

# TRANSPORTATION COST EQUIVALENCE LINE: EAST COAST VS. WEST COAST PORTS

GLOBAL RESEARCH AND CONSULTING

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# EXECUTIVE SUMMARY

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As the globalization and complexity of the supply chain advance, so must its optimization—particularly when it comes to companies’ real estate decisions.

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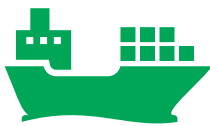
As transportation costs are among the most significant operational costs for a user, they offer tremendous opportunity for gaining savings and efficiency. Companies developing their supply chain strategies must determine the most effective way to move their freight through the transportation network.

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When shipping freight from Asia Pacific, the nation’s largest import region, cost efficiency is crucial. A cost equivalence line—representing equal pricing between shipping to the East Coast or Gulf Coast ports versus West Coast ports—can be generated by applying estimated shipper economics to each port of entry and logistics cost to each mode of transportation.

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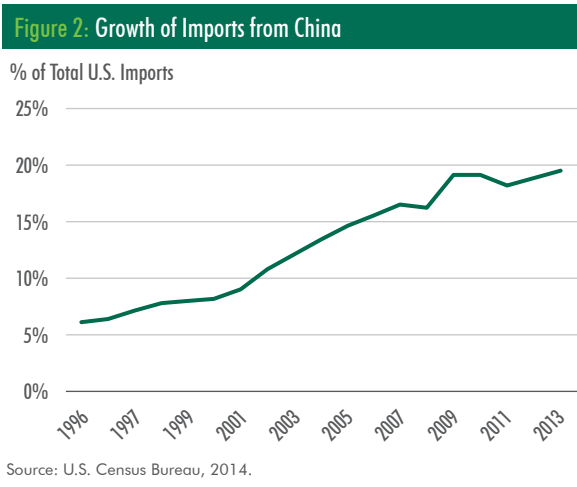
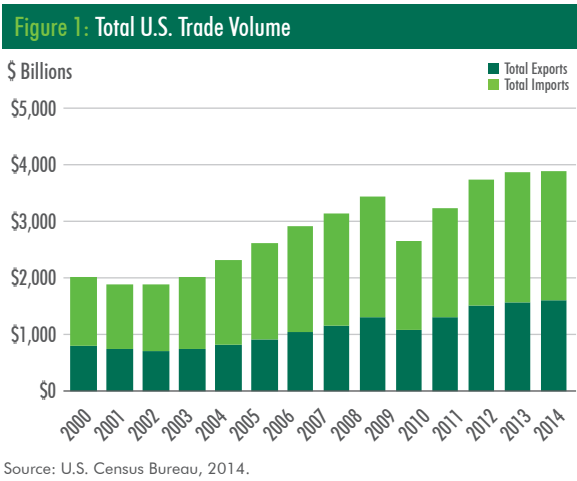
The expansion of the Panama Canal is not expected to have a major impact in the movement of freight across the U.S., as separate strategies are required for high-value, time-sensitive freight (quicker delivery) and for low-value, low-cost freight (cost-effective delivery).

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Distribution and fulfillment companies will continue to invest in densely populated markets in an effort to increase efficiencies and cost savings within their inbound and outbound requirements. Such markets will dominate industrial real estate activity in the coming years.

# GLOBALIZATION OF SUPPLY CHAIN AND GROWTH OF U.S. TRANSPORTATION NETWORK



**Figure 3: Transportation Network Length**

Highway	
Public Roads	4,077,756
Rail	
Class I Freight Railroad	95,387
Amtrak	21,225
Transit	
Commuter Rail	7,576
Heavy Rail	1,617
Light Rail	1,398
Water	
Navigatable Waterways	25,000

Source: U.S. Department of Transportation, 2011.

Supply chain dynamics experienced a fundamental shift in the late 1990s, largely driven by globalization in the manufacturing sector—specifically, manufacturing growth in China, the U.S.’s second-largest trading partner and its largest importer. Between 1995 and 2006, total U.S. imports from China grew from approximately \$45 billion to more than \$280 billion. In 2013, total imports from China were in excess of \$446 billion, representing nearly 20% of total U.S. imports. China also ranks third as a national market for U.S. exports, after Canada and Mexico. U.S. exports to mainland China and Hong Kong topped \$164 billion in 2013, accounting for 10% of total U.S. exports; this was an increase of 82% from 2009, representing the fastest growth among the U.S.’s top 10 export markets over that period. With the sustained emergence of globalization, increasing complexity and its rising impact on logistics costs makes the need for efficient and cost-effective logistics strategies one of the most important components of the supply chain.

