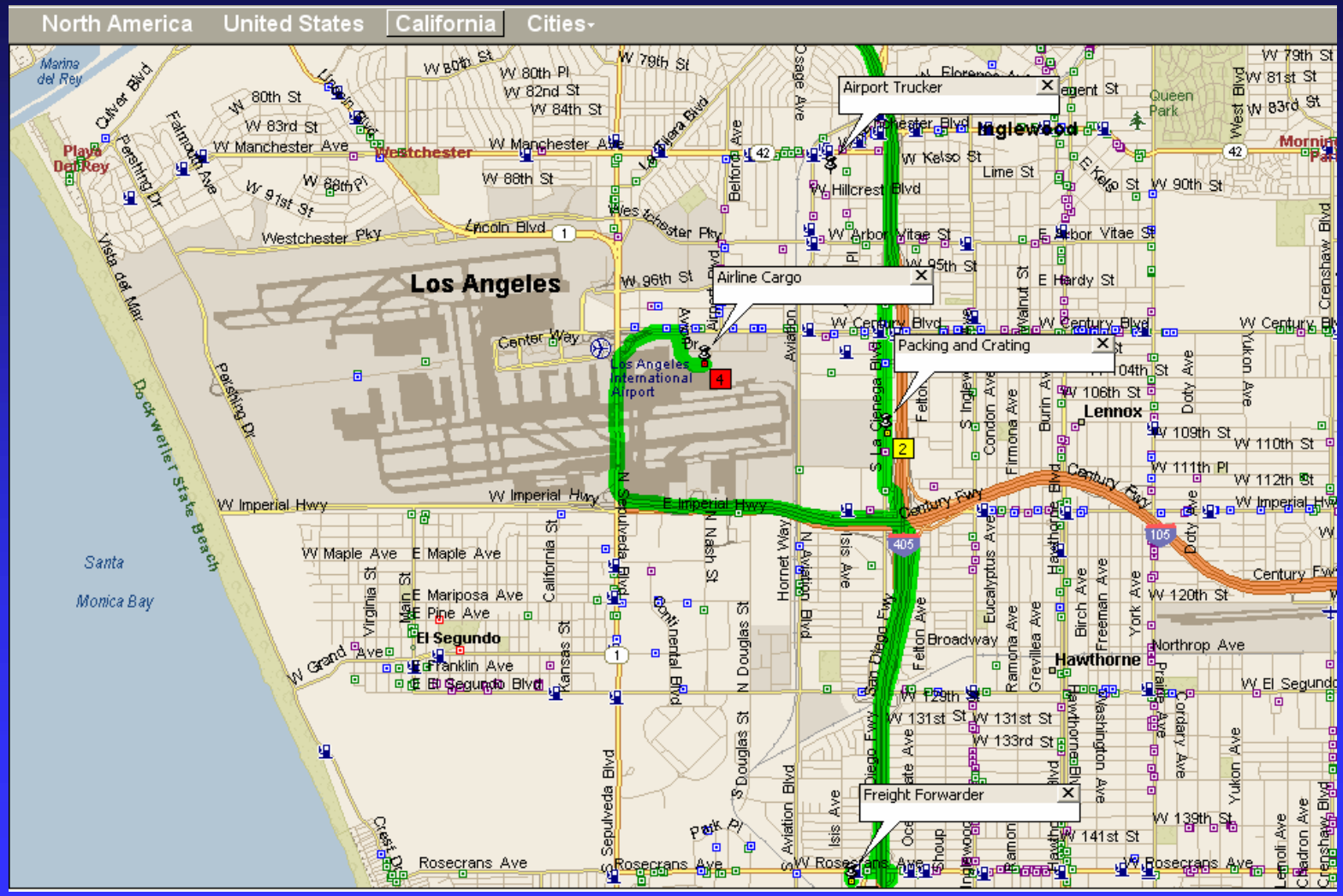
- A freight forwarder arranges the pickup from Sundstrand Aviation in Goleta, CA and dispatches a local trucker to get the part to a packing company in Inglewood.
- The packing company then uses a trucker to get the part to the forwarder.
- The forwarder uses another trucker to get the part to the airline.
- This part has now passed through 4 company's hands (pickup trucker, packing co, packing co. trucker, forwarder) before getting to the airline.

De Trucks… de Trucks…

Somewhere in the island…
they wait for the part…

During this class, we'll talk about all the parties involved in getting this part where it's going!

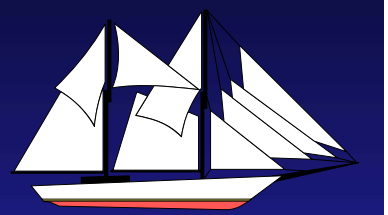
De Trucks… de Trucks…



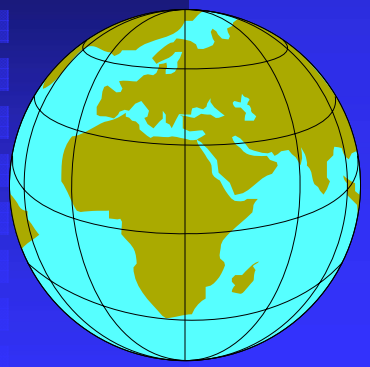
And now...

An Introduction to Air Freight

The history of the air freight industry

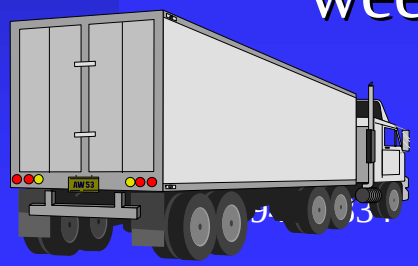


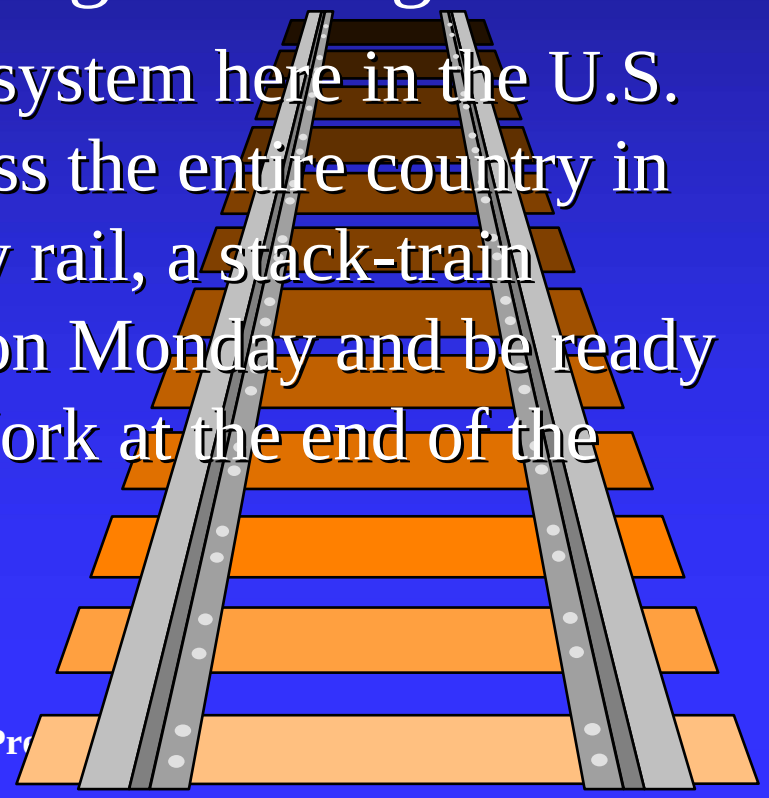
- **Global Transportation Before the 20th Century**
  - Before the 20th century, our world was a much larger place. A trip from New York to Sydney could take months. Today, this 10,000 mile journey is accomplished in less than a day.



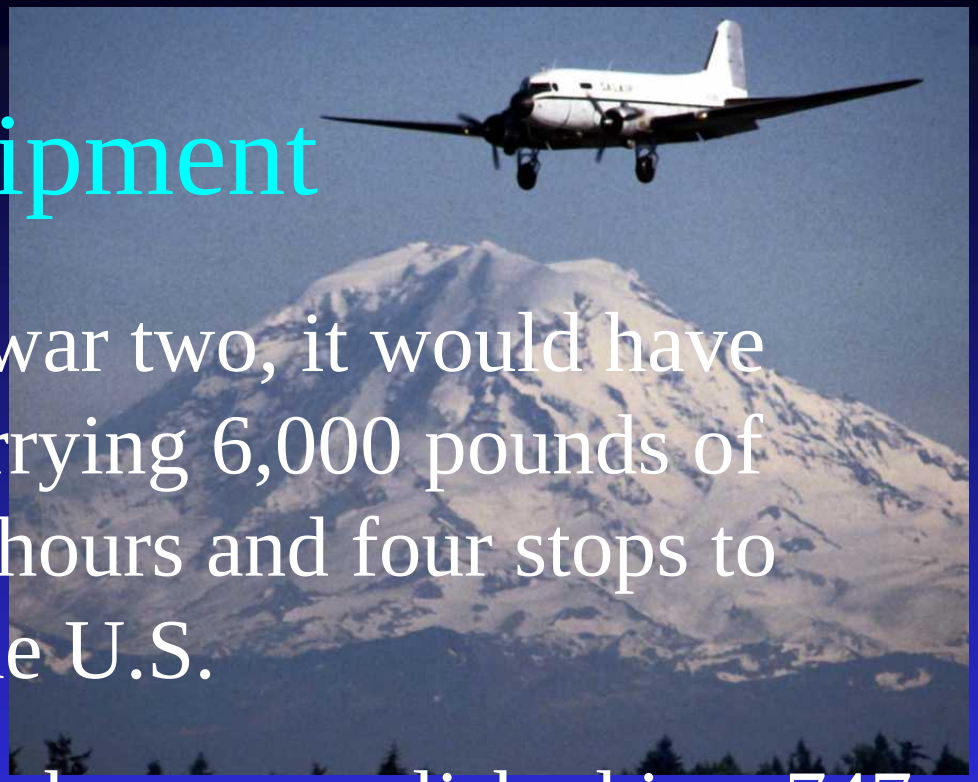
Modern Transportation (highway, rail, vessel, air)

- Today's modern transportation infrastructure circumnavigates the globe.
  - The interstate highway system here in the U.S. makes it possible to cross the entire country in less than three days. By rail, a stack-train loaded in Los Angeles on Monday and be ready for unloading in New York at the end of the week.





Primitive equipment



- Just after world war two, it would have taken a DC-3 carrying 6,000 pounds of cargo almost 24 hours and four stops to make it across the U.S.
- Now that trip can be accomplished in a 747 flying non-stop in about four hours and carrying over 225,000 pounds of cargo.

A look at the industry...

- Air freight once was a transportation mode reserved solely for emergencies.
- If an assembly line was about to shut down because of a missing part, then the cost of air freight was cheap compared to the cost of lost production.

The role of air freight, in perspective

- Accounts for a tiny amount of the tonnage compared to other modes
  - One or two giant container vessels would probably equal most of the available all-cargo lift in the entire world on any given day.

Fast Company Reports on Air Cargo…

www.fastcompany.com July, 2006

Over the past 30 years, [Dr. John] Kasarda [Professor at the University of North Carolina] will tell you, global GDP has risen 154%, and the value of world trade has grown 355%.

But the value of *air cargo* has climbed an astonishing 1,395%.

Fast Company Reports on Air Cargo…

www.fastcompany.com July, 2006

Today, 40% of the total economic value of all goods produced in the world, barely comprising 1% of the total weight, is shipped by air (and that goes for more than 50% of total U.S. exports, which are valued at $554 billion).

Fast Company Reports on Air Cargo…

www.fastcompany.com July, 2006

Raw materials and bulkier stuff still take the slow boats, but virtually everything we associate with our postindustrial, value-added economy--microelectronics, pharmaceuticals, medical devices, Louis Vuitton handbags, sushi-grade tuna--travels via jumbo jet.

We may think of the 1960s as the jet-set era, but the supremacy of (soft) airpower has only now begun to reshape our ideas about how cities should look, how they should function. "They're now effectively a part of global production systems," Kasarda says, "and without that connectivity, you're out of the game."

Top 20 US Trade Gateways by Value

- Here are some numbers that show where LAX fits in as far as "value" goes.
- Source:http://cati.csufresno.edu/cab/PDF/Mason_Role-of-Air-Cargo.pdf

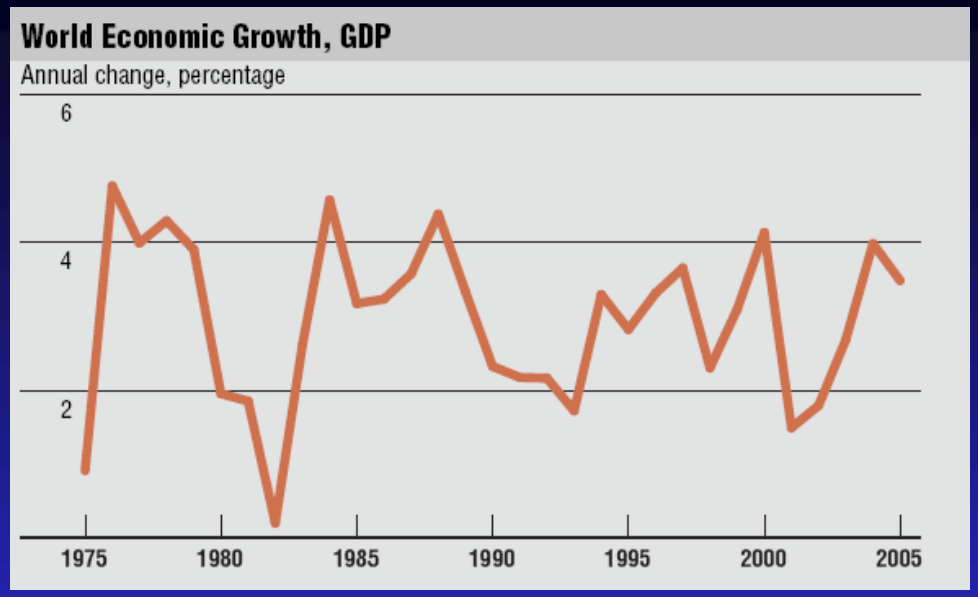
Top 20 U.S. Foreign Trade Freight Gateways by Value of Shipments: 2003[165]
(Billions of current dollars)

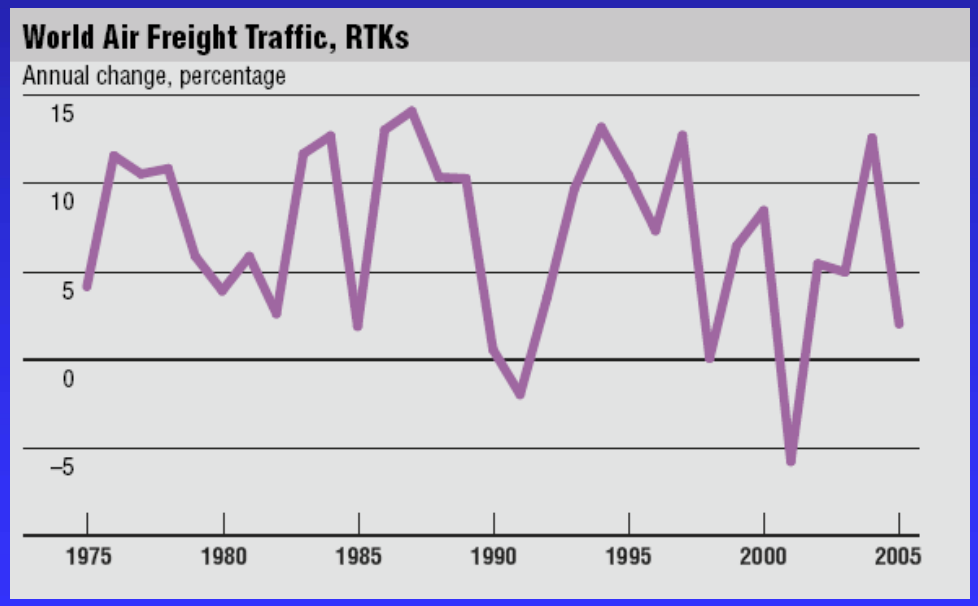
Rank	Gateway	Exports	Imports	Total
1	Los Angeles, CA (w)	16.9	105.2	122.1
2	JFK International, NY (a)	46.6	65.3	111.9
3	Detroit, MI (l)	54.5	47.3	101.9
4	New York, NY and NJ (w)	24.3	76.9	101.2
5	Long Beach, CA (w)	17.2	78.7	95.9
6	Laredo, TX (l)	32.4	46.4	78.8
7	Los Angeles Internatl. Airport, CA (a)	32.6	31.2	63.8
8	Port Huron, MI (l)	22.7	39.6	62.3
9	Buffalo-Niagara Falls, NY (l)	27.4	32.0	59.4
10	Chicago, IL (a)	20.6	33.7	54.3
11	Houston, TX (w)	21.4	28.5	49.9
12	San Francisco Internatl. Airport, CA (a)	20.6	26.1	46.6
13	Charleston, SC (w)	13.4	26.0	39.4
14	El Paso, TX (l)	16.7	22.5	39.2
15	Norfolk, VA (w)	11.0	18.5	29.5
16	New Orleans, LA (a)	13.7	13.7	27.4
17	Tacoma, WA (w)	5.2	21.1	26.3
18	Baltimore, MD (w)	5.7	20.3	26.0
19	Oakland, CA (w)	7.8	17.4	25.1
20	Dallas-Fort Worth, TX (a)	11.4	12.2	23.6

Key: a = air; l = land port/border crossing; w = water port.

