The Transportation Challenge

Moving the U.S. Economy Forward

Appendix C International Transportation Comparisons

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C. International Transportation Comparisons

C.1 Introduction

Over the last decade or so, the globalization of commerce and cultures has made the transportation industry, both freight and passenger, pivotal to most countries' economic growth—so much so that it has become respectable conversation in the mainstream of business and society. When viewed in conjunction with the value-added services that are needed to transport people and goods, the transportation sector generates $3.5 trillion of revenue per year.[101] The United States accounts for about 25% of that, or U.S. $900 billion,[102] but its dominance is fading. While U.S. economic growth hovers between 2% and 4% per year, China is galloping forward at 8% to 12% per year, and India, Korea, and other developing economies are not far behind. China will account for more of world consumption than the United States by 2009, and is producing an increasing amount of the world's production each year, while the U.S. share is decreasing. The rapid growth of China and other Asian countries, as well as burgeoning population and economies in other regions, are fueling demand for bigger and more sophisticated infrastructure to support transportation and logistics.

Inadequate infrastructure investment carries several undesirable side effects. The immediate effect is that the cost of logistics rises in a "rent-versus-buy" trade-off of paying now or paying later. The secondary effects are more subtle but more lasting and more dangerous. They include an erosion of a nation's long-term export competitiveness through higher costs, an inflation of the balance of payments deficit by making products less competitive and stimulating offshore manufacturing, and inequity between shippers and carriers and among carriers themselves due to a rising number of captive shipper situations.

101 Boston Logistics Group analysis of data from Datamonitor, Baird, and UPS. 2005 data.

102 Rodrigues, A., Bowersox, D., and Calantone, R., Estimation of Global and National Logistics Expenditures: 2002 Data *Update. Journal of Business Logistics*, Volume 26, November 2, 2005. The results are based on an econometric computation model that considers 29 variables capturing information regarding geographic region, income level, country size, economy level, and transportation (road, rail and air freight, and container port traffic).

The immediate effect of underinvestment is more costly transportation services. Congestion increases man-hours and fleet size requirements, and forces carriers to raise rates in order to remain profitable. However, the long-term impact of an inadequate transportation infrastructure is far more pernicious due to the secondary effects. Most significant, transportation costs can drive changes in the entire economic structure since they are involved in almost every aspect of the economy. In the words of David Canning of the Harvard School of Public Health, "Transportation infrastructure may have a profound impact on the extent of the market and the ability of producers to exploit economies of scale and specialization. Widening the market then brings benefits in terms of increased competition and contestability in markets. Transportation infrastructure also allows greater dissemination of knowledge and technology."[103]

Expensive transportation also damages export competitiveness and exacerbates the already large deficit in the balance of payments. High international transport costs put a "double squeeze on domestic incomes," in the words of Andreas Kopp of the OECD/ECMT Transport Research Centre. They force exporters to reduce their product in order to offset the higher transport costs. Similarly, they make importers pay higher prices, which he likens to a 21% import tax. "Improving the transport infrastructure endowment of a country from a median position to the 25th percentile [theoretically leads] to an increase of trade volumes by 68 percent," he concludes.

Countries are becoming much more sophisticated about the importance of transportation and logistics infrastructure to their industry productivity and international competitiveness. The following section provides comparisons of transportation and logistics costs among countries based on various international sources documented at the end of this appendix.

