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Federal Highway Administration

FREIGHT TRANSPORTATION:

The Latin American Market

INTERNATIONAL TECHNOLOGY EXCHANGE PROGRAM

AUGUST 2003

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16. Abstract

Latin America is a key trading region for the United States, Canada, and Mexico, the North American Free Trade Agreement (NAFTA) countries. The Federal Highway Administration, American Association of State Highway and Transportation Officials, and National Cooperative Highway Research Program sponsored a scanning study to examine characteristics of trade flows between NAFTA and Latin American countries and learn how countries handle trade-related transportation infrastructure, border crossings, and freight security.

The delegation observed that while the countries visited—Bahamas, Brazil, Argentina, Uruguay, Chile, Panama, and Mexico—depend heavily on trade, the economic downturn has aggravated financial and infrastructure challenges in those countries and limited trade expansion. Ports are major centers of trade for the countries, and the Panama Canal is emerging as the region's most strategic facility for NAFTA countries.

The scanning team's recommendations include continued monitoring of the Latin American market and the impact of trade on transportation infrastructure. The team also recommends that NAFTA countries work closely with Latin American countries and port authorities to coordinate border crossing and freight security strategies.

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FREIGHT TRANSPORTATION:

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This program has resulted in significant improvements and savings in road program technologies and practices throughout the United States, particularly in the areas of structures, pavements, safety, and winter road maintenance. Joint research and technology-sharing projects have also been launched with international counterparts, further conserving resources and advancing the state of the art.

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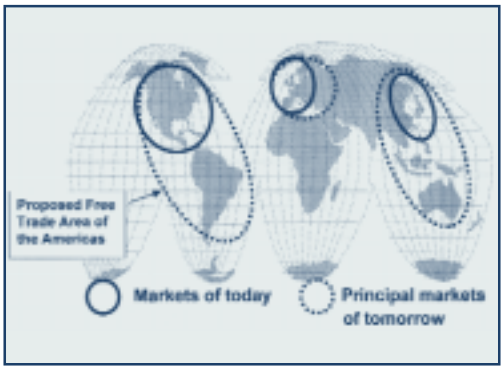

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Executive Summary

The purpose of this international scanning study was to identify the following:

- International freight issues in Latin America and the roles of individual countries that trade with North American Free Trade Agreement (NAFTA) countries.
- Future trends in logistics and trade infrastructure that could affect such trade.
- Whether trade projections made during Phase 1 of the Latin American Trade and Transportation Study (LATTS) are still valid.
- Issues that relate to freight security on imports and exports to NAFTA countries.
- Latin American countries' experience with such issues as interoperability, standardization, equitable taxation and pricing, and planning and financing trade-related transportation infrastructure. The scanning team was particularly interested in the Mercado Común del Sur (Mercosur) countries of Brazil, Argentina, Uruguay, and Paraguay and the challenges they face in developing a trade market.

Panel members reflected a diverse set of interests in both national and international freight movement. The Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO) jointly sponsored the scan. In addition to FHWA and AASHTO officials, the panel included representatives of the national ministries of transportation for Canada and Mexico; the departments of transportation (DOTs) for the States of Florida, Louisiana, and Mississippi; the metropolitan planning organization for the San Diego, California, metropolitan area; the U.S. Transportation Security Agency (TSA); the Latin America Trade and Transportation (LATTS) study; and academia. Panel members represented expertise in the areas of policy, planning, security, freight logistics, and economic development.

The panel targeted government agencies, terminal operators, logistics providers, and shippers to gain a broad understanding of how selected Latin American countries have been dealing with trade issues and the provision of transportation infrastructure, and how shippers and producers have been responding. Two pre-meetings were held in New Orleans, Louisiana, and Miami, Florida, to meet with both shippers and government officials with experience in Latin American trade. From October 30 to November 17, 2002, the panel then visited Freeport in the Bahamas, São Paulo and Santos in Brazil, Buenos Aires in Argentina, Montevideo in Uruguay, Santiago and San Antonio in Chile, and Panama City and Colón in Panama. From December 3 to 7, 2002, several panel members visited Mexico to obtain more information and participate in an implementation event.

The limited time of the scanning study necessarily constrained the number and representation of those with whom the panel met. The panel did not meet with groups that could have provided a broader perspective on the issues facing the development of the Latin American market, such as national railways, inland water and coastal shipping firms, and manufacturing and industry trade groups. In addition, the panel did not meet with non-government organizations representing environmental protection and sustainability issues. Over two-and-a-half weeks, however, the scanning panel met with more than 100 people representing a good cross section of the organizations and groups most involved in increased trade with NAFTA countries.

Lessons from this experience could be relevant to the United States, Canada, and Mexico in developing a common North American market. In addition, these lessons are important for national and regional investment decisions as they relate to enhanced freight movement within individual countries, serving primarily the domestic market. The rapid development of Panama as a logistics center, for example, and the possible expansion of the canal's capacity could have significant impacts on the competitive market for agricultural products at the global scale.

Scanning Study Observations

New Orleans—Although the New Orleans meeting was not part of the scan, the Port of New Orleans and the Louisiana Department of Transportation and Development organized it to provide briefings for

team members by individuals and firms that have done business with Latin America. Key observations included the following: 1) Latin America has been an important market for southeastern U.S. ports for many years; 2) Brazil dominates Latin America's economic market; 3) New Orleans and other U.S. ports expect increased trade flows because of free trade agreements; 4) the economic woes of Latin American countries have affected international investment in infrastructure and economic activities; 5) political uncertainty in some countries (e.g., Brazil and Argentina) has caused some concern in the investment community; 6) the agricultural hinterland of Brazil served by the Rio Paraña and connected to the Atlantic by the Rio Plata will have a significant effect on the U.S. agricultural industry, especially in the production of soy; and 7) security measures at U.S. ports have been heightened since the events of September 11, 2001, and will continue to be for all trade, especially Latin American trade.

Freeport, Bahamas—This visit focused on the new Hutchinson Container terminal that began operation in 1997 and primarily handles transshipments (99 percent of the containers moved). The growth in the number of containers transshipped is impressive. The terminal handles 800,000 20-foot equivalent units (TEUs) a year, with an expected increase to 1 million in 2003 and 2.5 million in 2004. The port is positioned to handle east-west traffic as well as feeder services into the United States. No conflict appears to exist between southeastern U.S. ports and the Freeport operations (although Freeport officials believe that Kingston, Jamaica, and Cuba could be their major competitors in the future). Indeed, Florida port officials view Freeport as an asset. In addition, the container port is part of a much larger economic development strategy that includes an airport, free trade zone, and tourist sites. The Freeport container port also illustrates the rapid introduction into the market and subsequent impact that private operators can have under a concession arrangement with Latin American governments.

Miami—Much of the freight movement through Florida ports originates in or is destined for Latin America (65 percent of the movement through the Port of Miami, for example). An economic study for Florida ports suggests that trade will double in five years, and that passenger cruises will increase between 8 and 12 percent a year over a similar time frame. Most of the increase in trade and passenger cruises will be in the Caribbean basin. A key challenge for Florida ports is rail and highway access, an issue pointed to by many port officials as a leading constraint to increased freight movement through Florida ports. In response to these and other needs, Florida has created a Transportation Finance Commission that provides funding for port improvements with a local match provision. Representatives at this meeting strongly recommended development of an international trade policy for the United States that ties trade flows into market and transportation investments.

São Paulo and Santos, Brazil—Brazil faces significant economic and political uncertainty with an ongoing economic recession and the election of a new president. Even with such uncertainties, Brazil will continue to be a major player in hemispheric trade, if for no other reason than the size of its market. Like other Latin American countries, Brazil has used different privatization strategies to provide additional transportation infrastructure, including highways, railroads, and port facilities. With the economic problems the country faces, however, the highway and railroad concessions face significant difficulties getting a return on their investment. North America is viewed as an important growth market for Brazilian goods. The agricultural industry in Brazil is looking to Asia as a major market for its products, especially if the Panama Canal is widened to allow larger ships. Participants did point out that significant vehicle delays occur at the borders because of the numerous agencies involved in customs, health, and safety inspections. Not much integration is apparent among different modes of transportation, although corridor studies have been undertaken, primarily to determine the feasibility of toll roads. Although the national government provides funds to build roads, much of this investment goes to rural states, so more urban states like São Paulo provide their own funding for road investments.