World Economic Growth and Air Cargo

Source: Boeing 2006-2007 Report

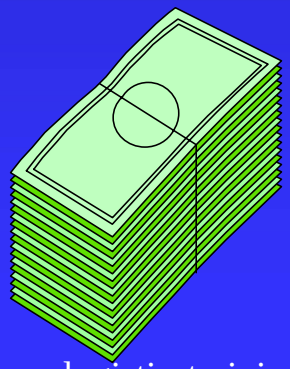




For a full copy of this report visit… http://www.tiaca.org/cm/G2/I351/

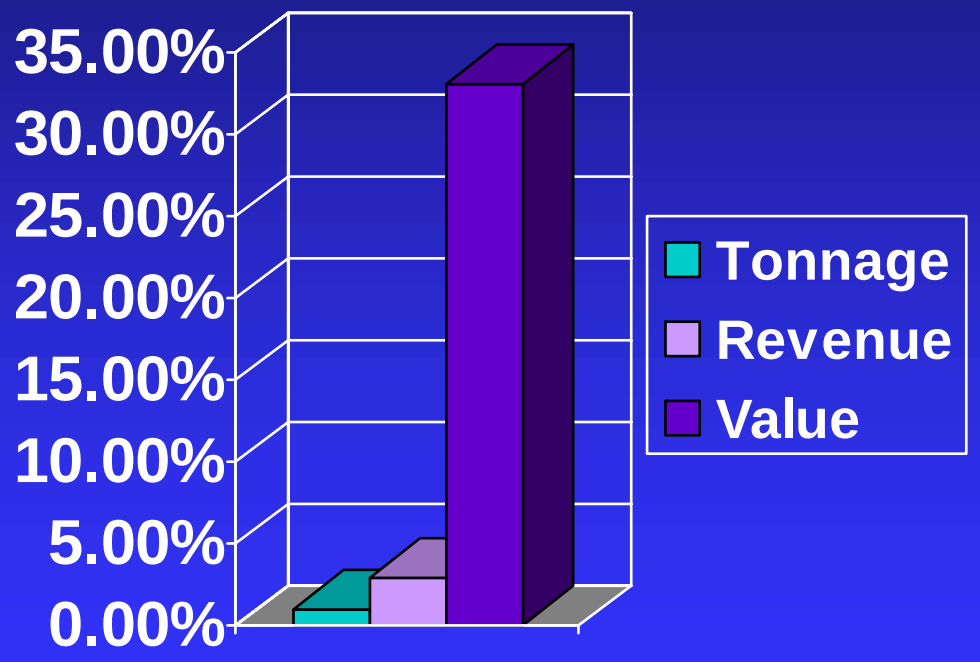
Air freight in perspective

- **Percentage of transportation dollars spent**
  - In terms of money spent on transportation, air freight does begin to register on the scale. If you add up all the money spent on air, rail, ocean and truck transportation, air weighs in at an unimpressive 3%.



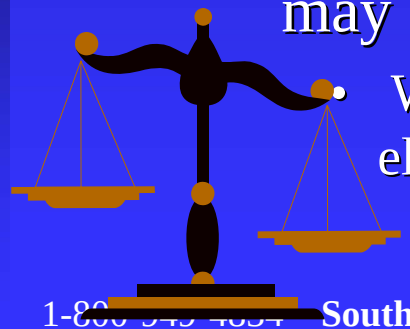
A look at the global air freight industry today

- The role air freight is playing
  - Market Share
  - (i.e. less than 1% of the tonnage but 33% of the value of all goods transported…)



Air freight in perspective

- **Percentage of total value of goods in transportation**
  - Now! Here's where air freight tips the scales.
  - If you add up the value of all the goods shipped by all the modes of transportation, air freight comprises over 30%.
    - When you consider that the single DC-8 freighter carrying high-tech computer chips and electronics, may be worth millions of dollars, it's easy to see.
      - When you look at it this way, the plane-load of electronics easily out-values the ship full of corn meal!



Types of products shipped by air

- High Value Products
  - Significant inventory carrying costs
    - Each day reduced in the "pipeline" means they can spend more on transportation.
    - High "value-density" is important
      - The higher the value per pound, the more likely it is for an expedited logistics program, as the cost of transportation is relatively lower in relation to the carrying costs
    - **Who are some of XYZ's big accounts that fall into this category?**

Types of products shipped by air

- Fast Selling "Hot" product
  - The hotter the product, the more important the velocity of the logistics pipeline becomes
    - It's no use having the best selling widget if you cannot get it to market.
  - **Can anyone thing of a really hot product these days where speed to market would be very important?**

iPhone

Types of products shipped by air

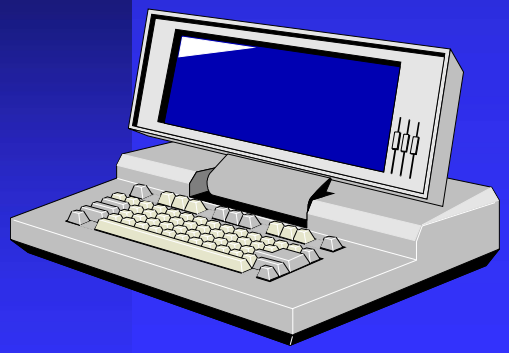
- Perishables
  - CoolChain Association (www.coolchain.org) estimates market at 13% of all air cargo! Growth at 10-15% annually.
- Cyclical sales cycle
- Examples of companies with big swings in their sales...
- Such as...
  - _____
    _____
    _____

Types of products shipped by air

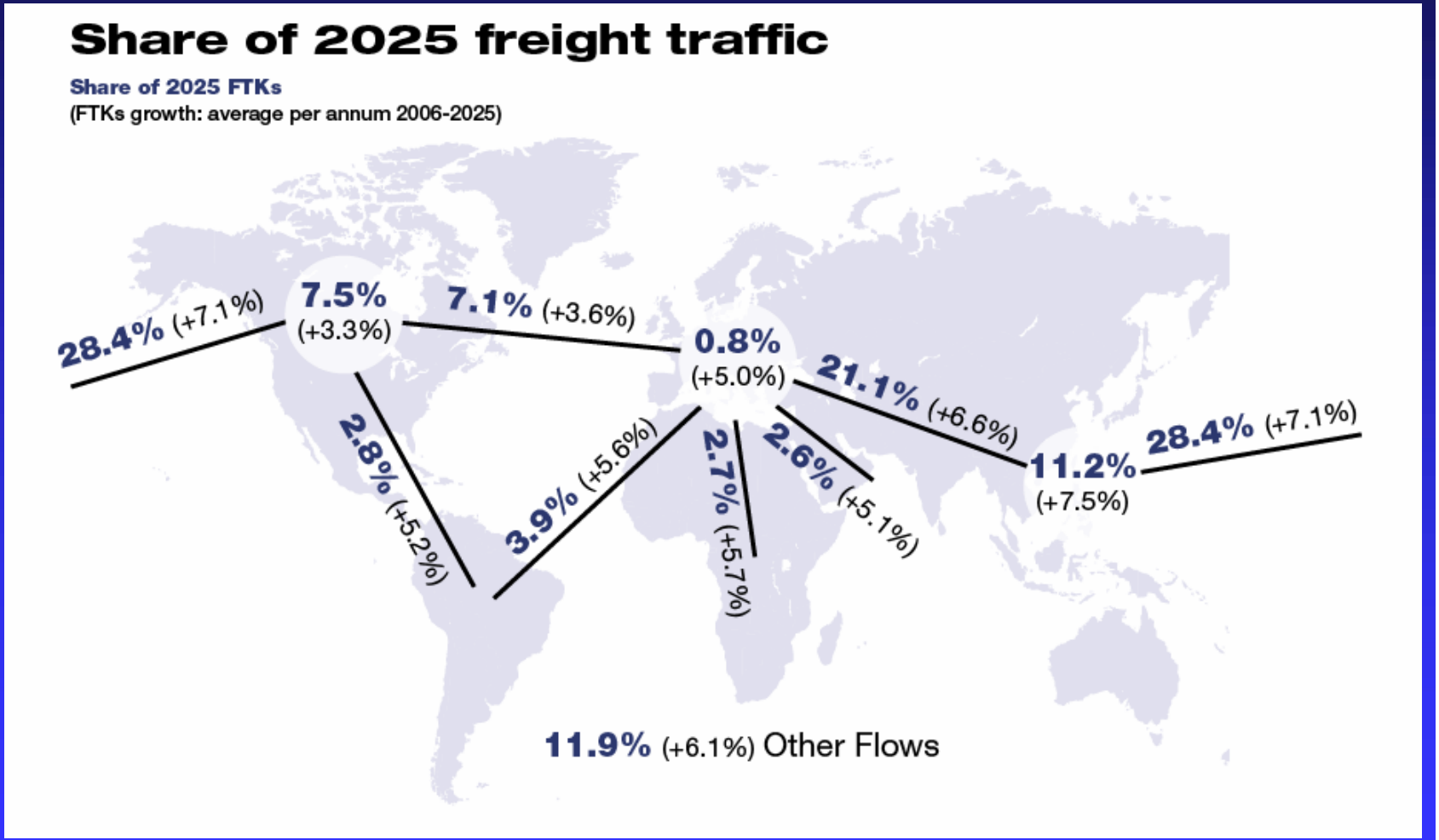
- Local Production, Global distribution
  - A company who seeks to compete globally with their product, but does not have the distribution resources needs expedited logistics programs

Types of products shipped by air

- High Product obsolescence
  - Any product that constantly looses value in the distribution channel is a good candidate. Laptops, cellular phones, software, all are good examples.



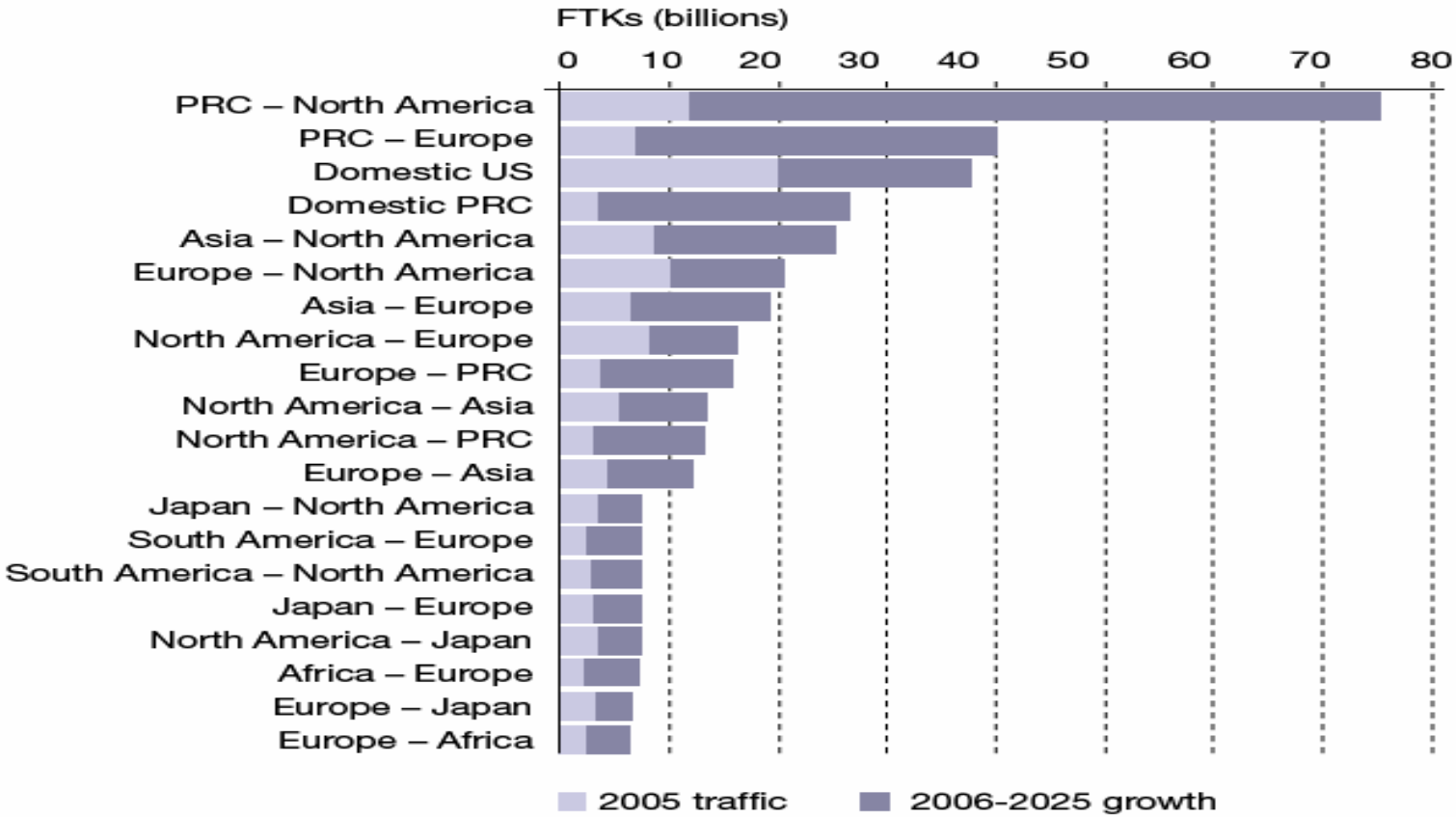
Air Cargo Biggest Lane Segments



Lane Segments

Source: Airbus Air Cargo Forecast

Top 5 Cargo markets 2005	Top 5 Cargo markets 2025
Domestic - US	PRC - North America
PRC - North America	PRC - Europe
Europe - North America	Domestic US
Asia - North America	Domestic PRC
North America - Europe	Asia - North America



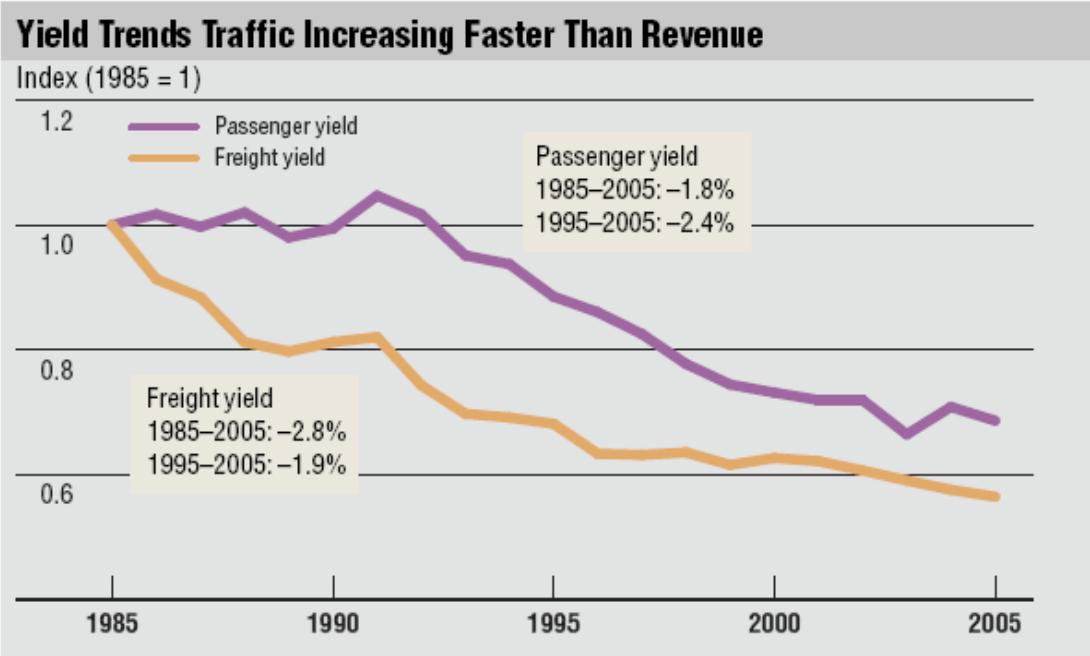
Boeing Forecast 2007

World air cargo traffic will expand at an average annual rate of 6.1% for the next two decades, tripling current traffic levels. Asia's air cargo markets will continue to lead the world air cargo industry in average annual growth rates, with domestic China and intra-Asia markets expanding 10.8% and 8.6% per year, respectively. As in the past, the more mature North America and Europe markets reflect slower and thus lower-than-average traffic growth rates, with the exception of those linked to Asia and Southwest Asia.

Executive Summary and Significant Industry Trends 1

Lots of Traffic… but lower Yields

Since 1985, the decline in scheduled freight yield has averaged 2.8% per year, after adjusting for inflation. Scheduled freight yield increased from 1989 through 1991 but then resumed its decline through 2005, with a noted exception in 2000. The increase in freight yield in 2000 of approximately 1.8% can be attributed to increased technology goods shipments during the Y2K scare and overall strong traffic growth throughout much of that year.



For a full copy of this report visit… www.tinyurl.com/12345

Comments? Questions?

- In the next section we'll take a look at inventory costs and product obsolescence – key drivers in the growth of air cargo.

Technology and Logistics

- Moores' Law
  - In General Terms
    - The rate of change is staggering, products are conceived, born, mature, age, and die within a fraction of the time they did just 20 years ago.
    - Logistics is a key element of the whole process from a products' creation to it's death (and disposal!)

The Impact of Rapid Change

- "Let's say you're going to a party, so you pull out some pocket change and buy a little **greeting card** that plays "Happy Birthday" when it's opened.

- After the party someone tosses the card into the trash, throwing away more computer power than what existed in the entire world before 1950."
  - John Huey, Fortune Magazine

Logistic costs are a big deal!

