

Introduction to Industrial Property

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Industrial Overview

Key topics

- Drivers of industrial demand
- Types of industrial property
- Importance of the retail market
- Importance of transport and standardized containers.
- Attributes of industrial property
- Industrial property trends

Industrial Demand Stems From....

- Storage of finished goods, i.e. car parts or replacement parts
- Manufacturers to other manufacturers or wholesalers to retailers
- Retailers to consumers that need temp storage or repacking facilities
- Manufacturers to consumers
- Exporters in foreign lands or Importers to wholesalers, retailers or consumers

Industrial Property Types

- Manufacturing plants: tend to be **build to suit** and so unique that they are **owner occupied**. Rarely there might be a sale leaseback on a unique facility.
- Storage: Includes Self-storage, humidity and temp controlled or pure garage space. Once this was an excess site use but now mainstream. Noise and views don't matter. Access need not be that easy.
- Warehouse distribution: Regional (larger scale)
- Warehouse distribution: Local (smaller)
- Warehouse distribution Intermodal: Air/Truck
- Warehouse distribution Intermodal: Small package handling or repacking

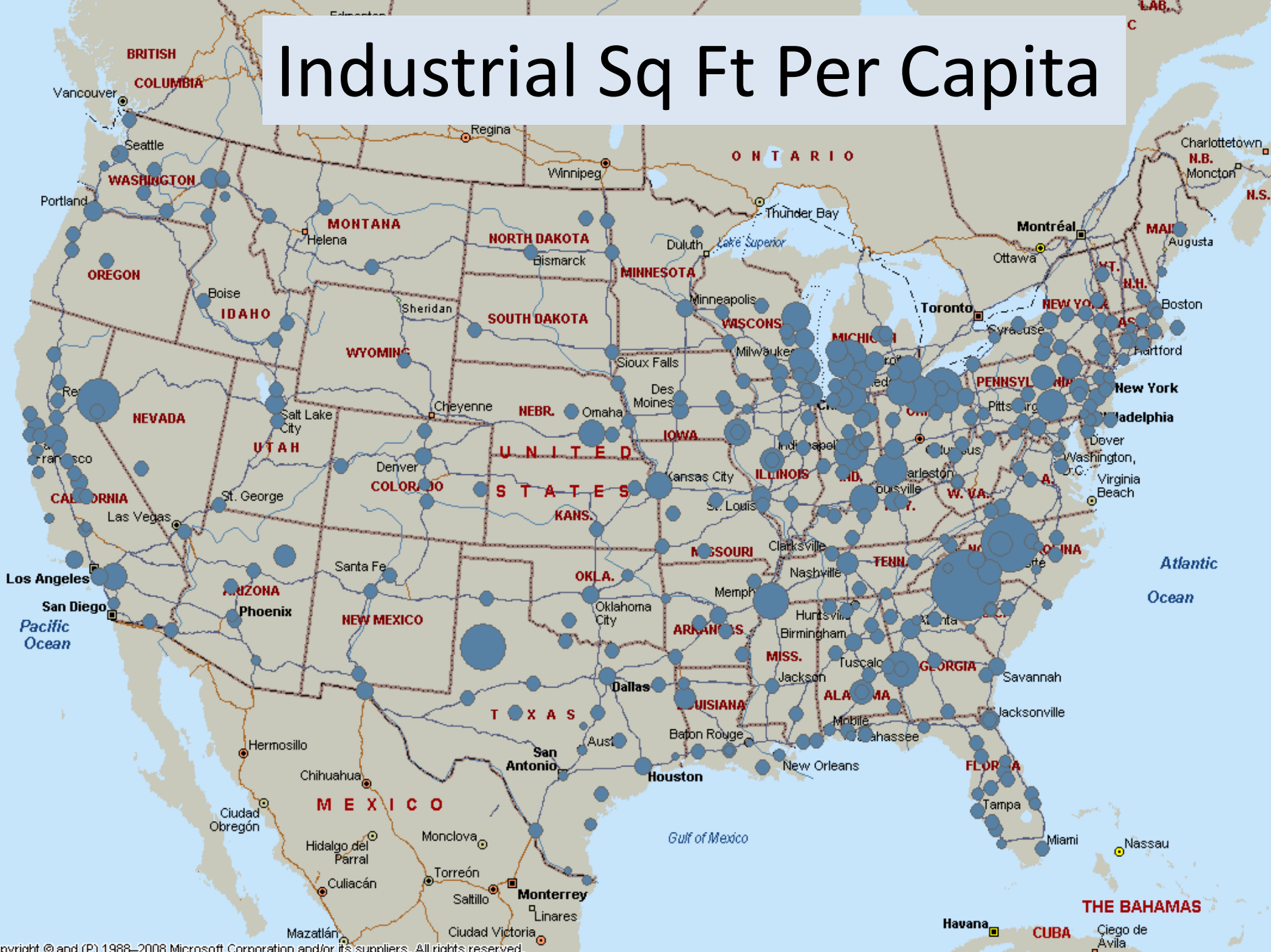
Industrial Property Types Continued

- R&D: Research and development space such as bio-tech or medical research, sometimes ultra clean rooms with extreme filtering, but also sometimes used to mean Flex space below.
- Flex: Includes office or showroom space up front (15% to 40%) and warehouse or manufacturing space in the rear (60-85%). Could include repair service facilities with a front office/reception.