C.2 International Comparisons of Transportation and Logistics Costs

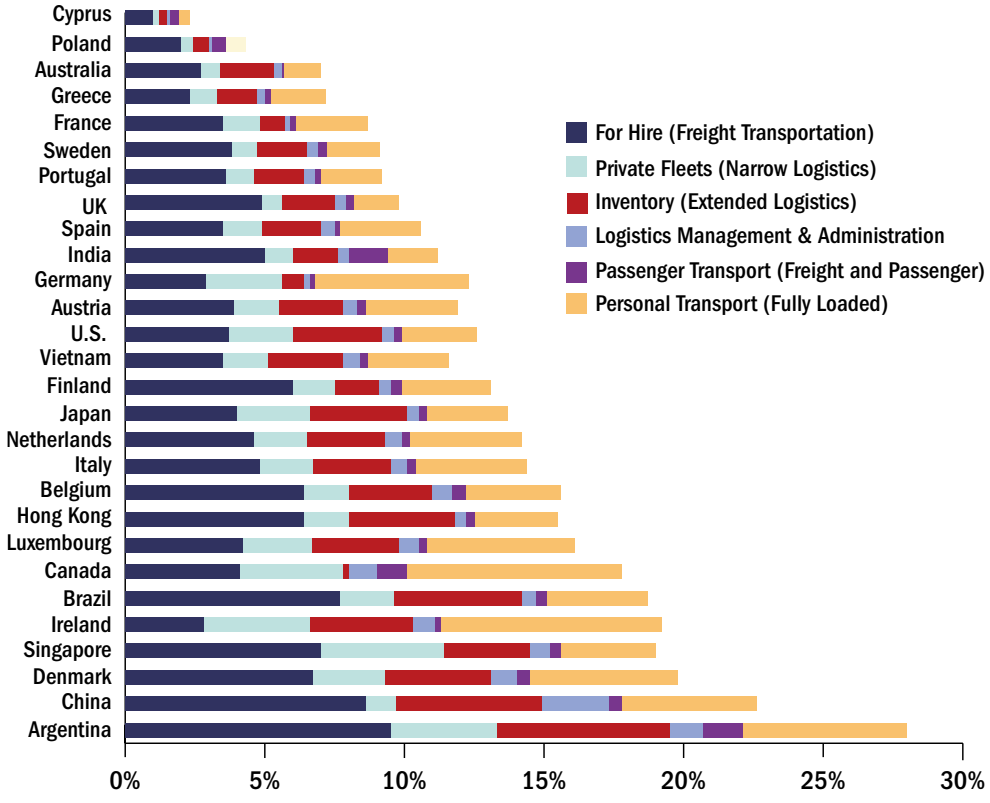
The United States spends more on transportation and logistics as a percentage of GDP[104] than countries such as Germany, Spain, and France. Transportation and logistics costs can be viewed as having six components: 1) for-hire transportation, which is often found in countries' national accounting data; 2) private fleets, which in the United States can now be identified through satellite accounts; 3) inventory costs, which depend on supply chain design, best practice logistics implementation, and interest rates; 4) logistics management and administration; 5) passenger transport; and 6) personal transport, which includes the expenses of individuals for their private transportation such as commuting.

103 Round Table Document No. 132.

104 Although this metric has come under some fire recently, especially when viewed over time, the United States can be compared at a point in time with other countries with similar economic structures. The Group of Eight, which regularly meets to discuss macroeconomic issues, can serve as a reasonable benchmark.

By this measure, the United States has a higher transportation and logistics cost than France and Spain in areas such as private transport costs and inventory. The United States also has a higher transportation cost than Germany, which has a similarly extensive roadway network (built around the same time as that of the United States). However, Germany's advantage relative to the United States seems to be offset by its "car culture," in which individuals spend more on personal transportation. The United States has a lower for-hire transport cost than the United Kingdom, but higher overall transportation and logistics costs, in part due to the United States' higher cost of private fleets (see Figure C.1).