Logistics costs as a percentage of GDP (Source CASS)	
1980	16.1
1985	12.4
1990	11.4
1995	10.4
1996	10.3
1997	10.2
1998	10.1
1999	10.0
2000	10.1
2001	9.5

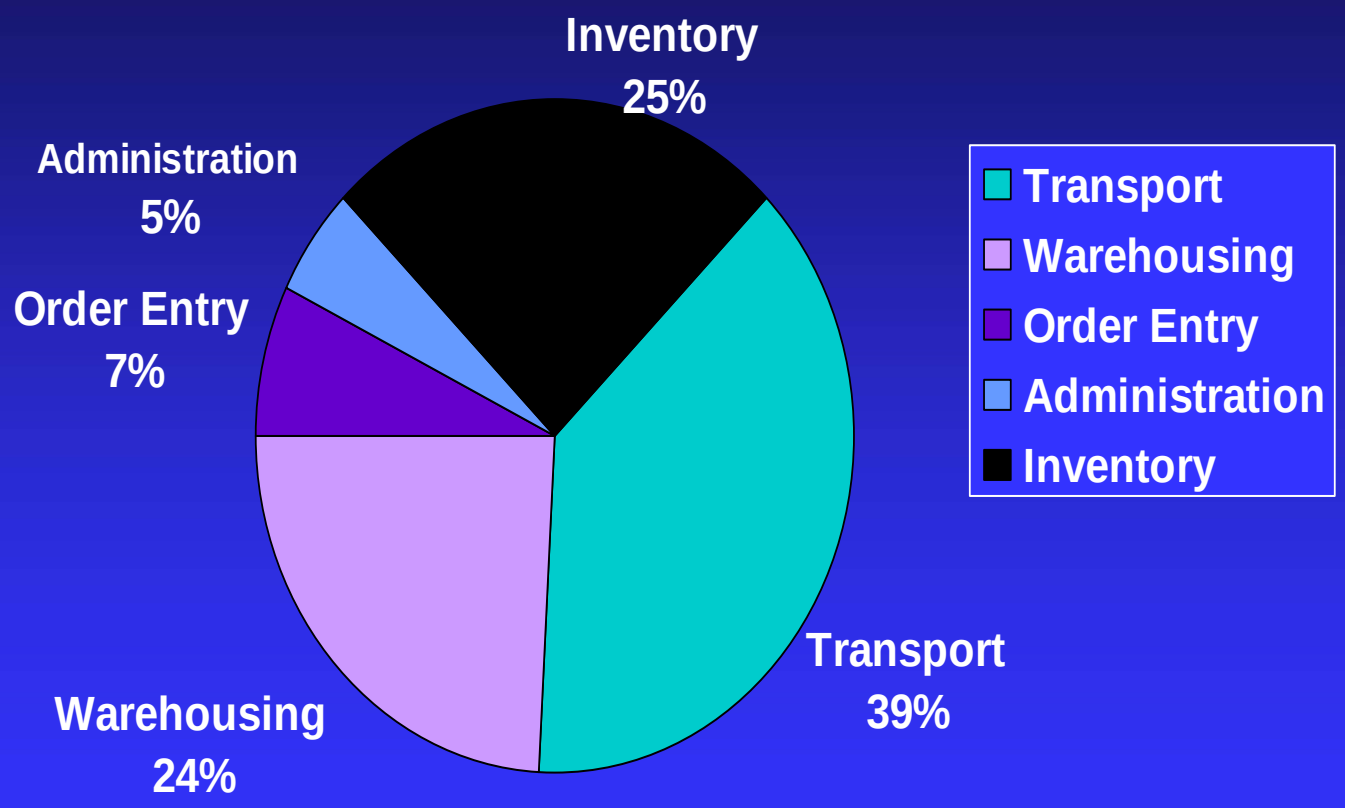
- Logistics Costs make up about 10% of GDP
- Logistics Costs have been declining steadily
- This went as low as 8.5% in 2003 but has gone back up to around 10% in 2005.
- Why? We'll see in a minute.

A Logistics Overview

Inventory Carrying Costs and Air Cargo

Why <u>More is Less</u> (you can spend more money on air cargo but less on inventory).

Breakdown of Logistics costs

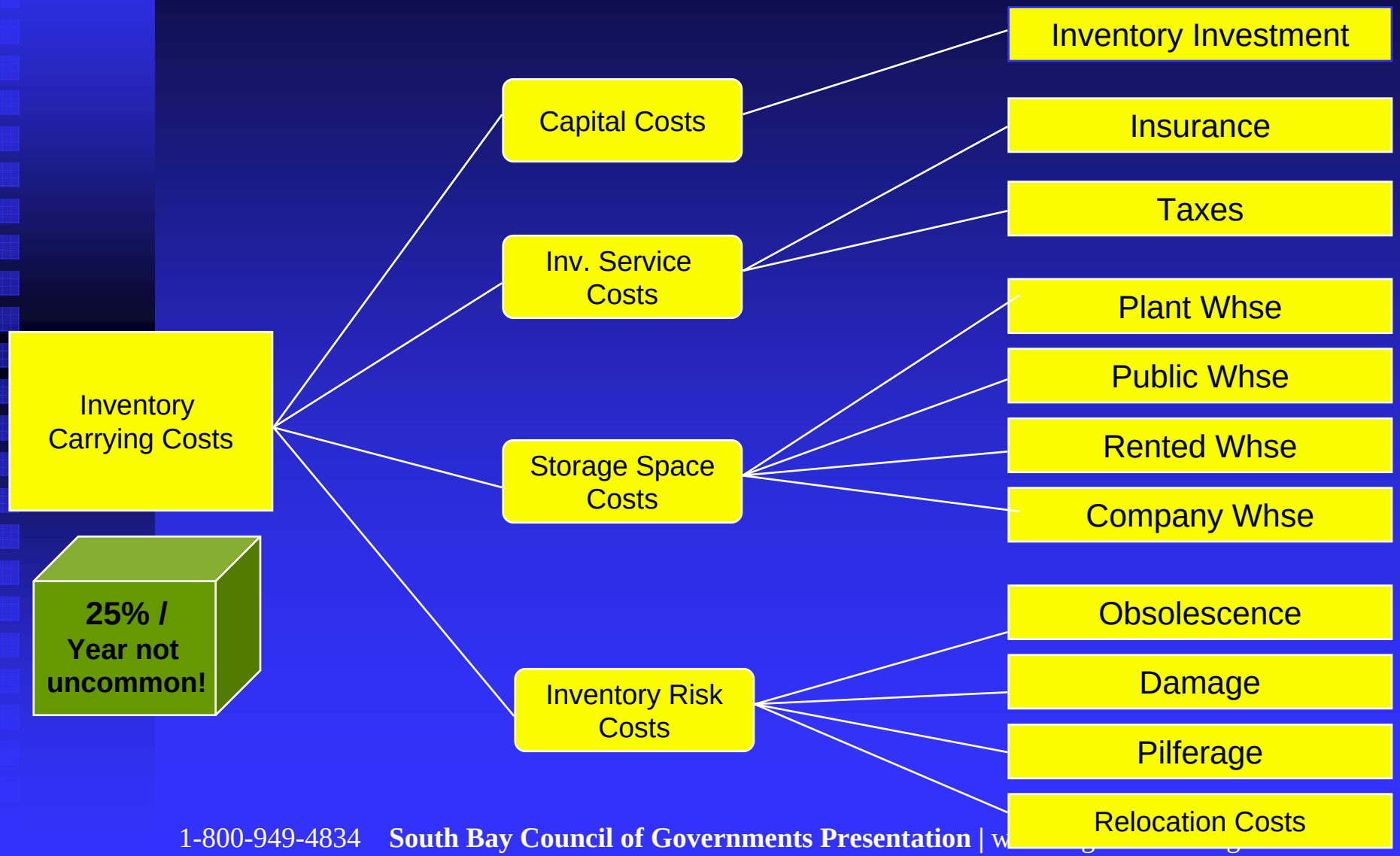


Source: P-E Intl, Egham, Surrey, U.K.

Inventory Cost is a major factor...

- This is one of the biggest shifts a transportation salesperson has to make in selling logistics to their clients
  - There is a cost to owning the inventory. We tend to think in terms of things that are paid for, yet there are ongoing costs...

Inventory Carrying Costs



25% / Year not uncommon!

Inventory Cost

- Inventory carrying costs at 22% (of inventory value) total inventory valued at 1.76 Trillion
- Inventory costs are about 1/3 of all logistics costs
- Trucking now represents over half of all logistics costs and almost 80% of total transport costs
- Air Cargo and Domestic Surface and Air Forwarding account for between 5 and 8% of total transport costs.
- $12.455 trillion nominal GDP (Source Worldbank)
- Logistics Costs are about 10% for 2005. This is a significant increase over 2003 when is

US Logistics Costs 2005			
Carrying Costs			
Interest	$	58	
Taxes, Obsolescense, Depreciation			
Insurance	$	245	
Warehousing	$	90	
Total Carrying Costs	$	393	
Transportation Costs			
Motor Carriers			
Intercity Trucks	$	394	
Local Trucking	$	189	
Total Trucking	**$**	**583**	78%
Other Carriers			
Railroads	**$**	**48**	
Water - International	$	29	
Water - Domestic	$	5	
Total Water	**$**	**34**	
Oil Pipelines	**$**	**9**	
Air			
International Air	$	15	
Domestic Air	$	25	
Total Air	**$**	**40**	5%
Forwarders	**$**	**22**	3%
Shipper Related Costs	**$**	**8**	
Total Transportation Costs	**$**	**744**	100%
Logistics Administration	$	46	
Total Logistics Costs	**$**	**1,183**	

Inventory Costs

Value of Inventory over a given fiscal year		$	250,000,000
Carrying Costs			30%
Carrying Costs per day		$	205,479.45
	Transit Time (Days)		
Transit Time - Ocean (Days)	14	$	2,876,712.33
Transit Time - Air Consolidation	4	$	821,917.81
Inventory Cost Savings (Air vs Ocean)		**$**	**2,054,794.52**

Two million dollars in savings will buy a lot of air freight!

Massive Change in Business Models

- Old production model
  - Mass Production
  - Long Runs
  - Production Planning
  - Safety stock
  - Vertical integration
- Evolving Model
  - Mass Customization
  - Units of one
  - Demand Management
  - JIT
  - Outsource everything

Let's talk about how these factors impact air cargo.

It’s about speed and efficiency

- Old business model
  - Sales focus
  - Mass Marketing
  - Highly Generic product
  - Product life cycles
  - Put your competitors products out of business
  - Very inexpensive distribution methods
- Evolving Model
  - Marketing focus
  - Individual marketing
  - Customized products
  - Rapid obsolescence
  - Put your own products out of business
  - Whatever it takes...

Mass Customization - Examples

- Can anyone think of some mass production type items that are actually customized for individuals?
  - Perhaps ones that are not on the list in the following pages?

Lands End (www.landsend.com)

Lands End (www.landsend.com)

Ordered this item before? Reorder Here

MEN'S CUSTOM JEANS

FABRIC & FEATURES | FIT | FINISH

step 1

Choose Fabric & Features

To get started, select your fabric, pick out your color preference and choose the styling features you want for your custom garment.

• How Custom Works

All Custom Jeans include: Brass zipper fly; brass rivets; tied-in front pocket; black and indigo colors have gold top stitching, other colors have dyed-to-match stitching.
Please note: The Sandblast colors will show fading on the thighs and seat.

Choose a fabric

Click color swatch for a larger view.

Men's Custom Denim Jeans $70.00
Our classic jeans. 14 oz. cotton denim, woven from stronger, ringspun yarns that hold darker colors longer.

Choose a color

Click color swatch for a larger view.

Antique Indigo | Black | Indigo | Light Antique Indigo

Rinsed Dark | Sandblast Indigo | Sandblast Light | Sandblast Antique

Landsend.com print

Here's how it works:

You complete a brief online profile by answering a few simple fit questions (don't worry, you won't need to take any complicated measurements). Please read the measuring instructions section, as this will help you answer the size questions more accurately.

While some questions may seem a little peculiar ("Why are they asking my shoe size?"), these questions help us make some inferences about your general body type.

Using the information you give us - along with a database containing millions of detailed sets of body measurements - we calculate all the little measurements along the way.

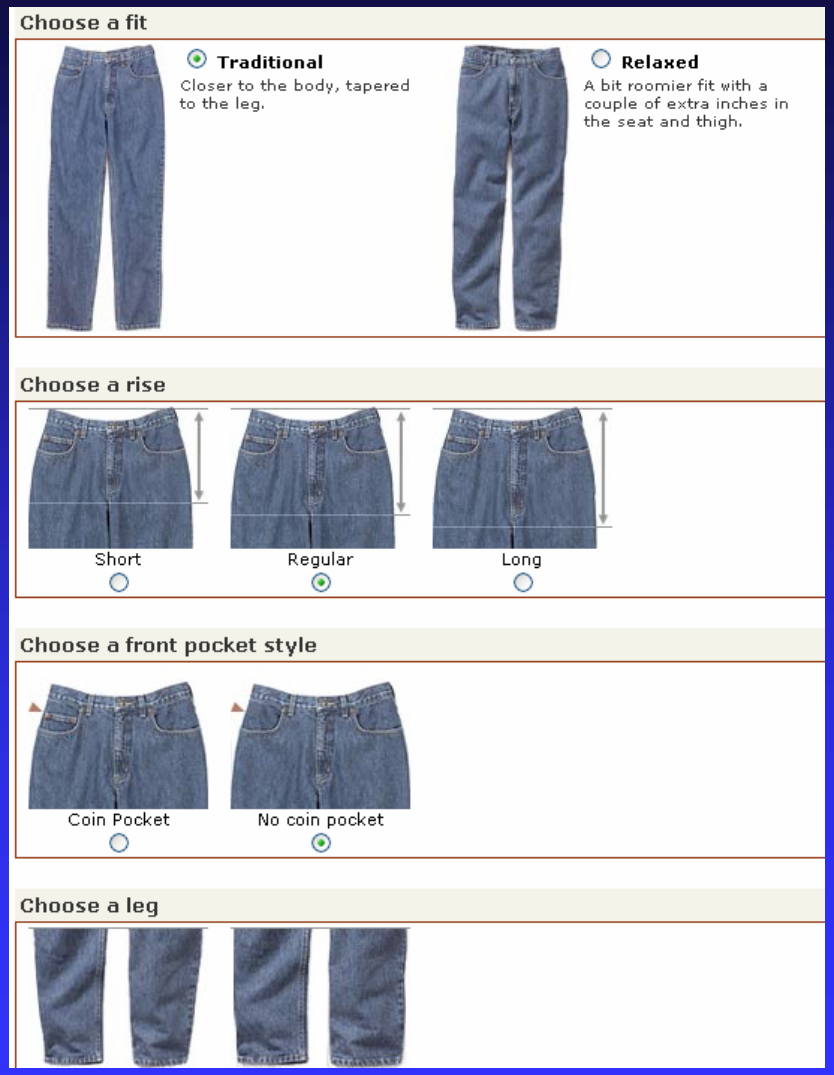
The result is a mathematical model of your body.

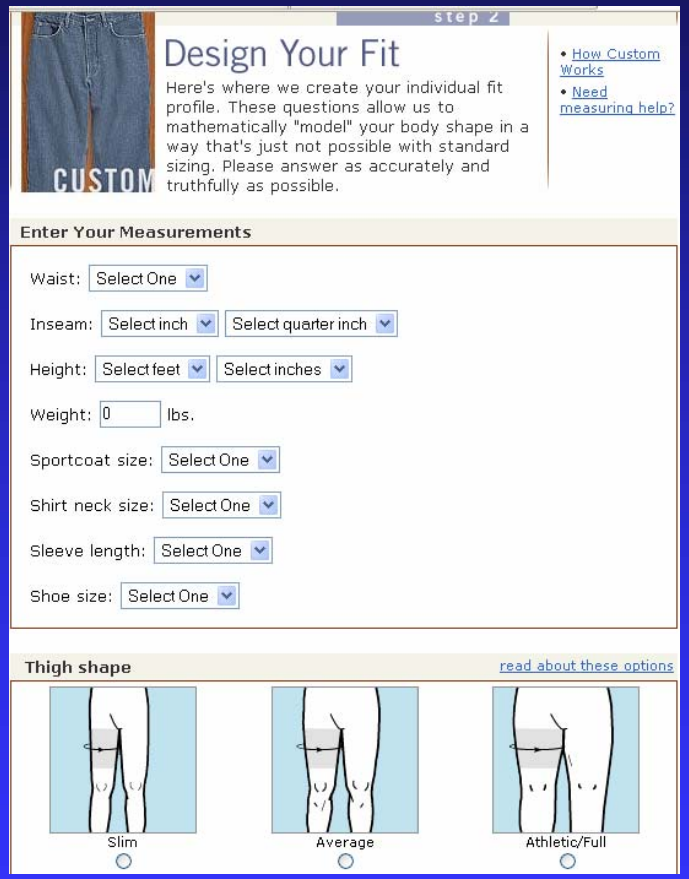
Your LANDS' END CUSTOM garment is then individually cut-and-sewn to a pattern based on your unique fit profile.

If the fit isn't "just so" the first time around, you can nip and tuck your profile accordingly and re-order a new item. We save all your information, so you can fill your order with just a few keystrokes. And, if your Lands' End Custom garment is anything less than perfect, you may exchange it, or return it and we'll reimburse you for the purchase price. Lands' End Custom is Guaranteed. Period®.

If you have any questions about the Lands' End Custom program, please call us anytime at 1-800-288-9091.

Lands End (www.landsend.com)





Lands End (www.landsend.com)

- This is but one example of a commodity where the value of air cargo greatly outweighs the cost.

Questions? Comments?

- Next we'll talk about the Metropolis that is the airport and the surrounding areas.
- What kind of businesses make up the "ecosystem" around the airport
  - And for me, in this case, "eco" is short for "economy".

And now...

The Aerotropolis

Where this all comes together…

An Interesting Term..

- I first heard this term Dr. O'Brien from Cal State Long Beach.
  - Ultimately I think it's a term that Dr. John Kasarda coined..
- When you think about it, it makes a lot of sense.
- Like a City, or Metropolis, there are many different components, all inter-related and dependant on one another.

Who is part of this "whole"

- Besides the logistics providers we will talk about, the city, state and federal government are all part of the picture.
- While the airports reside on land that may be city or state controlled, many aspects of the airport are under federal jurisdiction or at least oversight.
- And in some cases, the facility is not (for some purposes) considered to be part of the United States.
  - For tariff purposes – we'll talk about Free Trade Zones later.

The role of transportation providers

- The Airports
- Airlines (both Passenger and All Cargo)
- Forwarders/Consolidators
- Couriers
- Integrated Carriers / Express Operators
- Custom's Brokers
- Bonded Warehouses / CFS / Free Trade Zones
- Wholesalers/Co-loaders
- Truckers & Cartage Agents

The Airports

- Without whom none of this would be possible…
  - Okay, you need airplanes too..
- As we'll see, a huge amount of the worlds "lift" capacity is on passenger carrying aircraft.
  - One study pegged the number at over 50 percent of cargo moved in the bellies of passenger planes.
    - (http://cati.csufresno.edu/cab/PDF/Mason_Role-of-Air-Cargo.pdf)
  - Unlike passengers who by round trip tickets, cargo is a one-way commodity.
  - Many lane segments cannot justify regularly scheduled all-cargo service because of this.

The Airports

- There are a very few “all cargo airports” around the US, but they (generally) are based on the activity of the “integrators” -- carriers like FedEx, DHL and UPS.
- Cargo has to go where the flights are. It’s as simple as that.
- When you look at some of the trade statistics, it’s easy to see that most of this traffic is not flying into outlying cargo airports.