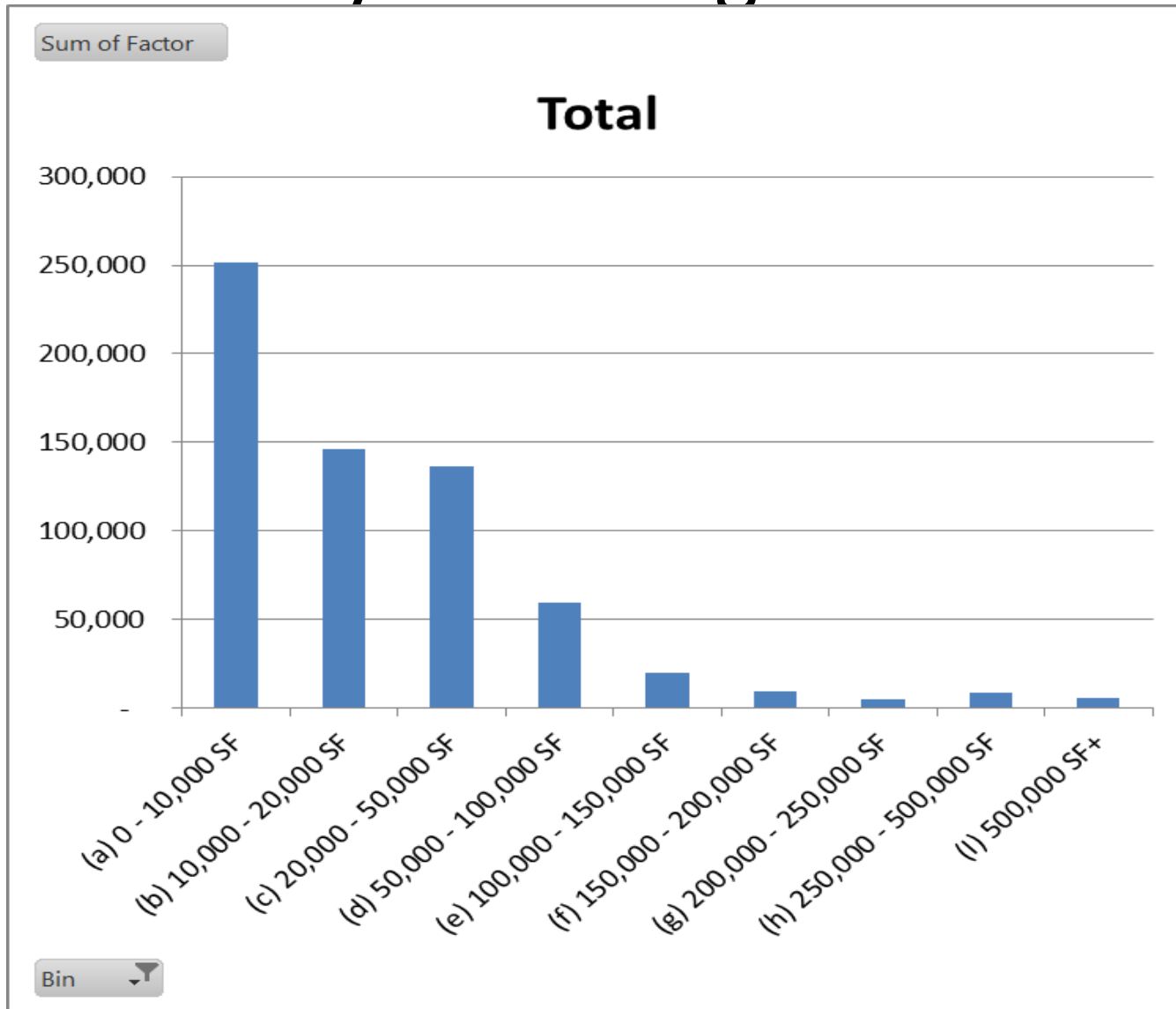
Specialized Industrial

- Data Storage Centers: Redundant and back up power, very dry facilities capable of carrying heavy floor loads, with lots of cooling capacity for data servers. Sometimes located in cooler climates with cheaper power.
- Bio-tech: Ultra clean facilities, could be dry or wet (with plumbing for chemical work) and have lots of air circulation and filtering.
- Cold storage: Food, wine, groceries, etc.

