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INTERNATIONAL TRANSPORTATION: MOVING THE GLOBAL ECONOMY FORWARD



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ECONOMIC PERSPECTIVES

International Transportation: Moving the Global Economy Forward

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Globalization has forever changed the way we grow, communicate, and learn. Globalization has also unleashed new challenges and opportunities that fundamentally affect our economic prosperity and the way government, together with its stakeholders, makes judgments and decisions about the future. This new world of change demands new ways of thinking about transportation, including thinking about new tools, new alliances, and a new architecture.

Our vision of a transportation system of the future is a seamless, integrated network of roads, rail lines, ports, and aviation corridors. Transportation systems must be maintained that facilitate global trade, serve the urban infrastructure, and deal with human needs. A collective visionary and vigilant leadership will be required of all stakeholders to continue our pursuit of transportation excellence and innovation.

Transportation is about more than concrete, asphalt, and steel — it is about people, and making sure that no one is left behind. Transportation projects should be designed with a view toward making our communities more livable, giving our citizens greater choice and mobility, and helping create a truly global community.

*This issue of **Economic Perspectives** addresses some of the key transportation issues that affect our global economy. Authors discuss issues such as financing infrastructure investment, the benefits of opening aviation markets, safety and security, and the impact of electronic commerce on our transportation system. These articles are designed to stimulate further discussion on ways to enhance our transportation systems and will serve to focus our efforts for identifying and implementing effective mechanisms of information exchange while promoting development of the international transportation system for meeting the needs of the 21st century.*

The Department of Transportation welcomes your ideas and comments on the issues presented in these scholarly articles. I invite each of you to join the Department in designing a new international transportation network that will lead to an ever more prosperous future for all nations.

-- Secretary of Transportation Rodney E. Slater

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Editor, Economic Perspectives
IIP/T/ES
U.S. Department of State
301 4th Street, S.W.
Washington, D.C. 20547
United States of America
E-mail: ejecon@usia.gov

Publisher	Judith Siegel	Art Director	Sylvia Scott
Editor	Jonathan Schaffer	Cover Design	Joseph Hockersmith
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□ TRANSPORTATION: THE KEY TO GLOBALIZATION

By Rodney E. Slater, Secretary, U.S. Department of Transportation

Globalization has dramatically altered the volume and pattern of freight and passenger movement and has increased the demands on both international and local transportation systems. In this article, Transportation Secretary Rodney E. Slater lays out the role transportation plays in the globalization of the world's economies.

The last decades of the 20th century witnessed the extraordinary growth in international economic relationships, the almost instantaneous flow of capital across national boundaries, and the new production and distribution methods that collectively are termed globalization. Developing countries, while still benefiting from lower labor costs, must rely less on abundant natural resources and more on access to international transportation and telecommunications, the quality of local infrastructure, and a supportive policy climate to compete in the global marketplace. Economically advanced nations have adjusted to these changes and continue the process of strengthening the integration of their economies and institutions and improving their transportation and communication networks.

Globalization has dramatically altered the volume and pattern of freight and passenger movement and has increased the demands on both international and local transportation systems. Manufacturing firms have become increasingly international. They have developed globally dispersed production facilities, and much of their freight consists of intra-firm shipment of intermediate products, while finished goods are consigned to markets throughout the world. Modern telecommunications are essential to international trade in services, besides supporting goods trade in many ways.

In 25 years, international commerce will represent a larger portion of total world economic output than today's level of 18 percent. Without careful planning, international transportation systems and domestic collection, distribution, and intermodal facilities will be severely strained. Not only those systems that serve global trade, but also the urban infrastructure that

supports industrialization and living standards, must be reconstructed. Problems of pollution and unplanned growth will come to be seen as affecting both a country's attractiveness as a target of investment and its acceptability as a trading partner. In order to remain competitive, nations must improve the performance of today's transportation systems, investing in new technologies and modernizing regulatory and financing institutions.

The anticipated growth of international commerce and transportation will invariably raise issues about the compatibility of national and global safety, security, labor relations, antitrust, and environmental standards and regulations. Dealing with such issues to ensure that they do not unacceptably burden international cooperation and integration will be a major challenge as we advance to the year 2025.

THE DIMENSIONS OF INTERNATIONAL COMMERCE

The world has witnessed an unprecedented growth in the volume of international transportation over the past few decades, reflecting both the growth of the global economy and the associated increase in personal travel for business and pleasure. Total exports increased approximately 170 percent from 1970 to 1997. Over the last 25 years, U.S. import and export levels have grown at an extraordinary rate, climbing from \$132,000 million to \$2,100,000 million. Exports and imports increased from 13 to 30 percent as a percentage of the U.S. economy. Worldwide, waterborne trade has been growing at an annual rate of 3.8 percent and carries some 90 percent of the total weight of U.S. international trade

Economic globalization has significantly increased foreign investment throughout the world. For example, annual U.S. foreign investment has grown from an average of \$45,300 million in the 1970s to \$117,500 million in the first half of the 1990s. As a percentage of U.S. gross domestic product, that represents an increase of 60 percent. These increases in foreign investment reflect, in

part, the integration of the world's industries as companies become truly international in their operations, financing, and marketing.

A growing proportion of the output of U.S. firms is being produced in foreign countries. In the early 1990s, approximately 20 percent of the total output of U.S. firms was produced in other countries. Similar increases can be anticipated for the economies of many nations by 2025. In 1998, transportation equipment, mainly automobiles and aircraft, represented 19 percent of total U.S. merchandise imports, the second-largest import sector.

WHERE WE ARE, WHAT WE WILL NEED

Virtually all international shipments require the use of more than one mode of transportation from origin to final destination. Each of the world's freight and passenger transportation modes has played an essential role in facilitating geographic diversification. While transportation cannot claim exclusive responsibility for the success of economic globalization, it remains an essential factor that cannot be compensated for or substituted. Firms invest in foreign locations with the expectation that they can rely on international transportation services.

Together with advanced communication networks, companies are able to operate in an international environment, rendering borders all but invisible. Similarly, the transfer of goods from one transportation mode to another requires intermodal facilities that operate efficiently, safely, and predictably, and that can adjust and expand as the demands placed on them grow and diversify. The next two decades will require technological progress in transportation systems to lower costs, improve reliability and safety, and increase environmental compatibility.

Aviation and maritime systems handle a major part of international freight transportation. Trucking and rail transportation, on the other hand, are the predominant transportation modes for shorter shipments linking the long-haul movements with local points of origin or final destinations. In the recent past, the largest growth in fleet capacity has been in large containerships — their capacity increased 103 percent between 1993 and 1997. Global shipping alliances now dominate containership service, utilizing vessel-sharing agreements that offer shippers integrated services, single rates, and fixed

schedules. The efficiencies offered by these alliances are critical to the future of globalization, but they must be monitored for possible restraint of trade to ensure that consumers reap the rewards of improved efficiency.

The larger ships, however, need expanded port facilities and greater channel depths. In the future, this may force countries or groups of countries to establish port development policies and regulations that will guide the rational and efficient development of port infrastructure to employ the available resources most economically. Growing cities should remain competitive in the global economy but at the same time comply with environmental, safety, and security standards.

Perhaps more than any other transportation mode, aviation has grown on a worldwide scale. Developments in air cargo and express package services that are essential to the operation of the international economy provide a particularly compelling example of the way transportation can contribute to globalization. Air cargo now represents one-fourth of all U.S. international cargo, by value. The speed of air shipment has allowed businesses to substitute lean inventories, just-in-time deliveries, and on-demand service for the large and costly inventories of the past. U.S. policy has encouraged a significant opening up of the aviation system, particularly in the cargo area. The nearly 50 Open Skies agreements, as well as other cargo-specific liberalization agreements, have removed many of the restrictions that prevented airlines from introducing cost-effective and flexible service initiatives to respond to changing traffic flows. Following the deregulation of the U.S. airline industry, many more carriers have entered to serve international markets from many more origin and destination points. One response to increased U.S. carrier competition has been the privatization of a number of foreign carriers. About 75 percent of the world airline industry is now privately controlled, with a consequent increase in efficiency.

Trucking and rail will continue to move commodities from their points of origin to transportation hubs, where they are consolidated for long-haul movement or for distributing shipments to the final points of delivery. Regional economic integration, particularly in North America and Europe, is generating a growing reliance on international trucking. In the future, both international long-haul transportation systems and local distribution systems are expected to face increasing demand, and the problems of congestion, pollution, wear on roads, and delay in border crossings are likely to intensify.

Investments in new technologies will be needed if costs are to be controlled and service levels improved. Technological solutions may not be adequate, however, without parallel increased incentives for rail shipment and investment in rail infrastructure. Operating regulations and financing mechanisms will also have to be adjusted to respond to changing market conditions.

In a growing number of locations, local street congestion is hampering the ability of trucking to access intermodal terminals. Similarly, ground transportation congestion delays access to airports by passengers and air cargo carriers. Many of the larger airports in the United States also experience significant air traffic control and terminal delays. Addressing these growing local congestion problems will be a major public policy challenge in the United States as well as in other nations that want to compete successfully in the global economy. Policy initiatives toward meeting these challenges must focus on the linkages to global trade and travel networks and on the systems that make a city a convenient and attractive place to live, work, and invest. Quality of life will be an essential ingredient of economic prosperity in the future because the increasing mobility of labor and its growing importance as a factor of production make many more locations around the world suitable for investment.

THE CHALLENGES BEFORE US

Over the next two decades, growth in world trade and travel will continue as a direct consequence of the further internationalization of business and industry. The economic factors of production will become ever more widely distributed around the globe. The ability of nations to make public and private sector investments in transportation will determine which compete successfully and which become minor players with declining economies and living standards. All of the transportation modes will play important roles in the global economy, whether for transporting goods over long distances between nations and continents or for shorter movements to and from intermodal terminals.

Adequate infrastructure for foreign trade is only part of the equation. We will not achieve full success if we do not remain sensitive to the livability needs of local communities as we address future transportation demands.

Nations and international organizations will be called upon to devise policies that address safety, security, labor, anti-monopoly, and environmental concerns worldwide. International cooperation will be needed to support research and development, to smooth the integration of international companies with local economies. Much as the challenge has been great for those countries that already have advanced transportation systems, vigorous research and development programs, and effective regulatory regimes, it will be even more daunting for the less advanced and developing nations. These are the challenges that lie before us if we are to develop a transportation system that is intermodal in form, inclusive in nature, international in scope, intelligent in character, and innovative in approach. □

□ THE FUTURE OF AIR SERVICES LIBERALIZATION

By Alan P. Larson, Under Secretary for Economic, Business, and Agricultural Affairs, U.S. Department of State

Liberalized aviation markets have meant lower fares, new jobs, and increased investment income for nations throughout the world, says Alan Larson, U.S. under secretary of state for economic, business, and agricultural affairs.

Larson says the United States would like to build on existing Open Skies agreements by pursuing multilateral aviation accords with like-minded countries, and hopes to pursue new, more stringent standards to protect the environment within the International Civil Aviation Organization.

Aviation is one of this decade's biggest economic success stories. In the United States, the State Department, working closely with the Department of Transportation and other U.S. government agencies, has played a pivotal role in that success. We have worked to open the skies from the Netherlands to New Zealand, creating opportunities for private sector ingenuity to develop new markets for goods, services, and ideas across the globe.

THE CIRCULATORY SYSTEM OF THE GLOBAL ECONOMY

Air transport has become the circulatory system of the global economy. Consider the following facts:

- In a recent study, total economic activity related to airline services was estimated at \$976,000 million. Of that figure, provision of services accounted for approximately \$318,000 million, use of services for \$529,000 million, and activity related to manufacturing of goods for \$126,000 million. Earnings (comprising wages and salaries related to airline services) derived from airline operations were \$278,000 million. The industry itself accounts for 10.9 million airline-related jobs, including employees of the industry as well as those who support the industry, such as hotel and travel service employees.
- About 40 percent of U.S. export value now moves by air.

These are just a few examples of the enormous impact of the aviation sector on our economies. It is the reason

that efforts to liberalize the sector throughout the world are so important.

OPEN SKIES AND THE LIBERALIZATION OF AIR TRANSPORT

Two developments during the last decade have contributed significantly to the growth of air transport and its integration into the global economy. First was the advent of Open Skies agreements. Since 1992, the State Department has led negotiations resulting in 47 Open Skies agreements in Europe, Asia, Latin America, the Middle East, and Africa, 13 of which have been negotiated in the past year alone. When one adds the significantly liberalized markets of Japan, France, Canada, and Mexico, approximately 60 percent of the U.S. international aviation market now falls under either Open Skies or modern, significantly liberalized arrangements.

An analysis prepared by the Department of Transportation shows that Open Skies agreements have lowered fares to consumers by approximately 14 percent, compared to less than 3 percent on routes with non-Open Skies countries. They have cleared the way for air service to new cities around the world, creating jobs and economic value far beyond the direct benefits of the service.

Many countries have moved to take advantage of the benefits to be offered under a significantly liberalized regime and have signed similar agreements among themselves. For example, in the Pacific, New Zealand has signed liberal bilateral agreements with nine other countries, while Australia has all-cargo bilateral agreements with 10 other states. In Latin America, Chile and Panama have both signed liberal bilateral agreements with four different countries. In the Middle East, the United Arab Emirates has liberalized arrangements with at least three other countries, in addition to their Open Skies agreement with the United States. In Asia, Singapore, Brunei, and Taiwan all have liberalized agreements with other states. In Africa, Uganda, Ethiopia, and Kenya have moved to open their markets to other parts of the world with liberal bilaterals. And finally, in Europe, the European Community (EC) has a

uniquely integrated aviation regime among member states, in addition to the many individual liberalized agreements with countries outside the EC.

SEAMLESS TRANSPORTATION NETWORKS AND INTEGRATION OF ELECTRONIC COMMERCE

The further liberalization of the air transport sector has also generated a second major development in the 1990s: the movement toward seamless global air transport networks. To meet demand and improve efficiency, airlines began to form alliances and unique marketing arrangements such as code-share partnerships (whereby one carrier shares the designator code of another to create more convenient connections or ground handling services) to create competing worldwide hub-and-spoke systems. In fact, the number of international airline alliances has virtually doubled since 1994, providing consumers with a range of choices in transportation services at considerably lower costs. These international networks have the ability to provide seamless service to hundreds of communities and to connect those communities to the global marketplace in ways we could scarcely imagine just a decade ago.

Just as air transport networks and airline alliances have connected communities around the globe, on a much broader scale the development and integration of telecommunications, transportation, customs, and delivery services in support of electronic commerce will revolutionize the way we do business in the 21st century. E-commerce has already become an integral part of basic transportation infrastructure — from the delivery of goods and services, to the sales and marketing of transportation services. A report by the Gartner Group states that businesses providing travel information, reservations, and ticket sales online brought in \$5,000 million in 1998 and will bring in more than \$30,000 million by the end of 2001. Internet purchasing, Internet check-in, automatic paging, and onboard Internet access will also become standard features in air travel.

The liberalization of transportation regimes, especially the air transport sector, is a vital element in making e-commerce work. Companies traditionally labeled as “airlines” or “transportation companies” are beginning to think of themselves as “information companies.” Additionally, the enormous potential for cross-border sales of physical goods online can only be fulfilled if the

infrastructure exists to order, ship, track, clear, and deliver those goods to the customer’s door. In the United States, President Clinton and Vice President Gore have laid out an important policy framework for seizing the benefits of e-commerce to support trans-sector integration. We are actively exploring innovative concepts to integrate the sectors, and are finding receptive audiences with policy-makers around the world.