The U.S. freight transportation system is a highly sophisticated and interconnected network of highways, waterways, airways and railroads that provides the nation with an efficient method of transporting goods. These networks play a significant role in providing the freight mobility that is needed to sustain economic vitality and to strengthen the global competitiveness of U.S. industries. According to the U.S. Department of Transportation, the transportation system connects an estimated 8 million businesses and 120 million households, moving approximately \$17 trillion in freight shipments within the U.S.

The health of the U.S. economy is highly dependent on a multi-modal transportation system that efficiently links businesses with consumers, suppliers and markets; and on its ability to connect U.S. consumers with agricultural, economic, logistics and manufacturing centers across the globe. The nation’s transportation infrastructure consists of more than 4 million miles of public highways and roads, over 120,000 miles of national, regional and local railroad networks, 25,000 miles of commercially navigable waterways and 5,200 public-use airports—over which trillions of dollars in freight value moves. Freight shipments will typically move by several modes, which often work as complements to each other in delivering a shipment to its final destination. With public roads accounting for the majority of the U.S.’s transportation infrastructure mileage, trucks move the greatest amount of freight on a tonnage basis.

As the U.S. population continues to expand, the U.S. transportation system will be required to handle more freight. The U.S. Department of Transportation estimates that, between 2010 and 2035, the U.S. transportation system will see a 30% increase in the tonnage it moves. By 2050, with an estimated 420 million people in the U.S., the increase is projected to be more than 35%.

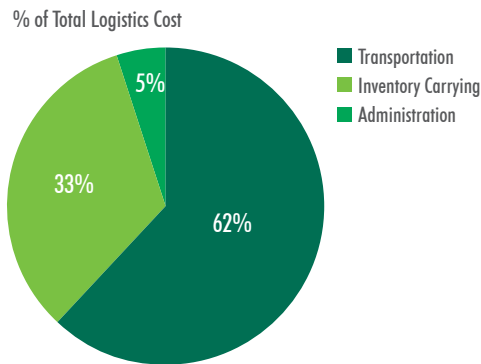
**Figure 4: More People, More Freight**



Source: U.S. Department of Transportation, 2011.

## TRANSPORTATION COST REMAINS THE PRIMARY DRIVER

**Figure 5: Logistics Cost Breakdown**



Source: Supply Chain Digest, 2013.

When designing and optimizing supply chain strategies, transportation costs remain the primary consideration for operators. It is estimated that transportation represents approximately 62% of total logistics costs—nearly double the second leading factor, inventory-carrying, estimated at 33%. The significant impact of transportation costs makes it crucial to optimize logistics strategies in order to maximize cost savings. Overall transportation costs can be broken down into several components, including but not limited to: port-to-port ocean costs, canal and port fees, port-to-truck/rail cost and intermodal transportation between locations.

In comparing routing options to the North American market, the cost structure associated with the transportation network is an important determinant. It is especially important for freight originating from the Asia Pacific region, as there are a few different options to choose from when servicing the East Coast and Central U.S. markets. A supplier could ship directly to a West Coast port such as Los Angeles, and then move the freight onward via the extensive network of railroads and roadways. Or it could ship freight to one of the Gulf Coast or East Coast ports by way of the Panama or Suez canals before transport to its final destination.

Choosing the best means of transport depends on analyzing many factors, including delivery time, flexibility, cost and volume. As users build out their supply chain strategies, they must identify the most effective way to transport their freight through the transportation network. Each mode of transportation offers unique advantages and challenges.

**Figure 6: Standard Modal Freight Unit Capacities**

Modal Freight Unit	Standard Cargo Capacity	Units Needed to Carry 1,750 Short Tons of Dry Cargo
Highway – Tractor/Trailer	25 Tons	70
Rail – Bulk Cargo	110 Tons	16
Barge – Dry Bulk	1,750 Tons	1

Source: U.S. Department of Transportation, 2007.