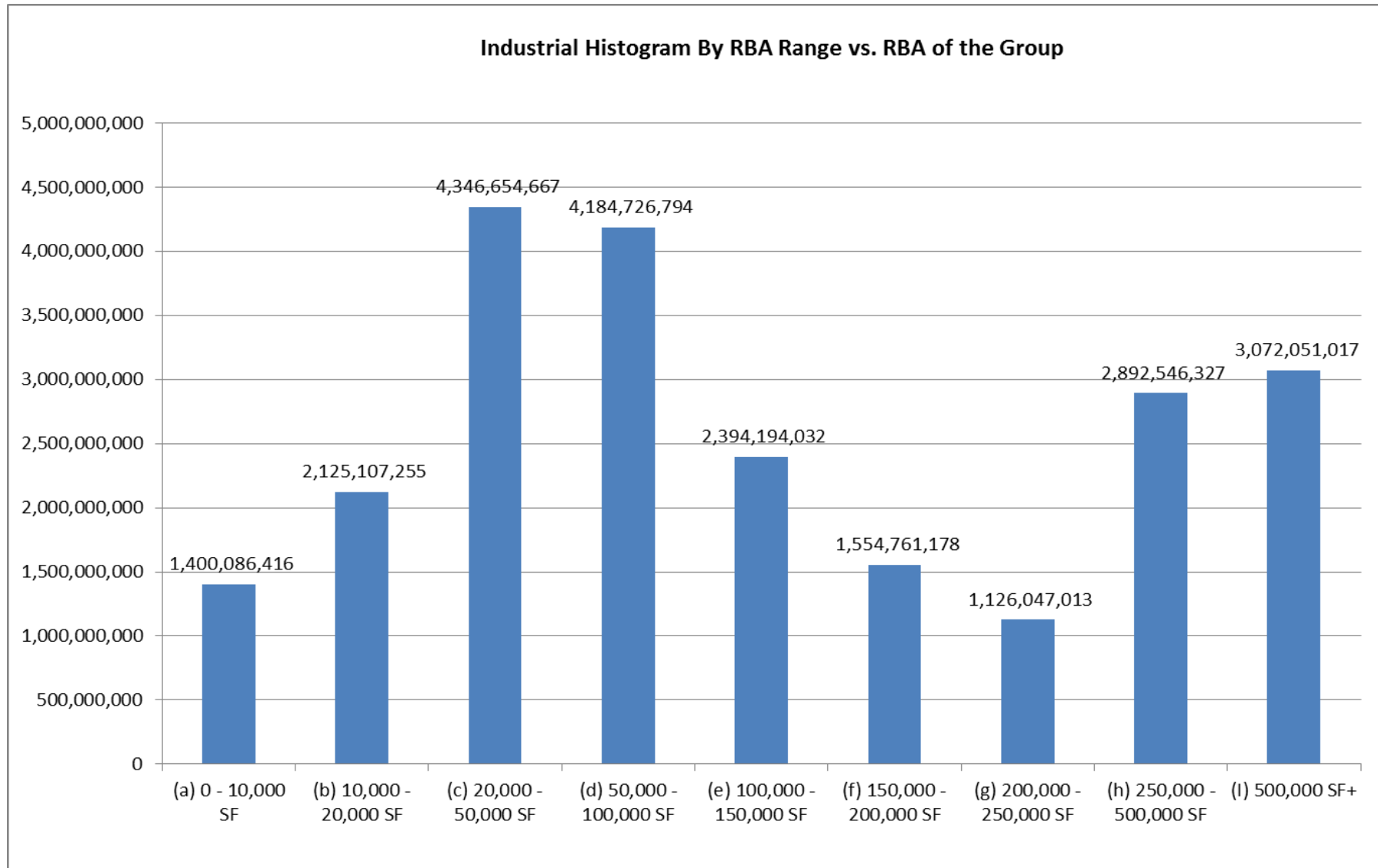
Industrial Sq Ft Per Capita



Distribution of Industrial Building Count By Size Range 2010 Data



Distribution of Industrial Building RBA by Size Range 2010 Data



Note importance of containers

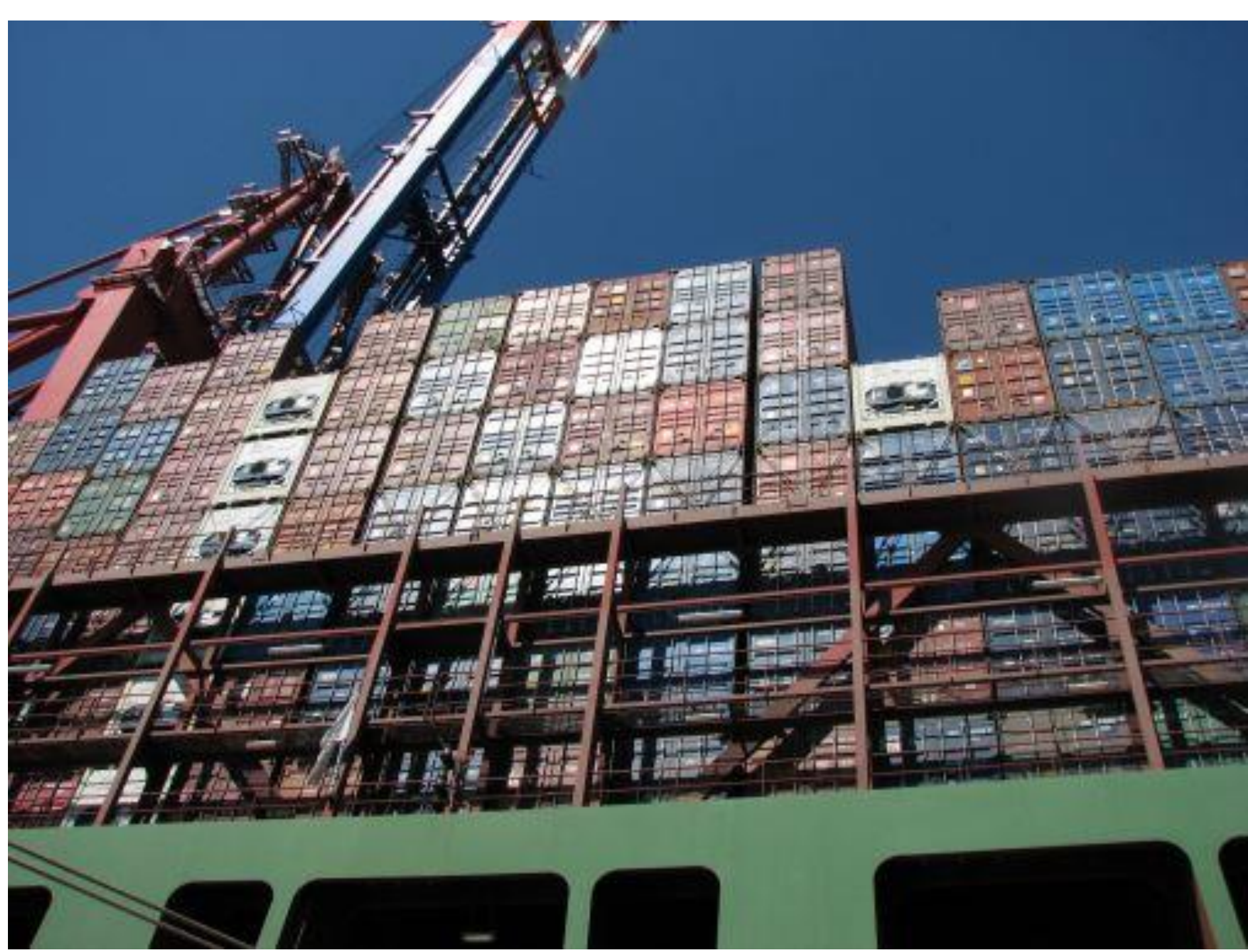
- Standardized as 20 feet or 40 feet long, 8 ' wide, height 8'6", or "high cubes" at 9'6" or 10' 6"



1 20 ft box 8'w &
8'6" h= 1 TEU or
ton equivalent unit
1 40 ft container
unit = 2 TEUs

40 ft units fit on
trucks

Can stack several
high and wide

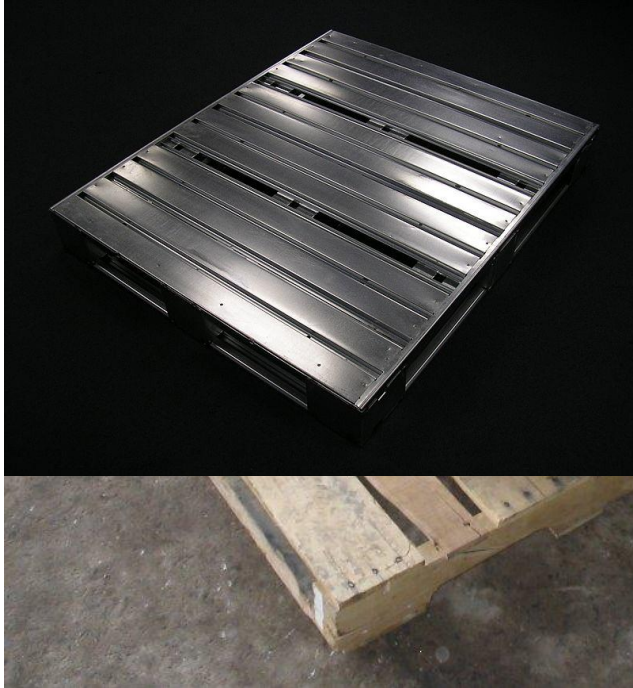


From ships to trucks or vice versa

- More on shipping later



Within containers we also use standardized racks and standardized pallets and loading dimensions



1016mm × 1219 mm	40 in × 48 in by 4 in h	3.7% (20 pallets in 40 ft ISO) is all the excess space in container	Used mostly in North America, can hold 2200 pounds each
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These are moved by forklifts, often operated by humans but.....

How do we reduce labor in a warehouse?

Driverless Forklift



Robotic Pallet Movers and Inventory Pickers

- http://www.liftruck.net/product_list.asp?Fkindno=F002310



Modern Bulk Distribution Warehouse



How do we move our freight?

- Why do we see so many warehouses near airports?