OUR AGENDA FOR LIBERALIZATION

The United States is moving forward on all fronts to open new opportunities for the global aviation industry, building on the successes of the past to meet the challenges of the future. We have made considerable progress already.

- Our efforts to liberalize the aviation regime began in Europe. In partnership with the Netherlands, we began forging the Open Skies path in 1992. As part of an initiative announced by then U.S. Transportation Secretary Federico Peña in late 1994, we concluded Open Skies agreements with nine other European partners in 1995: Luxembourg, Finland, Iceland, Austria, Switzerland, Sweden, Norway, Denmark, and Belgium. The landmark Open Skies agreement with Germany followed in May 1996. Subsequent partners included the Czech Republic, Romania, Italy, Portugal, and Turkey. Today, nearly half of air traffic between the United States and Europe moves under Open Skies arrangements.
- At the same time, we are pursuing the possibility of multilateral accords among like minded countries of the Asia-Pacific Economic Cooperation (APEC), in the Organization for Economic Cooperation and Development (OECD) discussions for a multilateral accord on all-cargo services, and in a dialogue with the European Commission.
- In Asia, where six Open Skies agreements exist with the United States, we hope to achieve bilateral liberalization in other markets, including China, Hong Kong, Thailand, and Vietnam. We want to build on the important advances we reached with Japan in 1998. We are taking an active role with a group of APEC members on a possible multilateral agreement for air transport, consistent with the principles set forth in our bilateral Open Skies agreements. In order to achieve region-wide economic integration by 2010 or even 2020, we must begin to create the necessary transportation infrastructure right now.

- In the Americas, we continue to work for Open Skies arrangements wherever possible. We have an important trans-border Open Skies agreement with Canada, and full Open Skies with 12 countries in Central and South America and the Caribbean. We will also continue to talk with others, such as Brazil and Argentina, about the mutual benefits of open aviation regimes.

- In the Middle East and Near East, Open Skies agreements exist with Jordan, the United Arab Emirates, Bahrain, Qatar, and Pakistan. We continue to encourage Egypt and Israel to open wider transportation links to the global economy. In addition, we have been discussing Open Skies with a number of countries, including Morocco and India.

- In Africa, we now have Open Skies arrangements with Tanzania, Namibia, Burkina Faso, Ghana, The Gambia, and Nigeria. Negotiations with Ethiopia and Kenya are well advanced. It is very encouraging that so many African nations are taking this essential step to connect their economies to the worldwide marketplace, and we hope to see a number of others follow the example set by their neighbors.

SAFETY, SECURITY, AND THE ENVIRONMENT

In the context of all these initiatives are the important tenets of safety, security, and protection of the environment. They have always been, and always will be, fundamental to the health of the aviation industry.

We must continue to pursue new, more stringent standards to protect the environment within the International Civil Aviation Organization (ICAO). ICAO is the appropriate — indeed, the only — forum in which to develop those standards. Under ICAO's stewardship, over the past 20 years the world's leading air carriers have achieved a 70 percent reduction in carbon monoxide emissions, increased fuel efficiency by nearly 50 percent, and, since the first generation of jets was

introduced, reduced noise by 85 percent. We look forward to the successful resolution of the more challenging issues that are now on the table in the Committee for Aviation Environmental Protection.

With the Department of Transportation and the Federal Aviation Administration, we continue to join with other governments to encourage uniform adherence to international standards and thereby ensure the safety and security of international civil aviation.

THE STATE DEPARTMENT'S COMMITMENT

Secretary Madeleine K. Albright and I are committed to advancing the interests of U.S. passengers, airlines, shippers, and workers in the global aviation marketplace. We have worked hard to ensure that State Department civil aviation negotiators are knowledgeable, accessible, and tough, and that our embassies provide the support that is critical to the resolution of "doing-business" problems. We will remain vigilant in ensuring full implementation of the rights we have negotiated. We are proud of what we have accomplished together and look forward to the challenges ahead.

I truly believe we are on the brink of significant advances in global economic policy — advances and innovations that have the potential to bring broad economic benefits to an ever increasing number of people around the world. Aviation is a vital, indeed indispensable, part of the global economic integration trend. We will continue to be your partner in ensuring that aviation remains the hub of the global economy. □

□ MARITIME SERVICES: STAYING COMPETITIVE IN A GLOBAL MARKET

By Harold J. Creel Jr., Chairman, U.S. Federal Maritime Commission

The Federal Maritime Commission (FMC) is closely monitoring the shipping practices of China and other countries to make sure U.S. shipping interests are not adversely affected, says Harold Creel Jr., chairman of the Federal Maritime Commission. Creel reviews U.S. laws related to international shipping and discusses major changes in global shipping alliances that have resulted, in part, from the Ocean Shipping Reform Act of 1998.

Most of our major ocean trades face situations that require all in the industry to develop new approaches or adjust established plans in order to stay financially afloat. The economic crisis in the Asian community has created a tremendous trade imbalance that poses a host of issues affecting ocean commerce in the transpacific. In the North Atlantic, more and more carriers have entered the trade, but the inbound and outbound segments are approaching equilibrium. And North-South trades also are affected by economic woes and trade imbalances.

To meet changing circumstances, the U.S. liner shipping industry today, much like other industries, has moved toward consolidation and concentration, often involving mergers. And if not by outright mergers, many have found it desirable to form alliances or other types of joint ventures. Major ocean carriers, transportation intermediaries, and even various exporters and importers are finding it beneficial to combine in one form or another to cut costs and increase chances for profitability.

As we face increasing globalization in the transportation industry, those companies that continually seek to maintain an edge or are planning long-term growth and development must, out of necessity, establish effective global relationships and global operations. Those that do not will have to be satisfied with being niche players, or in the worst case, not being players at all.

In the maritime industry, we are also witnessing a shift of influence from the traditional conference system, which focused on setting rates and seeking members' adherence to trade-wide discussion agreements that involve broader operational matters and are based on voluntary actions.

This shift brings with it a number of new competitive and regulatory issues.

OCEAN SHIPPING REFORM

In November 1998, the U.S. Congress passed the Ocean Shipping Reform Act of 1998 (OSRA). As we implement OSRA, we must not ignore the above trends, each of which, in its own right, has a major impact on commercial operations. But now that OSRA is in effect, how has it changed the landscape of ocean shipping?

From a general standpoint, OSRA has dramatically changed the thinking and planning of all participants in U.S. ocean commerce. OSRA has put the focus for international trade where it belongs, on effective partnerships, long-term relationships, reliability, flexibility, and accountability. Previously, for example, when a shipping line and an exporter sat down to negotiate a service contract for the movement of goods, they essentially talked about basic ocean service and bottom-line rates. Of course, certain parties went further than that, and some historical partnerships existed in all trades. But the preponderance of deals, from what I can tell, boiled down to what's the best rate I can get for the volume of cargo I am promising you. OSRA changes all that. Now shippers and carriers can tailor their deals to their specific needs and mutual benefits without disclosing all of the details of those deals to others.

In addition to shippers and carriers becoming better attuned to each other's needs and advantages, OSRA is increasing the efficiency of ocean transportation. OSRA has convinced all in the industry that achieving success in the 21st century will require a concerted corporate effort to identify means of maximizing efficiencies down the road and not being so influenced by doing whatever it takes to increase short-term profit levels. Now that the new law is in effect, a good dose of uncertainty has been removed from the equation, and long-term planning can be accomplished from a more informed and definite basis.

I think almost everyone expected that OSRA's pro-

competitive changes would result in the weakening of the traditional rate-setting carrier conference. However, I don't think anyone expected the decline of the conference system to occur so rapidly. In 1997, we had 32 conference agreements filed with the Federal Maritime Commission. Today we have only 22, with only one conference still operating in the major East-West trades.

The FMC has embarked on a comprehensive study of OSRA to be issued in 2001. Our interim report, issued June 22, 2000, shows that since OSRA's implementation, service contracts are up sharply. Also, for the first time, OSRA permits ocean carriers to enter into service contracts that include not only U.S. trades but also foreign-to-foreign trades. Only 3 percent of the contracts surveyed fell into the category of "global," and these generally included carriage between Mexico or Canada and other foreign countries. There was only one truly global contract. This may be more a function of the newness of OSRA. As carriers and shippers develop more individual, customized contractual relationships, we expect to see more global contracts. In fact, for some major shippers, the ability of an ocean carrier to provide global service may be more important than the cost of such service.

Under OSRA, carriers and shippers can agree to keep their deals confidential from their competitors. Moreover, conferences cannot restrict or prohibit their members from entering into service contracts on their own. Although ocean carriers have retained the right to obtain antitrust immunity for certain activities, it appears that, in many trades, rate-setting conferences are becoming a thing of the past, replaced by discussion agreements.

INTERNATIONAL MARITIME COMPETITION

There remain concerns about the nature of competition in the international maritime industry and, in particular, the measures that some countries feel are necessary to protect or enhance their own maritime industries. Before discussing the FMC's tools to address unfair or discriminatory practices of foreign governments, there is one noteworthy development that may affect how the FMC approaches foreign shipping restrictions in the future. This is the recent acquisition by foreign companies of several traditional U.S. carriers. American President Lines was recently purchased by Neptune Orient Lines, Sea-Land Service by Maersk, and certain of Crowley's operations by Hamburg-Sud. Nonetheless, the

maintenance of a strong U.S.-flag fleet continues to be a top priority for national security and defense purposes, and maintaining free and open shipping markets remain critical for U.S. trade.

The FMC has the authority to address restrictive or unfair foreign shipping practices under section 19 of the Merchant Marine Act, 1920; the Foreign Shipping Practices Act of 1988, or FSPA; and the Controlled Carrier Act of 1978. Section 19 empowers the FMC to make rules or regulations to address conditions unfavorable to shipping in our foreign trades. The FSPA allows the Commission to address adverse conditions affecting U.S. carriers in our foreign trades that do not exist for foreign carriers in the United States. And under the Controlled Carrier Act, the FMC can review the rates of foreign-government-controlled carriers to ensure that they are not below a level that is just and reasonable.

Most U.S.-flag container ships are now used in services operated by large foreign-owned carriers. This will obviously impact the way that the Commission analyzes foreign shipping restrictions in the future, but the Commission's role will continue to be an important one.

ADDRESSING UNFAIR AND DISCRIMINATORY PRACTICES

Under section 19, the Commission is charged with protecting the interests of U.S. shipping generally — not just the U.S.-flag fleet. The term "shipping" covers a wide range of U.S. interests including the U.S.-flag fleet, U.S. importers and exporters, and other U.S. companies involved in trade, including non-vessel-operating common carriers (NVOCCs) and ocean freight forwarders. In the future, when looking at foreign practices under section 19, we will carefully identify and weigh the U.S. interests involved.

Shipping disputes will become increasingly complex in the future because of the transnational impact of shipping practices. For example, a particular Asian restriction might impact U.S.-flag vessels, European-owned carriers, and shippers from around the globe.

In August 1998, the FMC began investigating whether the laws, rules, or policies of China might adversely impact U.S. shipping and warrant action under section 19 or the FSPA. The responses indicated that Chinese laws and regulations had discriminated against and disadvantaged U.S. carriers and other non-Chinese

shipping lines. For example, non-Chinese carriers are barred from opening wholly-owned companies or branch offices in China in areas where the carriers' vessels do not make monthly calls; they are barred from performing a number of vessel agency services for themselves; there are restrictions on their freight forwarding services; they must obtain governmental permission before beginning or changing vessel services. Also, proposed rules under consideration could result in the disclosure of confidential service contract terms and further restrict non-Chinese carriers' ability to offer multimodal transport services in China. The FMC will continue to assess this situation and will take appropriate action as necessary.

Recent action by Brazil also raised serious concerns with the Commission. A Brazilian law appeared to provide unfair tax and duty exemptions to vessels enrolled in its second register, and, in late 1998, U.S. ocean carriers were denied access to Brazilian government-reserved cargoes and subject to discriminatory duties. The FMC signaled that it was preparing to take action. Subsequently, as a result of favorable maritime consultations between the United States and Brazil, Brazil

agreed to take corrective action to address the Commission's concerns.

Under the Controlled Carrier Act, the FMC can review the rates of government-owned or -controlled companies to ensure that they are just and reasonable and are not used in a predatory manner. OSRA recently enhanced this provision by removing the loophole that allowed these carriers to flag out and avoid FMC scrutiny. OSRA also expanded coverage of the Controlled Carrier Act to the bilateral trades. □

❑ ESTABLISHING INDEPENDENT INVESTIGATION AGENCIES: A GLOBAL CHALLENGE

By James Hall, Chairman, U.S. National Transportation Safety Board

As our transportation systems become increasingly integrated, it is important for countries that have not already done so to establish independent accident investigation agencies to preserve public confidence in those transportation systems and to ensure that the proper lessons are learned from transportation-related accidents and incidents, according to James Hall, chairman of the National Transportation Safety Board.

In this article, Hall examines the issues involved with transportation safety and its impact on international transportation systems.

Improving global transportation safety is a difficult task with numerous challenges and opportunities. As our transportation systems become increasingly integrated, it is increasingly more important for countries that have not already done so to establish independent accident investigation agencies to preserve public confidence in those transportation systems and to ensure that the proper lessons are learned from transportation-related accidents and incidents.

Whenever a serious accident occurs anywhere in the world, the 24-hour news media instantaneously transmit pictures and word of the tragedy to millions around the globe. The general public, the victims' families, and government officials all want to know what caused the accident as soon as possible, and they want to be assured that steps will be taken to prevent similar accidents. Only truly independent investigations can get to the root causes and determine the appropriate remedies to avoid similar future tragedies.

THE NTSB ROLE

The U.S. National Transportation Safety Board (NTSB) supports development of independent and multimodal safety boards worldwide. Independent accident investigative bodies are a necessity, not a luxury. No governmental or industrial entity should be expected to investigate or oversee itself — that process cannot and does not work. For that reason, I have long advocated

that all countries should have an investigative organization separate from other governmental agencies that oversee the regulation and operation of the transport system.

The NTSB was created in 1967 and has established a worldwide reputation for impartiality and objectivity in determining accident causes and developing recommendations to address safety deficiencies. Independent accident investigation boards now exist in several countries, but in too many nations investigations are still conducted by the same government inspectors who draft regulations and ensure compliance. In other countries, a temporary committee may be formed, chaired by a judge or other non-transport official, for the purpose of investigating an accident. Each has the potential to create unavoidable conflicts of interest.

Because of the competing pressures of safety, economics, government, and societal responsibilities, independent investigative agencies can serve as safety advocates for society to ensure objective and impartial investigations as well as government and industry accountability.

THE NEED FOR INTERNATIONAL COOPERATION

Independent aviation investigative agencies are being mandated in the European Community. But the NTSB and the International Transportation Safety Association, a small but growing group of independent accident investigation boards worldwide, support multimodal boards that will investigate accidents in all modes of transportation similar to the NTSB, the Transportation Safety Board of Canada, and the new Dutch Transport Safety Board.

Additionally, with the continued globalization of our transport systems, accident investigators cannot work in isolation. It is clear that we all must do a better job of sharing accident investigation facts, safety lessons learned, and potential remedies. There must be a cooperative system for sharing factual, timely information.

No matter where in the world they occur, the causes and contributing factors of transportation-related accidents are strikingly similar. In the summer of 1996, NTSB investigators examined an American Airlines MD-11 passenger jet that experienced an in-flight upset over Rhode Island, injuring two flight attendants and a passenger. A year later, Japanese investigators looked into an incident involving a Japan Airlines MD-11 that experienced abrupt pitch oscillations while on a flight from Hong Kong to Tokyo. Both the NTSB and Japan's Aircraft Accident Investigation Commission separately issued similar recommendations to the U.S. Federal Aviation Administration, calling for better pilot simulator training, modifications to autopilot systems on transport category aircraft, and revisions to flight manuals.