The Port of Santos is the largest port in Brazil and handles the majority of international cargo. Port terminals, which have been privatized, have seen substantial investments from terminal operators. Access and distribution within the port are two important issues. The port operates 24 hours a day because of congestion, and is considering an internal truck-only road to provide more efficient movement of trucks. A strategic plan for the port includes channel deepening, application of intelligent transportation systems (ITS) technologies, truck storage facilities, and creation of a free trade zone. Port officials are concerned about new security clearance requirements that might entail increased investment in new equipment, although some expect that terminal operators would shoulder the burden of increased costs. Privatization of port

activities has had a significant impact on productivity, resulting in a loss of jobs in the port itself.

Buenos Aires, Argentina—A weak economy and a continuing fiscal crisis have led to great uncertainty in Argentina about future trade. Unlike Brazil and Uruguay, Argentina is focusing on regional trade, and not as much on global or even hemispheric trade. As one of the leaders in privatization in South America, it is not surprising that Argentina's transportation system relies heavily on concessions. Given the economic downturn, however, many of these concessions are having a difficult time recouping their investment. Without a stable transportation funding source from the government, little investment in transportation for either expansion or maintenance appears to be occurring. It is not clear during this time of uncertainty about who will become president (Argentina faces national elections) what national policies will be developed on such investment. As a Mercosur member, Argentina has experienced the problems at border crossings mentioned by others. In addition, rail gauges are different in many international corridors, further exacerbating the cross-boundary movement of trade. A corridor perspective is being considered for investment purposes once funding becomes available. Because of the location of the Port of Buenos Aires on the Rio Plata, dredging is a key issue, as is port access. Port officials also expressed concern about increased security costs for container movements.

Montevideo, Uruguay—Uruguay is fully aware of its location between two much larger countries, Argentina and Brazil, and that its economic success depends to a large extent on what happens in these countries. The Port of Montevideo views itself as an emerging logistics center in South America, with private terminal operators providing much of the investment in port facilities. Like Freeport, many port terminals have been able to put significant capabilities in place in a short time to take advantage of the competitive market. Uruguay has a good road system that connects to the borders, but border-crossing delays were mentioned as a significant problem. Mercosur has had problems getting member countries to develop consistent procedures that will foster more efficient cross-border movements. In addition to the port, a major free-trade zone in the Montevideo suburbs called Zonamerica is becoming an important distribution center for the Southern Cone countries. Uruguay—Montevideo in particular—wants to expand its market influence, and is looking to Asia, Europe, and North America for market opportunities. Officials suggested that increased security requirements could be viewed as a niche market for the Port of Montevideo, with high security levels making it a desirable gateway into the NAFTA market.

Santiago and San Antonio, Chile—Because of its location at the tip of South America, Chile has had to adopt an aggressive strategy for being part of global trade. With a heavy reliance on mining, Chile has developed a strong export business in raw materials. Now, however, Chile is trying to become a logistics service center for the Southern Cone countries. Major highways (about 2,500 kilometers out of 16,000 kilometers of paved road), airports, and ports have been privatized through concessions. A national restructuring of ports several years ago resulted in the nation's ports being run in a semiautonomous fashion, with port terminal operations under private management. Chile—along with Argentina—has been trying to provide investment in cross-Andes travel corridors, especially rail, but the investment climate has been weak. Border crossings were mentioned in Chile as being a serious constraint to trade. National officials look to the NAFTA, European, and Asian markets as key trading partners, and are anxious to have a free trade agreement with the United States and become a NAFTA member.

The Port of San Antonio is one of newest and most modern in Chile. It handles all forms of freight and has become a leading Chilean container port. From 1990 to 2001, the number of TEUs handled rose from 50,000 to 420,000. The primary markets for the port are Asia, North America, and Europe. The port has expansion plans that will allow it to handle bigger container ships and to provide more of a distribution service to the Southern Cone countries. Port officials expressed concern about new security procedures, but, as in Uruguay, suggested that high-quality security at the port could make it a desired gateway to the NAFTA market. The rapid expansion of this port and the proposed plans indicate the short timeframe that many Latin American port terminal operators can operate under to make an impact in a market.

Panama City and Colón, Panama—Panama, one of the most important crossroads of global trade, has taken steps over the past five years taken to become an even bigger player in international commerce. The most important asset in this strategy is the Panama Canal. When the United States turned the canal over to Panama in 1999, the economic strategy changed as well. While the United States viewed the canal primari-

ly as a strategic defense facility, Panama considered it an important economic resource that could be used to attract development. As a result, since 1999 major new container ports have been built on both coasts, free trade zones have been created, and the combination of being a nexus of fiber-optic cables and a center of commerce has created a service-oriented perspective in the government and private sector. The significant passage of the world's commerce through the canal (close to 15,000 ships, of which about 9,000 are going to or from a U.S. seaport) has also raised security issues. As one U.S. official noted, Panama is the most important security challenge for the United States after Canada and Mexico.

The Canal Authority is planning enhancements to the canal that would allow the passage of post-Panamax ships. Providing for larger ships would have a significant impact on the global market. For example, several officials mentioned that larger ships passing through the Panama Canal would allow Brazil to better compete in the Asian market with its growing agricultural industry (at the likely expense of the United States).

Other observations from the visit to Panama include the importance of free trade zones as centers of hemispheric logistics, the need for improved road infrastructure to complement an effective sea-based transportation system (including improvements to the Pan American Highway), the extent of cross-border delays and barriers because of inefficient customs and security strategies, the role of Mexico as a leader in developing a Central America-focused investment program, and the use of port terminal concessions that allow private operators to develop infrastructure quickly and efficiently.

Mexico City and Querétaro, Mexico—Mexico is a critically important trading partner for the United States and Canada. Not only does the Mexican market represent a significant portion of the imports and exports for both countries, but the Mexican transportation system also is becoming an important means of shipping international (non-Mexican) goods into the United States. Efficient logistics and integrated intermodal transportation corridors receive the attention of many Mexican government officials and private shippers. The Mexican economy faces serious challenges from other countries, primarily in Asia and Central America, for goods that are competitive primarily because of low wages. It is now cheaper to produce and transport some goods from China to the United States than it is from Mexico. Mexican officials believe that to remain competitive in the global market, they must take advantage of their proximity to the world's largest consumer market, and compete with more efficient transportation and logistics services. Improved logistics, along with enhanced security procedures, would maintain or even enlarge Mexico's trading partnership with the United States. An example of the possibilities in enhanced, security-conscious logistics is the Trans-Pacific Multimodal Security System (TPMSS). Originally created as a showcase for the Asian-Pacific Economic Cooperation Forum meeting held in Mexico, TPMSS demonstrated the feasibility of making significant improvements in transport time from Asia to internal U.S. markets by transporting goods to Pacific Mexican ports and then moving the goods by rail to the U.S border. Advanced monitoring systems, security measures, streamlined customs procedures, and transportation service improvements were made to illustrate the economic potential of such movements.

The border (broadly defined to include customs, immigration, safety inspections, and infrastructure) with the United States is viewed as a significant logistics barrier. Mexican officials welcome recent U.S. decisions to open the border to Mexican trucks, but they are concerned about how this is being accomplished (e.g., state inspections of Mexican trucks seem, in some cases, to be overly rigorous). Much of the trade moving across the U.S. border is in trucks. Mexican railroads have begun to make infrastructure improvements and are participating in interservice agreements with U.S. railroads. Intermodal service is in its infancy in Mexico, however, and will likely take some time to expand. Coastal and Gulf maritime shipping have important potential, especially from the southern Mexico and Central American markets into the Gulf ports. Significant improvements are being planned and implemented in Mexican ports on both the Gulf and Pacific coasts.

Other key issues discussed in Mexico include the following: 1) developing a strategic perspective on logistics and transportation in the context of the North American market; 2) harmonizing equipment standards; 3) analyzing the concept of deconstructing the border as has been done on the U.S.-Canadian border; 4) providing improved logistics with enhanced security; 5) developing trinational data collection and analysis capability for system, corridor, and modal transport activity; 6) developing system or corridor performance-based analysis and decisionmaking; and 7) possibly engaging the private sector in pushing for border improvements.