By tonnage within the country

- Trucks move 80% of the tonnage
- Rail moves 19% of the tonnage
- Air less than 1% (but much more of the value)

Traditional Distribution **Bulk**

Warehouse Attributes

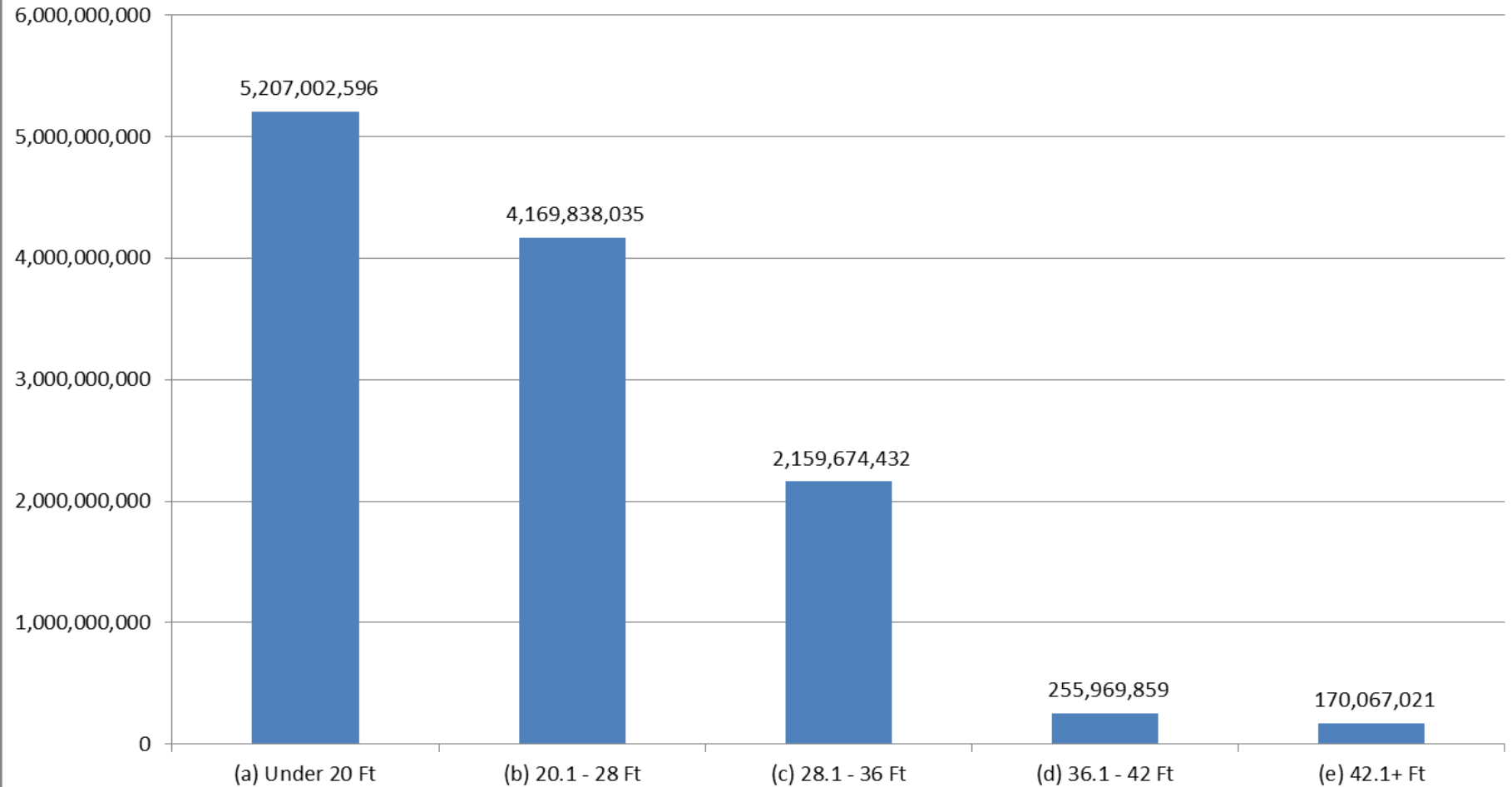
- **Multi-tenant**
- **High ceilings - 28' to 32' are typical some 40'**
- **Solar light or T8s Sky Lights in the most modern!**
- **Big fans, often Big Ass Fans**
- **ESFR (early suppression fast reaction) high pressure water sprinkler system**
- **hyperflat floors for automated forklift warehousing if ceilings exceed 36 feet.**
- **Lots of dock doors**
- **Cross docking**
- **RFID tags or Barcodes on all pallets or goods**
- **Very automated with robotics and low parking needs (2500 sq ft per worker)**
- **Reflective roofs some with PV cells becoming common**
- **Note: manufacturing on demand equals less warehouse space needed or will 3D printers change everything?**



Distribution of Industrial Ceiling Height

2010 Data

Industrial Histogram By Ceiling Height vs. RBA of the Group

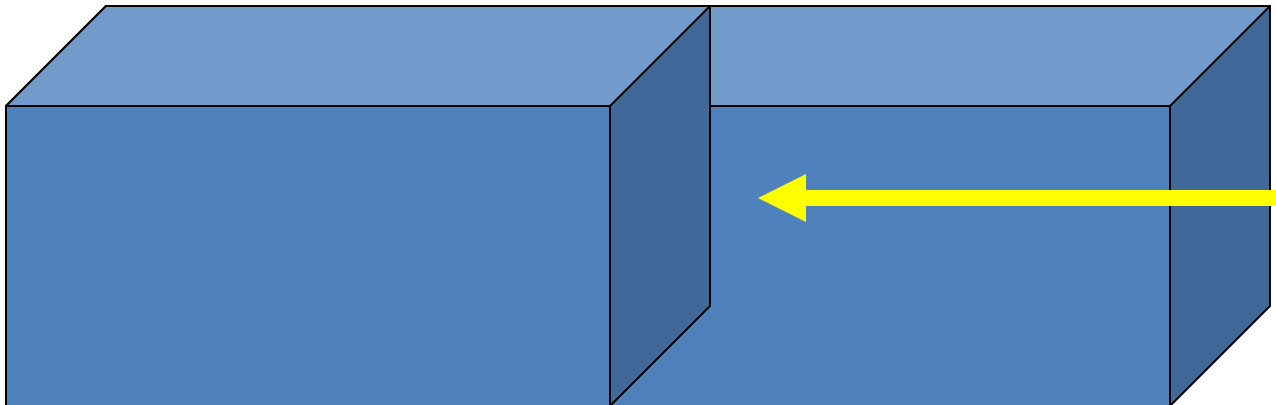


Warehouse Trends

- National trend is towards consolidation of warehouses into those that can serve markets in under one day with a larger variety of finished goods stock – via the Bulk Warehouse.

A reduction in inventory for “just in time” manufacturing” means less time in warehouses, more time relatively on trucks and less bulk space required.