The Airports Top Cargo Airports

- Some of the numbers are skewed because of the Integrators (MEM, SDF, CVG, IND, ONT, TOL, possibly EWR)

North America's top 30 cargo airports in 2003. *(in tonnes)*

World Rank	Airport	Traffic	% change
1	Memphis (MEM)	3,390,515	0.0
4	Anchorage (ANC)	2,097,488	2.7
6	Los Angeles (LAX)	1 806,164	2.7
8	Miami (MIA)	1,637,278	0.8
9	New York (JFK)	1,633,026	2.9
11	Louisville (SDF)	1,617,907	6.2
12	Chicago O'Hare (ORD)	1,604,755	23.7
20	Indianapolis (IND)	890,615	2.8
21	Newark (EWR)	868,164	1.0
22	Atlanta (ATL)	797,419	8.6
25	Dallas/Ft. Worth (DFW)	667,527	–0.3
28	Oakland (OAK)	619,802	–4.7
31	San Francisco (SFO)	573,448	–3.8
34	Ontario, Calif. (ONT)	529,184	6.6
35	Philadelphia (PHL)	524,771	–3.0
37	Honolulu (HNL)	416,363	–0.4
39	Cincinnati (CVG)	393,468	11.4
40	Houston (IAH)	384,487	16.6
43	Boston (BOS)	363,082	–6.4
45	Seattle/Tacoma (SEA)	353,410	–5.7
50	Dayton (DAY)	327,362	–16.1
51	Denver (DEN)	325,218	–2.4
53	Minneapolis/St. Paul (MSP)	317,226	–0.9
56	Phoenix (PHX)	308,144	–3.6
59	Washington Dulles (IAD)	285,271	–12.2
60	Toledo (TOL)	281,063	–4.0
69	Portland (PDX)	238,632	–2.9
72	Baltimore/Washington (BWI)	233,373	–6.5
75	Detroit (DTW)	220,236	–4.8
76	Salt Lake City (SLC)	216,871	0.3

Source: Airports Council International

Top Cargo Airports

Top 25 Airports by Landed Weight of All-Cargo Operations[1]

Airport	2004 Rank	Landed weight (thousands of short tons) 2000	2001	2002	2003	2004
Anchorage, AK (Ted Stevens Anchorage International)[2]	1	8,084	7,777	8,994	9,007	9,844
Memphis, TN (Memphis International)	2	6,318	6,865	8,826	8,760	8,885
Louisville, KY (Louisville International-Standiford Field)	3	3,987	4,026	4,202	4,172	4,388
Miami, FL (Miami International)	4	2,929	3,055	3,174	3,239	3,423
Los Angeles, CA (Los Angeles International)	5	2,892	2,929	3,038	3,120	3,062
New York, NY (John F. Kennedy International)	6	2,793	2,543	2,912	2,937	2,898
Chicago, IL (O'Hare International)	7	2,062	2,012	2,217	2,351	2,359
Indianapolis, IN (Indianapolis International)	8	2,884	3,154	2,338	2,277	2,314
Newark, NJ (Newark Liberty International)	9	1,961	1,795	1,758	1,835	1,765
Oakland, CA (Metropolitan Oakland International)	10	1,811	1,639	1,746	1,695	1,703
Fort Worth, TX (Dallas/Fort Worth International)	11	1,691	1,546	1,481	1,481	1,431
Philadelphia, PA (Philadelphia International)	12	1,454	1,452	1,466	1,365	1,371
Ontario, CA (Ontario International)	13	1,220	1,291	1,444	1,338	1,326
Atlanta, GA (William B. Hartsfield International)	14	1,090	1,043	1,166	1,194	1,162
Covington/Cincinnati, OH (Cincinnati/Northern Kentucky International)	15	912	980	1,043	1,098	1,141
Honolulu, HI (Honolulu International)	16	692	789	970	1,017	970
Phoenix, AZ (Sky Harbor International)	17	920	838	867	779	801
Dayton, OH (James M. Cox Dayton International)	18	2,233	1,444	897	784	787
Denver, CO (Denver International)	19	900	803	783	747	763
San Francisco, CA (San Francisco International)	20	1,267	1,012	1,035	1,200	740
Portland, OR (Portland International)	21	882	807	816	749	718
Houston, TX (George Bush Intercontinental)	22	480	463	482	666	697
Minneapolis, MN (Minneapolis-St Paul International/Wold Chamberlain)	23	622	586	621	687	678
Rockford, IL (Greater Rockford)	24	654	681	630	625	677
Salt Lake City, UT (Salt Lake City International)	25	751	606	583	599	621
Top 25 airports[3]		**52,381**	**50,701**	**53,942**	**53,947**	**54,526**
United States, all airports[4]		**74,743**	**71,441**	**73,433**	**73,072**	**74,297**
Top 25 as % of U.S. total		**70.1%**	**71.0%**	**73.5%**	**73.8%**	**73.4%**

[1]All-Cargo operations are operations dedicated to the exclusive transportation of cargo. This does not include aircraft carrying passengers that may also be carrying cargo. Aircraft landed weight is the certificated maximum gross landed weight of the aircraft as specified by the aircraft manufacturers.
[2]Anchorage includes a large proportion of all-cargo operations in-transit.
[3]Represents top 25 airports in the reference year not necessarily the airports shown here.
[4]Limited to airports with an aggregate landed weight in excess of 100 million pounds (50,000 short tons) annually.
Note: 1 short ton = 2,000 pounds.

LAX Profile

LOS ANGELES INTERNATIONAL AIRPORT (LAX)
Los Angeles (Los Angeles County)
Identifier: LAX.
www.lawa.org/lax
Air Service:
Total Carriers: 106,
All-Cargo: 34
Cargo Space:
Total Ramp/Tarmac Surface for Cargo Handling: 170 acres.
Warehouse Space: 2.1 million s.f.
Occupied: 99 percent
FTZ: No
Special Services/Facilities: Handling for large animals,equine; refrigeration for cut flowers, perishable food, frozen goods; bonded and secure storage.
Customs: Yes
USDA Inspector: Yes

Note the distance to rail terminal and ocean port.

Traffic:
Total '02 Tonnage: 1,806,164 m.t. +2.7 percent.
Total '02 Aircraft Movements: 622,378, -3.6 percent.
Distance to Connecting Transport (miles):
Rail Terminal: 17,
Ocean Port: 20,
Interstate Hwy: less than 1,
Truck Terminal: 3-5

Air Mail and Freight at LAX

Source www.lawa.org/lax/cargo.cfm

Year	Air Mail Tons	Air Freight Tons	Total Air Cargo
1992	162,840	1,202,317	1,365,157
1993	173,827	1,288,503	1,462,330
1994	186,878	1,516,567	1,703,445
1995	193,747	1,567,248	1,760,995
1996	194,091	1,696,663	1,895,754
1997	212,410	1,852,487	2,064,897
1998	264,473	1,787,400	2,051,873
1999	253,708	1,912,147	2,165,855
2000	246,536	2,002,614	2,249,152
2001	178,072	1,778,267	1,956,340
2002	92,422	1,869,932	1,962,354
2003	97,193	1,924,883	2,022,076
2004	92,353	2,109,895	2,202,248
2005	88,731	2,048,817	2,137,188

LAX Compared to other LAWA Airports

Note: A majority of cargo traffic at ONT is Integrators

Los Angeles Area Air Cargo Flows, 2003

	Air Cargo (tons)		
Airport	**Inbound**	**Outbound**	**Total**
Los Angeles International (LAX)	899,658	734,625	1,634,282
Ontario International (ONT)	240,881	254,298	495,179
Burbank (BUR)	15,037	22,542	37,580
Long Beach (LGB)	23,431	29,145	52,576
John Wayne/ Santa Ana (SNA)	1,954	12,380	14,334
Total	1,180,961	1,052,990	2,233,951

Source: Bureau of Transportation Statistics, Air Carrier Statistics T-100 database.

Flow of goods in and out of Los Angeles by Mode

Commodity Flows Into and Out of the Los Angeles Region, 2003

Mode	Tonnage	Percent
Trucking	378,995,000	64%
Railroad	82,013,000	14%
Marine Vessel	124,791,000	21%
Aircraft	2,234,000	0.4%
Total	588,033,000	100%

Source: FHWA Freight Analysis Framework (trucking and rail); Bureau of Transportation Statistics, Air Carrier Statistics T-100 database (air); U.S. Army Corps of Engineers, *Waterborne Commerce of the United States* database (marine).

Rankings

Top 20 U.S. Foreign Trade Freight Gateways by Value of Shipments: 2003[165]
(Billions of current dollars)

Rank	Gateway	Exports	Imports	Total
1	Los Angeles, CA (w)	16.9	105.2	122.1
2	JFK International, NY (a)	46.6	65.3	111.9
3	Detroit, MI (l)	54.5	47.3	101.9
4	New York, NY and NJ (w)	24.3	76.9	101.2
5	Long Beach, CA (w)	17.2	78.7	95.9
6	Laredo, TX (l)	32.4	46.4	78.8
7	Los Angeles Internatl. Airport, CA (a)	32.6	31.2	63.8
8	Port Huron, MI (l)	22.7	39.6	62.3
9	Buffalo-Niagara Falls, NY (l)	27.4	32.0	59.4
10	Chicago, IL (a)	20.6	33.7	54.3
11	Houston, TX (w)	21.4	28.5	49.9
12	San Francisco Internatl. Airport, CA (a)	20.6	26.1	46.6
13	Charleston, SC (w)	13.4	26.0	39.4
14	El Paso, TX (l)	16.7	22.5	39.2
15	Norfolk, VA (w)	11.0	18.5	29.5
16	New Orleans, LA (a)	13.7	13.7	27.4
17	Tacoma, WA (w)	5.2	21.1	26.3
18	Baltimore, MD (w)	5.7	20.3	26.0
19	Oakland, CA (w)	7.8	17.4	25.1
20	Dallas-Fort Worth, TX (a)	11.4	12.2	23.6

Key: a = air; l = land port/border crossing; w = water port.

California Statistics

California Merchandise Exports by Mode of Transportation

1997-2004

(In Millions of Dollars)

	Total Exports	By Air	%	By Sea	%	By Land	%
1997	$99,161	$61,266	61.8%	$17,899	18.1%	$19,996	20.2%
1998	$95,768	$57,533	60.1%	$16,032	16.7%	$22,203	23.2%
1999	$97,920	$61,522	62.8%	$14,217	14.5%	$22,181	22.7%
2000	$119,640	$77,859	65.1%	$16,810	14.1%	$24,971	20.9%
2001	$106,777	$64,879	60.8%	$19,350	18.1%	$22,548	21.1%
2002	$92,214	$52,726	57.2%	$17,234	18.7%	$22,254	24.1%
2003	$93,955	$50,375	53.6%	$19,878	21.1%	$23,742	25.3%
2004	$109,968	$60,171	54.7%	$21,319	19.4%	$28,477	25.9%

Source: WISER

LAX Statistics

LAX
TOP TEN CARRIERS
January 2002 Through December 2002

Air Freight (tons)	Measurement	% of Market
1 Federal Express	410,631	21.85%
2 United Airlines	118,714	6.32%
3 Korean Air	107,149	5.70%
4 American Airlines	79,342	4.22%
5 Delta Air Lines	65,285	3.47%
6 Singapore Airlines	63,338	3.37%
7 Northwest Airlines	59,620	3.17%
8 Eva Airways Corporation	58,431	3.11%
9 China Airlines	54,847	2.92%
10 Gemini Air Cargo	46,876	2.49%
Subtotal	**1,064,234**	**56.64%**
All Other	814,670	43.36%
TOTAL	**1,878,904**	**100.00%**

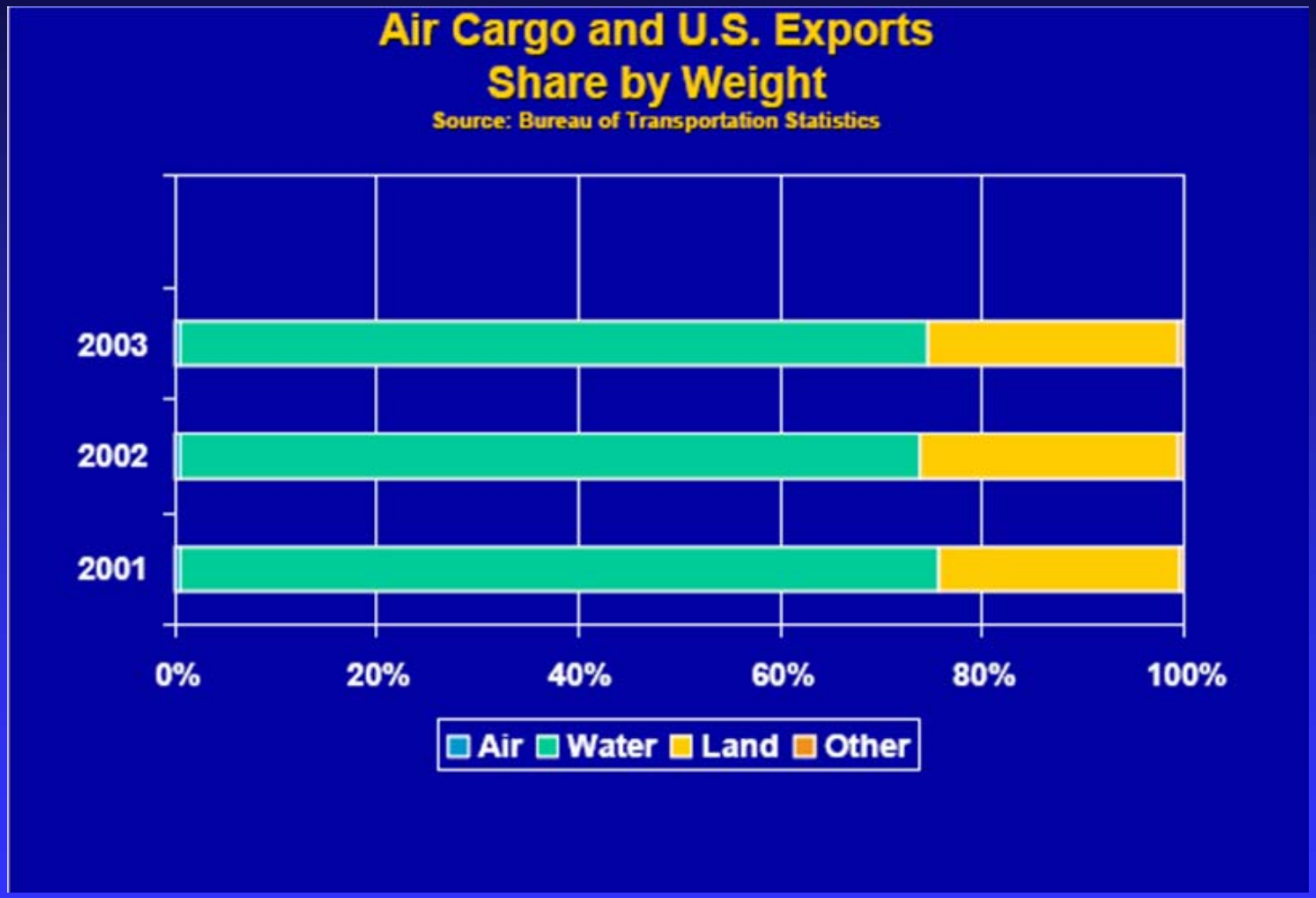
Modal Statistics 5/100ths of a percent of tonnage

SHIPMENTS BY MODE AND WEIGHT: 2002 AND 2035 (MILLIONS OF METRIC TONNES)

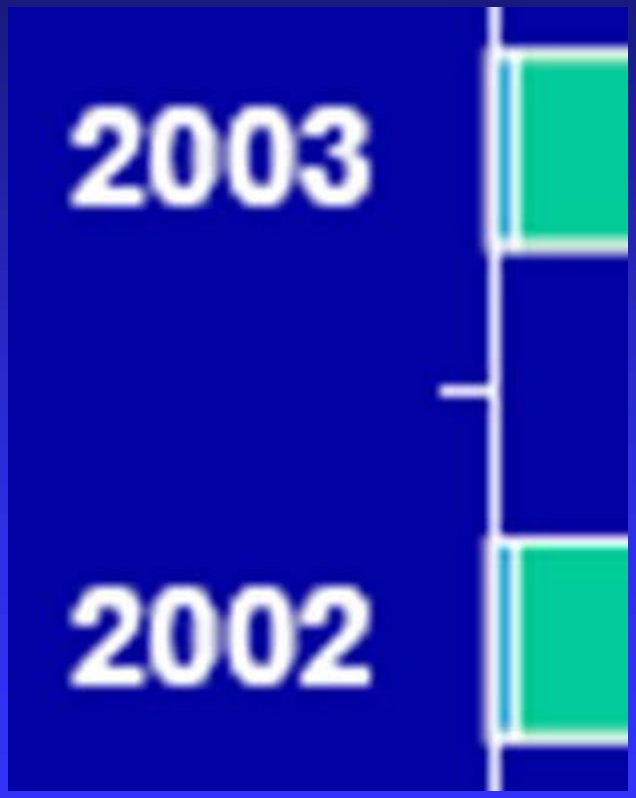
	2002				2035			
	Total	Domestic	Exports[3]	Imports[3]	Total	Domestic	Exports[3]	Imports[3]
Total	(P) 17,532	16,030	(P) 475	(P) 1,028	(P) 33,727	30,543	(P) 1,002	(P) 2,181
Truck	10,468	10,284	96	88	20,697	20,168	238	291
Rail	1,704	1,605	29	71	3,198	2,987	52	160
Water	636	539	57	40	945	793	103	49
Air, air & truck	(P) 9	3	(P) 13	(P) 4	(P) 24	9	(P) 16	(P) 9
Intermodal[1]	1,172	178	287	707	2,357	303	599	1,455
Pipeline & unknown[2]	3,543	3,421	4	118	6,506	6,284	5	218

Key: P = preliminary.
[1] Intermodal includes U.S. Postal Service and courier shipments and all intermodal combinations, except air and truck.
[2] Pipeline and unknown shipments are combined because data on region-to-region flows by pipeline are statistically uncertain.
[3] Data do not include imports and exports that pass through the United States from a foreign origin to a foreign destination by any mode.
Note: Numbers may not add to total due to rounding.