Although aviation is the transportation mode most associated with international cooperative efforts, accident data can and should be shared by all countries in all modes. Then we will not have to re-learn lessons already learned somewhere else in the world. Only then will we be adequately protecting our citizens.

PUTTING CHILD SAFETY FIRST

I believe there is one specific area that we all need to focus more attention on if we are to improve the safety of our respective citizenry — especially our youngest and most vulnerable. I spend much of my time as chairman listening to the concerns of transportation accident survivors and the families of victims. Many of my conversations are with parents who have lost a child in a traffic accident. They all tell me how frustrated they are at how difficult it is to ensure their children's safety when they are traveling by automobile.

Those discussions made it clear to me that the United States was not doing enough to protect our children from death and injuries in transport accidents. As a result, in 1999, I made child passenger safety in the United States my top priority at the NTSB. But I believe it needs to be everyone's first priority. There should be one level of safety for every child in every country of the world — especially on our highways. Traffic crashes claim more lives than any other transport mode in every nation.

The statistics here in the United States provide just one grim example:

- More than 90,000 children, infants to teenagers, were killed in the 1990s in motor vehicle crashes, and more

than 9 million children were injured.

- More than 16,500 children under age 10 died in motor vehicle crashes, averaging 33 children each week.
- More than 57,500 children between ages 15 and 20 died in traffic crashes, more than 110 each week.
- Six out of 10 children who died were not using seat belts or other restraints.
- The vast majority of children under age eight who are "buckled up" are improperly restrained.

Every country should have zero tolerance for unbuckled children and should require children to be buckled up in restraints appropriate for their age, size, and weight. Research by the NTSB and other organizations has shown that too many small children, especially those under the age of eight, use seat belts that are designed for adults and that, therefore, do not provide adequate protection for youngsters.

To help parents in the United States, the NTSB has urged federal and state governments and the automobile and child restraint manufacturers to establish permanent fitting stations, like those in Australia. At these stations, trained technicians inspect child safety seats to ensure that they properly fit the child based on the child's age and size, that the child is properly buckled into the seat, and that the seat is properly secured in the automobile. Surveys in the United States show that although 96 percent of parents think their child safety seats are installed correctly, four out of five are not. I have also called upon our automobile manufacturers to design their vehicles with children in mind.

We are making progress. Several U.S. states and a number of automobile companies are establishing fitting stations across the nation. We have more work to do. But I hope that other nations will take the lessons we have learned and work toward making their highways safer for their children as well.

TOWARD A SAFER WORLD

However, we should not stop there. We need to put children first in every mode of transportation. We need to design aircraft seats with integrated child seats or make them compatible with universal child safety seats. And we need rules that require our smallest children to be

properly secured during takeoff and landing, and during turbulence. Similarly, no child should be allowed in a recreational boat or on a personal watercraft without a personal flotation device. These are only a few of the measures that can be taken in every country to put our children's safety at the forefront. If we all put children first, in the end we will all be safer.

During my meetings with aviation accident survivors and victims' families, I also heard horror stories about the indifferent, often callous, treatment they received from airlines and government authorities. The U.S. Congress and the president heard the same stories. As a result, they gave the NTSB the responsibility for coordinating the family assistance effort following accidents to ensure that families are treated the way we would want our families to be treated in such tragic circumstances.

Actions by airlines and government entities, both here and abroad, following aviation accidents have shown that we are all learning from one another's experiences. And we are all working to make an unbearable situation a little easier for families to endure.

In summary, there are actions governments around the world can take to improve transportation safety for all of us. One of America's founding fathers, Thomas Jefferson, said: "The care of human life and happiness is the first and only legitimate object of good government." He was right —not only for the government of the United States — but for every nation in the world. Government has no greater role than to ensure the safety of its citizens. □

□ THE GLOBAL SPAN OF RAIL TRANSPORTATION

By Jolene Molitoris, Administrator, Federal Railroad Administration, U.S. Department of Transportation

Modern rail technology holds promise that railroads will deliver even more value in future years, as users of transportation worldwide demand ever more speed, reliability, capacity, and efficiency, according to Federal Railroad Administrator Jolene Molitoris. In this article, she examines new rail systems, best practices, and linkages to international air travel and international intermodal freight.

Railroads already enjoy an intercontinental reach, even though they stop at the oceans' edges. They represent important components of the global intermodal transportation system. They efficiently move huge quantities of goods and large numbers of passengers, and they serve to complement connecting water, land, and air-based modes. Moreover, modern rail technology holds promise that railroads will deliver even more value in future years, as users of transportation worldwide demand ever more speed, reliability, capacity, and efficiency.

The railroad industry evolved during the 19th century almost exclusively from private companies that consolidated or merged over a period of time. In most countries, the railroads were eventually taken over by national or local governments and treated as public utilities. An important exception has been the United States, where all but a few small rail freight carriers remain in the private sector, while passenger carriers are public entities heavily subsidized by their sponsor national governments. In the last 20 years, most nations have taken steps either to privatize their national systems or to put them on a commercial basis and allow competition among private railroad operating companies running on publicly owned lines.

The rapid growth of world trade has made movement of freight, particularly intermodal freight, by rail increasingly attractive because of the longer hauls involved in international movement and the cost advantage that railroads have over trucks for these longer hauls. Meanwhile, on the passenger side, with the impressive growth of international air travel, the simultaneous increase in road congestion, and the increasing availability of high-speed rail service, railroads, local and intercity,

have become more important as collectors and distributors of intercontinental air trips. At the same time, high-speed rail is seen as a possible substitute for short-haul air movements, thereby freeing airport capacity for intercontinental or other long-haul flights.

RAILROADS AND INTERNATIONAL INTERMODAL FREIGHT

Railroads are increasingly forming commercial alliances with maritime companies and truckers to provide their customers with the most economical combination of modes. Independent freight forwarders provide the same function by brokering a combination of transportation services, some of it through e-commerce channels. In the United States, for example, intermodal traffic is now second only to coal, and container traffic is a very fast-growing segment of the railroad freight business. The development of double-stack equipment over the last 20 years has given an added boost to the attractiveness of container movement by rail. The economic advantage of using a two-person locomotive crew and only a few powerful locomotive units to haul 200 containers from the port of Long Beach in California to the city of Chicago, Illinois, some 2,000 miles away, versus, for example, 100 truck drivers and trucks hauling 100 double trailers, is undeniable. This is why the major long-haul trucking companies in the United States are delivering their trailers or containers to railroads and using their trucks for pickup and delivery.

Cross-border movement of containers in North America and Europe has received added impetus from the North American Free Trade Agreement (NAFTA) and the European Union (EU). In Europe, EU members are seeking to harmonize their railroad standards to facilitate the movement of these containers by rail.

Governments are also recognizing the public benefits of safety and environmental enhancement associated with promoting container movement as an alternative to trucking. The EU is assisting in the development of the Betuwe Line, a new railroad between Rotterdam and the German border. The Clinton administration is assisting in the development of the Alameda Corridor, a segment

of grade-separated railroad connecting the port of Long Beach with inland rail yards and beyond.

RAILROADS AND INTERNATIONAL AIR TRAVEL

Intercontinental trips are among the fastest growing segments of air travel, in parallel with the growth of discretionary income and world trade. Getting to and from large airports in congested highway traffic is becoming a problem that may constrain the growth of international aviation and world trade in the future. Airport sponsors are turning to rail service as a solution.

Recently built major airports in Asian cities such as Osaka and Hong Kong have a new rail link as part of the complex. In Europe, a number of existing airports have been linked to the main urban centers they serve by rail, and the use of rail access by passengers exceeds 30 percent at Oslo, Geneva, Munich, and Zurich, and 25 percent at London (Heathrow), Frankfurt, and Amsterdam. In some cases such as Paris, Lyon, and Frankfurt, rail linkages are available not only to local rail lines but also to intercity lines, sometimes high-speed lines, serving other cities.

In the United States, where airports are more ubiquitous than in Europe or Asia, the use of rail — and even public transportation in general — for access is much less common, even though some type of rail access is available at 13 airports. Washington's Reagan National Airport has the highest use of rail by far, at 13 percent. However, because of foreseeable congestion, airport and transit authorities are continuing to plan and build rail links, including those under way in San Francisco and Newark, New Jersey, with another planned for Providence, Rhode Island.

HIGH-SPEED RAIL

High-speed rail lines such as the Train à Grande Vitesse (TGV) in France, the InterCity Express (ICE) in Germany, and the Acela service in the northeastern United States are already connected to large airports, but there is another way in which high-speed trains can facilitate international travel — through the substitution of rail trips for air trips, even when rail does not serve an airport. In Europe, rail travel is already the mode of choice for many international trips, and high-speed lines have allowed rail to retain or increase its market share in certain city pairs even as air travel increases elsewhere.

Perhaps the best examples are the Eurostar services linking Paris, Brussels, and London.

High-speed rail can also facilitate international travel even when serving city pairs entirely within a nation's boundaries, by attracting trips that would otherwise use air, thereby freeing airport capacity to accommodate more international flights. This is particularly applicable to North America, where the opportunities to serve international trips by rail are scarce. A recent study by the U.S. Federal Railroad Administration found that the major source of non-rail-user benefits of building high-speed rail systems in intercity corridors would be attributable to decreased congestion at airports.

NEW DEVELOPMENTS

Fortunately, new developments in operations and communications technology offer the opportunity to expand the capacity of the rail system even more, allowing railroads to carry more freight on the existing right-of-way. Several complementary efforts are already under way, in both the private and public sectors. Advanced train control systems, which allow more trains to use the same track, effectively increase the capacity of existing rail lines without the need to build additional lines. Under the Clinton administration, the U.S. Department of Transportation (DOT) and the railroad industry are working to develop Intelligent Railroad Systems to incorporate the newest digital communications technologies into Positive Train Control (PTC), braking systems, grade crossings, and defect detection.

PTC consists of integrated command, control, communications, and information systems for controlling train movements with safety, precision, and efficiency. PTC systems bring together digital data link communications networks, continuous and accurate positioning systems such as the Nationwide Differential Global Positioning System, on-board computers on locomotives and maintenance-of-way equipment, in-cab displays, throttle-brake interfaces on locomotives, wayside interface units at switches and wayside detectors, and control center computers and displays.

These new communications-based train control systems are also a key to making the railroad system safer. PTC systems will significantly reduce the probability of collisions between trains, casualties to roadway workers, damage to equipment, and over-speed accidents.

Electronic sensors and transmission systems will help railroads achieve the long sought-after goal of advance detection of hazardous conditions in equipment and track. Electronic sensors on or alongside tracks and on locomotives and freight cars will identify track and equipment problems and transmit the information to train and maintenance crews and control centers, to stop or slow a train if necessary, and to initiate repairs.

New technologies to prevent crashes at rail-highway grade crossings, such as four-quadrant gates, photo enforcement, and roadway medians, also improve railroad service and service reliability. Intelligent grade crossings with sensors will send information about trains to highway traffic control centers and to motorists through roadside traffic information signs.

Technology also offers the means to improve the flow of information among railroads, and between railroads and shippers, improving efficiency and allowing more productive use of resources. Electronic commerce, the general term for this emerging technology, can take many forms. For example, most major railroads now maintain Internet sites where shippers can obtain rate and routing information and track individual shipments. The Internet is also used by railroads to sell used equipment by auction to other railroads. At least one major U.S. railroad, as well as several "third-party" firms, are exploring ways to provide both online filling of shippers' orders and guaranteed payment to freight transportation providers. In the future, railroads will be able to determine traffic lanes with excess capacity at particular times and auction off this capacity via the Internet. Shippers will be able to take advantage of low rates for off-peak service, reducing both production costs and the delivered price of goods.

Government must also do its part to facilitate foreign trade. The customs clearance process must be made faster, without compromising national interest. Here again, technological advances hold the key to more efficient operations. To improve clearance time for all transport modes at U.S. borders, the Clinton administration has launched the International Trade Data System (ITDS) to automate reporting of international trade and transportation transactions. ITDS is being developed by the U.S. Customs Service under the direction of an inter-agency board of directors, including DOT. The initiative is designed to build and implement an efficient, cost-effective, automated system to report more complete and accurate information on rail

shipments, equipment, and immigration information about crew members to the governments of both exporting and importing countries in advance of arrival or departure at the border.

ITDS will be the front end to the overall modernization effort to update the U.S. Customs Service's electronic filing systems. The new system will provide government inspectors with more accurate and timely information to improve their decisions on admissibility and compliance, as well as provide better statistical information to track long-term trends. The first test of the new system will be a series of pilot tests on the U.S. and Canadian border in early 2001. A pilot for motor carrier traffic will be initiated first in Buffalo, New York, followed by rail pilots on the U.S.-Canadian border. Laredo, Texas, is likely to follow as the first U.S.-Mexican border pilot.

PROSPECTS FOR THE FUTURE

Rail transportation will become an increasingly important factor in global trade if only because of road and air congestion in the future. But how are developments in the rail industry itself likely to either accelerate or slow this trend?

In the United States, freight railroads have seen remarkable increases in productivity through incremental improvements in technology, higher-capacity equipment, and consolidation of manufacturing plants through mergers, all leading to the need for fewer workers. Further improvements are likely to come through both physical and institutional improvements in the interchanges between rail and maritime and road transportation. In the rest of the world, there is still considerable opportunity for the kind of freight railroad productivity improvement we have seen in the United States, and efforts are under way through at least partial privatization to allow these to occur.

In the passenger sector, productivity improvement has been slower in the United States, while in Europe and Japan, the advent of high-speed rail has led to profit-making opportunities in an otherwise unprofitable sector. The Department of Transportation under the Clinton administration is encouraging the development of new high-speed rail projects in addition to the Acela services being introduced on the "Northeast Corridor," primarily through the incremental improvement of existing rail

lines. A possible technological breakthrough could come through 300 mile-per-hour magnetic levitation (maglev) trains.

In Germany the technology is ready for implementation, and in Japan an alternative form of maglev technology is likely to be ready in about five years. The United States and Germany are engaged in separate efforts to pick a site in which to implement a short maglev demonstration

project in each of their respective nations. Either of these could lead to the implementation of intercity maglev lines that provide quantum improvements in rail transportation and bring with them an even more powerful means of facilitating international commerce than current high-speed rail. □

□ BUILDING THE 21st CENTURY TRANSPORTATION WORK FORCE

By Kelly S. Coyner, Administrator, Research and Special Programs Administration, U.S. Department of Transportation

Ensuring a trained, capable work force that understands and can meet fast-changing transportation needs is a major challenge for transport officials the world over, says Kelly Coyner, administrator of the Department of Transportation's Research and Special Programs Administration. Coyner lays out the difficulties and opportunities facing transportation managers, and highlights potential ways the transportation and learning communities can build the work force needed in the 21st century.

The demand for a skilled and technically competent work force for transportation is greater now than ever before. In areas where the economy is primarily rural and agrarian, there is a critical shortage of specialized workers such as engineers. In densely populated urban regions with booming high-tech economies, employees who can build, operate, and maintain the infrastructure are in short supply.

Twenty-first century transportation employees — whether they are planners, implementers, or system monitors — need a wide variety of skills. First, technology capabilities, such as computer skills for traffic management and knowledge of alternative fuel technologies for environmental protection, are increasingly important. Second, specific transportation policy skills may require an understanding of topics such as equitable and optimal traffic management, the environmental impacts of vehicle fuels and engines, energy needs, and the linkages between transportation and other aspects of society, such as urban structure and economic development. Third, there are related, non-traditional policy skills, such as an understanding of strategic management, program operations, human resources, and fiscal responsibility. Finally, some employees need to enhance their skills through updates in safety and security technologies and in maintaining existing transport systems.