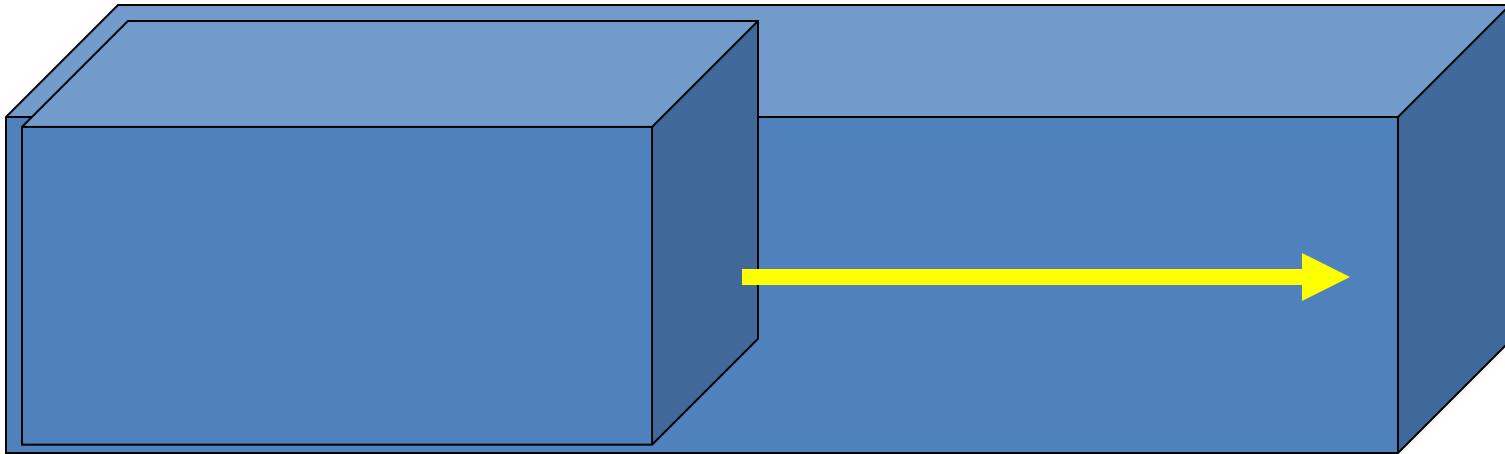
- More warehouses closer to customers allows fast service from vendors like Amazon.



But immediate gratification by consumers, who may pay an

extra shipping fee, means more local warehouses as does a “guaranteed in stock” approach.

And will “just in time” become “just in case”
if terrorism is a concern?



Small package handling

Fed X





FedEx
Ground

fedex.com
1.800.GoFedEx

FedEx
800.393.6349

69

69

70

71

72

73

74

E-Commerce Means a New Type of Warehouse

- **We will need more larger automated small package handling facilities.**
- **Labor intensive which means....?**

More parking required from 1/1000 or less to 2 or more



A Morning Call Investigation

Inside Amazon's Warehouse



Amazon fulfillment center

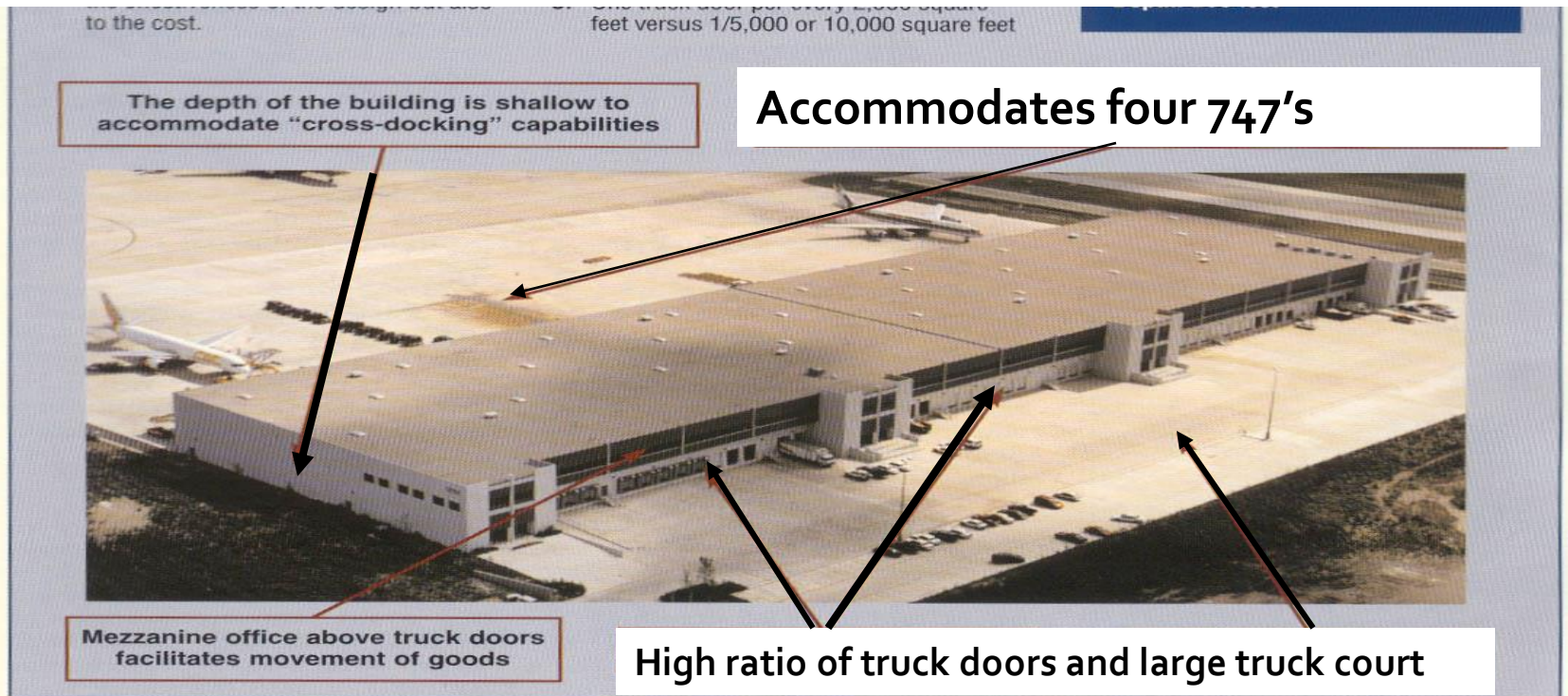


Airports are actually starting to carry more cargo, a small % by weight but 10%+ by value, much by Fed EX, UPS, Emery, DHL, Airborne Express and as backfill in the belly of passenger planes.

- **HTD facilities by AMB. HTD = High throughput Distribution. 250,000 to 500,000 sq ft near population centers or airports, 30 to 32' ceiling**

DFW Cargo Warehouse

AMB Property developed with Trammell Crow in 1998 for the tenant: Lufthansa Cargo at Dallas Fort Worth Airport. Building: 232,873 sq ft Clear Span 150 x 800 Ceiling ht = 38' One truck door per 2,900 sq ft versus 1 to 5000 or less with 20% office above truck doors 35" pavement depth on the 747 docking side vs 6" on the truck only side



What world event will affect shipping and transport paths and the demand for warehouse space?

Why Expand the Canal?

