



# Global and Regional Infrastructure, Logistics Costs, and Third-Party Logistics Market Trends and Analysis

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## **ABOUT ARMSTRONG & ASSOCIATES, INC.**

Armstrong & Associates, Inc. (A&A) was established in 1980 to meet the needs of a newly deregulated domestic transportation market. Since then, through its leading Third-Party Logistics (3PL) market research and history of helping companies outsource logistics functions, A&A has become an internationally recognized key resource for 3PL market information and consulting.

A&A's mission is to have leading proprietary supply chain knowledge and market research not available anywhere else. As proof of our continued work in supporting our mission, A&A's 3PL market research is frequently cited in media articles, publications, and securities filings by publicly traded 3PLs. In addition, A&A's email newsletter currently has over 42,000 subscribers globally.

A&A's market research complements its consulting activities by providing continually updated data for analysis. Based upon its unsurpassed knowledge of the 3PL market and the operations of leading 3PLs, A&A has provided strategic planning consulting services to over 30 3PLs, supported 17 closed investment transactions, and provided advice to numerous companies looking to benchmark existing 3PL operations or outsource logistics functions.

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# Global and Regional Infrastructure

Supply chain management capabilities vary greatly between countries. Differences fall into two major categories: 1.) information flow and controls and 2.) physical limitations. Advanced economies generally have better highways, ports and railways, as well as better communication systems and technology to leverage. Political changes can especially complicate the latter, but normally are limited to emerging market/developing economy countries. As a general rule, logistics costs as a percent of gross domestic product (GDP) are lower in advanced economies and higher in emerging market/developing countries. Table 1 presents basic infrastructure results for 15 countries.

**Table 1. Global Transportation Infrastructure**

Country	Ranked by 2016 GDP Size* (US\$ Billions)	Roadways Rank	Roadways km	Railways Rank	Railways km	Waterways Rank	Waterways km	Pipelines Gas km	2016 3PL Revenue (US\$ Billions)
United States	18,569.1	1	6,586,610	1	293,564	5	41,009	1,984,321	166.8
China	11,218.3	3	4,577,300	2	124,000	1	110,000	70,000	166.7
Japan	4,938.6	6	1,218,772	11	27,311	44	1,770	4,456	44.1
Germany	3,466.6	12	645,000	6	43,468	18	7,467	26,985	32.1
United Kingdom	2,878.2	18	381,126	16	18,337	31	1,200	28,813	21.2

Sources:

International Monetary Fund <http://www.imf.org/external/pubs/ft/weo/2017/01/weodata/index.aspx>, April, 2017

Central Intelligence Agency <https://www.cia.gov/library/publications/resources/the-world-factbook/>, August, 2017

Not surprisingly, the countries with the largest economies dominate infrastructure statistics. The United States has the most kilometers of highways, railways and pipelines. China, with the second largest economy, is third in the amount of highways and second in railways. India is second in total kilometers of roadways. However, just over 60% of India's roadways are paved and it has very few modern four-lane highways. Even some of these, like Highway 9 from Mumbai to Pune, have uneven surfaces and transportation obstacles. Australia, India, and Brazil have railway systems with different gauges making railcar and locomotive interchanges impossible. As a result, the rail and intermodal abilities are compromised.

Pipelines are the most inexpensive and environmentally friendly methods of transportation. The U.S. and Canada have the largest amounts.

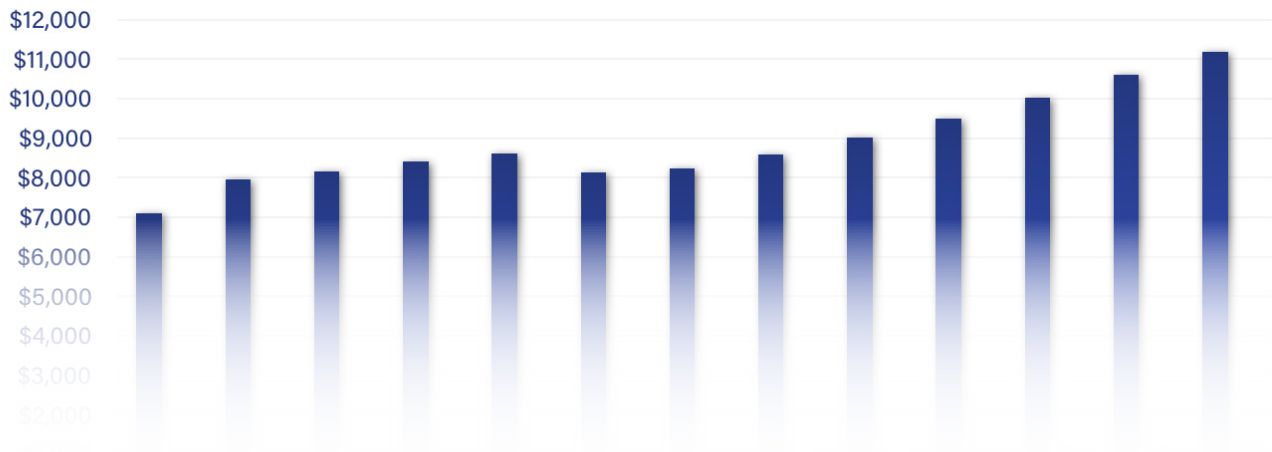
Some small countries/regions like Singapore, Hong Kong and the Netherlands have high-quality infrastructure for all transportation modes. They are also key crossroad locations for global trade, transportation and storage.