Traditionally, formal education in transportation-related topics focused on two types of individuals. One career path — usually through a formal education program — prepared professionals to act as transportation

administrators. The second supported the operator who ran the system and needed vocational or technical training programs to update skills.

Several factors now impact on efforts to meet these challenges. First, the current revolution in technology (led by enhanced communication) has had a dramatic impact on the transportation work force. It affects a nation's ability to compete, as well as the effectiveness and efficiency of its workers. Countries in parts of Asia, India, and Malaysia, for example, are rapidly growing based on their computer infrastructure and learning capabilities, rather than going through the traditional development phases of manufacturing.

Second, globalization is pushing both problems and potential solutions across geographic and political borders. Moreover, policy planners and decision-makers in international organizations such as the United Nations find it difficult to set priorities regarding economic growth, environmental impacts, territorial dispute resolution, and other issues. For example, air pollution control requirements that resolve an environmental problem in one country may require actions by a neighboring country that are not economically feasible. Such regional conflicts now overshadow the stark conflict between centrally planned economies and free market systems that characterized much of the latter half of the 20th century.

Demographic factors also have an impact. Barriers put up by individual governments and regional economies are breaking down so that workers are now free to move, often leaving a position difficult to fill. Such movements involve migrations from Africa to Europe, from Southeast Asia to the Middle East, from Central and South America to North America, and they are not necessarily limited to unskilled workers. The vitality of the current worldwide economy makes it difficult to get and keep transportation workers at all skill levels.

A nation's commitment and the availability of resources is a final factor. How, for example, does a transportation expert in an urban area choked with cars, pollution, and

congestion measure their impacts on health, well-being, and land utilization? This is especially important in transitioning economies that are faced with competing policy initiatives, all requiring scarce resources. The world's largest and fastest growing cities may have their nations' largest proportion of population; but they may also have the least amount of investment in infrastructure to meet current and future needs. The interaction between the various economic, political, social, and cultural forces impact on decisions involving the movement of goods and services, resources, communication, the environment, and quality of life, both now and in the future.

HOW TO MEET THE WORK FORCE CHALLENGE

Several good options are available to ensure that academic, public, and private interests work to meet transportation work force needs.

Create and Support an Enhanced Learning Environment. Educators now realize that to meet the increasing work force demand, they must start earlier by stimulating the learning process among school-age children. Expanded math, science, and technology programs, for example, could include a unit focused on transportation-related math problems and science or technology projects. These would open doors for those who have not considered a transportation-related career or who do not understand the relationship between transportation and policy areas involving safety, security, innovation, technology, and the like.

Another option is to broaden the traditional scope of jobs and careers to include women and minorities, who could fill not only key management and leadership positions in transportation, but also non-traditional technical slots. Also, we need to promote the concept that education does not stop when someone leaves the classroom, but continues on throughout one's career and life. It involves the professional at all levels who wants to enhance his or her skills through formal class work or informal learning methods.

If these options are to be successful, the transportation-based curricula should be restructured and expanded. Transportation professionals in the 21st century must understand how their work affects the environment. The "costs" may include adverse impacts to the air, land, and water, as well as increased energy use. At the same time, they must have the skills to understand how their

decisions relate to community stakeholders. Emerging technological innovations are also making the study of the relationship between different air, land, and sea modes of travel increasingly important. A final example might incorporate non-traditional topics, such as ethics, into the revised curricula.

Develop Long-term Partnerships and Short-term Collaborations Between Transportation and Non-transportation Stakeholders Both Internationally and Regionally. With the rapid pace of change, it is unrealistic to expect that one part of society — whether it is the academic, public, private, or nonprofit sector — will have total responsibility for transforming transportation learning in the 21st century. What is needed are long-term partnerships and short-term collaborations — inter- and intra-governmental collaborations among transportation officials, as well as government-industry cooperation. These efforts can be on a national, regional, or international scale, and include local community involvement.

Build Bridges Between Traditional Learning Mechanisms and New Technology Alternatives. Learning processes involve not only education but also research efforts and technology transfer mechanisms. Traditional methods (such as library books) are now being supplemented and enhanced by technology-based applications, satellite broadcasts, audiovisual adaptations, and digital recordings. These media offer many opportunities that transcend traditional geographic, financial, and pedagogical learning.

The new media have special meaning for those in remote areas, those who do not have direct access to training and research resources, those who have limited funding, those who have targeted needs (e.g., young people wanting to know more about transportation careers or existing practitioners who need to update skills). The implications are especially important for policy planners and program administrators in transitioning economies where funds and personnel are in short supply to meet existing needs, much less plan for future improvements.

Next Steps

In a global, highly competitive economic environment, the challenge for the transportation community is to attract the brightest students and to retain the best employees. These are the individuals who not only bring

creative thinking to transportation problems, but also question the status quo to move the system forward.

To accomplish this, several general and specific actions are needed:

- Educators in every country must adapt to continuous, changing demands through the courses of study they offer and the research opportunities — both in tools and applications — their institutions provide. They must make a continuing commitment to broaden the focus beyond “traditional learning” to “students” of all ages.
- Numerous stakeholders must provide and share with others engaged in related transportation activities the necessary resources, such as scholarships, grants, research opportunities, internships, and computer hardware and software.
- Educators must build new partnerships that bridge the gap between the academic, public, and private sectors in their respective countries.

- Educators need to market their success to other educators, policy-makers, and the general public so there is an awareness of the benefits that transportation provides to the overall economy, to the community, and to individuals. This enhances the perception of the transportation enterprise and supports additional initiatives.

The new horizons in transportation learning offer exciting opportunities. On an individual level, they build student achievement at all academic levels and promote a lifelong learning agenda. On a national level, they strengthen the transportation learning process and build cooperation with other policy areas. On a societal (and international) level, the benefits can support safer, more efficient transportation systems that meet the needs of a highly competitive, worldwide 21st century environment. □

□ SCHIPHOL AIRPORT: FOSTERING A JUNCTION IN THE GLOBAL NETWORK ECONOMY

By T. Netelenbos, Minister of Transport, Public Works, and Water Management, The Netherlands

In view of the continuing advance of the global network economy, it is of vital importance that the economic activities at and around Amsterdam's Schiphol Airport are expanded and upgraded, says T. Netelenbos, transportation minister for the Netherlands. She says that further development of Schiphol will require a clear definition of the role of the government. The Dutch government is creating the conditions (for example, airside and landside accessibility) and setting and enforcing clear standards (for example, for noise, safety, and air quality) within which the air transport industry can undertake and improve its business operations and Schiphol can operate "as a business."

She discusses how the Netherlands has developed a "mainport" policy that links the global economy with domestic economic issues, traffic and transport policies, spatial planning, safety, and the environment.

How can the traffic and transport policy in general, and the aviation policy in particular, be designed so that the business sector can profit fully from the dynamic international economy? As we move toward a global and knowledge-based network economy, a large part of the answer to this question lies with the responsible fostering and cultivation of traffic, transport, and information junctions — junctions surrounded by a high density of economic activity and a conurbation.

THE GLOBAL NETWORK ECONOMY

The global network knowledge-based economy is being stimulated by three interrelated and mutually reinforcing factors. The first of these is the ongoing liberalization of international markets. The elimination of trade barriers is boosting economic dynamism and creating ways of making quicker use of innovations in other countries and continents. As a result, the connection between economic activities in the world is steadily increasing. Companies are at once supplier and customer of other companies. The production chains consist of a growing number of links. Second, the increasingly knowledge-

intensive nature of the economy and the greatly improved means of communication are making it not only possible but indeed essential to achieve more rapid cooperation and communication over greater distances. This increasing economic importance of knowledge is creating a need for communication and "face-to-face" contacts across borders, leading to further progress toward a "world economy." Finally, the development of ever cheaper and faster transport is making an essential contribution to present changes in the international economy.

An important consequence of the globalization of the economy is that more and more companies are becoming part of international alliances, and truly national companies are being relegated to a background role. It is less self-evident, for example, that Dutch companies will opt for the Netherlands. This is also changing the position of the national authorities. The natural solidarity between government and national companies is becoming less marked.

THE FUTURE OF CIVIL AVIATION

The effects of the global knowledge-based network economy will, in the next few years, be noticeable even in the tendrils of national economies. On a worldwide level, this will lead to three important trends that are relevant to the aviation sector.

First, there will be a marked increase in goods and passenger transport via air. This increase can be explained by the growing international orientation of businesses and the increase in prosperity and well-being. At the same time, however, as people's income has risen, the importance that people attach to the quality of the living environment — i.e., non-material well-being — has grown as well.

Second, the knowledge-based (ICT) economy will lead to a substantial change in the airport itself and in the economic structure around the airport. ICT is being

increasingly applied within the aviation industry to make both physical flows and information and transaction flows more efficient. The economic structure around Schiphol Airport in Amsterdam is also changing. Many knowledge-intensive businesses are setting up operations in the vicinity of Schiphol. A highly trained labor force, good accessibility by air, the proximity of other business services, and ICT infrastructure are leading to the creation of clusters of knowledge and ICT-oriented companies. This is creating a positive interaction between physical infrastructure and the knowledge-intensive environment. Indeed, the impact has been such that the Schiphol Airport could even lay claim to being a “brainport,” too.

Third, the network economy will lead to demand for better coordination between the management of international transport flows and the management of international production networks. Gradually, the management of transport flows is becoming an independent activity.

Trends specific to air transport that seem likely to continue are:

- The liberalization of the global air transport market.
- The privatization of airlines and airports in Europe.
- The harmonization of competition and environmental policy within the European Union (EU).
- Concentration within the global air transport market, for the time being in the form of alliances between airlines from different continents.
- As a result of the previous four developments, increased international competitive pressure on airlines and airports in Europe.
- A blurring of the national identity of airlines and airports. Future investments of airlines and airports will be where expectations of profit are the greatest.
- A shortage of capacity at the major European hub airports and the risk of continuing inefficient use of European airspace.

- The expansion of the European high-speed rail network. The high-speed train will play a competing and complementary role.

- A rise in the number of direct connections, to some extent avoiding the hubs, which will be operated by smaller, independent airlines or semi-independent subsidiaries of the major airlines.

- A decrease in concentration of network development of the global alliances of airlines in Europe on just a single hub.

SCHIPHOL AS A MAINPORT

To secure healthy economic development, the Netherlands, as every other country, is wise to concentrate on that which it is good at. The Netherlands has always been a trading nation. This has largely been determined by the country's geographical location. The combination of an excellent location, good entrepreneurship, and supportive government policy has resulted in the creation of two large international ports in the Netherlands: the Rotterdam port and Schiphol Airport.

Since 1989, these two large ports have been one of the keystones in spatial economic policy in the Netherlands. We call this policy the “mainport” policy. A mainport is a large-scale regional concentration of population and activity that historically is built around the storage and transshipment activities of an (air)port. Such an (air)port is a junction between continental and intercontinental streams (sea, air, and land) of goods, passengers, and information. The mainport has been redeveloped into a high-quality center for (air)port-related and non-(air)port-related activities. This policy aims to link the global knowledge-based network economy with a combination of economic policy, traffic and transport policy, spatial planning, and a safety and environmental policy. This combination cannot be avoided because (air)port-related policy, which encompasses interwoven economic activities and a conurbation, affects all these policy areas and because it is in the relations between policy measures that the synergy gains are to be found.

CONTRIBUTION TO THE DUTCH ECONOMY

Since Schiphol's mainport policy was initiated, it has been a spearhead of the Dutch economy. Not only has the Schiphol Airport become internationally competitive, but

the position of the Dutch national carrier, KLM, has been greatly strengthened, and the international accessibility of the Netherlands by air has been substantially improved.

The economic importance of Schiphol can be illustrated in terms of employment and value added. In 1998 more than 50,000 people were directly employed in production at Schiphol, with a value added of 5.9 billion Netherlands guilders (\$2,350 million in current U.S. dollars).

Despite the limited size of the local market, the development of a high-quality network of connections has had a favorable impact on the attractiveness of the Netherlands for foreign businesses. So the economic importance of the mainports goes further than the value added and the employment generated by the transport activities themselves.

Schiphol is also a factor in attracting businesses to the local area, which then use the services provided by the Schiphol complex. These encompass activities such as European head offices, European distribution centers, and international tourism. Other companies, for example those looking for office premises, are attracted to the Schiphol region by the transport facilities, such as many knowledge-based businesses. This has led to concentrations of high-quality companies in the western conurbation, where they benefit from their mutual proximity and from the high caliber of the urban amenities for their personnel. It is hard to quantify how much of these indirect “forward” activities can be contributed to Schiphol. After all, the presence of high quality aviation infrastructure is only one of the factors in attracting businesses to the area. Other factors include the tax climate, the economic climate, and the labor market. But tentative estimates put the number of people working for companies that indicated that Schiphol was the main factor in attracting them to the area at more than 20,000 in 1998.

YESTERDAY’S KEY FACTORS IN SCHIPHOL’S SUCCESS

An important factor in the results achieved was the convergence of views among the government, the airport, and the hub airline on the way in which Schiphol should be developed into a mainport. The government not only allowed the aviation sector at Schiphol sufficient scope for development, but also expanded access for Dutch airlines to the international market by means of bilateral air

transport negotiations. This resulted, among other things, in an Open Skies agreement with the United States and in the conferral of American antitrust immunity for the alliance between KLM and Northwest Airlines

The aim of the Dutch aviation industry was to develop Schiphol as a central European hub for aviation within governmental parameters. The success of the commercial strategy pursued by KLM is a reflection of the introduction of concentrated arrival and departure peaks and the conclusion of strategic alliances. It was also assisted by a strategy pursued by Schiphol Airport, as reflected in the “one terminal” concept, which is unique to such a large airport.

Clearly, the factors responsible for yesterday’s success are no guarantee of success tomorrow. Furthermore, the growth strategy of concentrating on market share had proved more beneficial for the Schiphol Group, as the airport operator, than for KLM as hub airline. Since the Netherlands wishes to maintain a large enough airport and airline company to benefit from the strength of our internationally orientated economy, the Dutch government will have to pay even more attention to the creation of the right conditions for such an airport and airline company.

CHALLENGES TO EXPANSION

The tension between the economic advantages of the further growth of air transport and the resulting disadvantages in terms of the environment, safety, and spatial planning has become increasingly pronounced in recent years. Dutch airline companies have successfully taken advantage of the ongoing liberalization and privatization of the aviation market, thereby boosting the development of air transport and traffic through Schiphol.

But it has come at a cost to the quality of life, particularly in relation to the level of noise surrounding Schiphol. While aircraft have become more noise efficient, this effect has been nullified by growth in aircraft movements. Not only has the number of complaints increased in the past period, but the area from which they emanate has widened. Owing to the intensity of emotion generated by this issue in society, the government has accorded priority to tackling the problem.

In further development of the airport and the airport

industry, it is not the place of the government to step into the shoes of the entrepreneur. The government sees as its task to create the conditions and define the parameters for “Schiphol as a business.”

The government views its task as creating sufficient scope for controlled growth, arranging bilateral agreements, and ensuring the good airside and landside accessibility of Schiphol Airport. In addition, the government is promoting the accumulation and application of knowledge. This is not only conducive to the efficiency of Schiphol; it is also having a favorable effect on investment in the “Randstad” conurbation.

Just as in the case of other industries, the government defines the parameters within which the air transport industry can undertake and improve its business operations. It is up to the government to impose limits on the nuisance and overall safety risks caused by the business operations at the airport and to enforce these limits in such a way as to strike a good balance between the economy and the quality of life.