Overall strong growth over past few years

- Ports were big investment areas for private capital
- U.S.-Chinese trade transformed the game

LB bottleneck

Coastal Competition

- Suez Canal
- Intermodalism

West Coast Port Strike

Environmental Actions

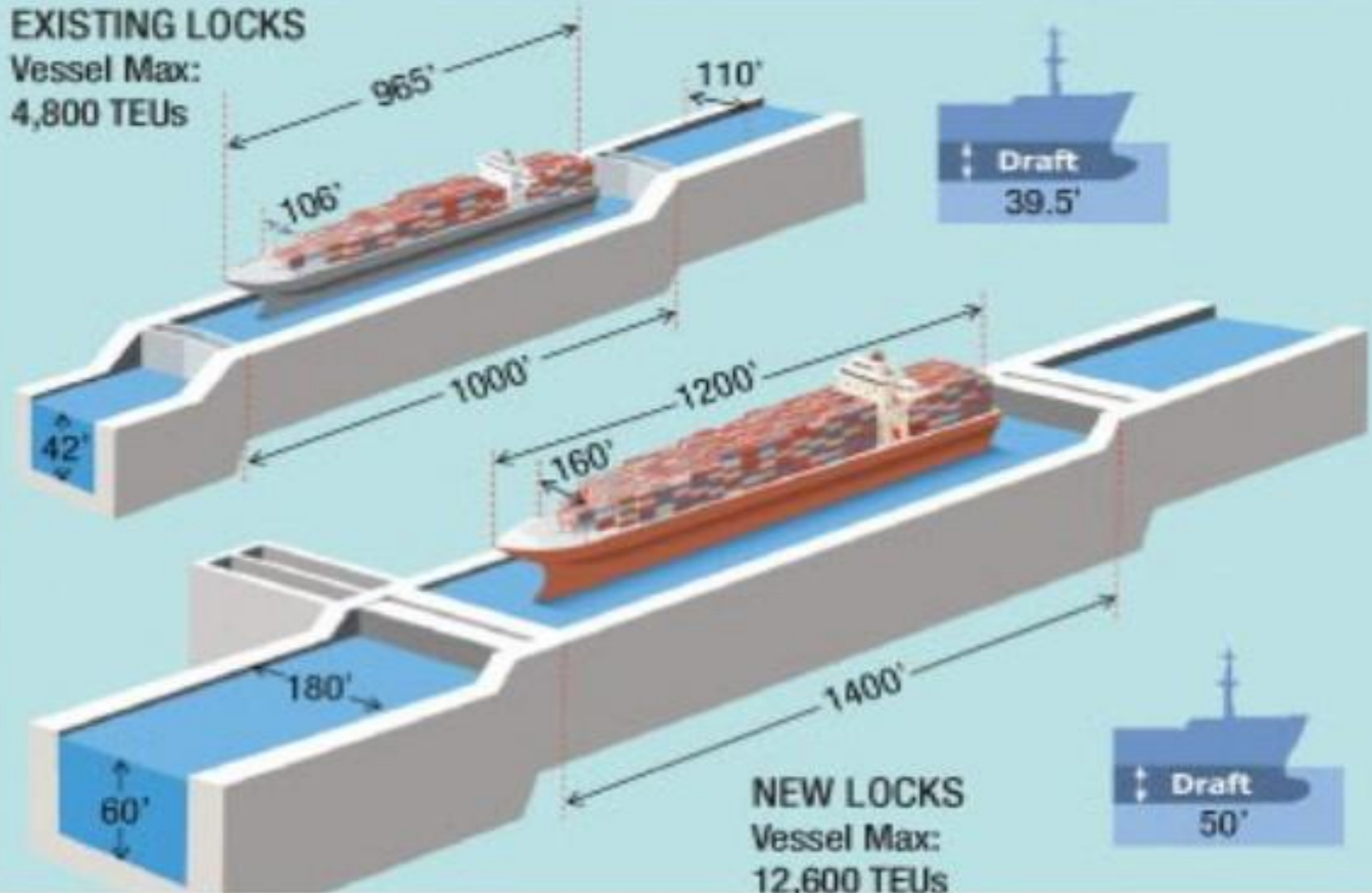
Vessel Economics



Impact of Panama Canal Expansion

EXISTING LOCKS

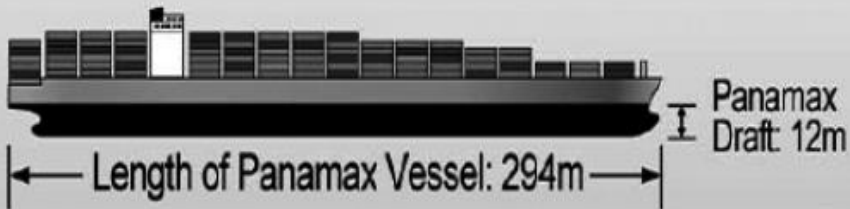
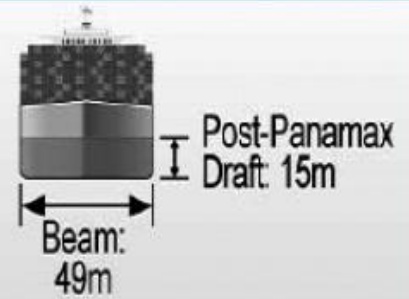
Vessel Max:
4,800 TEUs



NEW LOCKS

Vessel Max:
12,600 TEUs

Comparison between Panamax and Post-Panamax Container Vessels



	Panamax	Post-Panamax
Capacity:		
Containers(TEUs)	4,500	12,000
Dimensions:		
Beam	32m (106')	49m (160')
Length	294m (965')	366m (1,200')
Draft	12m (39.5')	15m (50')