Road transport is suited for door-to-door transport and widespread distribution of goods in the 24-hour cycle. Its strengths include high flexibility in terms of transport jobs and changing plans, fewer idles and waiting periods and relatively low transport times for short and medium distances. Weaknesses include heavy reliance on fuel, limited transport volume, susceptibility to traffic jams and weather effects, legal restrictions and restrictions on the transport of hazardous goods and various ecological effects.<sup>1</sup>

1. DHL Transportation Comparison Report.

Rail transport is suited for bulk shipping of many types of goods over distances of 200 miles or more. Strengths include its higher speeds and economy over longer distances, low environmental impact and lack of exposure to road traffic and driving bans (Sundays and holidays, for example). Weaknesses include high fixed costs, rail-network and scheduling inflexibility, unsuitability for transport over short-distances or with frequent cargo changes and the monopolistic position of the main operator.<sup>2</sup>

Ocean shipping is suited for the intercontinental shipment of bulk cargo, bulky goods and dangerous materials such as oil and gas over large distances. Strengths include its economy, environmental friendliness, capacity and weather-independence. Its weaknesses include high capital costs, slow speed, ties to the water network and dependency on large container ships and specially equipped ports.<sup>3</sup>

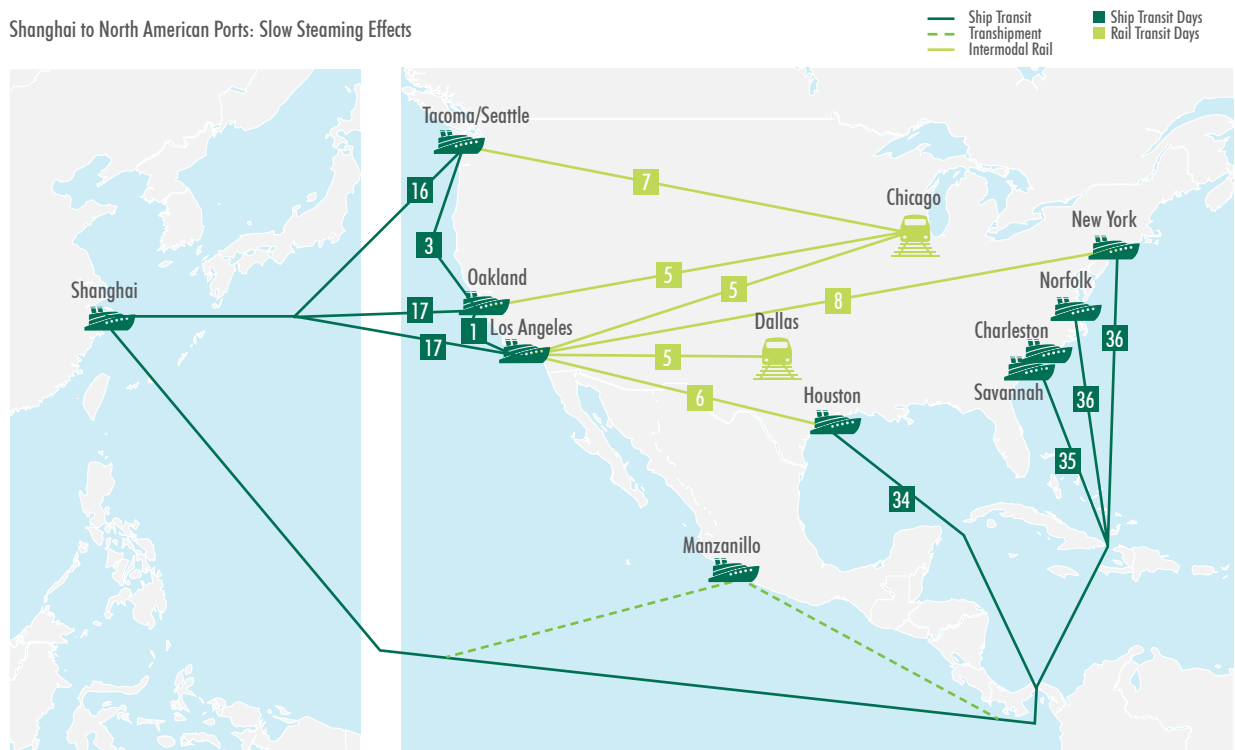
2 & 3. DHL Transportation Comparison Report.

## TRANSPORTATION COST EQUIVALENCE LINE

With the expansion of the Panama Canal, the current 4,000 to 5,000 20-foot-equivalent-unit (TEU) maximum cargo capacity of ships passing through the canal will increase to 8,000 to 13,000 TEUs; these larger, post-Panamax ships will allow for more cost-effective shipping to East Coast and Gulf Coast ports. According to a report from Maritime Strategies International (MSI), it is estimated that post-Panamax vessels will represent 62% of total container ship capacity by 2030. Although it remains uncertain how much cargo will be rerouted through the Panama Canal as a result of the expansion, shippers are working to optimize their supply chain networks. The biggest disadvantage of shipping through the Panama Canal is the slower delivery time compared to intermodal routes from West Coast ports as cargo can take up to 10 days longer to reach the East Coast.