# Global Logistics Costs and Third-Party Logistics Revenues

Armstrong and Associates, Inc. (A&A) has developed logistics cost and third-party logistics revenue estimates with projections through fiscal year 2022. Our overall and regional estimates are based upon individual estimates developed for 190 countries. The complete Global Logistics Costs and Third-Party Logistics Revenues tables are in Appendix A.

Global logistics costs have increased from \$71 trillion in 2010 to \$8.2 trillion in 2016.

**Figure 2. Global Logistics Costs and Third-Party Logistics Revenues (US\$ Billions)\***



\*Based on current U.S. dollars.

The global logistics cost decline in the chart above from 2014 to 2015 is primarily due to the U.S. dollar strengthening against other currencies and declining fuel costs.

Globally, modern industrially developed and post-industrial countries have the lowest relative logistics costs as a percent of GDP. For example, in 2016, North America's logistics cost as a percent of GDP was 8.6% and Europe's was 9.5%. Asia Pacific's estimate was 12.7% and South America's was 12.0%. This is a function of logistics (road/rail/port) infrastructure, the lifecycle deployment of leading logistics practices, and influence of ongoing process improvements including eliminating unnecessary governmental, bureaucratic obstacles.

**Table 3. Select 3PL Acquisitions (US\$ Millions)**

Acquirer	Target Company	Acquisition Date	Purchase Price	Target Company Yearly Revenue	Target Company EBIT or EBITDA	EBIT* or EBITDA** Multiplier
C.H. Robinson Worldwide	American Backhaulers	12/1999	100 cash/ 36 stock	280	13.0	10.5*
Exel	Tibbett & Britten	12/2004	598	2,600	87.9	6.8**
Welsch, Carson, Anderson & Stowe	Ozburn-Hessey Logistics	8/17/05	396	302	43.0	9.2**
Deutsche Bahn	BAX Global	1/31/06	1,210	2,734	113.0	10.7*
Ozburn-Hessey Logistics	Barthco International	7/7/06	90	120	10.0	9.0*
Oak Hill Capital	Jacobson Companies	6/1/07	500	375	45.0	11.0**
Apollo Management/CEVA	EGL	7/2007	2,200	3,200	152.0	14.5**
SNCF	Geodis	7/1/08	1,735	7,043	181.0	9.6*
Toll Holdings	Express Logistics Group	10/23/09	45	113	5.6	8.0*
Toll Holdings	Summit Logistics International	2/2/10	70.3	261	7.6	9.3**
GENCO Distribution System	ATC Technology	7/2010	513	476	77.7	6.6**
Ryder	Total Logistic Control	12/31/10	200	250	36.0	7.0**
Norbert Dentressangle	TDG	3/2011	320	1,100	55.0	5.8**
Hub Group	Exel Transportation Services/Mode Transportation	4/4/11	83	717	4.0	20.8*