Lessons for North America

The following lessons result from this scan:

1. The global market and logistics chain respond to many influences, only some of which relate to infrastructure owned and operated by public agencies. **Understanding the motivation of logistics decisions and their local implications is a critical point of departure for a national or multinational effort to foster and prepare for trade.** Panel members heard from both shippers and government officials about the need for a broad or global systems perspective in understanding trade flows. The countries that adopt this vision—places like Chile, Panama, Brazil, and, to a lesser degree, Uruguay—will be more successful than those that do not.

2. **Perhaps the most significant observation from this scan is the changing nature of Panama as an emerging hemispheric logistics center, based on its location as a major maritime crossroads.** In a relatively short time, since the transfer of canal ownership to the Panamanians in 1997, Panama has become the location of new major container terminals, and has created new free trade zones as major inducements to foreign investors. From information gathered during this scan, it seems likely that Panama will be even more influential in global trade flows serving the NAFTA countries. It is unclear what impact proposed improvements to the canal that would allow bigger ships to pass would have on the NAFTA countries, the United States in particular. Such a development might create the demand for more transshipment ports outside U.S. territory to provide feeder services to the United States, or a demand for increased capacity at U.S. ports. It might mean a shift in market characteristics that hurt NAFTA interests (e.g., making Brazilian agricultural products more competitive with NAFTA products in the Asian market). This issue should get more attention.

3. **Within the context of global east-west container movements in the western hemisphere and the need for transshipment locations in the Caribbean or along the Gulf-Atlantic Coast, the major players in the transshipment business consider Cuba as a potential threat or opportunity.** Havana and other Cuban ports are ideally located to provide such service and have excellent port potential. Although it is unclear what will happen with an administration change, it is likely that Cuba will be a major gateway to the Caribbean in several decades.

4. Levels and patterns of trade are directly related to patterns of economic growth, production, and consumption. The recent economic downturn has affected global trade, and it is unclear what the immediate future holds. **Over the long term, the LATTS forecasts, which indicate a tripling of trade from Latin America, should be reexamined at a commodity-specific level, particularly because of changes under way in the Mexican economy (e.g., losing maquiladora plants to Asia).** In addition, real potential appears to exist for enhanced Gulf of Mexico and Pacific Coast maritime services into the United States for certain commodity types.

5. Given governmental policies on planning, environmental, and investment requirements that differ from those in NAFTA countries, private entrepreneurs in most of the countries visited have been able to quickly establish a substantial market presence in hemispheric trade. **NAFTA countries need to understand that the time needed to respond to market opportunities will most likely be much less than that allowed by governmental rules and regulations.** As the global market expands and becomes more dynamic (i.e., more time-sensitive to changing market demands), the response time for providing needed infrastructure could become a serious constraint to NAFTA countries. This suggests a need for better, continual, and more strategic efforts to understand global trade patterns and the shifting context of economic centers for producing, consuming, and handling commodities. This need exists at the NAFTA, national, State and metropolitan levels (where trade movement is an important part of transportation system performance).

6. **One of the most important concerns identified by freight shippers, port operators, and national transport officials during this scan was the level of effort and funding required to provide security for maritime freight movement that will satisfy international mandates.** Specific mandates have yet to be determined, so much of this concern relates to worst-case scenarios, assuming the most extensive and intrusive types of security procedures. The panel's perception is that many of the ports visited do not have the level of

security that would likely satisfy new requirements. Working with Latin American countries and ports to develop acceptable procedures and approaches for secure freight movement could be an important task for NAFTA countries. Of some interest was the suggestion by several port and country officials that private terminal operators most likely will be responsible for providing the required security, and that having an approved security gateway into the NAFTA market could become a major competitive advantage to some countries.

7. **The Latin American experience illustrates the importance of having a national transportation policy that reflects the needs of trade flows and the global positioning of the NAFTA market.** None of the countries visited has a comprehensive and systems-oriented national transportation policy. Little integration or coordination is evident among investment programs for different modal systems. Accordingly, the response to increased trade volumes with the NAFTA market most likely would be in the hands of private shippers and port terminal operators.

8. Public budget and financing mechanisms for funding freight projects were not found in many of the countries visited. Latin American countries have relied on concessions to private companies for providing the necessary port access and port terminal infrastructure. In several countries, the national government has no dedicated transportation funding source for public investment. In the case of port terminal operations, concessions have been used to turn over to private operation those aspects of logistics services that a private business is best able to provide. Private concessions for port terminal operations have largely been successful in the countries visited. The necessary provision and maintenance of other infrastructure (such as roads and railroads) are not occurring, however, because of the economic challenges the region faces and the heavy reliance on investment returns for privately funded infrastructure. **This model of finance holds important lessons for investment strategies that rely too heavily on private provision of transportation.**

9. **Increasing NAFTA connections to Latin America will likely focus a great deal of attention on alternative financing schemes for providing the infrastructure necessary to handle increasing trade volumes.** Providing hemispheric exchanges and consensus-building activities on innovative financing strategies could be an important part of a NAFTA-driven effort to develop necessary trade-related infrastructure. It is interesting to note that European and Asian investment has occurred at significant levels in the past five years in Latin America, much of it focused on transportation infrastructure.

10. Mercosur faces significant challenges in providing a stable trade market. Considerable economic challenges in Mercosur countries, uncertainty about a new government in Brazil, and important problems with standardizing border procedures have slowed progress on achieving major productivity gains that should occur with a trading block. The Mercosur countries are focusing much of their attention internally, with an emphasis on protecting production and commodity groups, rather than growing trade through an open boundaries strategy as found in the European Union. One major development worth watching is the prospective alliance between Mercosur and the Andean Pact countries. **If Mercosur can find a way to make internal transportation more efficient and to promote trade growth, it may become a much larger player in global trade.** Many significant issues must be resolved for this to happen in the short term.

11. **Increasing port effectiveness is an important issue in the ports visited.** The use of port terminal concessions has been successful in providing needed investment in dockside operations. For historical reasons, though, many ports are located in central areas of large cities, and face significant congestion in port access. With limited investment resources available, governments have used concessions for access projects as well, with limited success. Most ports visited operate 24 hours a day, seven days a week. This is done in response to rising congestion levels and to provide customer-oriented service. The Port of Santos is considering a truck-only road that would provide better internal circulation to this largest port in Latin America. Both concepts are worthy of investigation in NAFTA countries.

12. **The Mexico-U.S. border still remains a critical barrier to improving NAFTA trade.** Delays are caused by the inspection procedures used by numerous government agencies, inadequate physical infrastructure at border crossings, lack of data

sharing among governmental agencies, and incompatible vehicle technology. Enhanced logistics, which Mexican government and private sector officials view as key to economic prosperity in the global economy, will depend on fixing border problems. Improvements are being made at Mexican ports and in inland transportation corridors to provide better service to the U.S. border. Such improvements need to be augmented with new ways of expediting trade across the border in an efficient, security-conscious manner. Improving gateways, borders, and international trade corridors through coordinated planning, investment, and technology deployment can improve trade transport efficiency and security.

13. **Although not the focus of this scan, it is important to note that every port visited had plans for, was constructing, or had just opened cruise ship terminals.** The cruise ship business is something that every port expects to benefit from. This raises interesting questions about the economics of such a large and expensive investment in this industry. In addition, if the level of maritime tourism reaches desired levels, security of onboard passengers and entrance into U.S. waters will become a concern.

Recommendations

Based on its observations and findings, the scanning team developed a number of recommendations. The observations, conclusions, and recommendations are those of the scanning team and not of FHWA.