In order to protect the public and the corporate users of the airport against possible abuse of market domination, it is necessary to apply competition policy and have an

industry regulator. In principle, the Dutch Competition Authority (NMa) can fulfill this role.

These conditions and parameters for the development of the airport, the air industry, and the Schiphol area are part of different policy fields: spatial planning, economic policy, traffic and transport policy, safety, and the environment. The right combination of these conditions and parameters, a coherence that the Dutch government strives for in the mainport policy, determines whether a government policy for fostering the junction in the global economy can be successful. The ultimate success of the mainport strategy will depend on the extent to which the government succeeds in positively contributing to the climate for the establishment of businesses in the mainport, and to which the airport, the air transport sector, and the businesses localized in the Netherlands manage to capitalize on these opportunities. □

Notes: 1. This article is based on the memorandum “The economic significance of Mainport Schiphol” and the memorandum “The economic significance of Mainport Rotterdam” issued by the Dutch government in June 2000.

2. The opinions expressed in this article do not necessarily reflect the views or policies of the U.S. government.

□ KEEPING PACE WITH GLOBAL BUSINESS: UPS TAKES AN INTEGRATED APPROACH

By Jim Kelly, Chairman and Chief Executive Officer, United Parcel Service

State-of-the-art information technology has allowed United Parcel Service (UPS) to become one of the world's largest transportation companies, says its chairman, Jim Kelly. He describes how UPS has been transformed from a trucking company with technology to a technology company with trucks. This article is a case study of one company's experience in addressing the challenges of global transportation.

The pace and scope of international business have changed. Increasingly, companies view the entire planet as their area of operation. As companies “go global,” they seek multiple sources for materials, multiple sites for manufacturing, and multiple markets for finished products. Just-in-time manufacturing techniques cut inventory costs and permit flexible manufacturing processes. This globalization has stretched supply chains and placed extraordinary demands on corporate logistics systems to operate efficiently.

In addition, consumer tastes are changing more rapidly, and the production of goods designed to cater to those tastes has likewise accelerated. Firms that cannot develop, manufacture, and distribute new products in time to take advantage of the latest advance in technology or the latest fad in fashion run the risk of “missing the market.”

The explosion of electronic commerce also has opened completely new markets and forced the international trading system to adapt. Orders are placed and transactions confirmed at the speed of light — from half way around the world. E-commerce is exploding, yet only about 15 percent of U.S. e-businesses are willing to deal with the challenges of shipping their products internationally. UPS must do all it can to help every e-business become a player in the new world market.

MEETING THE CHALLENGE OF INTERNATIONAL COMMERCE

Many know UPS principally by its brown trucks. These vehicles are the backbone of the company, which was founded in 1907 and which today operates more than 150,000 of these package cars, vans, and tractor trailers.

Additionally, UPS is the United States' single largest shipper of trailers on intermodal rail cars. But in today's global environment, UPS has to be more.

In 1988, to meet the needs of customers and to meet the increased demands of international business, UPS started its own airline. Today, UPS is the world's 10th largest airline, operating or chartering more than 500 aircraft serving more than 391 airports in the United States and 219 abroad.

To meet the ever increasing demands of burgeoning international trade, UPS has become more than a transportation company. It is a logistics company, a finance company, and a leader in the field of e-commerce. In fact, UPS now offers three streams of services that compose global commerce. It offers the traditional transportation stream of goods. It offers a continuous stream of information. And it now offers a stream of funds.

Through UPS Logistics, a subsidiary of UPS, sophisticated supply-chain management techniques link together global companies' far-flung manufacturing and assembly facilities. UPS manages companies' inventories and warehouse systems. It manages the selection of optimal transportation price and service options (even when it may not be UPS). It even operates product service and repair centers for corporate customers, where products are repaired at UPS sites and quickly returned to the customers. And UPS does more.

Through the recently created UPS Capital Corporation, UPS is helping companies increase their international business by bringing speed and reliability to the flow of funds. By facilitating trade finance transactions, UPS is making it easier for smaller and less-experienced companies — many of which are e-businesses — to enter the world of international commerce. UPS finances accounts receivable and collect and deposit payments, reducing the risks associated with breaking into overseas markets and effectively increasing companies' working capital.

By combining these three flows of commerce, we have transformed UPS. *Forbes* magazine recently recognized UPS as the “Year 2000 Company of the Year.” The *Forbes* article states that, “UPS used to be a trucking company with technology. Now it’s a technology company with trucks.” This captures the spirit of UPS as it evolves to meet today’s environment.

ENABLING E-COMMERCE THROUGH INTEGRATED SOLUTIONS

UPS’s transportation, logistics, and finance businesses have all been heavily influenced by the explosion in e-commerce, and in turn have helped enable the growth of this dynamic way of transacting business. Each month, roughly 235,000 new e-commerce Web sites appear, and more Internet users are buying online or using the “Net” to communicate with vendors. These businesses are heavy users of express delivery services, and UPS services in particular. For example, in the “business-to-consumer” area, an independent research company estimated that UPS delivered 55 percent of the packages purchased online during the 1998 holiday season.

On the “business-to-business” front, UPS was quick to recognize the Internet’s power to reshape business relationships and revolutionize supply chains. Going beyond other transportation companies that only pick up and deliver goods, UPS offers a range of integrated services that can take its business customers through virtually every stage of an e-commerce transaction. For example, for athletic equipment manufacturer Nike, Internet orders arrive at a UPS Worldwide Logistics facility, where UPS processes the order, packs the product, and ships the package. The goods are then delivered by UPS, with the customer able to track the status of the order at any time using the UPS tracking number communicated by e-mail and traceable over the Internet. From the moment the customer places an order to the moment that order is delivered to the customer’s front door, UPS employees are doing all the work.

Smaller companies benefit from these services, too. PlanetOutdoors.com has used a variety of UPS tools to build a “virtual store” to supply gear, clothing, and accessories for outdoor sports enthusiasts. Freed from the need to operate showrooms, the company can offer a wider selection of products. UPS helped the company create a first-class order fulfillment and customer service system that provides virtually error-free delivery, a system for checking the status of orders, and a way to manage

thousands of shipments from a variety of vendors and still have them presented as PlanetOutdoors.com.

INFORMATION TECHNOLOGY — TYING IT ALL TOGETHER

For UPS, the common thread through all operations is information technology. UPS simply could not do all that it does without state-of-the-art technology.

UPS operates 14 mainframe computers, 218,000 personal computers, and 3,500 local area networks connecting 120,000 workstations. UPS delivery persons use 120,000 hand-held communications devices — known as DIADs — to connect to the databases to make certain that packages can be tracked from the shipper’s loading dock to the customer’s front door.

UPS operates a global telecommunications network connecting 100 countries and more than 600,000 users, processing 1.2 million cellular calls daily. The UPS Web site records an average of 12 million hits per day and logs more than 150,000 user sessions accounting for over 700,000 tracking requests. To make this all work, UPS employs over 4,000 technology personnel and expends some \$1,200 million per year on information technology.

UPS is a far cry from the Seattle delivery company that first hit the road in 1907. And perhaps not so far after all. UPS has always been a technology company. At its birth, it employed the latest technology of the early 20th century — the bicycle — just as today it is using the Internet. At the beginning of the next century, UPS will use yet unimaginable future technologies.

Our business has become global. Eliminating barriers to commerce can benefit industry in nearly all sectors. If UPS aircraft cannot fly to a particular nation or UPS packages cannot quickly clear customs, trade is slowed or even stifled. Open markets serve to enable global trade. Decades-old transportation, trade, and other agreements, as well as laws that hinder trade, need to be reexamined and replaced with modern procedures suitable for tomorrow’s electronic global economy so that companies like UPS will continue to evolve and deliver the goods. □

Note: The opinions expressed in this article do not necessarily reflect the views or policies of the U.S. government.

□ CUSTOMS HARMONIZATION AND FACILITATION OF INTERNATIONAL TRADE

By Michel Danet, Secretary General, World Customs Organization

Customs requirements must facilitate the international movement of legitimate trade to the maximum practicable extent, says Michel Danet, secretary general of the World Customs Organization. "It is fundamental that traders and transporters worldwide should expect similar treatment for their goods throughout the course of an international transaction."

In this article, Danet explains the necessity for a harmonized global customs system that requires customs administrations to adopt relevant international conventions and instruments.

Situated at the crossroads of international commerce and the transportation systems that support it, customs administration plays a vital role in the overall effectiveness of international trade. Governments traditionally charge customs with the timely and accurate collection of revenue; with ensuring compliance with border control aspects of the nation's health, environment, and other regulations, and with collecting important trade statistics. Traders and transporters, on the other hand, must rely on customs for fast and efficient clearance of goods in the international trade process.

As international trade has developed and expanded with the global economy, out-of-date, incompatible, and inefficient customs procedures have been recognized as a costly constraint. When commerce is constrained by these inefficiencies, transnational transportation systems find themselves stymied no matter how modern and efficient. With the general reduction in the levels of import taxes because of trade rounds advanced by the General Agreement on Tariffs and Trade (GATT) and its successor, the World Trade Organization (WTO), procedures designed to collect customs duties and taxes can cost more to operate than the amount of taxes collected.

Importers and exporters operating in more than one country need to cope with different rules and regulations, and this adds an unnecessary overhead to the costs of trading internationally and to transportation systems. Many small and medium-sized enterprises are

discouraged from expanding their businesses into foreign markets because they consider the myriad customs requirements to be too difficult and complex. There is a growing and urgent need for the implementation at the global level of simplified and harmonized customs systems and procedures.

Customs requirements must facilitate the international movement of legitimate trade to the maximum practicable extent, and this requires customs administrations to adopt relevant international conventions and instruments such as those developed by the World Customs Organization (WCO).

One important paradigm shift for modern customs is to change from the traditional method of focusing on transaction-by-transaction controls to a more facilitative and risk-based approach for the clearance of goods. While some customs administrations have been quick to respond to these challenges, others have reacted more slowly and may even lack the legal or resource infrastructure needed to keep pace with the demands of international trade. Customs modernization and harmonization in all spheres of activity therefore represent a key objective to facilitate international trade and, at the same time, to improve compliance with national and international regulations. Customs must also continue to maintain effective controls to combat cross-border crime, which has grown as criminals take advantage of operating in a global market.

CUSTOMS HARMONIZATION FOR INTERNATIONAL TRADE

It is fundamental that traders and transporters worldwide should expect similar treatment for their goods throughout the course of an international transaction. They should be able to operate and to interact with customs in a predictable and efficient manner. To achieve this, customs must adopt common standards and practices that incorporate certain fundamental principles such as transparency, consistency, and predictability for both trade and customs officials. Moreover, customs must take advantage of and use modern technologies to

function better in the present and future trade environments. Information technology must be used to the maximum practicable extent to process information about international trade and to facilitate cross-border movement of persons and goods.

The World Customs Organization (formerly known as the Customs Co-operation Council) was established in 1952 to increase the efficiency and effectiveness of its member customs administrations. The current membership is 151 customs administrations, which together cover about 97 percent of world trade. To achieve the highest degree of harmonization and uniformity, the World Customs Organization has developed a number of international instruments that are available for application by all customs administrations.

THE HARMONIZED SYSTEM

The Harmonized System (HS) was developed by the WCO as an international product nomenclature for the classification of goods for customs tariffs and for the collection of trade statistics. It is applied in almost all countries (98 countries are contracting parties to the HS Convention, and 176 countries use the system, representing more than 98 percent of world trade). The HS also provides the basis for the trade statistical instruments of the United Nations. The Harmonized System has in effect standardized a significant part of the “language” of international trade.

The system is used extensively in international trading and for a host of purposes. For example, it is used as a basis for rules of origin, in trade negotiations (e.g., the WTO schedules of tariff concessions), for transport tariff and statistics, and for monitoring controlled goods. The system is kept under constant review to keep it up to date with changes in technology and trade patterns.

THE WTO/GATT VALUATION AGREEMENT

Customs harmonization for the valuation of imported goods has been achieved by the WTO valuation agreement. This establishes uniform and predictable criteria for the valuation of imported goods based on “transaction value.” All WCO members that are also members of the WTO are obliged to apply the WTO valuation rules. The WCO, as the appointed international body responsible for interpreting and giving technical support to the valuation rules, assists developing

countries in their understanding and implementation of this agreement.

Work is under way, under the auspices of the WTO with technical support from the WCO, to develop harmonized non-preferential rules of origin to support the WTO Agreement on Rules of Origin. The implementation of non-preferential rules of origin will further harmonize customs operations worldwide.

THE NEXT STEP

The classification, valuation, and rules of origin for goods are fundamental and necessary tools to achieve harmonization and facilitation of international trade. However, the cross-border movement of goods also involves the procedures to which the goods are subjected. It is widely acknowledged that divergent, outdated, and inefficient customs procedures constitute a nontariff barrier to international trade. They cannot only hinder the movement of goods across frontiers, but also incur additional costs to trade. Businesses have regularly voiced their dissatisfaction at the lack of international standardization of customs procedures. Such standardization is therefore of utmost importance to achieve total harmonization.

THE REVISED KYOTO CONVENTION

WCO developed the International Convention on the Simplification and Harmonization of Customs Procedures (frequently referred to as the Kyoto Customs Convention) in 1973 to simplify and harmonize divergent national customs procedures. This convention contains the key principles, the majority of which are still valid today, that cover the entire spectrum of customs procedures. WCO completed a comprehensive revision of the convention and adopted it in June 1999. The revised Kyoto Convention provides the blueprint for modern and simplified customs procedures for the 21st century.

The revision has incorporated the core principles and modern concepts that would increase customs efficiency in clearing goods without compromising customs control. It calls for, among other things, harmonization, standardization, simplification, speed, equality of treatment, transparency, predictability, trade consultation, and independent appeal procedures. The use of information technology and risk-management techniques, including audit-based controls, have been integrated and

are designed to ensure that a customs administration is able to ensure full compliance with national laws while permitting the vast majority of legitimate trade to cross borders unhindered.

Above all, the core customs provisions have been made binding on contracting parties, fostering a greater degree of international harmonization of customs procedures.

A substantial step forward in customs harmonization will be achieved when the revised Kyoto Convention enters into force. This will occur as soon as 40 of the current 61 contracting parties accept the Protocol of Amendment to the Convention.

AREAS OF FUTURE HARMONIZATION

The Group of Seven (G-7) major industrialized countries' data harmonization initiative to develop a single and standard set of customs data requirements for international trade is nearing completion. The basic concepts behind the initiative include electronic reporting; reduced, harmonized and standardized data requirements for the arrival of goods, import and export; a single window to accomplish all regulatory requirements; and aligned export and import requirements to allow for seamless data exchange.

WCO is actively participating in this work and the technical message developments. WCO and the G-7 hope these developments will eventually be accepted and implemented by customs services worldwide.

CONCLUSION

Today's modern production and delivery systems linked with new forms of electronic commerce make swift and predictable customs clearance an important prerequisite for national prosperity. With ever-growing international trade and transportation systems, with the emergence of new commercial standards and practices, and with the demands of an electronic age, customs administrations have to re-engineer their clearance procedures to meet these challenges.

Customs administrations today and in the future must harmonize their operations to allow international trade to flourish and to better accomplish their missions. The wide application of the principles contained in a variety of existing instruments is the most realistic way to accomplish this aim. Trade and transport must encourage governments to step into the future by modernizing today's customs methods and preparing for tomorrow's opportunities. □

Note: The opinions expressed in this article do not necessarily reflect the views or policies of the U.S. government.