Figure 7: Illustration of Transportation Flows from Shanghai to North American Ports

Shanghai to North American Ports: Slow Steaming Effects



Source: IMS Worldwide, 2013.

By applying estimated shipper economics to each port of entry and logistics cost to each mode of transportation, a transportation cost equivalence line can be generated. This line represents the cost indifference point—for cargo transported across the U.S., the point at which shipping to the East Coast or Gulf Coast ports costs the same as shipping to West Coast ports and then moving freight to its final destination via intermodal transportation. In other words, if the final destination of goods is west of the line, it becomes more cost effective to ship freight through West Coast ports and vice versa if the final destination is east of the line. Generally speaking, for Asia Pacific-shipped goods, the cost equivalence line is approximately 300 miles from the East Coast. The line is fairly fluid due to the impact of various transportation cost influencers, including bunker prices, fuel costs, the use of Panamax ships and canal toll rates. The line has not shifted much since 2004, however; it is both quicker and more cost-effective to ship freight through West Coast ports to most U.S. regions.

**Figure 8: Transportation Cost Equivalence Line**



Source: IMS Worldwide, 2013.

The larger cargo capacity of post-Panamax ships will lower the cost threshold associated with shipping containers through the Gulf Coast and East Coast ports, offering a lower cost per TEU. As a result, some analysts believe the location of the transportation cost equivalence line will shift with the expansion of the Panama Canal in late 2015. However, while the expansion may see the line shift a bit to the West, the impact is expected to be minimal as supply chain dynamics will remain constant. High-value, time-sensitive freight requires a different shipping strategy than low-value, low-cost freight. Among large shippers and logistics companies, this will continue to be the pervasive view and the primary factor influencing the movement of goods. Decisions on which coast to route through will depend largely on the types of goods being transported, regardless of transportation costs.

Additionally, because West Coast ports are the closest point of entry for freight arriving from Asia-Pacific, it is more cost-effective for many nationwide retailers to ship their entire inventory to their West

**“THE EXPANSION OF THE PANAMA CANAL IS NOT EXPECTED TO HAVE A SIGNIFICANT IMPACT ON LOGISTICS STRATEGIES AS DECISIONS ON WHICH COAST TO SHIP THROUGH WILL BE PRIMARILY BASED ON THE TYPES OF GOODS BEING TRANSPORTED AND EXISTING SUPPLY CHAIN FUNDAMENTALS.”**

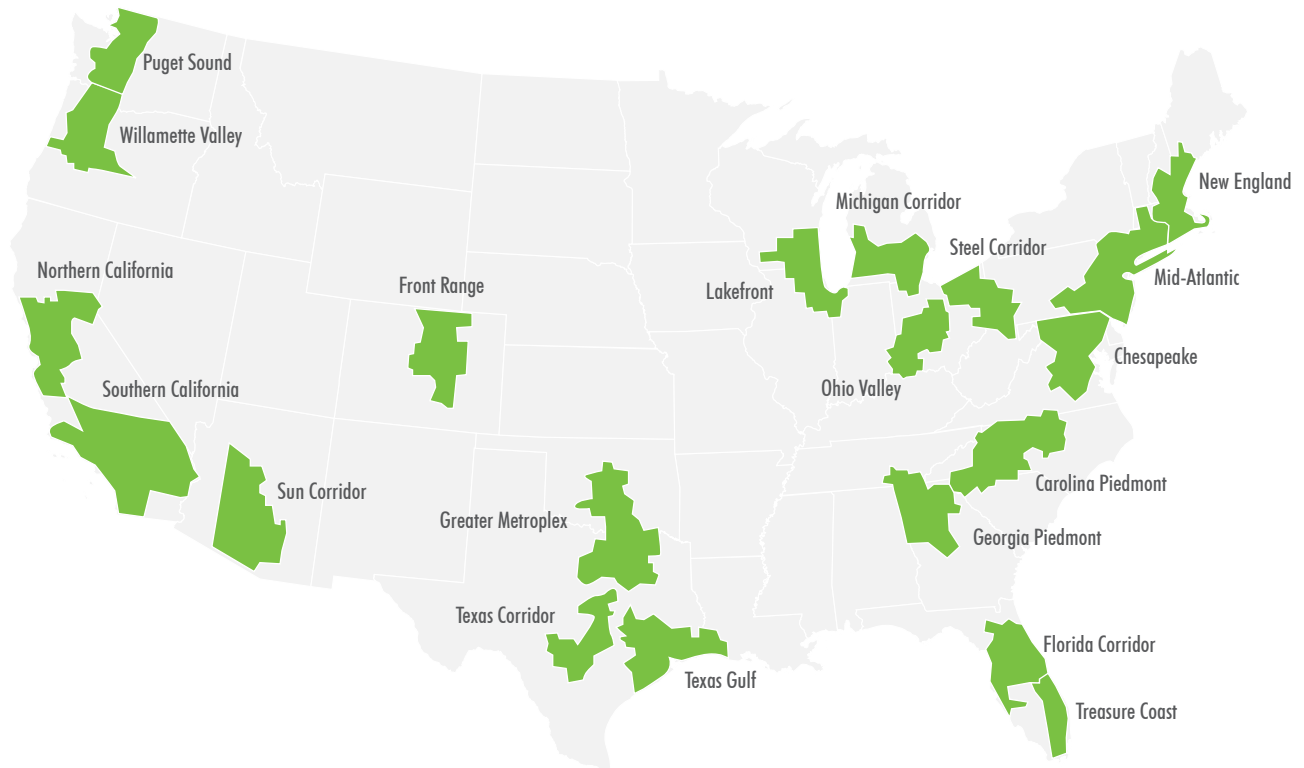
William Waxman  
Executive Vice President  
CBRE Global Port Logistics Group