1. International trade—Latin American trade in particular—has a dynamic relationship with the economic health of national economies and the global trade patterns that result. Studies of Latin American trade usually have examined historical trends in trade by commodity and product type, but have not often reflected changing global and hemispheric market factors that will likely have significant impacts on the future volume and composition of this trade. For example, the Mexican maquiladora industries face significant competition from China and other Asian countries. In the textile industry, Mexico is losing competitive advantage (i.e., its position as a low-wage country) to Honduras, China, and India. In addition, Mexican government officials want to evolve to a higher-value manufacturing economy that will raise the living standard for its citizens. These changes will have important consequences on the overall level of trade forecasts with Canada and the United States. They also could have significant impacts on the hemispheric logistics system and the need for corresponding transportation infrastructure. **The scanning team recommends further study of these dynamics and their related impacts on the performance of the transportation system. The team recommends that this, and related information, be incorporated into professional and organizational development activities for State DOTs.**

2. Scanning team members were impressed by the rapid change in trade flows and market presence that has occurred in several Latin American locations, perhaps represented best by the new container port in Freeport, Bahamas. **The scanning team recommends that monitoring of the Latin American market continue, given the rapid introduction into the market of new players. Institutional mechanisms should be developed to guarantee that the best available information is provided to State DOTs.**

3. Many types of international trade agreements have been implemented throughout the world, ranging from strategies to simplify tariffs to development of a borderless common market. In the context of Latin America, many countries have used free-trade agreements to establish trade advantages within the global market. As noted above, the private sector and, in particular, global corporations in the transport industry drive trade patterns to a great extent. We need to better understand the different types of trade agreements and their impact on trade and transportation infrastructure. **The team recommends that a clearer picture of the players and their roles should be developed and incorporated into the efforts of transportation agencies to engage more effectively with Latin American trade.**

4. The scan did not examine in detail the trade dynamics of the Central American and Caribbean market. This is an important market, especially for the United States. **The scanning team recommends that a scan be undertaken to understand the dynamics and potential of this important market and the role the Caribbean plays and will play in filling a transfer function for freight from all quadrants.**

5. The Central American and southern and eastern Mexican markets appear to have potential for creat-

ing a sea bridge with the U.S. Gulf Coast. Some services have already been tried, some successful and others too early to say. **Given changing market conditions, the team recommends a feasibility study of using the Gulf of Mexico for serving NAFTA trade to determine factors that would make such services successful.**

6. Both government and private sector officials discussed enhanced security at every site visited. Better understanding of supply chain logistics and more intense security provisions are important points of departure for understanding likely future trade flows. For example, some countries (e.g., Chile and Uruguay) view themselves as security gateways to NAFTA because of their ability to provide better levels of security for cargo heading to North America. If this proves to be the case, it could have important implications not only for these countries, but also for the types and levels of infrastructure provided at the destination ports. **The team recommends that the NAFTA countries work closely with Latin American countries, port authorities, and shippers to make sure they are aware of security requirements and to coordinate responsive strategies.**

7. Border issues were an important component of every discussion that focused on providing greater efficiency and productivity in international freight movement. This was especially true for discussions in Mexico. The United States and Canada have had a long and effective relationship in deconstructing the border, allowing for important inspections and security checks to occur, while at the same time providing for efficient movement of vehicles and passengers. This experience of deconstructing the border with Canada should be examined for lessons learned that could be applied to the U.S.-Mexican border. NAFTA countries face institutional, financial, and technological border challenges. **The team recommends a study on what has worked on U.S. borders and how these lessons could be applied elsewhere.**

8. The U.S.-Mexican border provides unique challenges in international trade and security. Numerous government agencies are involved with managing trade at the border. With the creation of the U.S. Department of Homeland Security, some agency functions may be consolidated, resulting in fewer delays at inspections. Shippers and private transportation providers, however, are more in tune with customers' planning, operations, and logistics needs, and thus of important transportation network needs. **The team recommends private sector involvement in developing border strategies, including a business plan for the border. This initiative could be supplemented with best practice case studies that could be incorporated into freight professional capacity-building programs.**

9. The scan team visited two types of ports—those that focus primarily on export and import flows and have important positive economic impacts on national and regional economies, and those that focus on transshipment of cargo. As container ships become larger, new transshipment ports (such as Freeport) will most likely gain in importance, given that larger ship sizes cannot be handled in existing ports without major i improvements. **The team recommends a study that examines the national, regional, and local economic impacts of such transshipment ports and provides observations on the benefits and costs of such facilities.**

10. The use of performance measures in transportation planning and decisionmaking is an important element of cost-effective transportation investment. The NAFTA countries have evolved over the past several years to a strategic corridor-gateway concept for enhancing the productivity of NAFTA trade. **The team recommends that the performance measures that best reflect the logistics and transportation problems of such corridors and gateways be identified and incorporated into the operations of State DOTs.**

11. In every country visited, strategic data collection and analysis were lacking (the same could be said of the United States). **The team recommends that NAFTA countries provide advice on and support for developing organizational capabilities in Latin American countries similar to Statistics Canada or the U.S. Bureau of Transportation Statistics.**

12. **Given the importance of the Latin American market to the NAFTA countries, the team recommends technical exchanges on topics such as finance, professional development, and multimodal transportation planning as important means of building institutional capacity with Latin American trading partners.**

CHAPTER 1

Overview

"...FREE TRADE, WITHOUT SUBSIDIES OR UNFAIR PRACTICES, ALONG WITH AN INCREASING STREAM OF PRODUCTIVE INVESTMENTS AND GREATER ECONOMIC INTEGRATION, WILL PROMOTE REGIONAL PROSPERITY, THUS ENABLING THE RAISING OF THE STANDARD OF LIVING, THE IMPROVEMENT OF WORKING CONDITIONS OF PEOPLE IN THE AMERICAS, AND BETTER PROTECTION OF THE ENVIRONMENT."

—Final Declarations, Summit of the Americas, 2001

Introduction

Not surprisingly, in a world increasingly connected via the global market, international trade is often a cornerstone of a strong national economy. Many national economies, such as those of Mexico and Panama, have become strongly dependent on international trade. Although the United States is not as much a trading nation as other countries on a percentage of gross domestic product (GDP) basis, the relative importance of international trade to the U.S. economy has increased steadily over the past three decades. At $16 trillion, international trade was responsible for half of the world's GDP in 2001. The relative contribution of trade to global economic activity has increased steadily over the past several decades. Since 1950, for example, the world's GDP has increased by 680 percent, while the value of goods traded has increased by 2,100 percent. The capability of a nation's transportation system to handle increased trade will be an important factor in the ability of shippers and customers to take advantage of the reduced tariffs and a more favorable market environment that will likely result from increasing trade connections.

The nature of trade relationships is such that countries often establish strong partnerships with certain regions of the world that reflect the exchange of resources needed for the production process and the markets desired for finished products. For the North American Free Trade Agreement (NAFTA) countries—the United States, Canada, and Mexico—Latin America is one such region. To better understand this market, the Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO) cosponsored an International Technology Scanning Program study of selected Latin American countries. The purposes of the study included the following:

- Identify international freight issues in Latin America and the roles of individual countries that trade with NAFTA countries.
- Determine future trends in logistics and trade infrastructure that could affect such trade.
- Assess whether the trade projections made during Phase 1 of the Latin American Trade and Transportation Study (LATTS) were still valid.
- Identify issues related to freight security concerning imports and exports to the NAFTA countries.
- Determine Latin American countries' experience with such things as interoperability, standardization, equitable taxation and pricing, and planning and financing of trade-related transportation infrastructure.

This scanning study was important and timely for several reasons. The NAFTA countries are negotiating with all of the countries of the Western Hemisphere (except Cuba) to create a Free Trade Area for the Americas (FTAA). This agreement, scheduled for a 2005 vote, will

create the world's largest free market zone (see Figure 1). The United States, Canada, and Mexico have already established bilateral free trade agreements with numerous Latin American countries, which could serve as an important indication of what might be expected with a trade zone at the hemispheric scale.

One of the purposes of this scan was to provide input into Phase 2 of the Latin American Trade and Transportation Study (LATTS). Phase 1 was a first-of-its-kind study of the Latin American market and its impact on the U.S. transportation system, particularly in the southeastern United States. The timing of the scan allowed Phase 2 of this study to be informed of the economic and political factors that might affect future trade flows with this important market. This assessment also could provide input into the formulation of initiatives considered by the U.S. Congress as it reauthorizes the Federal transportation program.

Finally, global market competition and the changing characteristics of the logistics chain suggest that understanding the capability of the transportation system to handle commodities and products could have an important economic effect on NAFTA. China and the European Union, for example, have made inroads into the NAFTA market primarily by investing in Mexico and Central American countries. The changing economics of competition could have a long-term impact on the type and scale of transportation infrastructure needed to handle trade flows in the NAFTA countries. The timing of this scan provides an important snapshot of this changing dynamic.

FHWA and AASHTO jointly sponsored this scan. Scan participants reflected a diverse set of interests and concerns for both national and international freight movement. In addition to FHWA and AASHTO officials, the panel included representatives from the national ministries of transportation for Canada and Mexico; the departments of transportation (DOTs) for Florida, Louisiana, and Mississippi; the metropolitan planning organization for the San Diego metropolitan area; the U.S. Transportation Security Administration (TSA); the LATTS study; and academia. These panel members represented a wide range of interests and expertise in the areas of policy, planning, security, freight logistics, and economic development.