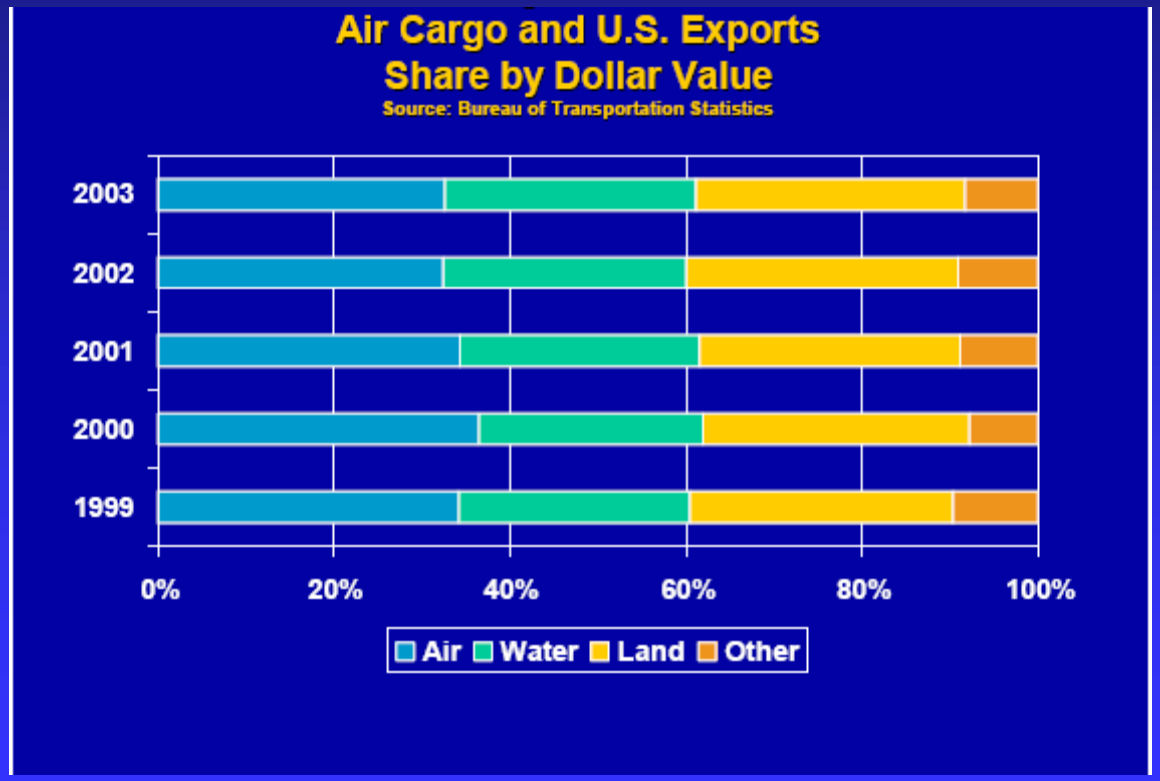
Tonnage Comparison by Mode



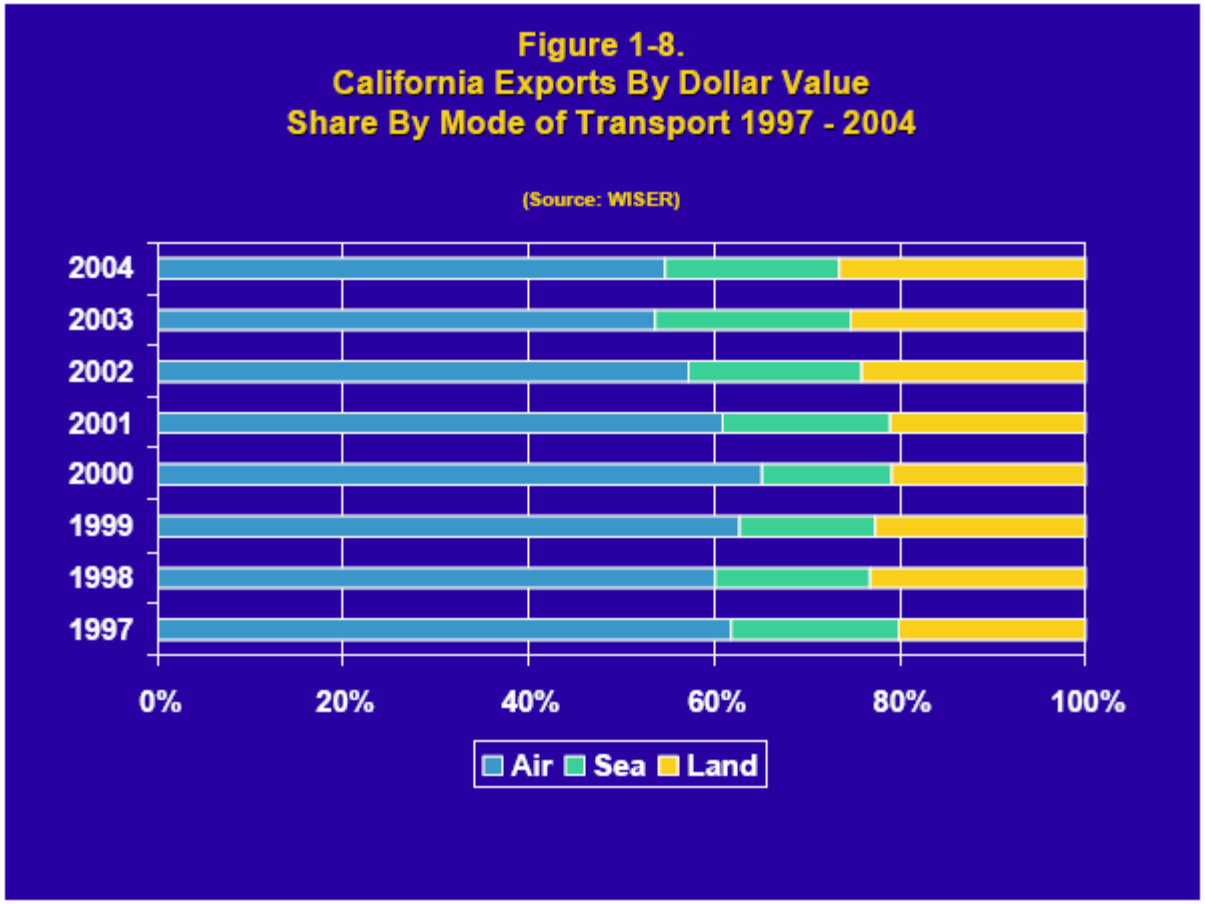
It’s hard to even see the air numbers…



Look at where are cargo really shines…



CA Exports



http://cati.csufresno.edu/cab/PDF/Mason_Role-of-Air-Cargo.pdf

LAX Cargo (Source www.lawa.org)

- **Los Angeles International Airport (LAX)** is the seventh busiest cargo airport in the world, handling more than 2 million tons of origination and destination air cargo in 2005.

- LAX is the major international cargo airport serving Southern California - the world's eleventh largest economy. Asia-Pacific is Los Angeles' top regional trading partner with 582,283 tons annually valued at $45.2 billion. Europe is second with 166,190 tons valued at $13.7 billion annually.

LAX Cargo (Source www.lawa.org)

- **Diverse Cargo**
  The products that are exported and imported through Los Angeles are as varied as the number of airlines and nations served. More than 1,000 flights depart and arrive every day carrying cargo.
- More than half of the air cargo at LAX arrives and departs in the bellies of passenger aircraft. This allows airlines serving LAX to offer some of the lowest airfares to travelers.

LAX Cargo (Source www.lawa.org)

- More than 50 percent of LAX air cargo activity is international in origin or destination. An estimated 79 percent of the region's air cargo is handled through LAX.

- Shippers will find the most broadly based selection of airlines of any U.S. airport. Every major international air carrier serving the Pacific calls at Los Angeles, while European and Latin American air carriers fully serve LAX as well.

LAX Cargo (Source www.lawa.org)

- The most exported air commodity in terms of tonnage from LAX is vegetables, fruit and nuts with 15.1 percent of the total weight.
- Other leading exports are base metals and articles thereof; computer equipment; photo, science and medical instruments; paper and pulp products; chemical products; plastics and articles thereof; prepared foodstuffs; special classification provisions; and aircraft products.

LAX Cargo (Source www.lawa.org)

- Apparel is the leading imported air cargo commodity, followed by computer equipment, audio and video media, fish, office machinery, textiles, footwear, vehicles other than railway, photo, science and medical instruments and electronic components.

LAX Cargo (Source www.lawa.org)

- Japan accepts over 70,033 tons of LAX's exports annually valued at $4.1 billion. United Kingdom is next with 32,404 tons nations valued at $2.2 billion annually. Other leading nations buying U.S. exports shipped through LAX are Taiwan, Australia, South Korea, Hong Kong, China, Singapore, Germany, and Mexico.

- China leads all nations in importing through LAX. Other Pacific Rim nations such as Japan, South Korea, Taiwan, Philippines, Malaysia, and Thailand find LAX a prime port of entry. The other nations in the top 10 are Australia, Germany, and Indonesia.

LAX Cargo (Source www.lawa.org)

- Extensive Airfield Cargo Network
  The ever-growing number of air carriers, presently 88 passenger and all-cargo airlines, and their worldwide service area have created an extensive air cargo handling network at LAX. The airport has 2.1 million square-feet developed for cargo on 194 acres.
- Four million square-feet is developed for cargo use in the immediate vicinity of the airport.
- United Airlines opened an 180,000 square foot cargo building in 2002. Virgin Atlantic Airways and Asiana Airlines also opened a new cargo building with 122,000 square feet.

LAX Cargo (Source www.lawa.org)

- Modern facilities -- convenient for shippers, forwarders and airlines alike -- are available in the Imperial Cargo Complex, the site of extensive development by domestic and international carriers. Major tenants include Lufthansa, Japan Airlines, Korean Air, Federal Express, China Airlines, Delta, Air Canada and Cargo Services Center (a provider to several air carriers). A modern U.S. Customs headquarters serves the growing trade.
- Improvements and enhancements by tenants and Los Angeles World Airports have been continually made at Century Cargo Complex, LAX's first air cargo area. American, United, Virgin Atlantic, and Asiana house their freight operations at the Century Boulevard location. Alaska Airlines, British Airways, Southwest Airlines and US Airways are located there as well.

LAX Cargo (Source www.lawa.org)

- Southern California -- The Nation's Top International Trade Center
  Los Angeles International Airport is the key transportation center for one of the world's most dynamic economies. The greater Los Angeles region's international trade is valued at $200 billion, with LAX alone responsible for more than $68 billion in exports and imports.
- Greater Los Angeles accounts for nearly half of the economy of California and a majority of the state's multi-billion dollars in international trade.

LAX Cargo (Source www.lawa.org)

- More than 400 freight forwarders and over 100 customs house brokers are located in the Los Angeles area to expedite air cargo.
- More than 36 U.S. banks with international operations have offices in Los Angeles, as do 108 foreign banking institutions.
- Forty trucking firms specialize in long-haul, air freight delivery service. Another 40 offer local pickup and delivery of goods for forwarders and brokers. More than 70 small package and document delivery firms regularly use LAX.
- Consular offices from 76 nations, trading offices from 33 countries and 35 foreign Chambers of Commerce assist the high volume of trade.

Ontario (Source www.lawa.org)

- LA/Ontario International Airport (ONT) is the center of a rapidly developing freight movement system which includes the airport, two rail lines, four major freeways and an expanding network of freight forwarders. ONT is located less than 50 miles from Los Angeles and Long Beach Harbors, and is ideally situated to be an airfreight center for Pacific Rim and European air cargo.

- **United Parcel Service (UPS) is ONT's largest airfreight carrier, handling more than 70 percent of the airport's cargo.** In April 2001 UPS began four weekly flights to China using Boeing 747 cargo aircraft. This marks ONT's first-ever direct flights to China, which is the Pacific Rim's largest and fastest growing market. ONT is the west coast hub for all UPS air freight operations.

- Other major freight carriers that serve ONT include Ameriflight, Arrow Air, Centurian Airlines, DHL, Empire Airways, Evergreen Aviation, ExpressNet Airlines, Federal Express, Gulf and Caribbean Cargo, IFL Group, Kalitta Air, United Parcel Service, West Air. In 2006, ONT handled 602,326 tons of cargo.

Ontario (Source www.lawa.org)

Hangar

A former Lockheed aircraft hangar at ONT was recently converted into a new facility for air cargo operations. The new air cargo facility accommodates up to three tenants. The project includes new office spaces, utilities to support the offices, a truck loading dock, and additional modifications such as roll-up doors in the existing hangar doors.

- ONT's cargo operations were conducted in the airport's Chaffey Hangar, which is no longer adequate for ONT's increasing cargo operations. When construction of the new air cargo facility was completed, tenants in the Chaffey Hangar were relocated to the new facility.

Ontario (Source www.lawa.org)

- **Air Cargo Complex**
  Promoting cargo operations and the development of a new air cargo complex at ONT is consistent with Los Angeles World Airport's goals to provide additional cargo capacity in the region to accommodate cargo demand that cannot be met by Los Angeles International Airport.
- The proposed site for a new air cargo complex at ONT is located on underutilized land in the northwest section of the airport which includes the West End Cargo Parking area and a portion of the former Lockheed site. The entire property measures approximately 110 acres. The site is well suited for the development of air cargo and supporting facilities considering its proximity to both airfield access ways and public roadways that to lead to major interstate highways.

Aerotropolis: Passenger Airlines

- Nearly all passenger carriers also carry freight. For many passenger carriers the cargo department is the most profitable in the organization.
  - The reason is that the passengers and mail pay for the cost of the trip, and the cargo revenue that is brought in is pure profit (theoretically). This depends a lot of how the airline accounting system allocates costs). Examples of passenger carriers that place a strong emphasis on cargo are:
    - UNITED, AMERICAN, KLM, LUFTHANSA, NORTHWEST, DELTA, JAL and many others.

Aerotropolis: All Cargo Carriers

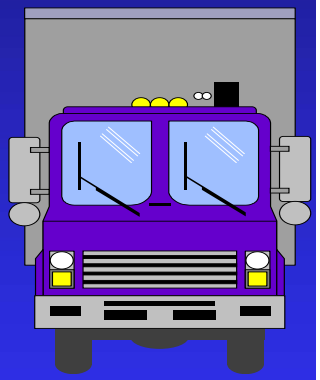
- There are many carriers that only fly cargo, some of the main ones are:
  - Kalitta Air
  - Kitty Hawk
  - Ameriflight
  - Evergreen
  - Polar/Atlas...
- You even have “hybrid” forwarder/airlines that may wet-lease aircraft to fly under their name.

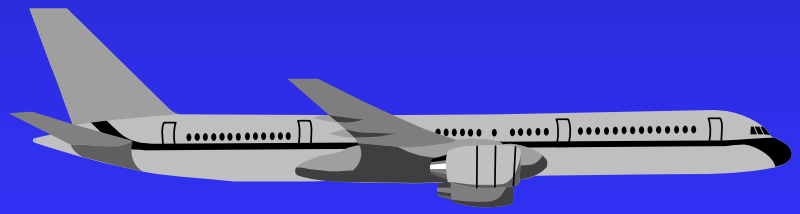
Aerotropolis: Combination Carriers

- These are carriers who fly passengers, but also have operated freighter aircraft…
  - KLM
  - Northwest
  - Korean
  - Aloha
  - British Airways
  - Etc, Etc.

Aerotropolis: "Integrators"

- These are cargo companies who fly their own aircraft for their own benefit
  - FedEx
  - DHL
  - UPS
  - TNT





Recent Ranking of All Cargo Carriers

- 2004 total scheduled freight tonne-kilometres flown
  - 1. Federal Express 14.579 million
  - 2. Korean Air 8.264 million
  - 3. Lufthansa Cargo 8.040 million
  - 4. United Parcel Service 7.353 million
  - 5. Singapore Airlines Cargo 7.143 million
  - 6. Cathay Pacific 5.876 million
  - 7. China Airlines 5.642 million
  - 8. Eva Airways 5.477 million
  - 9. Air France 5.388 million
  - 10. Japan Airlines 4.924 million

Recent Ranking of All Cargo Carriers

- 2004 international scheduled freight tonne-kilometres flown
  - 1. Korean Air 8.164 million
  - 2. Lufthansa Cargo 8.028 million
  - 3. Singapore Airlines Cargo 7.143 million
  - 4. Cathay Pacific 5.876 million
  - 5. China Airlines 5.642 million
  - 6. Federal Express 5.595 million
  - 7. Eva Airways 5.477 million
  - 8. Air France 5.384 million
  - 9. British Airways 4.771 million
  - 10. Cargolux 4.670 million

Recent Ranking of All Cargo Carriers

- 2004 total scheduled freight tonne-kilometres flown
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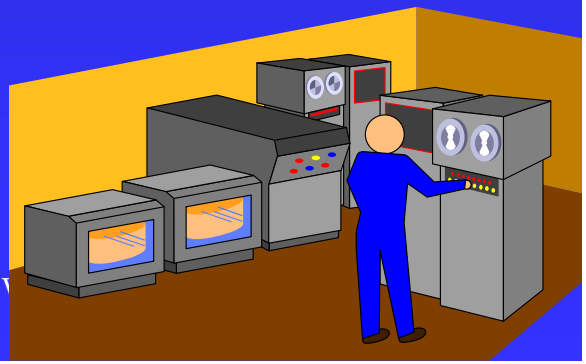
  - 9. Air France 5.388 million
  - 10. Japan Airlines 4.924 million

Aerotropolis: Freight Forwarders

- Often known as “consolidators” or “indirect air carriers”
- They provide a service to the public by buying space (“lift”) from the air carriers and reselling it to the public at a lower price than an individual shipper could get on their own
- Forwarders are the “middlemen” between the shippers and the airlines

What does it take to be a forwarder?

- In the U.S., air freight forwarders no longer have to be licensed by the government
  - However, they must file a security program with the TSA as an “indirect” air carrier
- You need to have at least the following:
  - Credit with the airlines
  - Staff or means to provide service
  - Agents or offices
  - A computer



How many forwarders are there?

- Thousands, in the U.S. alone
  - It's a very popular business, however it's just as competitive as it is popular
- How many forwarders at LAX?
  - Several hundred, at least.

Forwarders – Travel Agents for Cargo…

Shipments from different shippers (generally) are grouped together and tendered to the airline as one shipment with the forwarder becoming the "shipper" in the eyes of the airline.

The forwarder gets a much lower price because of the higher volume than the shipper could get themselves by going direct to the airline.

The forwarder or "consolidator" makes their money on the difference between what they charge the individual shippers and what the airlines charge them.