Coast distribution centers before moving products east to their regional distribution centers. “With over 40% of America’s imports entering through the Ports of Los Angeles and Long Beach, Southern California distribution centers are well positioned to ensure timely access to merchandise. Further adding to the efficiencies, intermodal route service has evolved to a cost effective method for transporting to regional distribution centers on the east coast. Therefore, even with the widening of the Panama Canal, we believe the West Coast will continue to be a great solution for the majority of our customers who are importing from the Pacific Rim,” said Jeff Brown, Vice Chairman and President of NFI.

## POPULATION-DENSE MARKETS WILL LEAD THE WAY

Choosing the location of its regional distribution centers is one of the key decisions a business will make. Demographics will continue to be the most important factor in this choice, as they have been for many years. As the goal of the global supply chain is to deliver products to customers quickly and efficiently, population-dense markets will dominate industrial real estate activity in the coming years. Expansion within highly populated areas will afford companies greater flexibility and diversity in their supply chains.

**Figure 9: Metropolitan to Megapolitan: 60 Million New People in 20 U.S. Markets by 2040**



Source: Virginia Tech Metropolitan Institute, 2013.

Between 2005 and 2040, the U.S. population is expected to grow by 100 million people—60 million of which are expected to reside within 20 markets characterized as “megapolitans.” These megapolitan markets comprise cities and counties linked by synergies and connections such as shared transportation networks, labor markets and/or water supplies. The 20 megapolitan areas, which can be further combined into 10 clusters, are projected to house about two-thirds of the U.S. population by 2040. These areas will not only claim most new population and job growth, but they will also capture a large share of the total investment dollars spent on development and growth.

The impact of population shifts on supply chain networks in the coming years will be significant. With additional volume moving through these megapolitan regions, potentially resulting in increased congestion and loss of productivity, continued investment in transportation infrastructure is crucial. In order to capitalize on the

greater container volume that will soon traverse the canal, many seaports have recently invested millions in infrastructure, creating alternative transportation solutions including short-haul rail and barge systems to accommodate post-Panamax ships. Globally, supply chains will continue to strengthen, and population growth and increased urbanization will increase supply chain specialization.

## WHAT DOES THIS MEAN FOR OWNERS, OCCUPIERS, LOGISTICS AND SUPPLY CHAIN MANAGEMENT?

The expansion of the Panama Canal is not expected to have a major impact in the movement of freight across the U.S. for Asia sourced goods. The cost equivalence line will largely remain in place, approximately 300 miles from the East Coast. Many users already using diversified supply chain strategies will continue to make decisions based on the type of freight being transported. Separate strategies are required for high-value, time-sensitive freight (quicker delivery) and for low-value, low-cost freight (cost-effective delivery)—companies will continue to make decisions based on these differences.