The panel targeted government agencies, terminal operators, logistics providers, and shippers to gain a broad understanding of how selected Latin American countries deal with trade issues and transportation infrastructure, and how shippers and producers respond to market conditions. (See Appendix A for a list of the questions that were asked of the participants and Appendix B for participants in scan meetings.) From October 30 to November 17, 2002, the panel visited Freeport in the Bahamas, São Paulo and Santos in Brazil, Buenos Aires in Argentina, Montevideo in Uruguay, Santiago and the Port of San Antonio in Chile, and Panama City and Colón in Panama. From December 3 to 7, 2002, several members of the panel visited Mexico to discuss trade issues with government and industry representatives, as well as to participate in a scan implementation event. Two pre-meetings were held in New Orleans, Louisiana, and Miami, Florida, to meet with both U.S. shippers and government officials with experience in Latin American trade.

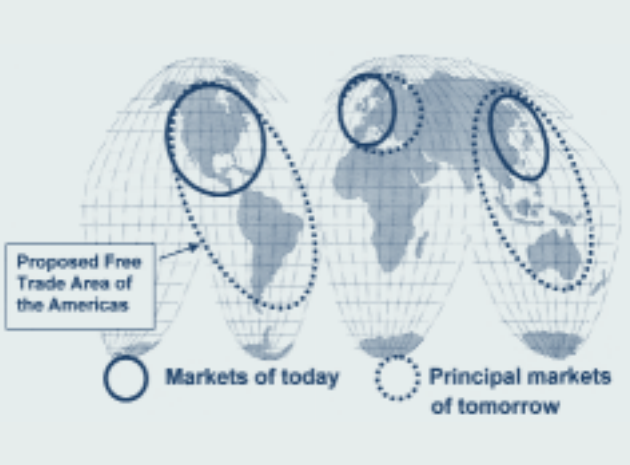


Figure 1. North America and Latin America will form one of the world's largest trading blocks in the future.

The limited time of the scan constrained the number and representation of those who met with the panel. The panel did not meet with groups that could have provided a broader perspective on the issues facing the development of the Latin American market, such as national railways, inland water and coastal shipping firms, and manufacturing and industry trade groups. In addition, the panel did not meet with non-government organizations representing environmental protection and sustainability issues. Instead, the scan participants focused on meeting with more than 120 people who provided a good cross section of the organizations that would be most involved with increased trade with the NAFTA countries.

The Mercado Común del Sur (Mercosur) countries of Argentina, Brazil, Paraguay, and Uruguay were of particular interest to the scanning team because they represent many of the largest and wealthiest countries of Latin America. Originally conceived by Brazil and Argentina in the 1980s as a means of developing a common market, Mercosur now includes Argentina, Brazil, Paraguay, and Uruguay as full members, and Bolivia and Chile as associate members. The market concept of Mercosur is that specified goods entering any of the four member countries are subject to a uniform tariff. Each country is allowed to select certain commodities that will be exempt from this tariff for a time period. Bolivia and Chile have entered into free trade agreements with Mercosur covering many of the same provisions, but differing in some cases on tariffs on certain commodities. Although economic difficulties have slowed economic growth, the creation of Mercosur seems to have had a stimulating effect on trade. Between 1990 and 1998, for example, Mercosur exports doubled from $46.4 billion to $81.4 billion, a 6 percent annual growth rate. Imports grew at an even more impressive rate of nearly 15 percent a year.

U.S. Trade

- The United States is the world's largest merchandise-trading nation, accounting for 12 percent of global merchandise exports and 19 percent of merchandise imports in 2000.
- By 2001, U.S. international merchandise trade was more than 20 times greater than in 1970, while total economic output was about 10 times greater.
- From 1990 to 2001, the value of U.S. international merchandise trade more than doubled, from $891 billion to more than $2 trillion (in inflation-adjusted dollars). This represented an 8 percent average annual growth rate, while the GDP annual growth rate was 3 percent.
- The ratio of U.S. merchandise trade to the value of GDP reached about 22 percent in 2001, compared to 13 percent in 1990.
- A more relevant measure of the importance of goods exports to the U.S. economy is the percentage of merchandise exports to goods GDP—which was 43 percent in 2000 compared to 15 percent in 1970.
- In 2001, the U.S. transportation system carried $736 billion in merchandise exports and $1.2 trillion in merchandise imports.

Source: U.S. Bureau of Transportation Statistics, *U.S. International Trade and Freight Transportation Trends*, Feb. 2003.

Mercosur is the third-largest trading block in the world after the European Union and NAFTA. Mercosur countries:

- Include 63 percent of South America's population at 217 million.
- Represent 76 percent of South America's GDP at $1.4 trillion.
- Contain significant industrial and natural resources important to world commerce, such as 26 percent of global cattle stocks, 14.4 percent of global forested areas, 10 percent of global steel exports, and 28 percent of global soy production.
- Are important trading partners to NAFTA countries (14.3 percent of non-intra NAFTA imports by value—35.6 percent by volume—originate from Mercosur countries, and 19.8 percent of Mercosur exports by value—12.9 percent by volume—are destined to NAFTA countries).

Not only is Mercosur an important trading partner for NAFTA, but as the hemisphere debates a Free Trade Area for the Americas (FTAA), Mercosur also represents a trading block with potentially different concepts and concerns about how such an agreement should evolve. Understanding Mercosur and its members' positions in trade and economic policy is an important point of departure in understanding much of the debate that will likely occur over creating an FTAA.

Lessons from this scan could be relevant to the United States, Canada, and Mexico in developing a common North American market. In addition, these lessons are important for national and sub-national investment decisions as they relate to changing freight movement in response to competitive forces. For example, the possible expansion of the Panama Canal could have significant impacts on the competitive market for the flow of agricultural commodities at the global scale. The effects would most likely be felt in the U.S Gulf Coast ports and in inland transportation systems that bring U.S. agricultural products to the ports for worldwide distribution.

The Latin American Context

In the context of this report, Latin America consists of all the countries south of the U.S-Mexican border, a market of just over 500 million people. Understanding this market involves understanding several important observations about trade relationships with the United States and NAFTA, and the economic, political, and social characteristics of the countries that make up this market. The following observations are important

points of departure for the conclusions and lessons learned from this scan.

Latin America is an important market for the United States and Canada. Latin American countries have for many years been important trading partners for both the United States and Canada. For example, 11 of the top 50 U.S. trading partners in 2001 were Latin American countries. Of the countries visited on this scan, Mexico represented 63 percent of all U.S. Latin American exports in 2001 (measured in dollars). Mexico's strategic position with the United States contributed to this high volume. Among other countries, Brazil represented 10 percent, Argentina 2.4 percent, Chile 2 percent, Panama 1 percent, and Uruguay 0.3 percent. The remaining 28 Latin American countries constituted 21.3 percent of U.S. exports to Latin America. When considering just South American (countries south of Central America) exports, Brazil represents 43.6 percent of U.S. 2001 exports, followed by Venezuela (15.5 percent), Argentina (10.8 percent), Colombia (9.8 percent), and Chile (8.6 percent). Seventy-two percent of Canadian imports from Latin America come from Mexico, 9 percent from Brazil, 8 percent from Venezuela, 4 percent from Chile, and 2 percent from Argentina. In addition, Latin America represented 19.5 percent of total U.S. private investment overseas from 1997 to 2001, demonstrating the importance of this region to the investment community.

Container movements for the most active trade routes between Latin America and the rest of the world in 2001 (measured in 20-foot equivalent unit (TEU) container carrying capacity) also indicate the important trade relationships between Latin America and North America. The largest movements were Panama-Asia (21 services, 100 vessels, 285,520 TEUs), Panama-East Coast of North America (19 services, 92 vessels, 263,740 TEUs), Mexico-West Coast of North America (18 services, 72 vessels, 166,296 TEUs), and Caribbean-East Coast of North America (37 services, 92 vessels, 129,928 TEUs).[1]

The Latin American market is important to many States. Many people consider Latin America important to those States that either border Mexico or have large ports that serve as gateways to the Latin American market. Latin America is also important, however, to many non-border, non-gateway States because of the market it represents for their goods. Figure 2 shows different ways of representing the importance of the Latin American market to individual States. As shown, over 65 percent of the movement of cargo through the 14 public ports in Florida is exports to or imports from Latin America. Figure 2b shows the implications of increasing trade flows on the U.S transportation system, in this case a more than doubling of cross-border vehicle movements at the two most important border gateways in California. Many States have strong economic ties to Latin America, as shown in Figure 2c. Thirty States exported more than $400 million in goods to Mexico in 2001, while 19 exported similar levels to South America. As this figure shows, the Latin American market is important to a large number of States.