□ TRANSPORTATION CAN HELP IN THE FIGHT AGAINST POVERTY

By James D. Wolfensohn, President, The World Bank

“The developing world’s need for transportation is striking,” says World Bank President James Wolfensohn. “Countries with low and middle incomes do not have enough of the right roads to help their economies grow and their citizens prosper.”

In this article, Wolfensohn says the World Bank is shifting away from support for large transportation infrastructure projects in favor of funding rural roads and urban transport so that the poor can reach jobs and markets more easily, collect water and fuel more quickly, and get to schools and health clinics more efficiently.

During the past five years, the World Bank has made significant strides in integrating transport development into our core mission of alleviating poverty. We have shifted away from lending for large infrastructure projects more easily financed by the private sector in favor of transport programs that will enhance regional trade networks in our poorest developing countries.

Despite this general shift away from infrastructure, we have continued to loan an average of \$3,000 million per year on transportation, claiming about 13 percent of our total portfolio. The bilateral aid agencies of the 22 members of the Organization for Economic Cooperation and Development’s Development Assistance Committee (excluding the regional development banks), meanwhile, averaged a total of \$4,500 million per year during the same period, two-thirds of which can be accounted for by Japan.

DEVELOPING COUNTRY TRANSPORTATION NEEDS

The developing world’s need for transportation is striking. Recent Bank studies show that countries with low and middle per capita incomes do not have enough of the right roads to help their economies grow and their citizens prosper. Of the 3 billion people who live in rural areas of developing countries, 900 million have no reliable (all-weather) road access, and 300 million have no connection at all to the rest of the country.

During the first few decades of its existence, the Bank devoted the bulk of its transport lending to building railways, ports, and highways. While the Bank’s involvement in aviation is relatively modest, it has been expanding. For example, an important recent initiative is the partnership between the Bank and the U.S. Department of Transportation that Secretary Rodney Slater and I put together to address air safety and related infrastructure issues in Africa. In recent years, we have reduced our port and railway lending to make room for private investors who have shown an increasing interest in those areas. Consequently, we shifted more toward funding rural roads, feeder roads, and urban transport so that the poor can reach jobs and markets more easily, collect water and fuel more quickly, and get to schools and health clinics more efficiently.

The Bank is now funding rural road projects in Peru, Nepal, Bhutan, Bangladesh, and Ghana, among other countries. These are funded mainly through self-standing rural transport, multi-sector rural development, and community-implemented social fund projects. These projects also promote labor-based work methods to maximize employment and rural incomes. The special problems of women are also being addressed. Based on successful experiences in South Africa, the World Bank is cooperating with the Self-Employed Women’s Association (SEWA) of India on a feasibility study on the use of micro-credit to increase women’s access to transport, and pilot micro-credit projects are already under way in Guinea and Senegal to help women purchase bicycles.

These kinds of projects bring rural residents closer to better transportation, and they also have many direct effects that spur a country’s development. In Morocco, for example, road improvements lowered the delivered cost of bottled gas, which reduced the need for girls to go out and collect new supplies every day. This, in turn, freed up many girls to attend school more regularly.

The problem is not only rural. In the very near future, half of the world’s poor will live in cities. Most of them will be forced to live either on the periphery of cities, far removed from jobs and services locations, or in slums,

which are often inaccessible to formal transport services. The very poor can spend up to three hours a day, on average, or up to 40 percent of their income, traveling to and from work. Bank urban transport lending has therefore emphasized the need for more affordable transport for the poor, including better public transport and non-motorized transport, and better road access to some of the very poorest areas.

The World Health Organization estimates that there were 1,171,000 road deaths in 1999, and millions are injured annually in road accidents. About three-quarters of these accidents happen in the developing world. Most involve the poor who, as pedestrians, cyclists, and roadside dwellers, are the most vulnerable. A Global Road Safety Partnership was launched in February 1999 at a meeting convened by the World Bank Group. The partnership, which aims to develop a comprehensive approach to improve road safety in developing countries through local capacity-building and collaboration, includes as members the representatives of multilateral and bilateral development institutions, governments, industry, and civil society.

TRANSPORT PROMOTES TRADE

Investing in transport infrastructure makes sense to people because it directly improves their daily lives. However, it also helps them indirectly by boosting their country's trade. The median landlocked country has only 30 percent of the trade volume of the median coastal economy. But halving transportation costs increases that trade volume by a factor of five. Institutional reforms, such as privatizing port and rail sectors and commercializing highway maintenance, also contribute significantly to the improved trading performance of some countries.

Moreover, the Bank has recently focused specifically on transportation's contribution to trade. In 1999 it launched the Global Facilitation Partnership for Transportation and Trade, which brings together private sector companies and national and international institutions.

The Bank is also participating in three regional integration initiatives. The Trade and Transport component of the Sub-Saharan Africa Transport Program helps partner countries build stronger regional links through improved intra-regional transport services. The

Transport and Trade Facilitation for Southern Europe project assists Southern European countries in improving their border-crossing procedures and facilities in preparation for EU accession. And the South Asia Regional Transport Initiative identifies and alleviates transport impediments to regional trade.

Building roads is a start, but maintaining them is just as important. In the late 1980s, a World Bank study showed that the loss of road infrastructure in the developing world through neglected maintenance was, in the previous two decades, approximately equal to the total World Bank lending for roads over the same period. Because of that, a growing part of the World Bank's transport lending has been aimed at helping countries establish the kind of institutional and policy changes that will make the transport sector more fiscally and financially sustainable.

For instance, the Bank has engaged in a major effort, the Road Maintenance Initiative, initially within the Sub-Saharan Africa Transport Program and subsequently on other continents, to restructure road agencies so that they manage roads more efficiently. In countries as disparate as Malawi, Pakistan, and Nepal, public-private road management boards have been set up with strong user representation to enhance stakeholder oversight and accountability. These boards determine the level of payment to be made for road use and the way in which the funds generated are to be used. Moreover, they establish a secure and stable flow of funds and work effectively. Increasing the involvement of the private sector as contractor and concessionaire has typically yielded a 25 percent cost reduction in the budget burden by private sector undertaking of the publicly financed works.

PRIVATIZING TRANSPORTATION

A review of World Bank's rail sector lending in the early 1980s showed that much investment had failed to yield sustained improvement in the public sector's performance. As a consequence, recent lending has focused increasingly on commercializing rail activities.

For example, in Latin America, the Bank has been facilitating the full privatization of most of the major freight railways and the concessioning of many urban passenger systems to the private sector. In Argentina alone, it is estimated that the public purse has been able

to hold on to about \$1,000 million per year, while the quality and quantity of urban rail service has improved substantially.

Although no more than 10 percent of transport infrastructure needs are likely to be met by private sector investment, the World Bank Group has strongly encouraged private financing in the last decade. In rail transport and ports, whole systems in Latin America and Africa have been concessioned to the private sector for periods of up to 50 years. Similar developments may soon occur in Eastern Europe. The World Bank has assisted both through technical assistance in concession and regulatory system design and through financing the rehabilitation of infrastructure and rolling stock. In the road sector, extensive private toll-road concessions exist in Mexico, Argentina, Malaysia, and Thailand. The Bank and its affiliate, the International Finance Corporation, have also been involved in concessions in smaller countries such as Colombia and Costa Rica.

Despite this experience, there are important constraints on the extension of private participation. Complex externalities and the difficulty of collecting revenue from limited access roads in an open network have deterred the private sector from carrying the residual risk. Hence, our challenge at the Bank is to help countries find

mechanisms for mobilizing private participation and profiting from the efficiency of supply. That need not be a losing battle. There are two areas where progress is most necessary. First, effective public sector regulatory and administrative frameworks are needed both to attract private participation and to protect against exploitation of any private sector monopoly power. Second, better arrangements, including improved guarantee instruments, are required for sharing risk and financial commitment between the private and public sectors.

If undertaken in the right policy environment, transport infrastructure investment can reduce poverty through its effect on stimulating and creating opportunities for growth. What's more, it is important that we target this investment to particularly underserved populations, to feed a potential for growth that is enormous. Then we can start talking about growth rates in exponential terms. The emphasis of the World Bank on sector reform, and particularly on extended collaboration with stakeholders in identifying where its interventions are best directed, is the basis on which transport infrastructure can be an integral part of the global fight against poverty. □

Note: The opinions expressed in this article do not necessarily reflect the views or policies of the U.S. government.

□ INTERMODAL TRANSPORTATION FOSTERS INTERNATIONAL TRADE AND SUSTAINABLE DEVELOPMENT

By Philippe Rochat, Executive Director, Air Transport Action Group

Safety, accessibility, speed, efficiency, employment, flexibility proper land use, and pollution control together form the main benefits of intermodal transportation systems, according to Philippe Rochat of the Air Transport Action Group. In this article, Rochat explains that success in developing these systems requires an overall vision and a balanced approach because an integrated transport system has to be based on a rational and thorough cost-benefit analysis and a fair and equal treatment of complementary modes of transport.

Michael Feldman, distribution services director of passenger services of the International Air Transport Association, defines intermodality as “the combining of different modes of transport into a seamless travel experience: bus to train, train to aircraft, aircraft to boat and boat to taxi through a common distribution and service delivery process and as a single commercial transaction.”

Most trips, beyond the normal distance for walking, bicycling or driving, are multimodal, combining the successive use of various modes of transport. Multimodal transfers usually take place at airports, railway stations, and harbors.

As far as air transport is concerned, flight services can be combined with:

- Local services between the airport and the neighboring city (provided by car, bus, boat, metro, or light train).
- Feeder services between the airport and the various parts of the surrounding region (mainly provided by train, high-speed train, or bus).
- Complementary or alternative services between the airport and the centers of neighboring regions (provided by high-speed train as a complement to or substitute for connecting flights).

Transport also becomes intermodal when it combines, for instance, the outward journey by air and the return by train, or when it facilitates ground connections between

two neighboring airports, or even when a cruise package includes the air link to get the passenger to the ship’s harbor.

Ground transportation services may compete with each other and with air services, but intermodality calls for cooperation with the view to:

- Satisfying customers expectations through the selection of best practices.
- Promoting the most cost-effective use of the means of transportation.
- Reducing congestion, air traffic control delays, and environmental impacts.

THE BENEFITS OF INTERMODALITY

Intermodality is therefore a key element in any modern transport system. It underpins international trade and economic growth, while satisfying the requirements for sustainable development. Indeed, the intermodal approach has been identified as a major tool for reconciling the economic, social, and environmental dimensions of sustainability.

In other words, safety, accessibility, speed, efficiency, employment, flexibility, proper land use, and pollution control form the main benefits of intermodality. Success in this regard requires an overall vision and a balanced approach, as any integrated transport system has to be based on a rational and thorough cost-benefit analysis and a fair and equal treatment of complementary modes of transport.

Emerging economies should keep those factors in mind for fostering improved transportation, which, in turn — and coupled with suitable telecommunications — fosters international trade and development.

Air-public transit links are generally considered the most attractive intermodal solutions for building a seamless travel experience. But as both modes of transport have

been developed as separate sectors, many obstacles have slowed down their integration, which is still in its infancy.

Special efforts are being made in order to:

- Reduce cultural differences between railway and airline operators.
- Stimulate intermodal thinking among politicians, other decision-makers, and infrastructure planners;
- Liberalize railway operations according to market requirements for removing major differences in infrastructure cost coverage.
- Develop true interfaces between air and rail regarding their distribution, reservation, and information systems.
- Promote common standards on ticketing and clearing, baggage handling, and other carriage conditions including liability, with a view to securing immunity and providing the necessary regulatory framework.
- Identify best practices of both modes to be retained as intermodal ones.

WHAT HAS WORKED

Seventy airports around the world have some form of air-rail link today, and about 140 are planned or thought about in most regions. Let us mention a few success stories.

Since its inauguration in 1998, the Heathrow Express rail link has reduced to 15 minutes the ground connection between London downtown (Paddington) and the top U.K. airport, thus bringing Heathrow as close to the city as London City airport, which was developed for offering domestic and European air passengers a quicker access to London's business center.

Close to 10 percent of Heathrow passengers (15,000 per day) take the train at Paddington, where they can check in their baggage and get their boarding cards. Road traffic has already been reduced by more than 2,000 cars a day!

The positive environmental impact of intermodality has also led to the creation of a dedicated train between Stockholm and the nearby Arlanda airport. Arlanda Express has indeed been imposed as a pre-condition to

the expansion of the airport serving the Swedish capital. In Switzerland, there is a unique "check-in-and-fly" system through railway stations. You can check in at more than 25 Swiss railway stations for flights on a number of carriers serving the Zurich and Geneva airports. You can also check your baggage to destinations worldwide at more than 100 Swiss railway stations. Moreover, the Fly Rail Baggage system lets you check bags from many foreign airports to most Swiss railway stations (3 to 12 hours delivery time).

The service, which started 15 years ago, allows passengers to check in well in advance, get rid of baggage, and arrive at the airport relaxed, at the very last moment.

At Paris's Charles de Gaulle airport, Air France, United Airlines, American Airlines, Lufthansa, and other airlines allow travelers to transfer to France's Train à Grande Vitesse (TGV, high-speed train) for connections to Lyon, Nantes, and Lille. There are proposals to expand the service to other French cities to accommodate passengers on intercontinental flights. It also is suggested that the TGV provide an alternative to short-haul air links. For instance, when traveling from New York to Lyon, a traveler would have the choice, after landing in Paris, to get to Lyon either by plane or by high-speed train, without any major difference in travel time.

Many airlines are now knocking at the door of the French national railway company to join the scheme, which does not yet include baggage handling. At the same time, the French railway company is exploring the pros and cons of joining one of the global airline alliances.

In order to complete this brief European tour d'horizon, let's mention the most recent intermodal development. A feasibility study has been launched about establishing a direct rail link between the airports at Copenhagen and Malmoe, Sweden. The recent opening of a bridge over the Baltic Sea between Denmark and Sweden has indeed created momentum for considering both airports, 30 miles apart, as a single hub whose passengers could be transferred from one airport terminal to the other.

A similar concept is being explored between Geneva and Lyon, 80 miles distant from each other. Proponents of a rail link say a very-high-speed magnetic underground vehicle in the future would be able to carry passengers from one airport to the other in less than 20 minutes.

EVERYONE GAINS

Intermodal transportation is becoming more and more attractive as its possibilities for better mobility and sustainability become evident. It is:

- Better from the environmental point of view,
- Better from the economy and trade point of view,
- Better from the passenger point of view, and
- Better from the transport operators point of view.

Almost everyone wins, nearly everyone gains!

As so eloquently stated by U.S. Transportation Secretary Rodney Slater: “The future system will be international in its reach, intermodal in its form, intelligent in its characteristics — using the power of technology, inclusive in its service — and innovative in its scope.” □

Note: The opinions expressed in this article do not necessarily reflect the views of policies of the U.S. government.

□ AIR TRANSPORT DIRECTIONS IN THE 21ST CENTURY: THE LESSONS OF HISTORY

By Ronald E.G. Davies, Curator of Air Transport, National Air and Space Museum, Smithsonian Institution

The world is ill-prepared to address the expected soaring demand for air transport over the next quarter century, says aviation historian Ronald Davies. In this article, Davies, the author of 17 books on commercial aviation, argues for the development of larger airliners, advanced planning for new airport infrastructure, and more investment in high-speed trains.

FOUR CORNERSTONES FOR FUTURE PLANNING

In planning the future course of air transport during the next century, I would like to start by emphasizing four main criteria:

- 650-seat airliners will be in service.
- Supersonic airliners will not.
- Airport planning for 2020 must start now.
- Major airports must incorporate high-speed rail.