A freight forwarder or "consolidator" is a company who has contracts with air-lines and can provide rates to the shipper that are lower than what they could get if they went to ship with the airline directly. Here is an example:

CUSTOMERS	WEIGHT	RATE WITH AIRLINE	TTL	SAVING
SHIPPER A	45	$ 5.00	$ 225.00	-
SHIPPER B	45	$ 5.00	$ 225.00	-
SHIPPER C	45	$ 5.00	$ 225.00	-
FORWARDER	**135**	**$ 3.00**	**$ 405.00**	
SHIPPER A	45	$ 4.00	$ 180.00	-20
SHIPPER B	45	$ 4.00	$ 180.00	-20
SHIPPER C	45	$ 4.00	$ 180.00	-20

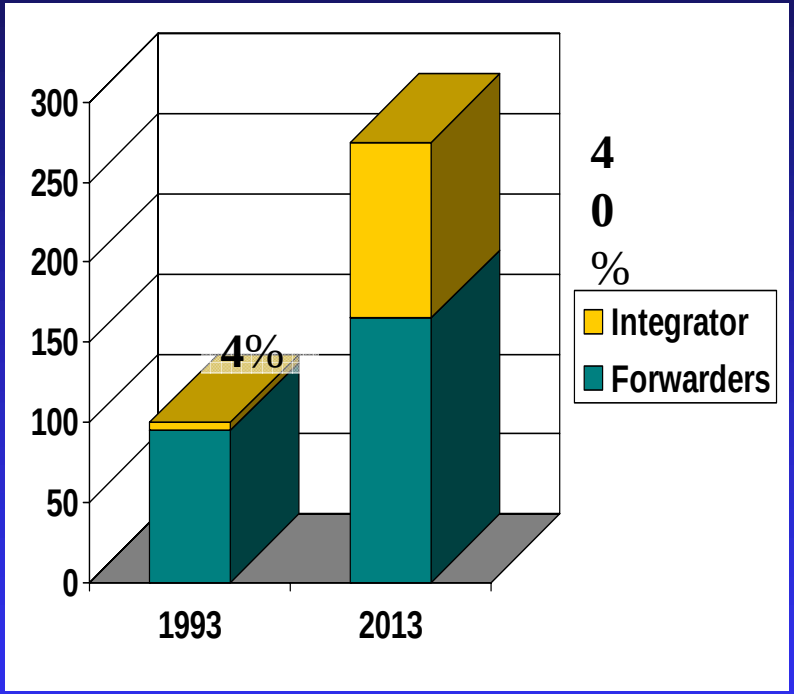
So you can see that because the forwarder can consolidate the shipments from several shippers they can get a less expensive rate from the airline and pass this saving on to the shippers and still make a profit themselves.

The "Integrators" vs.. Forwarders

- Integrated air carriers are carriers like UPS, FedEx, DHL, and smaller carriers like TNT.,
- Shipments involving freight forwarders involve a multitude of steps, passing the cargo and information from one intermediary to another. As an example:
- **Typical freight forwarder**

  SHIPPER → TRUCKER → FORWARDER → CARRIER → BROKER → FORWARDER AGENT → TRUCKER → CONSIGNEE (In some cases there's even a second forwarder involved called a "co-loader" or wholesaler.)
- This is what the market looked like 14 years ago vs. the projection for 2013 (source: Unisys Corp)

RTK's - International Air Freight Market



Integrator Model (i.e. FedEx)

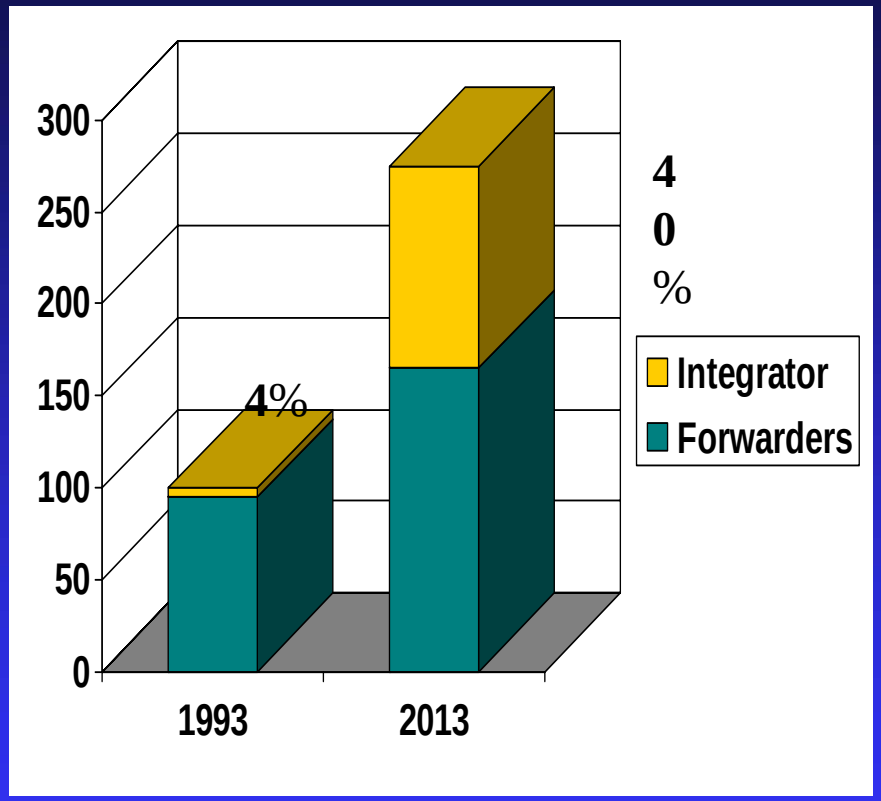
SHIPPER → FEDEX → CONSIGNEE

The integrators have been taking much of the "good freight" from the forwarders over the years and the typical forwarder's market share of high-revenue shipments has been dwindling.

Source Unisys

RTK's - International Air Freight Market

- **<u>RTK's - International Air Freight Market 40% to 4%</u>**
- With 3600 forwarders in the US alone, vs. a half dozen or so integrators – the forwarders area really feeling the pinch.
- Way too much handling and too many opportunities for problems in the traditional forwarding industry
- An average piece of freight is handled 36 times during the cycle
- An average piece of loose cargo will be stored in at least 8 different locations
- An average piece of cargo generates about 12 pieces of paper
- Some 15% of all consignments generate calls from the shipper to the agent.
- 1.5% of all AWB's are lost in the system
- *(Source: Unisys Cargo Study)*



Aerotropolis: Custom's Brokers

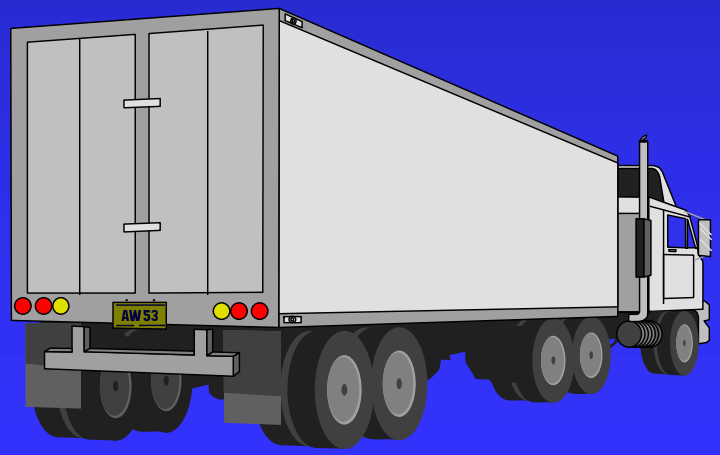
- The role of a custom house broker
  - Why do you need a broker?
    - Cargo cannot enter into a country unless it has been granted permission to do so by customs authorities.
    - And that usually means paying duties and tariffs.
    - Sometimes there are quota imposed
      - Which is another good reason to use air freight!
  - Brokers sometimes take physical possession of the freight, at other times it's a paper shuffle.

Aerotropolis: Co-loaders

- Role of a Co-loader
  - These are a "Forwarder's Forwarder"
  - Just like a ticket wholesaler will work with travel agents, on the cargo side there are more intermediaries who buy space wholesale from the airlines and resell it to forwarders.
  - Australia is a big market for this.
  - These people DO take physical possession of the cargo as the need to incorporate it into their consolidations… so again, more trucking.

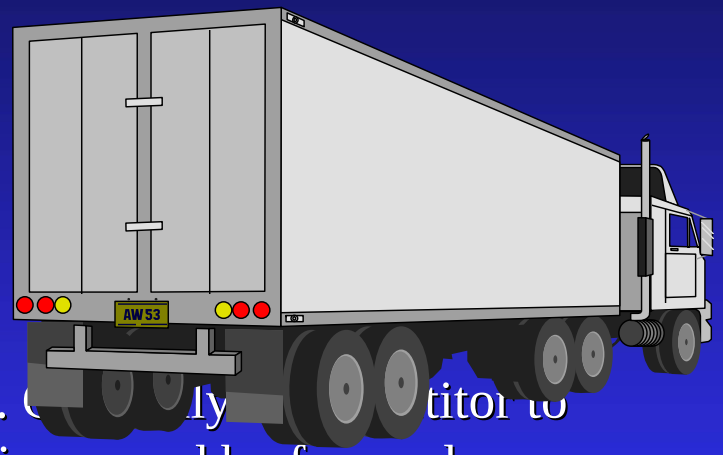
Aerotropolis: Truckers

- An introduction to the trucking industry
  - Cartage companies
    - These folks are all around LAX and provide (generally) short haul ground transport between shippers and forwarders (and consignees)
    - They also provide airport transfer services for forwarders and carriers.
    - There are scores if not hundreds of these truckers around Southern California.



The role that truckers play…

- Linehaul Truckers
  - Provide over the road shuttle type service between points for forwarders and carriers



- LTL
  - Less than trailer-load truckers. Usually competitor to domestic air freight but sometimes used by forwarders.
- Truckload
- Freight Brokers
  - People who arrange trucking services for a commission.

Domestic Heavy Air Freight

- Most of this market has been ceded to trucks over the years.

So, how fast can you truck it anyway?

- Typical transit times if you run your own trucks, with "team" drivers
  - "Team drivers" take turns driving and resting to stay within the legal hours of service requirements.
  - LAX to:
    - ORD: 40 hrs
    - EWR/JFK 65 hours
  - Basically, you can make it just about anywhere in the country in no more than 72 hours.

So, how fast can you truck it anyway?

- Sometimes ground transport is a bit slower… but you never know.

Other services

- End of Runway (repairs)
  - Repair depots for laptop computers are set up at Integrators Hubs – i.e. Toshiba and UPS in Louisville.
    - http://www.greensupplyline.com/showArticle.jhtml?printableArticle=true&articleId=192501056

Other services

- Logistics centers
  - Order fulfillment Centers

Other services

- Bonded warehouses
  - Import or In-Transit international shipments can be stored without the payment of customs duties.
    - Very useful for quota items or
    - International order fulfillment

Other services

- Free Trade Zone
  - Like a Bonded Warehouse except that you can actually work or “manipulate” the cargo.
    - So, a manufacturer should set up shop in a FTZ, import parts from around the world, assemble them into finished goods…
    - And then import (or re-export) the finished goods into the country at a lower duty rate than they might otherwise pay.

Jobs Related to Air Cargo

- Any other ideas?
- What are some other jobs?

Aerotropolis: Support Companies

- For all these key players – the airlines, the airport, the forwarders, the brokers, there are a whole host of support companies.
  - Facilities and vehicle maintenance
  - Banks
  - Personnel agencies (transport business uses a lot of "temps"
  - Warehousing companies, etc, etc.

Questions? Comments?

- Why are passengers so important to cargo?

Moving the Cargo

- Why passenger carriers are essential to air cargo.

Narrowbody Aircraft

- Narrowbody aircraft carry only loose cargo in the belly
- However, there are *so* many flights compared to all cargo aircraft.

An A320 “Airbus” is a narrowbody that carries specialized ULDs in the belly

A baggage conveyor

- This may be the only way to get cargo into a narrowbody aircraft.
- (Though this picture shows the bulk compartment on a 747)

List of Widebody Aircraft

- Only a limited number of aircraft are considered ‘widebody’ and are able to handle containers in the lower deck hold.
- Airbus
  - A300, A310, A330, A340, A350, A380 (eventually)
- Boeing / MD
  - B747, B767, B777, DC-10, MD-11
- Lockheed
  - L1011
- Illyushin IL86, IL96

Widebody Passenger Aircraft

Carry containers or pallets in the belly

B747 Front Belly Close up

ULD – Get in my belly…

B747 Inside the Rear Belly

Main Deck Freight

- Freight that is over 64” tall is considered “main deck” cargo and can only go on freighter or combi aircraft

Main Deck Loader

Pallet & Net Combination

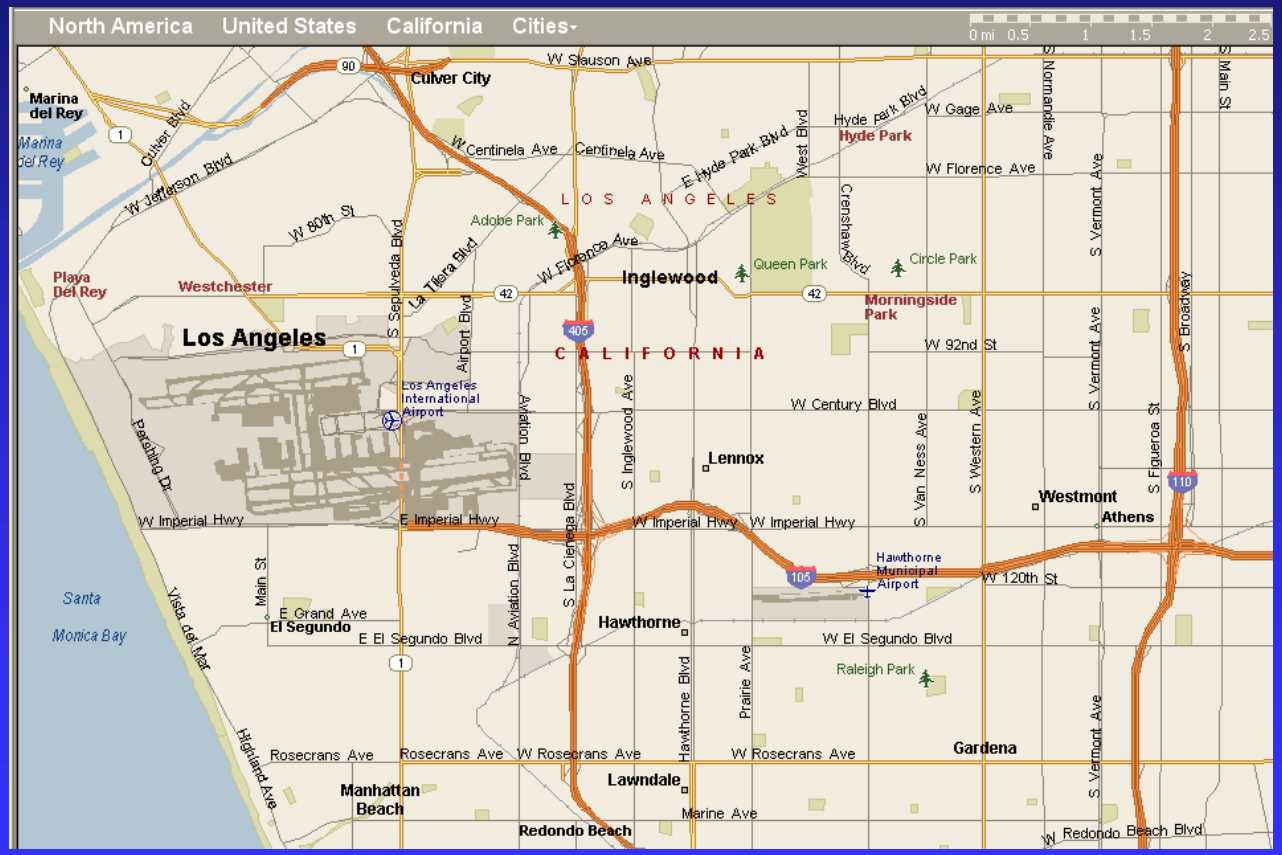
- Definitely "main deck" freight for a combi or freighter

Main Deck Container Loading

It’s a big chain…

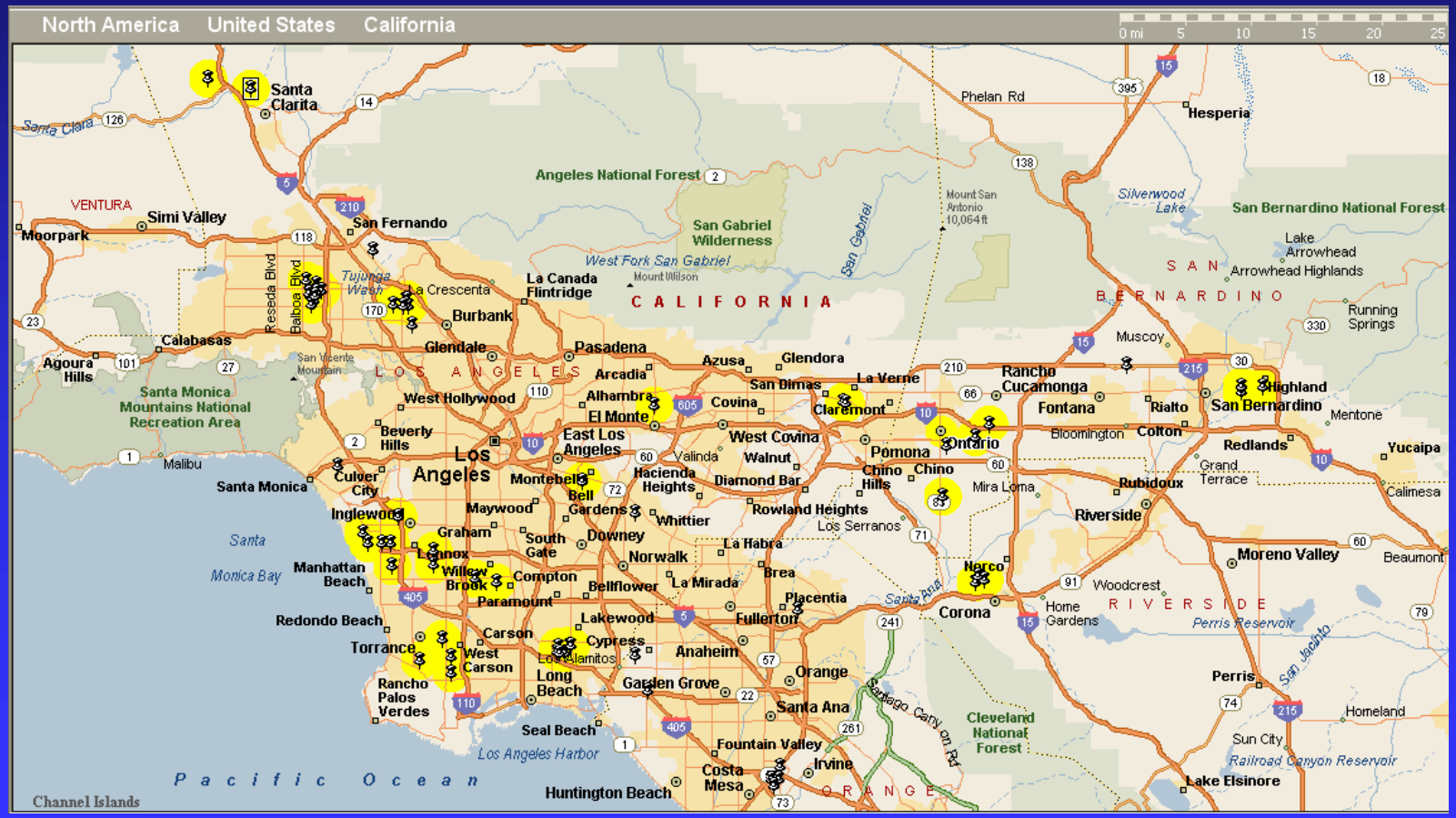
- Here’s a look at some of these companies and the jobs they represent…