The Latin American market also is important to other trading blocks. Although the NAFTA countries, and the United States in particular, are important trading partners to Latin America, they are not the only important customers for Latin American trade. From 1994 to 1998, for example, 27 percent of the imports into South America (by value) originated in North America, 26 percent in Europe, and 16 percent in Asia. Clearly, such trade flows vary by country. For example, just over 27 percent of Argentina's imports come from Brazil, a similar amount from Europe, and 22.5 percent from North America (excluding Mexico). For exports, 25 percent of Argentina's exports are destined to Brazil, 23 percent to Europe, and 11 percent to North America. Table 1 shows regions of the world with which selected Latin American countries have the greatest trade. Except for Chile and Mexico, North America (mainly the United States) is not the primary trading region for these countries. In addition to trade relationships, European and Asian investment in Latin America has been growing significantly over the past five years, both in private business and public infrastructure.

The statistics suggest that the NAFTA countries cannot take the Latin American market for granted. Indeed, the European Union has been negotiating for a free trade agreement with Mercosur (Argentina, Brazil, Paraguay, and Uruguay), and many Latin American countries already have such agreements with both European and Asian countries. Mexico has free trade agreements with 33 nations.

Latin American population and economic activity are concentrated in a few countries. Table 2 shows

[1] L. Boske, *Maritime Transportation in Latin America and the Caribbean,* Report 138, Lyndon B. Johnson School of Public Affairs, University of Texas, Austin, Texas, 2001.

Statistics show the importance of the Latin American market to the United States.

Figure 2a. Over 65% of trade using Florida ports is related to NAFTA/Latin American countries (FFSTEDC, 2002).

Figure 2b. Daily California cross-border trips (SANDAG, 2002)

States With Exports to Central America Exceeding $400 Million Annually, 2001					
FL	$2,164,106,000	NC	$753,382,000	KY	$440,548,000
TX	$755,486,000	CA	$743,434,000	GA	$419,073,000
States With Exports to South America Exceeding $400 Million Annually, 2001					
TX	$6,758,712,000	PA	$1,211,152,000	MA	$573,398,000
FL	$5,991,862,000	WA	$1,029,518,000	WI	$572,525,000
CA	$3,061,438,000	IN	$1,019,246,000	MO	$553,024,000
IL	$2,453,879,000	OH	$973,020,000	TN	$516,623,000
NY	$2,011,147,000	CT	$667,256,000	MN	$420,960,000
MI	$1,533,849,000	GA	$652,544,000		
NJ	$1,493,431,000	NC	$634,406,000		
States With Exports to Mexico Exceeding $400 Million Annually, 2001					
TX	$19,451,302,000	GA	$2,022,411,000	WA	$1,031,050,000
MI	$15,451,313,000	NC	$1,952,927,000	VA	$992,224,000
CA	$13,598,830,000	AZ	$1,900,803,000	CT	$981,674,000
OH	$5,139,692,000	TN	$1,692,923,000	KS	$782,147,000
IL	$3,603,758,000	SC	$1,381,184,000	NM	$760,841,000
NY	$2,971,943,000	MN	$1,350,593,000	KY	$721,086,000
FL	$2,589,688,000	MO	$1,170,518,000	AL	$596,235,000
PA	$2,416,006,000	MA	$1,169,281,000	MS	$495,574,000
IN	$2,346,196,000	WI	$1,055,424,000	MD	$474,823,000
NJ	$2,192,870,000	CO	$1,039,016,000	DE	$467,681,000

Figure 2c. State exports to selected regions of Latin America (**http://ese.export.gov**).

the size and state of the economy for the countries visited during the scanning study. Several characteristics of these countries merit special attention:

- Brazil dominates the region in population and South America in economic production (Mexico still has a higher GDP when compared to all of Latin America). Almost 33 percent of the Latin American population lives in Brazil and 19 percent in Mexico. Brazil is recognized by other South American countries as the major player in continental trade and economic policy.
- Mexico dominates Latin America in exports and imports, which is not surprising given its location next to the United States and its participation in NAFTA. It is expected that Mexico will account for more than half of Latin American trade by 2020. Panama is expected to experience the fastest growth rate in exports, given the attraction of the Panama Canal and the country's specialization in value-added re-exporting.
- In most cases, the GDP of Latin American countries grew impressively during the 1990s. Much of this had to do with liberalization of trade laws and adoption of privatization strategies for providing infrastructure. Recent data, however, shows that the economic recession has slowed this impressive growth.
- Several countries have adopted trade strategies aimed at increasing its importance in their national economies. Exports, for example, represented only 16.4 percent of Chile's GDP in 1981, while in 2001 this figure had risen to 34.7 percent. In Mexico, exports grew from 10.4 percent to 27.6 percent of GDP over the same period.
- Heavy reliance on trade makes all of Latin America, and some Latin American countries in particular, vulnerable to economic downturns in the world market. Since the United States is a major trading partner, a slowdown in the U.S. economy is felt throughout Latin America, and usually with more significant effect.
- Countries with the highest average income include Argentina, Chile, Uruguay, Mexico, and Venezuela. These countries represent the most appealing consumer market for trade (in addition to Brazil because of the size of its population). Given the economic downturn in many of these nations, more recent income data will most likely be lower than that shown in Table 2.

Even though many Latin American countries have faced economic and political uncertainties over the

	Percentage of imports from:				Percentage of exports to:			
	By value		By volume		By value		By volume	
Argentina	Brazil	27.2%	Brazil	46.9%	Brazil	25%	Europe	27.8%
	Europe	27.2%	Europe	15%	Europe	23.3%	Asia	24.2%
	N. America	2.5%	N.America	11.6%	Asia	16.4%	Brazil	20.9%
	Asia	2.4%	Asia	6.2%	N. America	10.9%	Africa	10.7%
Brazil	Europe	33.8%	Europe	28.2%	Europe	31.2%	Europe	42%
	N. America	32.7%	N.America	24.6%	N. America	24.4%	Asia	34.6%
	Asia	12.7%	Uruguay	16.5%	Asia	14.5%	N. America	9.5%
	Argentina	9.6%	Argentina	15.1%	Argentina	11.4%	Argentina:	3.9%
Chile	N. America	31.8%	Argentina	25.5%	Asia	31.4%	Asia	31.4%
	Europe	23.4%	N. America	22.1%	Europe	17%	Europe	17%
	Asia	17.4%	Europe	19.6%	N. America	7.7%	N. America	17.7%
	Brazil	8.4%	Brazil	13.1%	Brazil	5.4%	Brazil	5.4%
Mexico	N. America	82.4%	N. America	96%	N. America	91.7%	N. America	89.1%
	Asia	5.8%	Asia	1.6%	Asia	1.3%	Europe	4.3%
							Asia	3.3%
Uruguay	Argentina	26%	Argentina	38.2%	Brazil	23.2%	Brazil	31.4%
	Brazil	22.5%	Brazil	25.7%	Europe	20.7%	Argentina	25.8%
	Europe	23.3%	Europe	17.5%	Argentina	17.1%	Europe	21.1%
	N. America	11.9%	N. America	4.8%	Asia	11.7%	Asia	7.9%

Source: J. Hoffman, G. Perez, and G. Wilmsmeier, *International Trade and Transport Profiles of Latin American Countries, Year 2000,* ECLAC, Santiago, Chile, Feb. 2002.

Table 1. Origins and destinations of imports and exports, selected countries, 2000.

past 10 years, Latin America is still expected to show an economic performance higher than many other parts of the world in the future. For example, between 1997 and 2020, total real GDP in Latin America is expected to grow 4.4 percent annually, compared to 3.6 percent in Asia and 2.8 percent globally. Nominal GDP per capita in Latin America is also higher than other parts of the world. In 1997, average annual income in Latin America was $3,478, compared to $2,593 in Asia.