FORECASTING AIR TRAFFIC DEMAND

The most important factor in examining the directions of future global air travel and transport is to forecast the traffic demand, because this will determine the magnitude and the means by which that demand can be met. Most transportation industry analysts and government agencies (such as the Federal Aviation Administration, the International Civil Aviation Organization, the International Air Transport Association, Boeing, and Airbus, to name the most influential) all seem to agree that a growth rate of 5 percent per year can be confidently assumed for the next decade. I would not dispute that. But one of the main points that I wish to make is that a 10-year forecast is simply not enough.

Long-term Forecasting Essential. The aircraft manufacturing industry is about to make decisions very soon on the size and specification for the next generation of airliners — not a generation that will span only one

decade. The time span will be at least three decades, possibly four or five. Here is an immediate lesson of history: the last generation of front-line airliners, the flagships of the world's leading airlines' fleets, has lasted 30 years already. The Boeing 747 went into service in 1970. It is still going strong, and well over 1,000 of them have been built. So to forecast up to the year 2010 is irrelevant to the main objective.

Indisputable Urban Growth. Fundamental to any aviation planning formula is an analysis of world population trends, particularly in urban areas where rising business and personal incomes have boosted demand for air travel. The forecasting model for determining relative proportions of traffic demand, simply stated, is that the relative volumes of travel or traffic demand vary directly with the size of the populations of cities or urban concentrations and vary indirectly with the distance between them. By 2015, 14 urban centers in the world will have more than 15 million people; four of these will have more than 20 million — Tokyo, with about 30 million, followed by Lagos, Bombay, and São Paulo. Five of the 14 urban centers will be in the Indian subcontinent.

Making allowance for this diversity in the urban areas, and recognizing the difference between the cities of affluence in the developed countries and the less affluent cities in the developing countries, one can draw a map to indicate, globally, where the concentrations of air traffic potential will be, which is synonymous with concentrations of commercial activity and the consequent wealth. As in the past, Europe, eastern Asia, and the United States are prominent. But these traditional sources of traffic have been joined by others, so that India, China, and southern South America will emerge as important contributors to the global airline patterns of routes.

Inevitable Traffic Demand. The alarming aspect of the figures is that they apply only to the year 2015. This will mark about a quarter of the service life of the airliners that will come into service in 2005. If these 2015 figures are cause for alarm, what will be the situation in 2025,

which even then will be only the half-life of the super-jumbo jets of the next generation? And what of the later years, when a stretched version of the super-jumbo may be necessary?

Between 1960 and 1970, international world air traffic, measured in passenger-kilometers, quadrupled. In the next decade it almost trebled, doubled in the next, and then, between 1990 and 2000, doubled again.

Such growth has been phenomenal. To emphasize the point, the incremental growth of traffic during the year 2000 will alone be approximately the same as the sum total of the whole growth up to 1970.

Translating this conservative approach into annual passenger-kilometers, this means that world international air traffic will double during the next 20 years and almost double again during the following 20. The next generation of airliners will have to cope with a traffic volume almost four times what it is today. That is the reality of the problem we face. Forecasting for 10 years hence is pointless.

COURSES OF ACTION

We are facing the doubling of world air traffic in about 17 or 18 years' time, or only a dozen years after the next generation of airliners is launched. The simple arithmetic reveals that the solution is either to make the aircraft bigger or to put more airplanes into service.

The Super Jumbo Is Here. In terms of size, there is no technical limitation to building a bigger-and-better Boeing. Indeed, the Russians have already built a fleet of 450-ton Antonov An-124 freighters with a 150-ton payload, and a giant 6-engined version, the An-225, which is able to uplift 250 tons. To build a super-747 or a super-Airbus — and the current favorite is the Airbus A3XX — is not a problem. The big problem will be to provide the facilities and to make the necessary arrangements to handle passengers at the airports.

Crowded Skies Are Not the Answer. The growth demanded of the airlines cannot be met simply by adding more airplanes. This approach may provide temporary relief, but it cannot solve the problem. Today there are about 18,000 airliners in the world's airline fleets. This figure includes turboprops, even a few piston-engined aircraft, but it does not include small aircraft with fewer than 40 seats.

If an average growth rate can be discerned from the past, the present-day figure will rise to about 34,000 by 2025. Of these, even allowing for a healthy growth in turboprop airliners, 27,000 will be jets, or about double the number today.

The implication is clear. Any forecast of the specification of the next frontline airliner to succeed the Boeing 747s or A340s must look toward at least the midlife of the generation, that is, the year 2025. Forecasting only to the year 2010 is to miss the point completely. This is not even at the half-life of the super-jumbo, or mega jet. It is only at the beginning.

Are the Airports Ready? Only one manufacturer has so far faced this challenge. The European Airbus, with its 550-seat mixed class A3XX.

Having determined that the only solution to coping with the huge demand for huge traffic is to build a huge airliner, the question is: are the world's airports ready? They have never been ready for previous new generations. When the Boeing 707 entered service, less than a dozen of the world's big cities had airports that could accept it with full payload-range. After 30 years, they do not seem to be entirely able to cope with the 747s. Every time I fly on a 400-seat Boeing 747, I board or disembark through a single door.

That is only the problem on the ground. The air space around the airports is so congested, and the access for the aircraft at the airports is so limited, that almost all the world's big intercontinental traffic hubs have run out of room. Traffic is dispersed to satellite or partner airports. New York now depends on three major and three other airports. London has four, and two secondary ones, including Southend. The air traffic control problem in many of these places has already reached crisis level.

Problems for New Airport Settings. In the United States, only Dallas and Denver have 21st century airports. The rest will be congested, with little hope of relief from air traffic control (ATC) technology advances. Airliner approach and departure separation is restricted by forces beyond ATC's control. Plans to build new airports have been presented in New York and Chicago on this side of the Atlantic, and a group in London is still studying. Any international airport needs at least four square miles of land, not including provisions for noise abatement in the surrounding countryside. The answer seems to be a

giant off-shore airport, with high-speed rail connection to the metropolis.

INTERMODAL NECESSITY

On short distances, an air passenger can spend far more time on the ground than in the air. Meanwhile, the airports become further congested.

High-Speed Rail Revolution. In 1964, the Japanese railroad industry introduced the Shin Kansen high-speed trains on the terribly congested Tokkaido route between Tokyo and Osaka, Japan's two largest cities. With an average start-to-stop speed of 100 miles per hour, new high-speed trains have advanced the quality of rail travel by a bigger margin than had been achieved in the previous half century. The result was more than just another faster railroad. It was a new form of transport.

The French TGV (Train à Grande Vitesse) matched, and even surpassed, the Japanese achievement, building a similarly perfect track between Paris and Lyon. The high-speed rail system was extended, and other European countries followed suit. The Spanish line from Madrid to Seville has been particularly successful. Within the next 10 years, it will be possible to travel by 150-mile-per-hour trains all over Europe.

Although the U.S. freight system is unsurpassed in its ability to carry vast loads for vast distances, the Metroliner, the United States' fastest train, averages 85 miles per hour. It would hardly qualify as a high-speed train in Japan or Europe. The reality is that, in ground transport, obsessed as America is with the automobile, the United States has fallen behind the world.

Congestion Solutions. The Europeans appear to have recognized the problem just in time. The congestion in the air space is still getting worse. Last year, in June 1999, official reports showed that there were 7,000 flight delays every day in Europe. High-speed trains are creating a benevolent transfer of air traffic to rail, significantly on the short-haul routes — those less than 300 miles long. And for the airlines, this is of great benefit, as on these short-haul routes the airlines find it difficult to turn in a profit, and, indeed, many have to cross-subsidize from the profitable longer routes.

The chairman of the Spanish national airline, Iberia, has gone on record as welcoming the success of the A.V.E.

high-speed Madrid-Seville line, not only because it benefits Iberia but because it benefits the Spanish economy as a whole.

In Japan and Europe, there seems to have been full recognition of the fact that airlines and railroads should not necessarily compete with each other. Cooperation, rather than confrontation, seems to be the watchword.

It is disconcerting to note that almost all the busiest air routes in the United States are over distances less than 400 miles.

SUMMARY

I have tried to touch upon what is in store for transport in the 21st century, with special emphasis on the need for big airliners and the critical need for cooperation, not confrontation, between the airlines and the railroads. Japan and Europe have made the front running. It is time that the United States take some positive and constructive steps before a crisis of congestion, amounting to aerospace gridlock, is upon us.

- The indisputable growth of the world's urban population outweighs all other considerations of forecasting future air traffic. The inevitable consequences of this means that airlines, coordinating with the airports, should prepare for the super-jumbo jet now.
- In Europe and Japan, high-speed rail has taken over much of the short-haul work from the airlines, which are thereby relieved of the pressures to provide high-frequency service on short, busy, and often loss-sustaining routes. The United States should recognize this trend and work toward developing high-speed inter-city railroads.
- Airports must start preparing now for the new generation of big airliners that will be introduced in about five years' time. In the United States, they should also follow the example of cities in Europe and Asia to integrate with high-speed rail (for regional connections) and with urban transit systems for better access to the city centers, which are the ultimate destinations of most travelers. □

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FACTS AND FIGURES

□ THE RESULTS OF INTERNATIONAL AIRLINE DEREGULATION

Open Skies agreements now in place between the United States and a growing number of countries are producing enormous benefits for consumers. These agreements have made it possible for the airline industry to provide better quality and lower-priced service around the world.

Apart from legal and infrastructure constraints, no individual airline has the economic resources to provide service with its own aircraft and crew to every destination its customers require. As a result of the strategic Open Skies alliances, airlines on different continents are able to link their networks and effectively flow passengers through those networks to cities around the globe. Alliances, therefore, are the only practical way to provide improved services to literally tens of thousands of markets.

In the transatlantic market, for example, multiple strategic alliances now compete with their growing networks. The Northwest/KLM alliance began in early 1993, and the United/Lufthansa and Delta/Austrian/Sabena/Swissair alliances began in early 1996. (The Delta alliance no longer exists, but its effects continue to be reflected in the most current data available. Also, American Airlines' relationship with Sabena and Swissair are not reflected in the data cited below.)

Consumer benefits include strong transatlantic traffic growth and large price reductions:

- During the three-year period (1993-1995) preceding the Delta and United alliances, traffic grew by 4.7 million passengers, or 16.6 percent, compared with traffic growth of 10.7 million passengers, or 30.5 percent, during the 1996-1998 period following the start of those alliances.
 - Between 1996 and 1998, average fares between the United States and Open Skies countries in Europe declined by 13.7 percent over all, and even more in connecting market sectors (unadjusted for inflation).
 - Fare benefits have increased as alliances have expanded. By 1999, average fares to Open Skies countries declined by 20 percent overall compared with 1996, and approached 25 percent in connecting markets beyond European gateways.
 - Double-digit fare reductions have occurred even in gate-to-gate markets in Open Skies countries.
 - Fares to non-Open Skies countries have also declined, albeit at much lower rates, as alliances have provided additional, competitive access to those countries as well.
- Traffic growth has been far stronger on strategic alliance carriers, and particularly in historically underserved connecting markets, where alliance carriers provide improved, more marketable service:
- Alliance carrier traffic increased by 55 percent overall between 1996 and 1999, and more than doubled in connecting markets.
 - By 1999, each of the three strategic alliances carried passengers in 4,000 to 7,500 individual city-pair markets across the Atlantic. Two or more alliances carried passengers in more than 3,000 of the same city-pair markets.
 - Liberalization has not benefited just alliance carriers. Other carriers have also been able to initiate service or expand capacity in Open Skies markets.
- Alliance development is a long-term process that provides service benefits in other countries:
- Seven years after its start, the oldest alliance, Northwest/KLM, continues to grow at a rapid rate. Between 1996 and 1999, their traffic grew by almost 50 percent.
 - Increased traffic flows from the United States through Amsterdam have enabled KLM to expand its network. This benefits domestic European passengers. The alliance has also enabled the carriers to increase service between

Amsterdam and a number of U.S. cities that are not Northwest hubs, increasing service options for both European and American travelers.

Alliance development is particularly important for smaller cities around the globe. According to data comparing 1999 to 1995:

- Traffic and fare benefits from large U.S. cities have been particularly strong to smaller European cities.
- From Philadelphia, Pennsylvania, traffic almost tripled (up 195 percent), and fares declined by 26 percent (no inflation adjustment).
- From Seattle, Washington, traffic almost tripled (up 182 percent), and fares declined by 22 percent.

Traffic and fare benefits from small U.S. cities to smaller European cities have also been impressive.

- From Austin, Texas, traffic more than doubled (up 112 percent), and fares declined by 15 percent.

- From Birmingham, Alabama, traffic doubled (up 99 percent), and fares declined by 34 percent.

- From Sioux Falls, South Dakota, traffic more than doubled (up 117 percent), and fares declined by 33 percent.

Transatlantic alliances continue to develop and grow, with the prospects of even greater consumer benefits. While Delta's alliance with Austrian, Sabena, and Swissair has ended, American has begun a strategic relationship with the latter two carriers. Delta, in turn, is developing its relationship with Air France. With multiple alliances now expanding in transatlantic markets, and taking advantage of liberal agreements to increase capacity, consumer benefits should continue to grow.

Source: U.S. Department of Transportation.

❑ U.S. AVIATION TRAFFIC FORECASTS FOR FY 2025

The following aviation forecasts project through fiscal year 2025 expected traffic demand from both domestic and foreign airline passengers and the impact of these enplanements on air traffic towers.

EXPECTED TRAFFIC DEMAND IN 2025

- U.S. domestic passenger enplanement forecasts for large commercial air carriers are based on continuous, uninterrupted, steady growth in the economy and declining fares, adjusted for inflation. For the forecast period, 1999 through 2025, domestic passenger enplanements are expected to more than double, increasing from 576 million in 1999 to 1,400 million in 2025. To accommodate the growth in traffic, the large air carrier passenger fleet is expected to expand from 4,312 aircraft in 1999 to 9,941 aircraft in 2025.
- Based on projections of U.S. and world economic growth, total passenger traffic between the United States and the rest of the world is expected to grow from 132 million in 1999 to 466.8 million in 2025, an increase of more than 250 percent. Passenger traffic is expected to be strongest in the Latin American and Pacific markets, growing by almost 350 percent over the forecast period. Passenger traffic is projected to grow 180 percent in Atlantic markets and 140 percent in transborder Canadian markets.
- The regional/commuter airline industry is expected to continue to outpace the large commercial air carriers in terms of growth. By 2025, the regional industry will enplane over 244 million passengers — more than triple the level achieved in 1999. By 2025, the regional/commuter industry's share of total domestic enplanements will be well over 15 percent, compared to 11 percent in 1999.
- The regional/commuter fleet is expected to expand from 2,237 aircraft in 1999 to 3,870 in 2025, an increase of 73 percent. More significantly, regional jets will become a large percentage of the fleet by the end of the period. By 2025, regional jets will account for almost 65 percent of the fleet compared to only 15 percent in 1999.
- U.S. domestic air freight revenue ton miles (RTMs) are forecast to increase by nearly four times from 1999 to 2025, going from 11,500 million in 1999 to 43,700 million in 2025. International air freight RTMs flown by U.S. carriers are projected to increase by over four-and-a-half times, moving from 13,600 million in 1999 to 62,600 million in 2025.
- The general aviation active fleet is expected to continue its growth over the next 26 years. The largest increase is projected in the number of active fixed-wing piston aircraft — from 164,000 in 1999 to 190,700 in 2025. The largest percentage increase is in turbine aircraft (up 96 percent), pointing to continued strong growth in corporate/business flying and fractional ownership programs.