Figure C.1 Transportation and Logistics Costs as a Percentage of GDP for Selected Countries

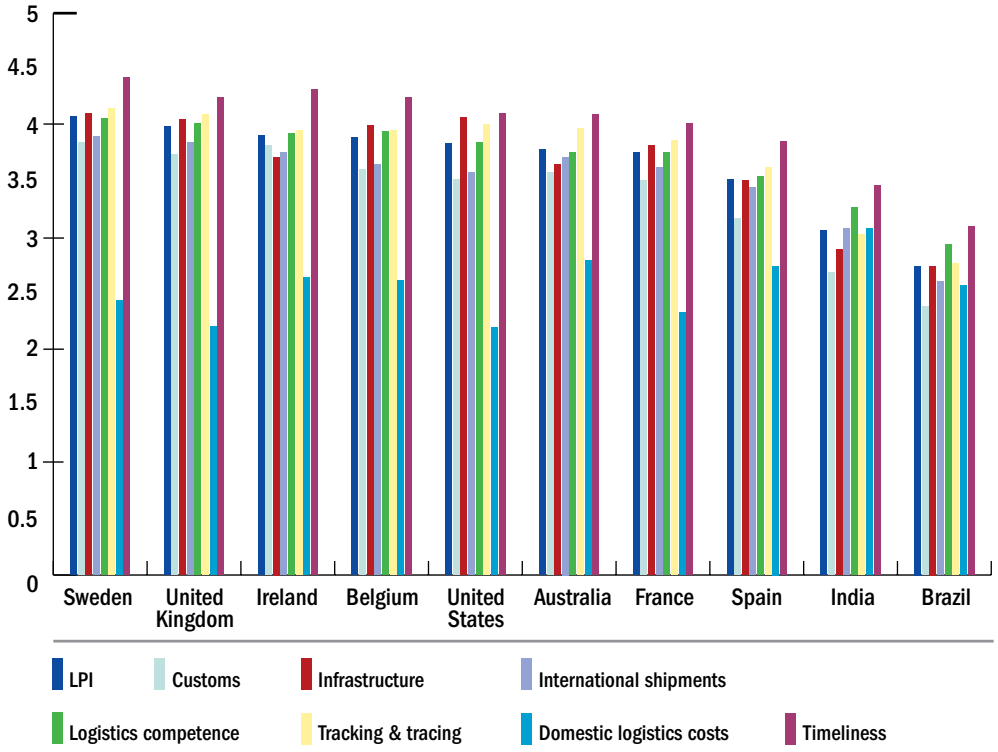


Source: Boston Logistics Group.

High transportation costs may "end up turning the clock back," says Doug Duncan, President of FedEx Freight. "It is causing American businesses to become less competitive, and leading to smaller markets and smaller jobs." Transportation costs must be seen in an international context due to today's intense competitive pressures. Infrastructure is a competitive weapon that must be used, or it will be used against you. The consequences of having it used against you are stiff indeed.

Lest there be a myth that the United States is superior in its logistics infrastructure performance compared to other countries, look at the World Bank's Logistics Performance Index in Figure C.2, which shows that on most indicators, the United States is just on par with many other developed countries, and it is only marginally better than Brazil.

Figure C.2 Comparative Logistics Performance Indicators



Source: World Bank.

Another measure of international comparison, referred to as the Access Index and developed under contract to FedEx, illustrates a nation's ability to compete in world markets.[105] The methodology considers 22 factors of physical and information access, including transportation, trade, and telecommunications. The top ten countries in the Access Index achieved an average GDP per capita growth rate of 22.6% in the last decade versus only 14.1% for the bottom ten scorers. Of concern is the fact that the United States does not even make the top ten, ranking 12th among 75 nations studied. The rankings are displayed in Table C.1.

Table C.1 Top Access Nations

1.	Hong Kong
2.	Singapore
3.	Denmark
4.	Switzerland
5.	Netherlands
6.	Finland
7.	Germany
8.	Sweden
9.	United Kingdom
10.	France
11.	Belgium
12.	**United States**
13.	Canada
14.	Austria
15.	Norway

Source: FedEx.

105 *How Greater Access Is Changing the World*. SRI International for FedEx, available at http://access.fedex.com.