The geographic challenges of Latin America and the location of population centers result in heavy reliance on maritime transportation for trade. Many Latin American countries are located far from major global trade routes and face formidable transportation challenges in competing in the international market. Given the geography of Latin America, it is not surprising that, except for a few countries, the majority of foreign trade is handled by ship. Figure 3, for example, shows the market share of international trade for selected countries by mode of transportation. Except for Mexico, which shares a long land border with the United States, and Bolivia and Paraguay, which are landlocked, over 60 percent, and in some countries over 80 percent, of international trade is handled by sea transportation. The long distances involved in transportation make South American trade goods more costly in the world market. For example, the average international transport cost from Latin America and the Caribbean to the United States is a much greater percentage of the cost of production than for other regions of the world.

This dependence on maritime transportation is reinforced by an historic pattern of development based on colonial port cities (a major exception being Mexico City). Most of today's major Latin American urban centers, and therefore the major centers of economic activity, are found in port cities or in cities close to the coast (e.g., São Paulo, Rio de Janeiro, Buenos Aires, Montevideo, Santiago, Panama City, Vera Cruz, etc.). The types of commodities and products shipped through these ports are also the type of goods most easily transported via ships (e.g., ores, petroleum, grains, and manufactured goods).

	2002 Population (Millions)	GDP ($ billion)				Total exports and imports ($ billion)				Exports as % of GDP			
		1981	1991	2000	2001	1981	1991	2000	2001	1981	1991	2000	2001
Argentina	37.9	78.7	189.7	283.1	268.5	--	20.5	51.4	49.8	7	8	11	11
Brazil	175	263.6	407.7	593.8	502.5	--	52.7	110.9	113.8	9	9	11	13
Chile	15.6	32.6	34.7	70.5	63.6	--	17.1	34.9	34.4	16	33	30	35
Mexico	101.8	249.9	314.5	580.1	617.8	39.5	82.6	340.9	326.8	10	16	31	28
Panama	2.9	4.3	5.8	10.0	10.2	--	2.6	5.0	4.5	46	36	33	--
Uruguay	3.4	11.0	11.2	20.1	18.4	--	3.2	5.7	5.1	15	21	19	19

	GDP average annual growth rate				Average annual growth rate of exported goods and services				Top 4 export partners			
	1981-91	1991-01	2001	2001-05	1981-91	1991-01	2001	2001-05				
Argentina	-0.1	2.9	-4.5	-1.1	4.2	8.8	2.9	0.7	Brazil 24%	Europe 21%	US 11%	-
Brazil	2.9	2.9	1.5	2.8	6.8	6.4	12.1	3.7	US 23%	Argentina 11%	Germany 5%	Japan 5%
Chile	5.3	5.9	2.8	3.7	8.8	9.0	9.7	5.7	Europe 27%	US 16%	Japan 14%	Brazil 6%
Mexico	1.3	3.1	-0.3	4.0	6.0	14.3	-5.1	5.4	US 88%	Canada 2%	Germany 0.9%	Spain 0.8%
Panama	0.4	3.5	0.3	3.4	0.2	0.6	-1.1	4.5	US 42%	Germany 11%	Costa Rica 5%	Italy 4%
Uruguay	1.4	2.6	-3.1	-1.0	4.4	4.8	-8.8	1.2	Mercosur 45%	Europe 20%	US 7%	-

Source: http://devdata.worldbank.org

Table 2. Characteristics of countries visited.

Geographic barriers in South America add to this dependence on maritime transportation. The Andes Mountains, for example, provide formidable challenges for cross-continent rail and highway connections. The South American rail network is heavily oriented toward the coasts, emanating from either side of the Andes Mountains. A land bridge connecting the Atlantic and Pacific coasts is found in only a few locations, although several expensive projects have been proposed to provide improved rail and highway facilities across the continent (between Argentina and Chile, for example). The Darien Gap in Panama, a dense jungle and swamp area that separates Panama from Columbia, historically has been a major obstacle to land transportation between Central and South America. To this day, the Pan American Highway ends at the Darien Gap because of the difficulty of extending it through such terrain.

Many types of trading partnerships and relationships have been established among Latin American countries. Countries can establish a variety of institutional mechanisms and economic agreements that liberalize the exchange of trade. In this case, the term "liberalize" means lowering tariffs and removing customs barriers at the borders to reduce the cost of trade among the participant countries. By lowering this transaction cost, national economies can become more efficient and more competitive in the world market. Major types of trade arrangements found in or being considered by Latin America include the following:[2]

- **Tariff Preference**—Agreements among countries to provide preferential tariffs on specified products.
- **Free Trade Agreement**—Agreements among countries to reduce or remove tariffs on specified commodities and products. A free trade agreement usually entails agreements to foster the movement of these commodities across national borders (an example is NAFTA). No common external tariff for trade with other countries exists, and individual countries must resolve disputes individually because no institution is established for this purpose.
- **Customs Union**—Agreements among countries to rationalize customs procedures and requirements, and to establish a common external tariff on specified products. A Latin American example is Mercosur, in which Argentina, Brazil, Paraguay, and Uruguay have adopted a common external tariff (CET) that ranges from 0 to 20 percent of the value of a commodity and covers about 85 percent of all traded goods. No governmental institutions direct trade block policies, and individual countries do not have to integrate or harmonize their economies to that of the trade block.
- **Common Market**—Similar to the European Union, national boundaries are removed for trade flows and the movement of labor, capital, and natural resources. No customs or other inspections occur at entry points into individual countries, except in those countries that serve as external gateways. A full economic union implies the creation of an organizational structure and jointly held policies that guide the activities of individual countries.

The creation of many trade blocks is one reason for rapid growth in the Latin American economy over the past decade. These relationships often vary in their intent to develop economic, social and, in some cases, political integration among member countries. The box on the following page describes the key trade organizations and relationships in Latin America.

The most common arrangement is the creation of a free trade agreement (FTA) between individual trading partners that reduces tariffs on selected goods. For example, Chile and Canada established an FTA in 1997 that eliminated tariffs on almost 80 percent of traded goods. In addition, the agreement covered topics relating to environmental protection, labor rules, and protection for investors. The United States concluded negotiations for a similar FTA with Chile in December 2002. Mercosur has signed FTAs with Chile and Bolivia,

Figure 3. Mode of international trade for selected countries.

[2] L. Boske, *Maritime Transportation in Latin America and the Caribbean,* Report 138, Lyndon B. Johnson School of Public Affairs, University of Texas, Austin, Texas, 2001.

Key Trade Relationships

Andean Community—A customs union designed to remove external tariffs and coordinate industrial and infrastructure policies, with a goal of eventually creating a common market. A 1996 agreement established an office of general secretary to arbitrate inter-country disagreements. Member countries include Bolivia, Columbia, Ecuador, Peru, and Venezuela.

Caribbean Common Market (CARICOM)—A customs union involving most of the Caribbean islands, Belize, Guyana, and Suriname. The intent is to evolve to a common market. Tariff-free imports of selected merchandise can be imported into the United States.

Free Trade Area for the Americas (FTAA)—An agreement being negotiated by all the countries of North and South America (except Cuba) to develop a free market in the Western Hemisphere. If successfully negotiated, the FTAA would be the largest in the world.

Latin American Integration Association (Asociación Latinoamericana de Integración or ALADI)—Created in 1980, its purpose is to promote economic cooperation and arrange for preferential trade agreements among member countries. Member countries include Argentina, Bolivia, Brazil, Chile, Columbia, Ecuador, Mexico, Paraguay, Peru, Uruguay, and Venezuela.

Plan-Puebla Panamá—An agreement among Mexico and Central American countries to coordinate national policies to foster economic development in Central America. The intent is to develop joint infrastructure and human resource development plans to raise the standard of living of the area's 60 million people. Mexico has taken a lead in this initiative.

Mercado Común del Sur (Mercosur)—A customs union designed to reduce tariffs on commodities within the Mercosur market, and to apply a common external tariff on the majority of traded goods. The intent is to develop a common market, but progress has been slow. Member countries include Argentina, Brazil, Paraguay, and Uruguay. Free trade agreements have made Chile and Bolivia associate members.