It is incumbent on users to invest where the people are, and successful distribution and fulfillment companies will continue to invest in densely populated areas in an effort to increase efficiencies and costs savings within their inbound and outbound requirements. Curtis Spencer, President of IMS Worldwide, recommends, “before deciding on a supply chain strategy, a user should determine their optimal locations first—based on their outbound requirements (buyers, people and stores). Then they must place their fulfillment and distribution centers close to the transportation infrastructure based on their inbound requirements (cargo port, inland ports and rail network).” In order to successfully reach U.S. population clusters while connecting to the multi-modal transportation system, finding the most effective distribution center location is crucial.

**Figure 10: Trade Flows by U.S. Ports, \$ Billions**

Rank	Market	Total Trade		Exports		Imports	
		Volume	Y-o-Y Chg.	Volume	Y-o-Y Chg.	Volume	Y-o-Y Chg.
1	Los Angeles	\$414.80	2.68%	\$126.96	4.70%	\$287.84	1.81%
2	New York City	\$378.95	-0.77%	\$155.12	-2.05%	\$223.83	0.13%
3	Laredo	\$253.15	5.87%	\$112.42	6.80%	\$140.74	5.14%
4	Houston	\$251.98	-8.02%	\$129.09	1.79%	\$122.89	-16.48%
5	Detroit	\$243.83	-3.62%	\$121.47	-5.40%	\$122.36	-1.80%
6	New Orleans	\$234.60	-3.76%	\$93.99	1.09%	\$140.62	-6.75%
7	Chicago	\$192.53	2.70%	\$40.09	5.48%	\$152.44	2.00%
8	Seattle	\$152.98	10.30%	\$90.34	19.03%	\$62.64	-0.26%
9	Atlanta/Savannah	\$129.54	-2.13%	\$47.65	-7.92%	\$81.88	1.59%
10	San Francisco	\$123.90	3.89%	\$54.23	7.28%	\$69.68	1.39%
11	Cleveland	\$122.46	3.83%	\$33.06	4.73%	\$89.39	3.49%
12	Miami	\$120.49	-3.30%	\$67.93	-7.17%	\$52.56	2.21%
13	El Paso	\$91.37	1.18%	\$39.70	3.66%	\$51.67	-0.65%
14	Buffalo	\$86.63	-3.85%	\$44.19	-7.62%	\$42.44	0.40%
15	Philadelphia	\$76.52	-2.03%	\$17.61	4.52%	\$58.90	-3.83%
16	Dallas/Fort Worth	\$72.32	6.03%	\$18.79	-2.48%	\$53.52	9.38%
17	Charleston	\$66.01	2.36%	\$25.75	3.91%	\$40.25	1.40%
18	Norfolk	\$59.13	4.68%	\$29.79	7.61%	\$29.34	1.87%
19	San Diego	\$58.91	4.26%	\$20.63	3.69%	\$38.28	4.58%
20	Baltimore	\$54.14	-2.70%	\$21.12	-3.99%	\$33.02	-1.86%
<b>U.S. Total Trade</b>		<b>\$3.85 Trillion</b>	<b>0.65%</b>	<b>\$1.58 Trillion</b>	<b>2.14%</b>	<b>\$2.27 Trillion</b>	<b>-0.37%</b>

Source: WorldCity & US Trade Numbers, 2014.



## CONTACTS

### Scott Marshall

Executive Managing Director  
Industrial Services, Americas  
CBRE

**t:** +1 630 573 7026

**e:** [scott.marshall@cbre.com](mailto:scott.marshall@cbre.com)

Follow Scott on Twitter:

[@S\\_R\\_Marshall](https://twitter.com/S_R_Marshall)

### Kurt Strasmann

Senior Managing Director  
Port Logistics Group, U.S.  
CBRE

**t:** +1 714 371 9320

**e:** [kurt.strasmann@cbre.com](mailto:kurt.strasmann@cbre.com)

### Gary Baragona

Director, Research and Analysis  
Global Research and Consulting  
CBRE

**t:** +1 213 613 3130

**e:** [gary.baragona@cbre.com](mailto:gary.baragona@cbre.com)

### David Egan

Director, Research and Analysis  
Global Research and Consulting  
CBRE

**t:** +1 312 935 1892

**e:** [david.egan@cbre.com](mailto:david.egan@cbre.com)

### Jared Sullivan

Senior Economist  
Econometric Advisors  
CBRE

**t:** +1 617 912 5243

**e:** [jared.sullivan@cbre.com](mailto:jared.sullivan@cbre.com)

### Matthew Ciampa

Economist  
Econometric Advisors  
CBRE

**t:** +1 617 912 5265

**e:** [matthew.ciampa@cbre.com](mailto:matthew.ciampa@cbre.com)

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