C.3 Other Countries Are Catching up Through Massive Infrastructure Investments

The United States historically has invested more in transportation infrastructure than other developed countries, compared to the size of their economies, because of its large physical area and transport intensity. But we should not be complacent because of past investments; other countries are charging ahead with massive investment programs. The United States currently is involved in only one of the top ten private transactions in the world (the Indiana toll road). France, Spain, and Korea each have two of the projects on the list. The rest are in South Africa, Australia, Canada, and Hungary (see Table C.2).

Europe has embarked on an ambitious infrastructure improvement program called TEN-T (the trans-European transport network), whose objectives are to "link island, peripheral, and landlocked regions with the Union's more central regions through interconnecting and interoperable international networks by land, air, sea, and inland waterways," according to Eurostat. The European Commission, through TEN-T, has prioritized 30 transportation infrastructure projects that will help achieve these objectives (see project list at end of this appendix).

Table C.2 Top Infrastructure Projects
Millions of U.S. Dollars

Project Name	Projected Value	Country
Abertis Acquisition of SANEF	10,000	France
APRR (Autoroutes Paris-Rhine-Rhone) Privatization	9,130	France
Indiana Toll Road	4,823	United States
Madrid Calle 30 PFI	3,709	Spain
Gautrain Rapid Rail Link	3,300	South Africa
Reliance Rail PPP	2,839	Australia
Budapest Airport Privatization	2,133	Hungary
Richmond Airport Vancouver Rapid Transit Project	1,660	Canada
South Korean Incheon Grand Bridge	1,600	South Korea
Bundang Railroad Project PFI	1,580	South Korea
Metro de Madrid PPP	1,470	Spain
Total	**42,244**	

Source: Infrastructure Journal database as quoted in "Infrastructure 2007" by the Urban Land Institute and Ernst and Young.

Italy is spending or budgeting about e7 billion to expand bullet train lines and freight transport capacity, according to the Urban Land Institute (ULI). Spain has allocated about $4.4 billion to modernize and expand its ports. According to the ULI report, an additional $7 billion will go toward improving airports, including large-scale expansions for Madrid and Barcelona, which serve many connecting international passengers. England just invested £1.6 billion to improve local transport "To put right decades of under investment," Transport Secretary Alistair Darling announced in December 2005.[106] France spends 20 times more per capita on railways than the United States does, according to the ULI.[107]

Europe is not alone. Less-developed economies have been ramping up their investment in transportation infrastructure. Although they invest less as a percentage of their GDP, developing countries have been investing dramatically in infrastructure over the last five years.

China and developing countries have gotten extensive support from the World Bank. In Shanghai, the Yangshan container port is adding major new capacity to a fast-emerging world container port city.[108] India and China received 39% of the World Bank's transportation lending during the 2001 to 2006 period, while Brazil, Indonesia, Argentina, and Vietnam also were substantial recipients.[109] Seventy-three percent of this money funded investments in roads, and 8% percent went to railways.[110] South Asia's percentage of the total commitments is declining, however, as Central Asia's (India's) percentage rose dramatically over the period.[111]

China built a 25,000-mile highway in 12 years and increased the mileage of the subway in Beijing from 70 to 335 miles in under a decade, according to the ULI report.[112] It has connected downtown Pudong and Shanghai's international airport by an eight-minute trip on a train traveling up to 270 miles per hour. In addition, China has just completed a $4.2 billion rail line between Beijing and Lhasa in Tibet. Taiwan just completed a $15 billion high-speed line between Taipei and the southern port of Kaohsiung, reducing travel time from four hours to 90 minutes, according to the same report.

India is close to finishing a $12 billion national ring road connecting major cities. Its government has identified $22 billion of investment needed for new ports and is building a $500 million container terminal in Kochi, a southwestern city. In addition, a $430 million privately managed international airport is scheduled for completion in

106 UK Department for Transport News Release (132) via the Government News Network., December 14, 2005.

107 "Infrastructure 2007." The Urban Land Institute (ULI) and Ernst and Young.