Transport Costs = Function of ship's size and fees

Panamax: 3000 to 5,100 TEUs Length 292m, Beam 32.2 m Depth 13.3 m

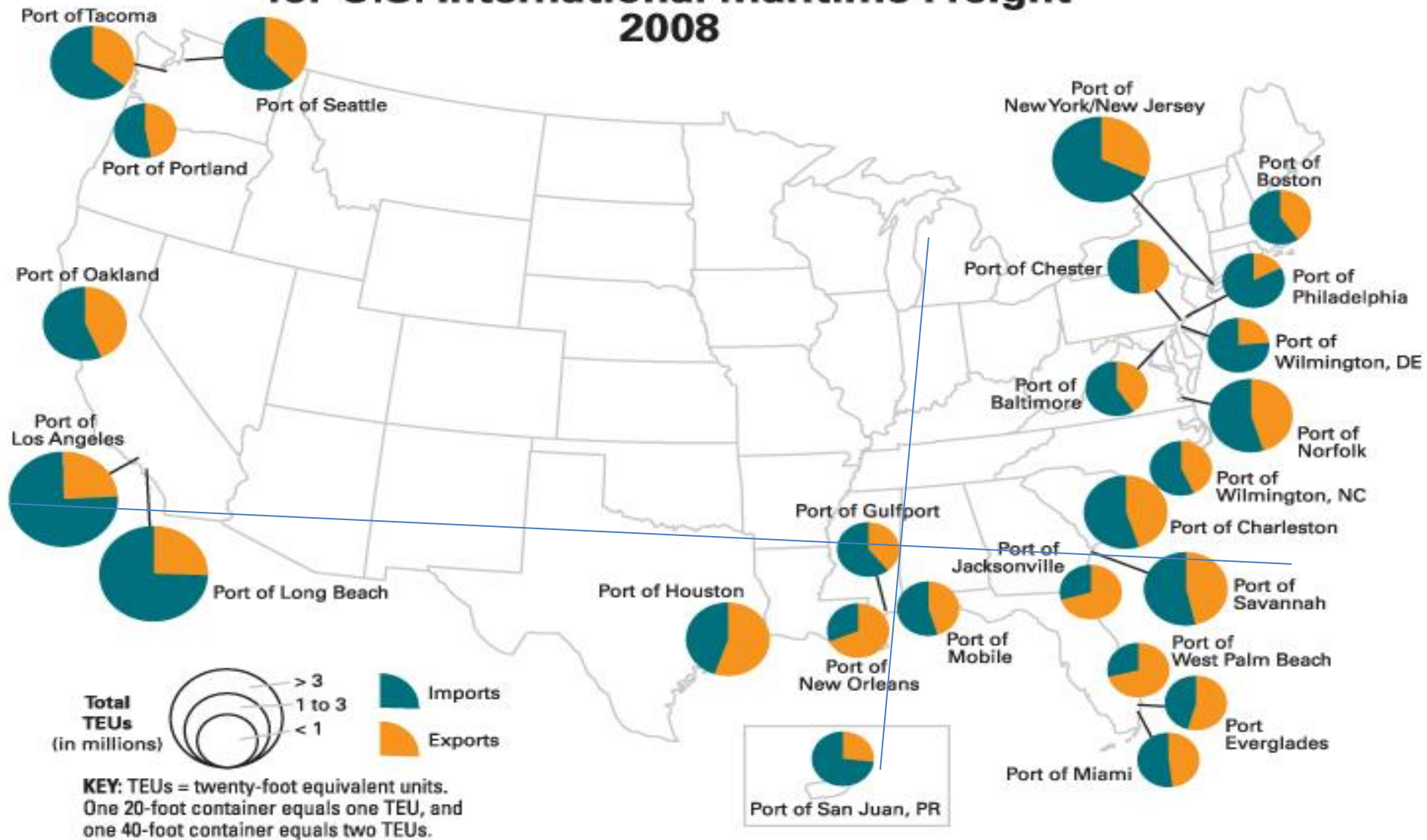
New Panamax: Beam 43M 10,000 to 14,000 TEUs

ULCV, Ultra large container ship: Length 307 m, beam width 56m, draft 15.5m capacity 15,000 TEUs

Shipping Cost to the US East Coast Estimates

<u>Panamax</u>	<u>Post Neo Panamax</u>
• Total vessel cost per year (labor, fuel, docking, M&R)	
• \$54,908,090	\$105,715,752
• Vessel utilization 80%	
• TEU moved each trip	
• 6,400	12,240
• Cost per TEU moved	
• \$1,481	\$953

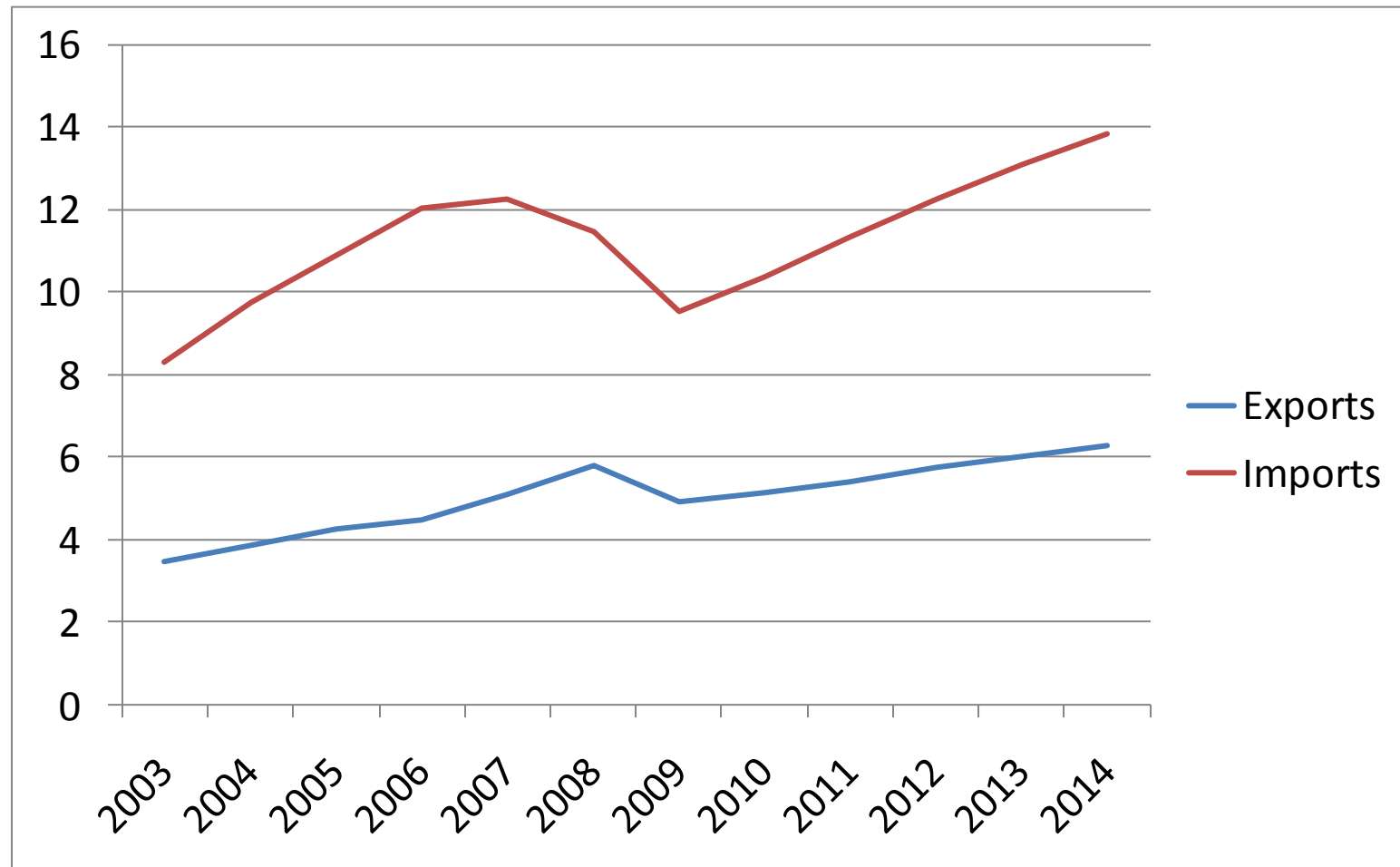
Top 25 Container Ports for U.S. International Maritime Freight 2008



NOTE: The data in this figure include only loaded containers in U.S. international maritime activity and cover U.S. imports, exports, and transshipments. Therefore, the trade levels will be greater than those reported from U.S. international trade statistics, which exclude transshipments. The data also exclude military shipments.