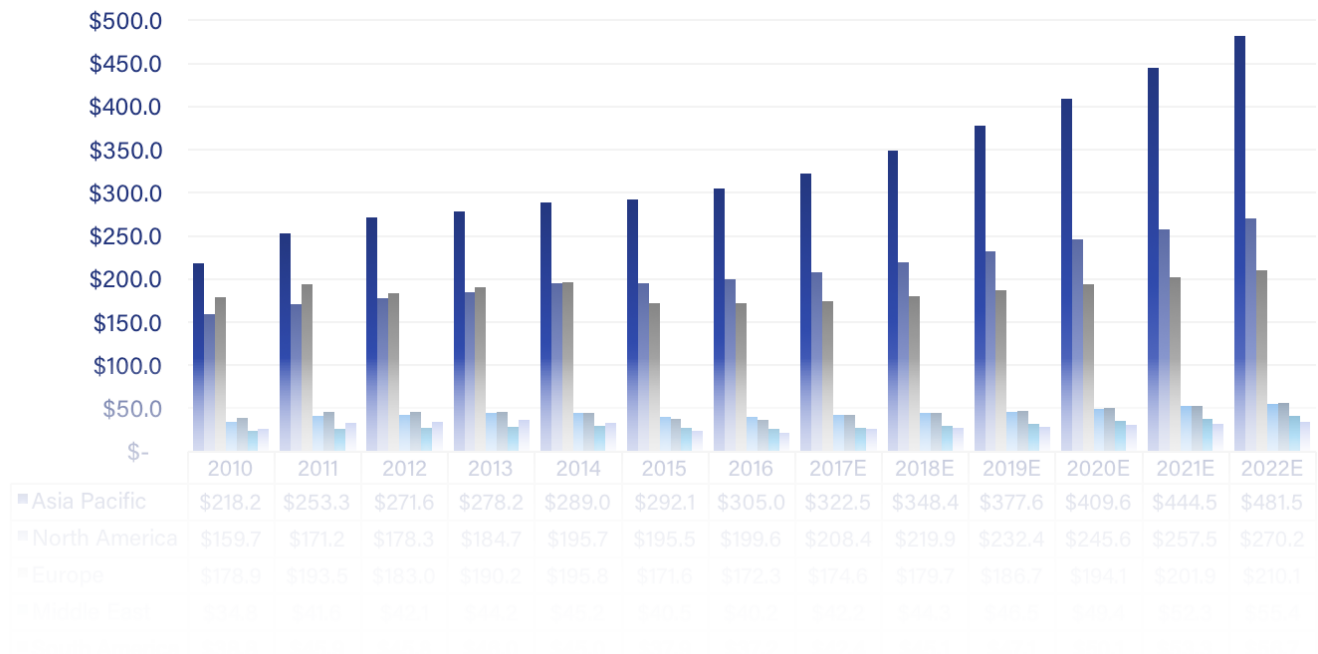
Sources: Primary, Company Information; Secondary, Armstrong & Associates, Inc. Estimates

International transportation management (freight forwarding and non-vessel operating common carrier (NVOCC)) and value-added warehousing and distribution are the key components of global third-party logistics.

International transportation management (ITM) 3PLs have a core competency in freight forwarding and often offer a host of additional value-added services. They traditionally act as intermediaries arranging for international and related domestic transportation between their customers and transportation providers. ITM 3PLs arrange and oversee all aspects of the transportation of products and materials, from origin to destination, by ground, ocean, air, and rail. An ITM 3PL will typically arrange to pick up goods from a shipper, consolidate shipments, procure transportation, and provide ancillary value-added services including preparation and submission of documentation, customs and other clearance processes, and often the warehousing and distribution of shipments. In addition, they will have systems for tracking and tracing shipments and automating processes with customs officials. Typically, ITM operations are non-asset based.

# Major Region 3PL Market Growth Trends

**Figure 12. 3PL Revenues by Major Geographic Region (US\$ Billions)**



In 2016, the Asia Pacific 3PL market, at \$305 billion, was 53% larger than the North American 3PL market. We estimate that it will surpass \$480 billion in 2022. When we look at regions for future 3PL market growth through 2022, the chart above highlights the Asia Pacific with a projected above-average compound annual growth rate (CAGR) of 6.8% from 2010 through 2022E.



# Major Players in Third-Party Logistics

**Table 6.** Top 50 Global 3PLs Ranked by 2016 Gross Logistics Revenue (US\$ Millions)\*

Rank	Provider	Country Headquarters	Gross Revenue
1	DHL Supply Chain & Global Forwarding	Germany	26,105
2	Kuehne + Nagel	Switzerland	20,294
3	Nippon Express	Japan	16,976
4	DB Schenker	Germany	16,746
5	C.H. Robinson	United States	13,144
6	DSV	Denmark	10,073
7	XPO Logistics	United States	8,638
8	Sinotrans	China	7,046
9	GEODIS	France	6,830
10	UPS Supply Chain Solutions	United States	6,793
11	CEVA Logistics	Netherlands	6,646
12	DACHSER	Germany	6,320
13	Blatch Transport System	USA	6,273

\*Revenues are company reported or Armstrong & Associates, Inc. estimates and have been converted to US\$ using the average annual exchange rate in order to make non-currency related growth comparisons.