Owners
Management
Drivers
Dockworkers
Adminis-trative Staff
Sales
Facilities and Maintenance



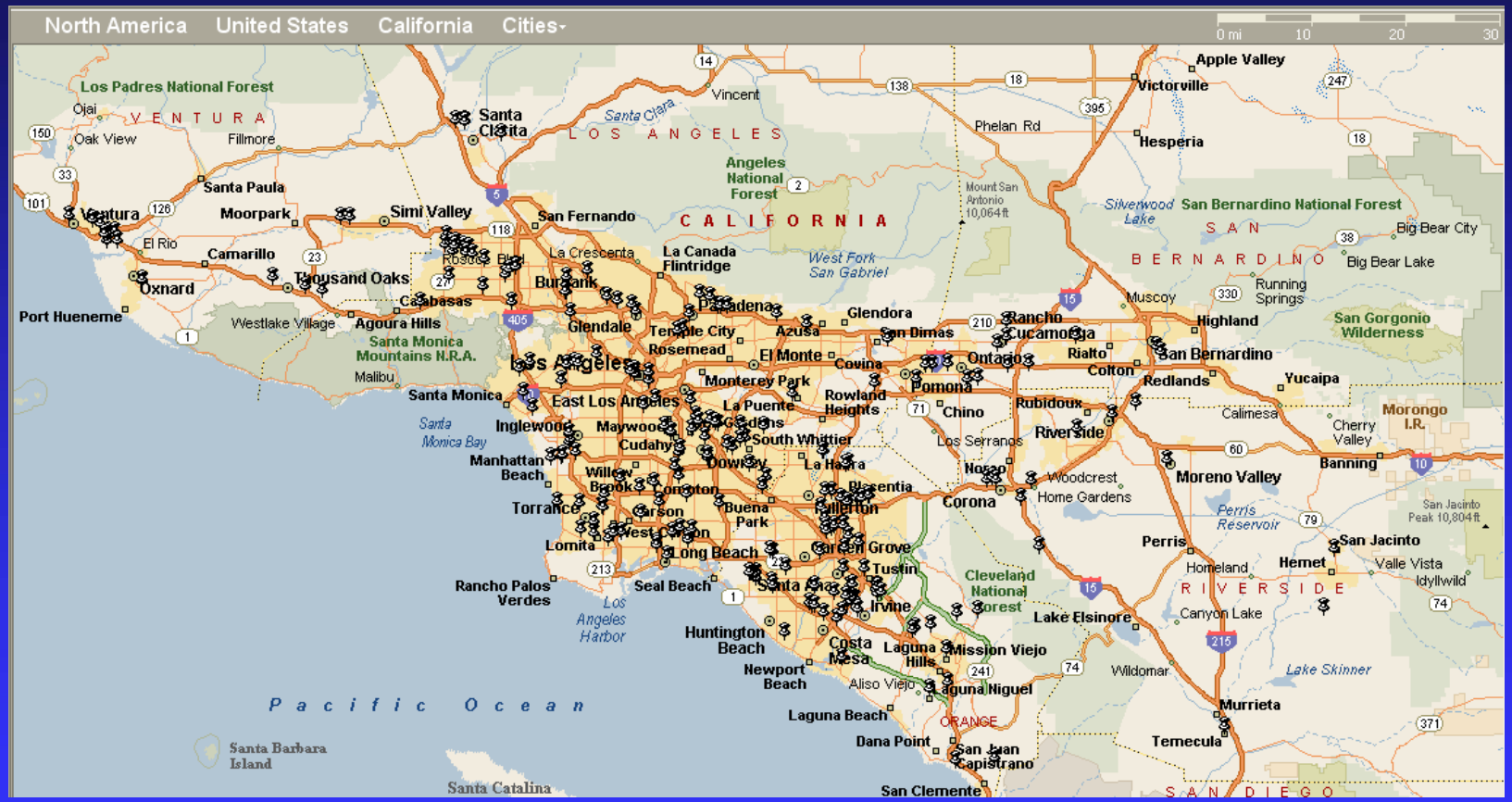
Shippers (i.e Aerospace)

- AOG* Shipments Could Originate Anywhere
  (*These are "aircraft on ground" one of the highest priority air freight shipments)



Shippers (Labs)

- Analytical / Research / Labs



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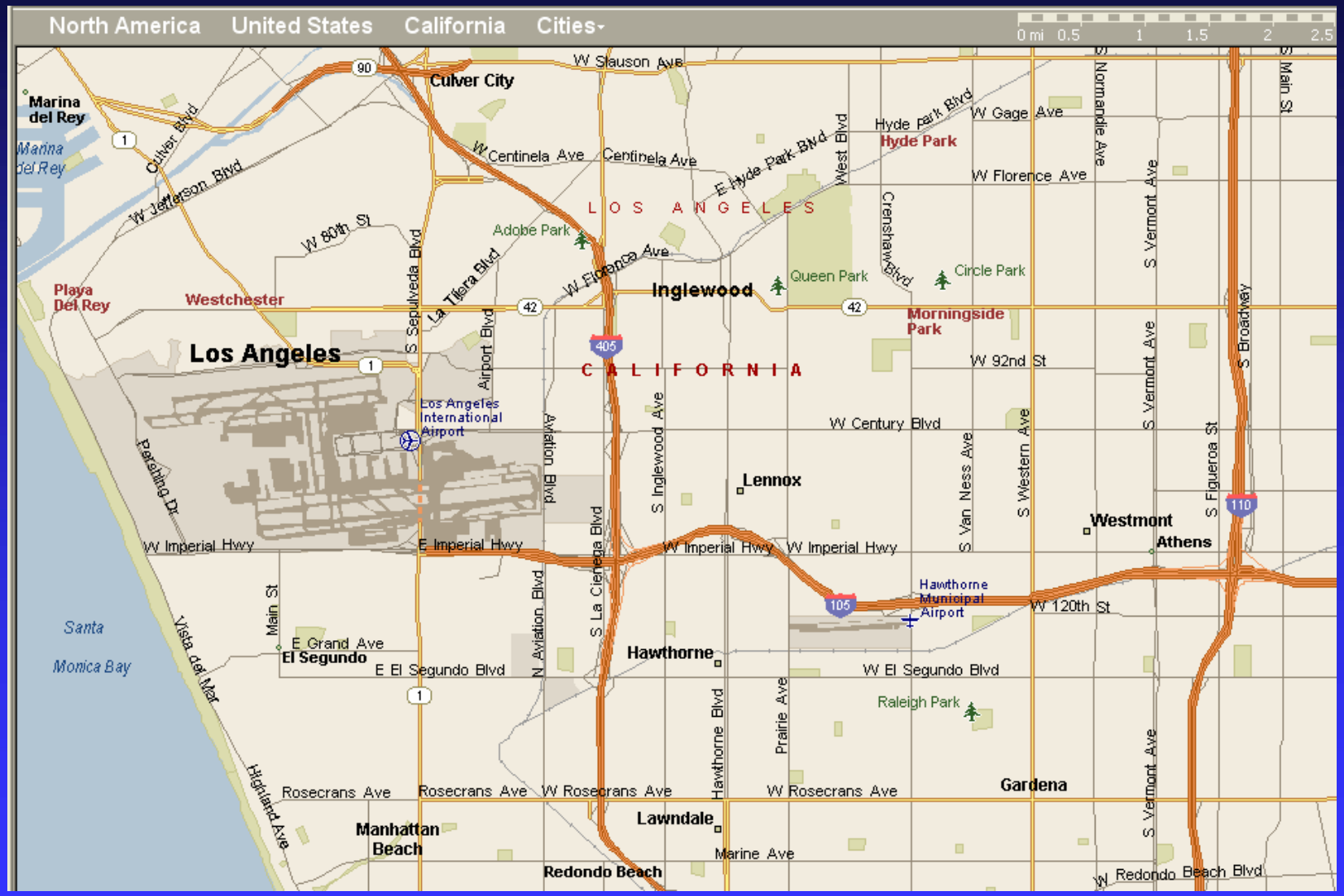
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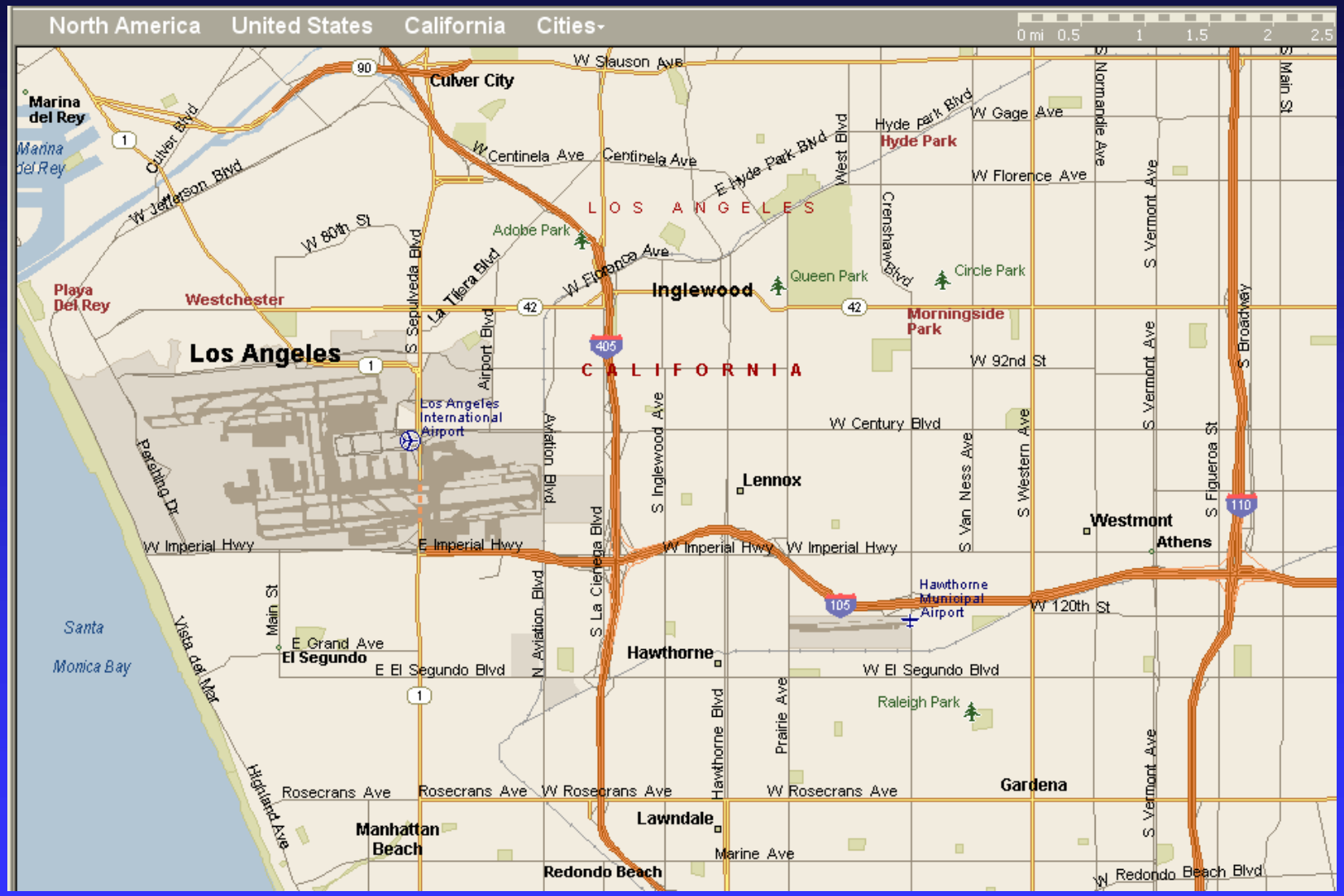
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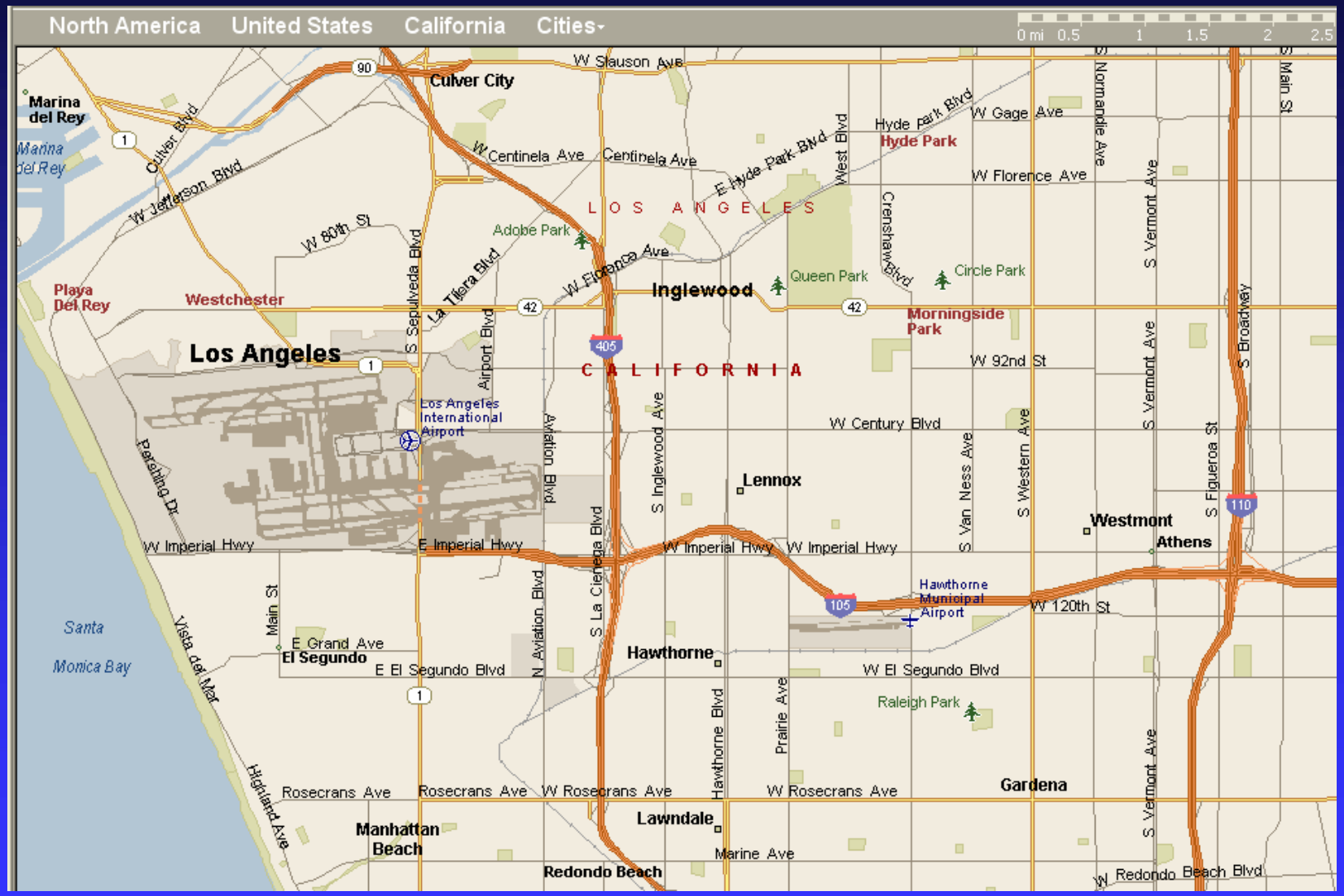
Forwarders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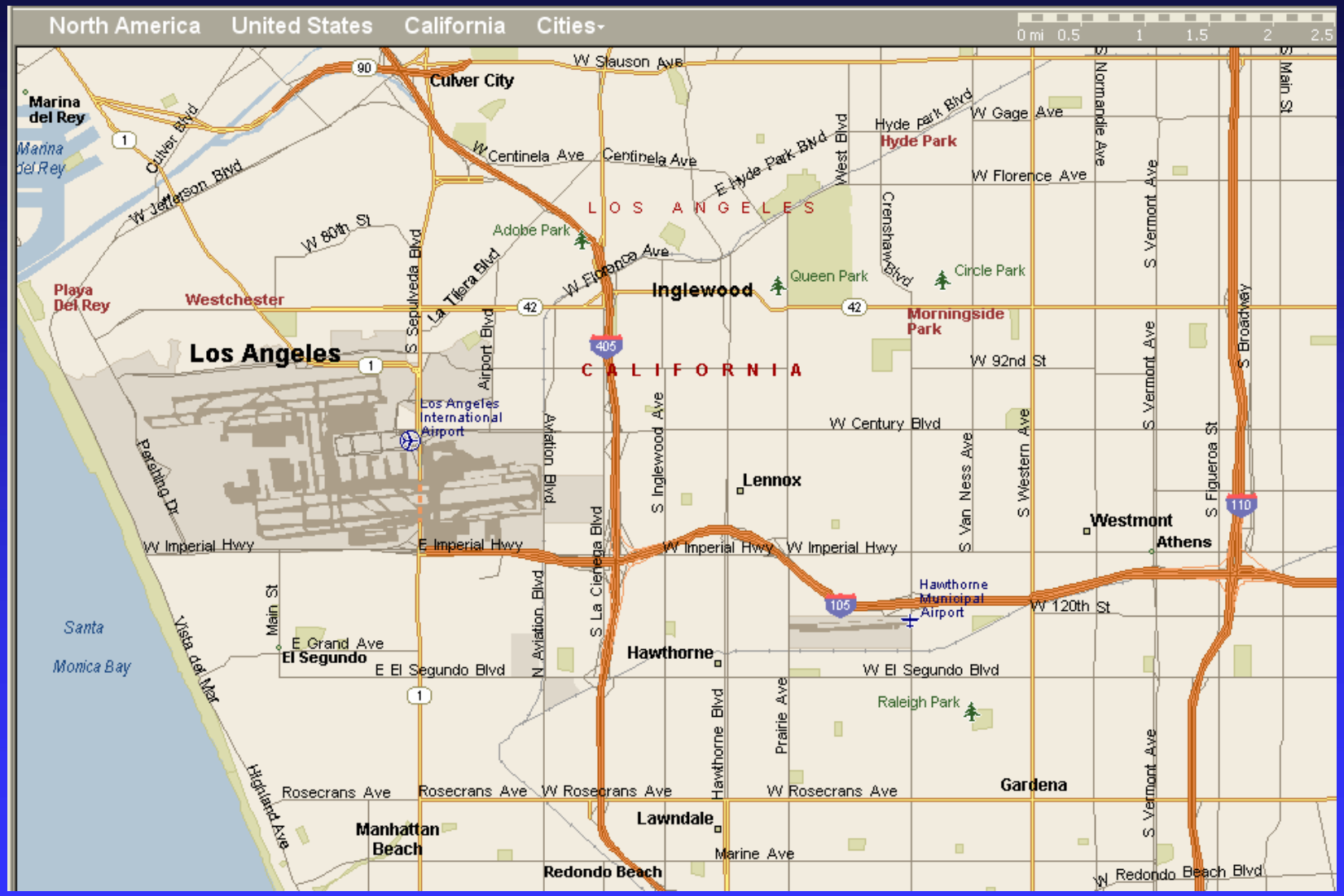
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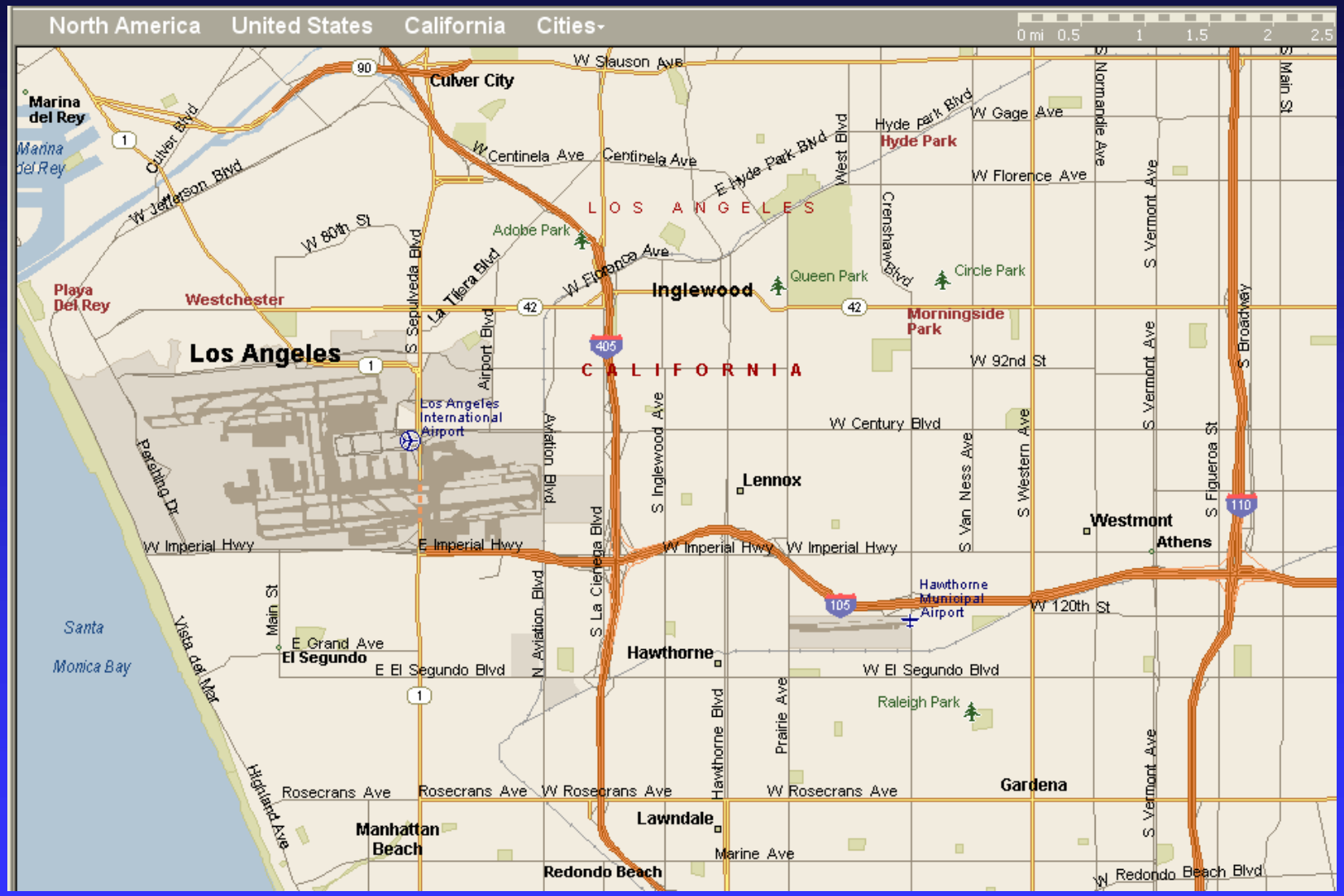
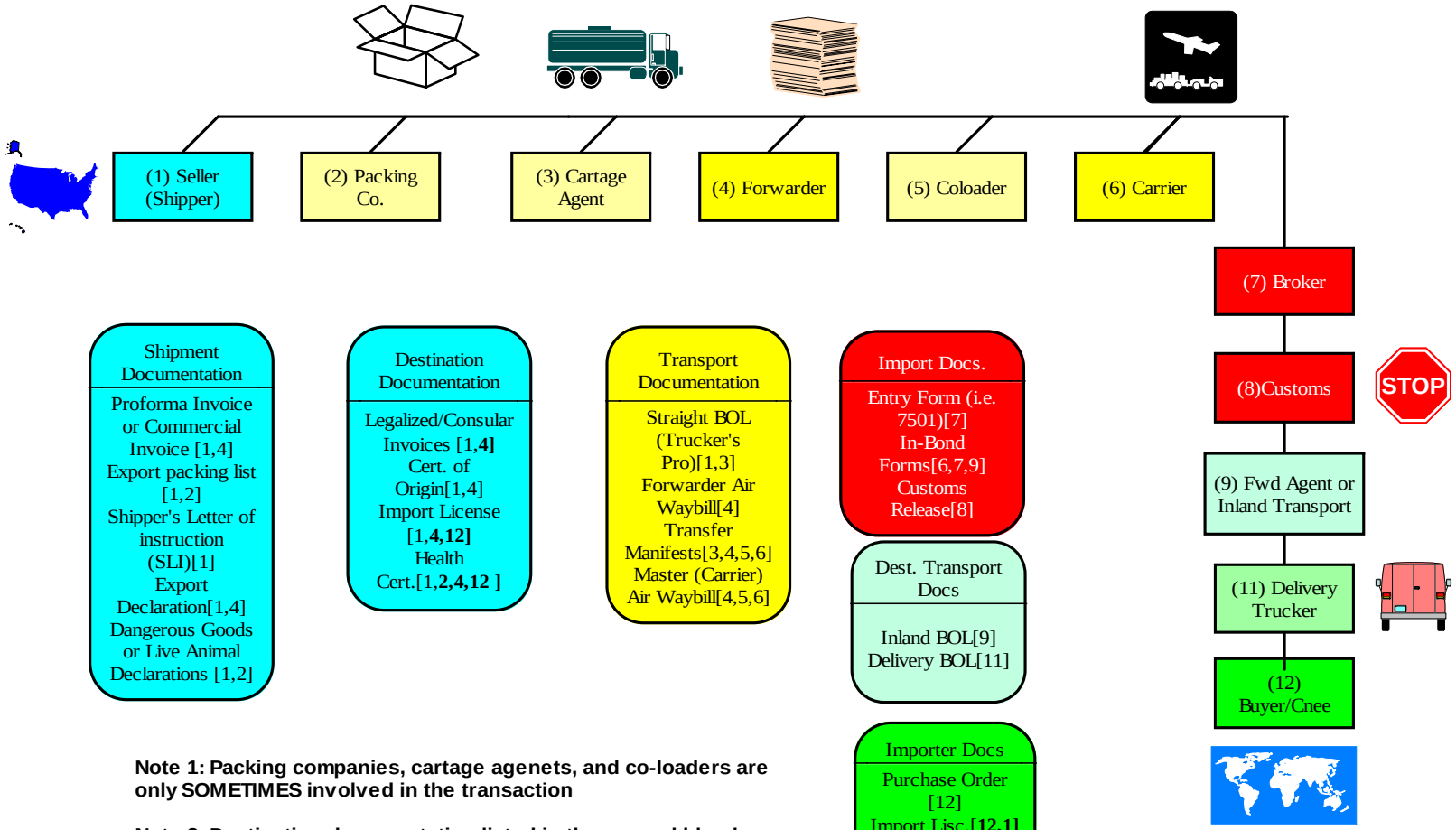