SOURCE: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, based on data from U.S. Department of Transportation, Maritime Administration, which are drawn from The Journal of Commerce, Port Import Export Reporting Service (PIERS), available at www.marad.dot.gov, as of March 30, 2009.

Forecast of U.S. Containerized Trade with Asia (millions of TEUs)



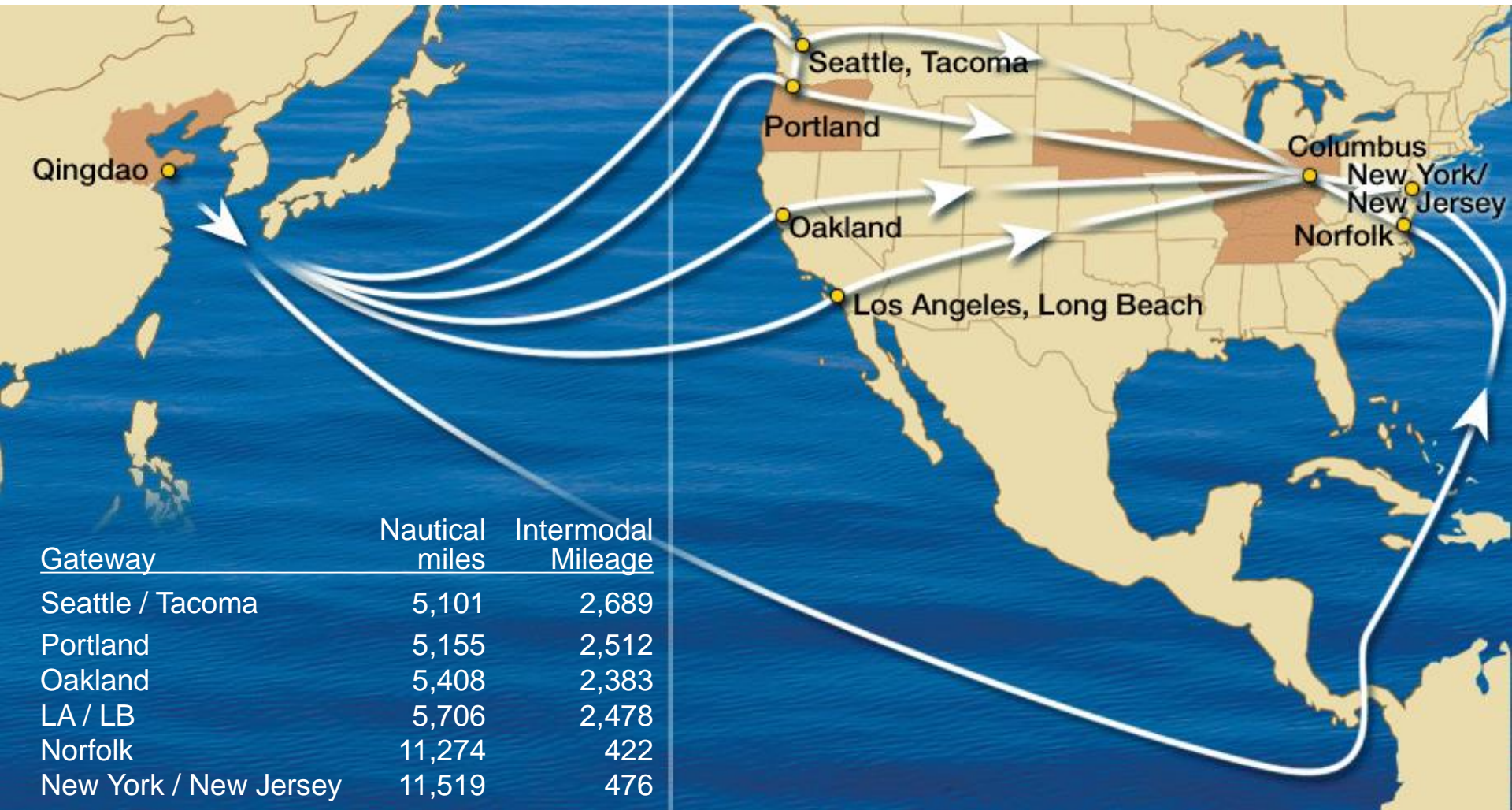
Source: IHSGlobal Insight

Ports in the east must be ready to receive these Cargos for
Panama Canal to reach its potential

- Required actions
 - Dredging
 - Railroad connections
 - Warehouses
 - Public infrastructure investments
 - What about the impact of global warming?

US West Vs East Coast Battle Lines Have Been Drawn

Qingdao to Columbus – Distance by Gateway



West Coast Carbon Emissions Advantages

A study was conducted in 2009 (by West Coast shippers) to analyze CO2 output of trade routes. Following is the findings of emissions between Shanghai and U.S. Midwest gateways using various ports.

Origin: Shanghai		CO2 emissions (metric tons/TEU)		
Discharge Port	Ship Size	Chicago	Columbus	Memphis
Seattle / Tacoma / Portland	6,500 TEU	1.579	1.664	1.715
Oakland	6,500 TEU	1.686	1.772	1.694
Los Angeles / Long Beach	6,500 TEU	1.672	1.757	1.672
New York via Panama Canal	4,500 TEU	2.520	2.468	2.574
Norfolk via Panama Canal	4,500 TEU	2.493	2.401	2.482
Savannah via Panama Canal	4,500 TEU	2.469	2.556	2.369
Houston via Panama Canal	4,500 TEU	2.470	2.510	2.323

- Transportation to mid-west locations via U.S. west coast has a smaller carbon footprint than other U.S. gateways.
- Even in 2014, when the Panama Canal expansion is complete and larger ships begin to transit the canal, West Coast ports will maintain their carbon emissions advantage.



West Coast Service Advantages (self claimed)

- Largest local market
- Largest intermodal market
- Most environmentally responsible
- No congestion (terminals, roadway, and rail)
- Largest pool of truck drivers and clean trucks that ensure reliability and compliance with BCO objectives and government requirements
- Largest national coverage
- Only ports capable of accommodating future large vessels
- Registered and well-trained longshore workforce with contract in place



Summary of Industrial Trends

- Warehouse demand is shifting but generally increasing in correlation with e-commerce growth.
- The Panama canal impact could be significant but in the long run global warming could impact shipping trends as well.
- Modern warehouses are of several forms, bulk, small package handling and regional warehouses to name a few.