**Table 7.** Top 25 Global Freight Forwarders Ranked by 2016 Gross Logistics Revenue and Forwarding Volumes, (US\$ Millions)\*

Rank	Provider	Gross Revenue	Ocean TEUs	Air Metric Tons	A&A Provider Information and Commentary
1	<b>DHL Supply Chain &amp; Global Forwarding</b>	26,105	3,059,000	2,081,000	DHL Supply Chain & Global Forwarding is the world's largest 3PL and contract logistician. Revenues for DHL Supply Chain North America (formerly Exel) are \$4.2 billion with 673 locations and 119 million square feet of space. DHL Global Forwarding (DGF) maintains more than 31 global carrier partners with contracts on a multitude of trade lanes and more than 330 gateway facilities. Its annual volume is 3 million TEUs (20' Container/Trailer Equivalent Units) and its LCL (Less Than Container Load) is 2 million cubic meters. There are more than 45,000 weekly point pairs for LCL globally. DGF handles 2 million shipments annually. DHL's scope allows its customers to more easily adjust vendor supply chains.
					Kuehne + Nagel is one of the world's leading logistics companies providing services at more than 4,300 terminals in over 100 countries. It has strong market positions in the

\*Revenues and freight forwarding volumes are company reported or Armstrong & Associates, Inc. estimates and have been converted to US\$ using the average annual exchange rate in order to make non-currency related growth comparisons. Freight forwarders are ranked using a combined overall average based on their individual rankings for gross revenue, ocean TEUs and air metric tons.

**Table 12. 2016-2017 Global Third-Party Logistics Market and Segment Revenues by Country/Region (US\$ Billions)**

Country/Region	2016					2017				
	2016 Logistics Cost	2016 3PL Revenue	2016 ITM Revenue	2016 VAWD Revenue	2016 TM Revenue	2017E Logistics Cost	2017E 3PL Revenue	2017E ITM Revenue	2017E VAWD Revenue	2017E TM Revenue
Algeria	26.5	2.0	0.6	0.5	0.9	28.7	2.2	0.6	0.6	1.0
Egypt	49.2	4.0	1.2	1.0	1.8	30.0	2.5	0.7	0.6	1.2
Morocco	15.5	1.3	0.4	0.3	0.6	15.8	1.3	0.4	0.3	0.6
Nigeria	65.4	4.6	1.4	1.2	2.0	64.5	4.6	1.3	1.2	2.1
South Africa	32.1	3.2	0.9	0.8	1.5	34.6	3.5	1.0	0.9	1.6
Sudan	16.5	1.2	0.4	0.3	0.5	20.3	1.5	0.4	0.4	0.7
Africa-Others	137.9	9.9	2.5	2.3	5.1	151.8	11.3	3.1	2.9	5.3
<b>Africa Total</b>	<b>343.1</b>	<b>26.2</b>	<b>7.4</b>	<b>6.4</b>	<b>12.4</b>	<b>345.7</b>	<b>26.9</b>	<b>7.5</b>	<b>6.9</b>	<b>12.5</b>
Australia	108.3	11.0	3.2	2.8	4.9	116.9	12.0	3.4	3.0	5.5
Bangladesh	35.6	2.8	0.8	0.7	1.3	38.8	3.1	0.9	0.8	1.4
China	1,626.7	166.7	49.2	42.2	73.9	1,710.3	177.0	50.4	44.8	80.2
Hong Kong	27.2	3.0	0.9	0.8	1.3	28.2	3.2	0.9	0.8	1.5
India	293.1	20.5	6.0	5.2	9.1	318.8	22.6	6.4	5.7	10.3
Indonesia	223.8	16.3	4.8	4.1	7.3	234.7	17.4	5.0	4.4	7.8
Japan	419.8	44.1	13.0	11.2	19.5	411.5	43.6	12.4	11.0	19.8
Macao SAR	4.4	0.4	0.1	0.1	0.2	4.6	0.5	0.1	0.1	0.3
Malaysia	38.5	2.7	0.8	0.7	1.2	40.3	2.9	0.8	0.7	1.3