North America
United States
California
Cities
0 mi 0.5 1 1.5 2 2.5
Marina del Rey
Culver City
W Slauson Ave
W Centinela Ave
Centinela Ave
E Hyde Park Blvd
Hyde Park Blvd
Hyde Park
W Gage Ave
W Florence Ave
W Jefferson Blvd
W 80th St
Adobe Park
L O S A N G E L E S
W Florence Ave
Queen Park
Circle Park
Inglewood
Morningside Park
Playa Del Rey
Westchester
Los Angeles
C A L I F O R N I A
W 92nd St
Los Angeles International Airport
W Century Blvd
Lennox
Westmont
Athens
W Imperial Hwy
E Imperial Hwy
Hawthorne Municipal Airport
W 120th St
Santa Monica Bay
E Grand Ave
El Segundo
E El Segundo Blvd
Hawthorne
W El Segundo Blvd
Raleigh Park
Rosecrans Ave
W Rosecrans Ave
Gardena
Lawndale
Manhattan Beach
Marine Ave
Redondo Beach
W Redondo Beach Blvd
S Sepulveda Blvd
La Tijera Blvd
Airport Blvd
Aviation Blvd
S Inglewood Ave
S La Cienega Blvd
Crenshaw Blvd
West Blvd
Normandie Ave
S Vermont Ave
S Broadway
S Figueroa St
S Van Ness Ave
S Western Ave
Main St
Culver Blvd
Parshing Dr
Vista del Mar
Highland Ave
N Aviation Blvd
Hawthorne Blvd
Prairie Ave

Connections…

- The Shipper
  - Gives freight to "house trucker"
    - House Trucker Transfers to linehaul trucker
      - Linehaul trucker transfers to Forwarder
        - Forwarder prepares shipment consolidation and
        - Tenders to airport transfer agent
        - Airport transfer to airline
        - Cargo loaded or built up into containers
      - Airline flies the freight and
      - Perhaps transfers to another airline
    - Shipment Delivered to Bonded Warehouse or CFS
    - Cargo is unloaded from containers - deconsolidated
    - Licensed Customs Broker clears customs
- Shipment trucked to consignee…*
  - *It may be much more involved than this…

The Air Freight Commerce Chain



Note 1: Packing companies, cartage agenets, and co-loaders are only SOMETIMES involved in the transaction

Note 2: Destination documentation listed in the second blue box is usually a shipper function, however an import license may be obtained by the buyer or the seller depending upon the terms of sale

Time…

- We start with the pickup
  - What time do you suppose the shipper wants the air freight trucker to show up at their dock?
    - The beginning of the work day?
    - Around lunch?
    - After lunch?
    - As close to the end of the work day without having to cause the shipper to stay over and incur overtime for shipping department employees.
  - Just in time for rush hour traffic!

Life at the Airline… Waiting…

- All of these activities lead to one singular event: Getting the Freight On the Aircraft!

Life at the Airline… Waiting…

- All airlines have “lockouts” or “closeouts” for cargo.
  - For many carriers it’s 2 to 6 hours before a flight.
- Many cases you cannot get freight picked up and processed in time to make an evening bank of flights.
  - Cargo will be held to the next day.
  - Which makes for a lot of airport activity any time of day or night.

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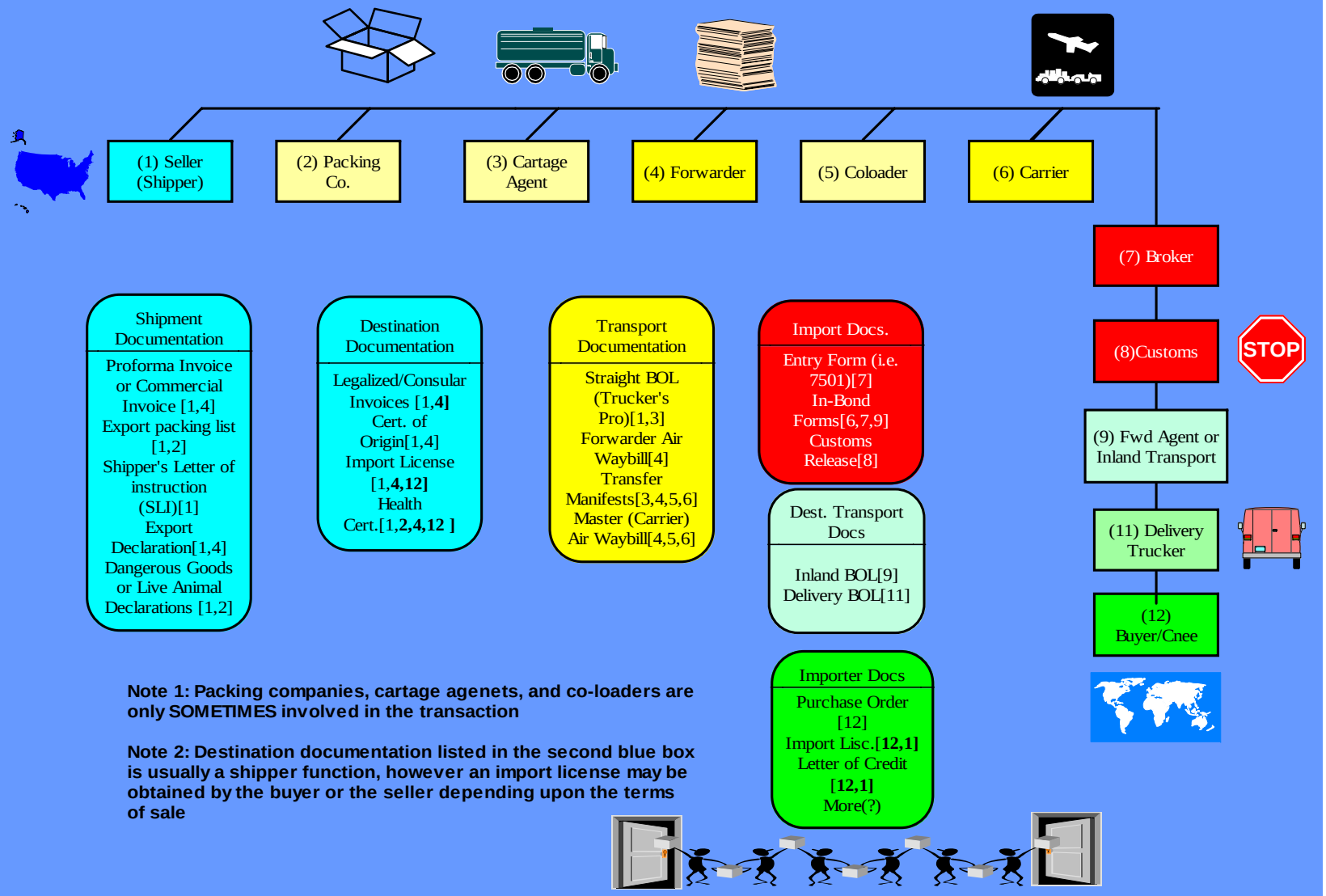

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Just a simple shipment…

- Unfortunately, between the local traffic and the hand-off between parties, it missed the connection.
- So back to our stranded passengers…
- An alternative part is found in Honolulu and flown on Pacific Air Cargo. Which is good because the passenger airline that could have taken the part down there, is the very aircraft that's broken… and it only flies once a week…

So What have We Learned

- Air Cargo is MANY moving parts
- A huge portion of the air cargo moves in the bellies of passenger planes
- Air Cargo accounts for a massively disproportionate amount of the value of all goods moved in world trade

So What have We Learned

- The most likely commodities that will be sent by air cargo include:
  - High Tech
  - High Value
  - Perishables
  - Fashion
  - Medical
  - _____
  - _____

So What have We Learned

- Freight Forwarders are an integral part of the air cargo supply chain.
  - There are thousands of them in the US (they are also known as "Indirect Air Carriers"

Freight Forwarders depend on a "network" of partners

Cartage companies who provide local trucking

Linehaul truckers for longer distances

Packing and Crating Companies

Customs Brokers and many more…

So What have We Learned

- The “Integrators” (FedEx, UPS, DHL) have a “captive lift” system that enables them to run many of their flight operations in secondary airports such as Oakland and Ontario.
  - Yet even the integrators need passenger aircraft from time to time, as most do not operate by captive lift alone.

So What have We Learned

- So many jobs depend on this “network”.
- Between the forwarders, the airlines, the brokers, the truckers, the banks, the service companies who support all these entities, the airport and everyone else…
- They’re all tied together in this network we call the Air Cargo industry.

So What have We Learned

- Other learning points?

This has been a work in progress

- There has been a lot of material we have covered here today and that you will learn tonight on the tour.
- We thank you for your attention, your participation and interest!
  - Jim Powell, Transportation Development Group jim@logisticstraining.com
  - 1-310-302-0808

Progress Check

- Let's pretend this is us, finally with a working airplane, we've made it to our tropical paradise.
- All these behinds the scene logistics add up.
- Oops… I forgot… we're going home…

Hey, Los Angeles isn't so bad…

- You could be back with my brother in Buffalo, trying to cheat his way out of shoveling the walk.

My sister in law told him he needed to get the snow off the walk… now.

Thanks Again!

Call me if you have any questions!

Jim Powell 1-310-302-0808

jim@logisticstraining.com