IMPACT ON AIR TRAFFIC CONTROL SYSTEMS

- Activity at combined U.S. Federal Aviation Administration (FAA) and contract towers is projected to expand over 60 percent, increasing from 68.2 million operations in 1999 to 110.2 million in 2025. Most of this growth is expected to result from increased commercial aircraft activity. Commercial air carrier activity is forecast to almost double, increasing from 25.2 million operations in 1999 to 48.7 million in 2025. General aviation activity is projected to increase at almost half the rate of commercial activity, expanding from 40 million operations in 1999 to 58.5 million operations in 2025.
- The projected large increase in the numbers of regional jets and general aviation turbine aircraft is expected to result in instrument operations increasing at faster rates than total tower operations. Combined instrument operations counts at FAA and contract-towered airports are expected to increase from 51.8 million in 1999 to 88.2 million in 2025, up over 70 percent. Commercial aircraft instrument operations are forecast to increase at a significantly faster rate than are general aviation instrument operations, up 93 and 52 percent, respectively.

- The workload at FAA en route traffic control centers will increase 78 percent over the next 26 years. In 2025, FAA en route centers are expected to handle 79.7 million aircraft, up from 44.7 million in 1999. The number of commercial aircraft handled at en route traffic control centers is projected to almost double, while the number of general aviation aircraft handled increases 57 percent. The higher growth rate at FAA en route centers, relative to activity at combined towered airports, reflects the fact that commercial activity accounts for a significantly larger percentage of center activity — 71 percent versus 37

percent at towered airports in 1999. Therefore, the projected larger increases in commercial aircraft activity have a much greater impact on total center traffic during the forecast period.

Details of the forecasts presented here can be found in “FAA Aerospace Forecasts, Fiscal Years 2000-2011,” U.S. Federal Aviation Administration, Office of Policy and Plans, and in “FAA Long-Range Aerospace Forecasts, Fiscal Years 2015, 2020, and 2025,” Federal Aviation Administration, Office of Aviation Policy and Plans. The Internet address for the forecasts is <http://www.apo.data.faa.gov>.

□ OPEN SKIES AGREEMENTS CREATE LIBERAL GROUND RULES

Open Skies agreements set liberal ground rules for international aviation markets and minimize government intervention. Provisions apply to passenger, all-cargo, and combination air transportation and encompass both scheduled and charter services.

Key provisions include:

1. Free Market Competition. No restrictions are placed on international route rights, number of designated airlines, capacity, frequencies, and types of aircraft.

2. Pricing Determined by Market Forces. A fare can be disallowed only if the two governments involved concur — “double-disapproval pricing” — and only for certain, specified reasons intended to ensure competition.

3. Fair and Equal Opportunity to Compete. For example:

- All carriers — designated and non-designated — of the two countries involved may establish sales offices in the other country and may convert earnings and remit them in hard currency promptly and without restrictions. Designated carriers are free to provide their own ground-handling services — “self handling” — or to choose among competing providers. Airlines and cargo consolidators may arrange ground transport of air cargo and are guaranteed access to customs services.

- User charges are non-discriminatory and based on costs; computer reservation system displays are transparent and non-discriminatory.

4. Cooperative Marketing Arrangements. Designated airlines may enter into code-sharing or leasing arrangements with airlines of either country, or with those of third countries, subject to usual regulations. An optional provision authorizes code-sharing between airlines and surface transportation companies.

5. Provisions for Dispute Settlement and Consultation.

Model text includes procedures for resolving differences that arise under the bilateral Open Skies agreement.

6. Liberal Charter Arrangements. Carriers may choose to operate under the charter regulations of either country.

7. Safety and Security. Each government agrees to observe high standards of aviation safety and security and to render assistance to the other in certain circumstances.

8. Optional 7th Freedom All-Cargo Rights. This provision gives authority for an airline of one country to operate all-cargo services between the other country and a third country, via flights that are not linked to its homeland.

Source: Bureau of Economic and Business Affairs, U.S. Department of State.

□ LIST OF BILATERAL OPEN SKIES AGREEMENTS

This list contains all of the current bilateral Open Skies agreements reached between the United States and foreign countries since the first agreement was signed in 1992.

COUNTRY	DATE AGREEMENT	COUNTRY	DATE AGREEMENT
1. The Netherlands	October 14, 1992	28. Peru	June 10, 1998
2. Luxembourg	June 6, 1995	29. Netherlands Antilles	July 14, 1998
3. Finland	June 9, 1995	30. Romania	July 15, 1998
4. Iceland	June 14, 1995	31. Italy	December 6, 1999
5. Austria	June 14, 1995	32. United Arab Emirates*	April 13, 1999
6. Switzerland	June 15, 1995	33. Pakistan	April 29, 1999
7. Sweden	June 16, 1995	34. Bahrain	May 24, 1999
8. Norway	June 16, 1995	35. Argentina*	December 6, 1999
9. Denmark	June 16, 1995	36. Chile	October 21, 1999
10. Belgium	September 5, 1995	37. Qatar*	October 21, 1999
11. Germany	May 24, 1996	38. Dominican Republic	December 16, 1999
12. Czech Republic	September 10, 1996	39. Slovak Republic*	January 8, 2000
13. Jordan	November 10, 1996	40. Namibia	March 16, 2000
14. Singapore	April 8, 1997	41. Ghana*	March 16, 2000
15. Guatemala	May 8, 1997	42. Turkey	May 2, 2000
16. Honduras	May 8, 1997	43. The Gambia	May 2, 2000
17. El Salvador	May 8, 1997	44. Portugal	June 30, 2000
18. Nicaragua	May 8, 1997	45. Nigeria	August 26, 2000
19. Costa Rica	May 8, 1997	47. Tanzania	August 30, 2000
20. Panama	May 8, 1997		
21. New Zealand	June 18, 1997		
22. Brunei	June 20, 1997		
23. Malaysia	June 21, 1997		
24. Aruba	September 18, 1997		
25. Uzbekistan	February 27, 1998		
26. Taiwan	March 18, 1998		
27. Korea	June 9, 1998		

*Agreements had been initialed but not signed as of September 1, 2000.

Source: Bureau of Economic and Business Affairs, U.S. Department of State.

❑ ROLE OF THE MARITIME INDUSTRY IN THE UNITED STATES

Waterways are the medium for the bulk of international and domestic shipments. In fact, the United States depends on marine transportation for the movement of 95 percent of its imports and exports. Twenty-five percent of the ton-miles of domestic goods are shipped by water. Maritime cargo activity yields 1.6 million jobs, \$150,000 million in services, and adds \$78,600 million to the gross domestic product. Efficient transportation reduces the cost of goods and improves the tax base, which relies on a growing economy; it stimulates economic growth, which creates new products, new jobs, and more tax revenue.

In the commercial market, intense competition in the international shipping market has put companies in all countries under enormous pressure to reduce costs. Many countries, including key U.S. trading partners, restrict outside competition to their national shipping companies in their home markets. Other countries give their shipping industries substantial advantages in operating costs by allowing the employment of foreign mariners from low-wage countries and through tax advantages that U.S. ship owners do not enjoy. Such conditions have adversely affected the U.S. industry. In 1970, for example, only four countries had more merchant shipping than the privately owned U.S.-flag fleet. By 2000, the United States slipped to 11th rank by tonnage and 26th by number of ships. Seagoing jobs have decreased by nearly 24 percent since 1990, to 10,458 billets. While the labor supply exceeds available jobs in normal times, the reduced pool of trained seafarers could create difficulties when trying to find crews for a large number of ships in an emergency.

At the same time, however, these trends reflect considerable gains in productivity. Containerization and other technological advances in ship design and operation — many introduced by U.S. companies — have greatly improved the flow of cargo, not only from port to port but to inland points anywhere in the world. Starting in the mid-1980s, U.S. shipping companies pioneered intermodal services using dedicated trains with special cars carrying containers stacked two high. Since then, this land bridge has displaced many of the all-water services between Asia and the eastern United States.

Many major U.S. ports now feature on-dock rail terminals. These sweeping changes have also had a profound impact on manufacturing and distribution processes. With greater reliability of transit schedules and more precise cargo tracking systems, manufacturers and retailers can set up just-in-time delivery systems and establish distribution and manufacturing facilities around the world to maximize cost savings.

These changes have prompted much greater efficiency. By 1995, U.S.-flag shipping in international trade carried more than 42 percent more cargo than in 1970 with larger ships and smaller crews. The average capacity of a U.S. liner ship was approximately 30,000 deadweight tons (DWT), compared to 12,000 DWT in 1970. Crews of 21 mariners (down from an average of 35) function as part of a network of related ocean, rail, and trucking services.

U.S. Oceanborne Foreign Trade by Type of Service, 1999

	Thousands of Metric Tons			Millions of Dollars		
	All Flags	U.S. Flag	U.S.%	All Flags	U.S. Flag	U.S.%
Liner	142,812	12,586	8.8	\$471,242	\$52,612	11.2
Tanker	590,941	13,154	2.2	\$78,411	\$1,781	2.3
Non-Liner	414,460	8,763	2.1	\$122,774	\$6,217	5.1
Total	1,148,213	34,503	3.0	\$672,427	\$60,610	9.0

U.S. OCEANGOING FLEETS

The U.S. commercially owned merchant fleet ranked 12th in the world merchant fleet of oceangoing vessels 1,000 gross tons and over as of April 1, 2000.

**World and U.S. Merchant Fleets in
Thousands of Deadweight Tons,
April 1, 2000**

	U.S. Flag	All Flags
Container Ships	2,990	63,967
Dry Bulk	579	276,196
Tanker	8,515	324,503
Roll-on/Roll-off	554	14,542
Cruise/Passenger	7	1,205
Other	696	82,875
Total	13,341	763,288

NATIONAL SECURITY ASPECTS

Marine transportation is also vital to national security and mobility. The U.S. maritime industry's ability to respond in a national emergency was clearly demonstrated during operations Desert Shield and Desert Storm, when 79 percent of the equipment and supplies moved on the U.S.-flag fleet. More than 60 commercial U.S.-flag ships provided cargo delivery service to the Persian Gulf area under the Military Sealift Command's Special Middle East Sealift Agreement. Many of these companies utilized larger vessels for the longer, line-haul portion of the voyage, then off-loaded the cargo onto smaller vessels that actually went into the Gulf. Many of these vessels were foreign-flag ships controlled by U.S. companies.

UNITED STATES SHIPPING POLICY

The Maritime Administration of the U.S. Department of Transportation develops and implements policies on water transportation services, including vessel operations, shipbuilding and repair, and port operations for commercial trade and national defense. Cargoes shipped by or on behalf of the U.S. government — including military shipments, foreign aid, and cargo financed by the Export-Import Bank — are set aside primarily for U.S.-flag shipping. In addition, exports of crude oil from the Alaskan North Slope may be carried only on U.S.-flag tankers. Foreign ships may carry up to half of the preference cargoes, depending on the type of cargo. These cargoes represent less than 1 percent of total international ocean shipments.

The Federal Maritime Commission (FMC) regulates the international shipping industry and has the authority to address restrictions affecting U.S. shipping interests. The

Shipping Act of 1984 regulates the commercial activities of shipping lines, terminal operators, ocean freight forwarders, and others involved with the international liner shipping industry. The Ocean Shipping Reform Act substantially changed U.S. regulatory policy for the international liner shipping industry as of May 1, 1999. Like most countries, the United States grants exemption from anti trust laws for agreements among shipping lines to discuss, regulate, or fix common transportation rates and other joint activities, including common through-rates for intermodal services to inland points.

To address concerns about the shrinking U.S. maritime sector, the U.S. government has taken a series of initiatives to revitalize the industry. In 1996, a new Maritime Security Program took effect to ensure that an active U.S. merchant fleet and adequate trained personnel can meet national security requirements for national sealift capacity. The 10-year program provides funding of up to \$100 million each year for up to 47 vessels. In return for an annual payment of \$2.1 million, owners and operators agree to make their ships available to the U.S. government in times of war or emergency, along with intermodal capacity and support.

The Clinton administration also initiated a program to improve productivity of the shipbuilding industry and to encourage exports of U.S.-built vessels. In 1994, federal loan guarantees formerly available to U.S. ship owners were extended to foreign buyers. The international maritime community recognized that government subsidies were distorting the world shipbuilding market by allowing shipyards to offer prices far below cost. The United States took part in negotiations at the Organization for Economic Cooperation and Development on an agreement to eliminate government shipbuilding subsidies. The agreement is now awaiting ratification the by U.S. Congress.

Despite these changes, the United States continues to maintain an open shipping market. With few exceptions, foreign carriers may compete for international commercial cargoes on the same basis as U.S. firms. Any shipping line may freely join a shipping conference serving the United States or compete as an independent line. Foreign operators may freely establish representative offices and acquire and operate intermodal services and port facilities.

Source: Bureau of Economic and Business Affairs, U.S. Department of State; Office of Statistical and Economic Analysis, U.S. Maritime Administration, U.S. Department of Transportation.

INFORMATION RESOURCES

KEY CONTACTS AND INTERNET SITES

UNITED STATES GOVERNMENT

U.S. Department of State
Bureau of Economic and Business Affairs
Transportation Affairs
2201 C Street, N.W.
Washington, D.C. 20520 U.S.A.
<http://www.state.gov/www/issues/economic/tra/index.html>

U.S. Department of Transportation (DOT)
400 Seventh Street, S.W.
Washington, D.C. 20590 U.S.A.
<http://www.dot.gov>

Bureau of Transportation Statistics (BTS)
<http://www.bts.gov>

Federal Aviation Administration (FAA)
<http://www.faa.gov>

Federal Highway Administration (FHWA)
<http://www.fhwa.dot.gov>
<http://www.international.fhwa.gov>

Federal Railroad Administration (FRA)
<http://www.fra.dot.gov>

U.S. Department of the Treasury
U.S. Customs Service
1300 Pennsylvania Avenue, N.W.
Washington, D.C. 20229 U.S.A.
<http://www.customs.ustreas.gov>

U.S. House of Representatives
Committee on Transportation and Infrastructure
2165 Rayburn House Office Building
Washington, D.C. 20515 U.S.A.
<http://www.house.gov/transportation>

U.S. Senate
Committee on Commerce, Science, and Transportation
508 Dirksen Senate Office Building
Washington, D.C. 20510-6125 U.S.A.
<http://www.senate.gov/~commerce>

Federal Maritime Commission (FMC)
800 North Capitol Street, N.W.
Washington, D.C. 20573 U.S.A.
<http://www.fmc.gov>

National Transportation Safety Board (NTSB)
490 L'Enfant Plaza, S.W.
Washington, D.C. 20594 U.S.A.
<http://www.nts.gov>

Oak Ridge National Laboratory
Center for Transportation Analysis (CTA)
P.O. Box 62
Oak Ridge, Tenn. 37831
<http://www-cta-ornl.gov>

NON-UNITED STATES GOVERNMENT

Air Transport Action Group (ATAG)
<http://www.atag.org>

International Civil Aviation Organization (ICAO)
<http://www.icao.org>

ITS America
<http://www.itsa.org>

Organization for Economic Cooperation and Development (OECD)
European Conference of Ministers of Transport
<http://www.oecd.org/cem>

San Jose State University
International Institute for Surface Transportation Policy Studies
<http://transweb.sjsu.edu>

University of California at Irvine
Institute of Transportation Studies
<http://www.its.uci.edu/its/main/main.html>

University of Leeds
Institute for Transportation Studies
<http://www.its.leeds.ac.uk/main.html>

World Bank Group
Transport Sector
<http://www.worldbank.org/html/fpd/transport/index.html>

World Customs Organization
<http://www.wcoomd.org>

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