108 CargoNews Asia. November 6, 2007.

109 Table 3.1: IBRD/IDA Commitments for Transport (billions of dollars): Share of Top 5 and Top 10 Countries, Fiscal 1995-2000 and Fiscal 2001-2006 (World Bank: A Decade of Action in Transport).

110 Table 3.3: IBRD/IDA Commitments for Transport (billions of dollars): Distribution by Transport Mode, Fiscal 1995-2000 and Fiscal 2001-2006 (World Bank: A Decade of Action in Transport).

111 Figure 3.3: Trends in IBRD/IDA Commitments for Transport by Region (World Bank: A Decade of Action in Transport).

112 The rest of the Asian investment examples in this section come from the ULI Infrastructure 2007.

Bangalore next year, and large-scale expansions and facelifts also are under way at the Mumbai ($515 million), Delhi ($600 million), and Hyderabad airports.

Singapore's latest project involves construction of the airport's third terminal. Korea has ten highway projects under construction, mostly serving congested Seoul, which houses about 25% of the country's population. The government plans to build a new $50 billion capital city 90 miles southeast of Seoul to help relieve congestion around the current capital.

Canada and Australia have lagged behind. Australia now spends one-half the amount on infrastructure it did between 1970 and today (it has decreased from 7.2% of GDP in 1970 to 3.6% today). Various levels of government in Australia collectively agree on the need for $100 billion in new infrastructure investments. Canada's infrastructure deficit will total $300 billion Canadian dollars through 2025, according to ULI.

C.4 Supporting Information for Transportation and Logistics Costs as a Percentage of GDP

Methodology

Boston Logistics Group researched and analyzed transportation operating expenses as a percentage of GDP for 28 countries.

For the purpose of reaching results with higher analytical value, "transportation" was divided into six categories: for-hire (freight transportation), private fleets (narrow logistics), inventory (extended logistics), logistics management and administration, passenger transport (freight and passenger), and personal transport (fully loaded).

Findings

More developed economies spend less on transportation because they operate more efficient transportation systems. On the other hand, some countries have a weaker understanding of logistic cost minimization, such as economies still under development. For example, India's spending on logistics industry is much higher than that of developed economies like the United States (9.5%) and Japan (10.5%).

Larger and underdeveloped countries tend to spend more on transportation—larger countries because distances are longer, and less-developed economies because their production facilities, which are often fixed locations such as mines, cannot be moved, so material must be transported across the rest of the country, or exports arrive in one region where better transportation infrastructure has been installed and have to be transported across regions.

Hub countries have higher transportation costs as a percentage of GDP since their economic activity largely consists of transportation-related industries. For example, Singapore is a major Asian transportation hub, strategically lying on major sea and air trade routes. Its history has been closely tied to the growth of its transportation industry since the establishment of its port. The transportation industry comprises over 10% of Singaporean GDP despite an increasingly diversified economy. The Port of Singapore, managed by port operators PSA International and Jurong Port, was the world's busiest port in 2005 in terms of shipping tonnage handled, with 1.15 billion gross tons handled, and in terms of containerized traffic, with 23.2 million 20-foot equivalent units (TEUs) handled. It was also the world's second busiest in terms of cargo tonnage, coming behind Shanghai with 423 million tons handled. In addition, Singapore is the world's busiest hub for transshipment traffic and the world's biggest ship refueling hub.[113]

Inventory-carrying costs are usually higher in less developed economies. Since moving goods through borders takes longer than the time warranted by the infrastructure, vehicle, or physical constraints, managing this risk either through increased inventory holdings or alternative modal choices adds to the already substantial logistics costs in developing countries. Anecdotal evidence indicates that in many less-developed countries, the business sectors (such as supermarkets) maintain high inventories (three months or more is frequent in landlocked countries) compared with their peers in advanced countries.

113 http://www.k12academics.com/singapore_transport.htm.