North American Free Trade Agreement (NAFTA)—Agreement among Canada, Mexico, and the United States to create a free trade area by removing regulatory barriers and reducing tariffs on selected commodities. The FTA became effective in 1994, although the implementation of many provisions has been staged over a multi-year period.

and is negotiating one with the European Union. The largest FTA in the Americas is the North American Free Trade Agreement (NAFTA) established by Canada, Mexico, and the United States, which took effect in January 1994. This agreement eliminated many tariffs and liberalized trade and investment restrictions in the three countries. As discussed in the section on Mexico, some challenges have been encountered in implementing parts of this agreement, especially concerning movement of vehicles across the Mexican-U.S. border.

Scanning Study Preparation

As part of its preparation for the Latin American visit, the scanning team held meetings with State DOT and port officials, shippers, and Latin American investors. A meeting in New Orleans focused on shipper and investor perspectives on Latin America's challenges and future prospects. A meeting in Miami focused on the challenges facing U.S. ports and transportation systems if increased trade with Latin America were to occur.

New Orleans pre-departure meeting—The Port of New Orleans and the Louisiana Department of Transportation and Development hosted a September 20-21, 2002, meeting that provided an opportunity for the scanning team to meet with investors, shippers, and port operators with a working knowledge of Latin American trade. Several important points were made at this meeting. Perhaps most important was an assessment of the current economic and, in some cases, political state of several Latin American countries. Several countries have been experiencing severe economic challenges, changes in government, and large-scale transitions to privatization of infrastructure over the past two decades. Brazil, Uruguay, and Argentina, in particular, have been hit hard by economic conditions and a lack of investment capital. Many Latin American countries have depended on natural resources (e.g., iron and copper) to generate foreign exchange, and have been subject to the fluctuations in world market prices. Others have tied their currency to the U.S. dollar and experienced rapid devaluation when the respective currencies were revalued. Still others have a tradition of businesses owned by families who tend not to reinvest in the company and the economy. Although the participants generally concluded that the Latin American market would continue to fluctuate, they expect trade with this market to increase over the long term.

Observations from meeting participants included the following:

- Latin America has been important for many years to southeastern U.S. ports.
- Brazil dominates the economic market of South America.
- New Orleans and other U.S. ports expect increased trade flows because of future free trade agreements.
- The economic woes of Latin American countries have affected international investment in infrastructure and economic activities.
- Political uncertainty in some countries (e.g., Brazil and Argentina) has caused some concern among members of the investment community.
- Convenient and easy-to-use distribution systems that connect internal markets to seaports are desirable for Latin American ports.
- Development of the agricultural hinterland of Brazil served by the Rio Paraña and connected to the Atlantic by the Rio de la Plata will have a significant effect on the U.S. agricultural industry, especially in the production of soy.
- Security measures at U.S. ports have been heightened since the events of September 11, 2001, and will continue, especially for Latin American trade.

It was interesting to learn that U.S. investors were funding improvements to inland water transportation facilities in the Rio de la Plata basin serving Brazil and Argentina. The intent of this project is to expedite the transport of goods from the interior of Brazil and Paraguay to Mississippi River ports. Insufficient road infrastructure is available to handle increased movement of agricultural products. Investments in the Paraña River have reduced the roundtrip barge time from the interior from two-to-three months to 23 days. This improvement in internal distribution will likely have a significant impact on trade flows in this part of South America.

From an investment perspective, the attitude of the investment community is to be cautious. The Latin American economic market is huge, and progress has been made in democratization over the past two decades. With lowered trade barriers associated with a Free Trade Area for the Americas (FTAA), the future is expected to be bright. Interestingly, a Port of New Orleans representative stated that the benefit of NAFTA has been to the United States as a whole, not only to the Gulf seaports. This is not surprising, given that NAFTA trade is primarily land-based. With the creation of an FTAA, however, ports will likely be the greatest beneficiaries because most of the trade will have to come to NAFTA countries via ships. A key question facing the United States is which ports will benefit the most. In anticipation, the Port of New Orleans is investing heavily in container-handling capacity.

One speaker suggested that the United States should adopt a strategic action plan to further the progress of Latin America. This action plan should encourage democratization, lower trade barriers, improved access to capital markets, and technology sharing to improve the efficiency of logistics and freight movement.

Miami pre-departure meeting—The Florida DOT and the Florida Ports Council hosted this meeting on October 30, 2002. While the New Orleans meeting

Latin American Container Trade Estimated TEUs, 2001

Brazil	2,207,019
Central America	1,081,087
Caribbean Basin	1,077,238
Mexico	992,447
Chile	846,500
Argentina	838,652
Venezuela	517,706
Colombia	482,615
Peru	247,585

Top 13 Container Ports in Latin America, TEUs, 2000

*Colón, Panama	1,210,852
*Santos, Brazil	1,047,685
*Buenos Aires, Argentina	1,011,748
Kingston, Jamaica	983,400
Puerto Cabello,Venezuela	618,195
Limón-Moin, Costa Rica	577,621
*Freeport, Bahamas	570,000
*Vera Cruz, Mexico	543,327
Callao, Peru	480,706
Haina, Dominion Republic	465,944
*Manzanillo, Mexico	457,946
Guayaquil, Ecuador	453,646
*San Antonio, Chile	410,796

**The scanning team met with representatives of these ports*

Source: **www.eclac.cl/transporte/perfil**

focused on shipper, investor, and port operator perspectives on Latin American trade, the Miami meeting emphasized the concomitant need for investment in U.S. trade-related transportation infrastructure.

Southern Florida considers itself the gateway to Latin America, and its ports and the shipping lines they serve as the superhighway to the Americas. Much of the freight movement through Florida ports originates in or is destined for Latin America (65 percent of the movement through the 14 public ports in the State). Some 40 shipping lines offer regularly scheduled service between the Port of Miami and 100 countries, serving 250 ports around the world. During fiscal year 2001, close to 1 million TEUs were handled in the port. An economic study for Florida ports predicts that trade will double in five years, and that passenger cruises will increase between 8 and 12 percent a year. Most of the increase in trade and passenger cruises will be in the Caribbean basin.

The Port of Miami, home to 18 cruise ships, is the world's largest cruise port, providing service to 3.4 million passengers in 2001. Just over $60 million is being invested by the port to upgrade and expand passenger terminals. About $120 million has been targeted for other port improvements.

A key challenge for Florida ports is rail and highway access, an issue many port officials pointed to as one of the most important constraints to increased freight movement through Florida ports. In response to these and other needs, Florida has created a Transportation Finance Commission that provides funding for port improvements with a local match provision (see box below).

Representatives at this meeting strongly recommended the development of an international trade policy for the United States that ties trade flows into market and transportation investments.

Innovative Financing For Florida Ports

The State of Florida has developed an institutional structure for financing capital improvement projects at seaports. The Florida Seaport Transportation and Economic Development (FSTED) Council consists of representatives of the 14 publicly owned seaports and the State DOT, Department of Community Affairs, and Governor's Office of Tourism, Trade, and Economic Development. The councils' major responsibility is to select improvements projects. The Florida Ports Council is a non-profit organization that is the professional association for Florida's seaports. By law, the council provides support services to the FSTED Council. The Florida Ports Financing Commission issues bonds to finance the capital projects.

Two types of funding programs have been established to provide state-supported capital improvements at Florida's seaports. A grant program, requiring a 50 percent local match, was established in 1990 at a level of $10 million per year. Of this, $8 million comes from the State Transportation Trust Fund and $2 million comes from the State DOT budget. Since 1991, $110 million has been made available through this grant program. Types of projects eligible for this grant money include:

- Transportation facilities in the port
- Construction and rehabilitation of wharves, docks, etc.
- Land acquisition
- Acquisition, improvement, and enlargement of facilities
- Construction and rehabilitation of port facilities
- Dredging
- Crane acquisition
- Environmental protection measure
- Intermodal access projects in plan
- Seaport security measures

The other type of financing program is based on revenue bonds, where the guaranteed receipts for debt service come from the State's motor vehicle license tax. A 1996 bond issue provided $222 million for the same types of port infrastructure improvements eligible for the grant program. A 50 percent local match is required for this program. A 1999 bond issue provided $150 million for capital improvements on a 50-50 match basis and for intermodal access projects on a 75-25 match basis. Intermodal access projects are defined as dredging or deepening of channels, turning basins, or harbors and rehabilitation of wharves, docks, or similar structures.

Source: **http://www.flsenate.gov/Statutes**

Scan Visits

The scanning team met with government agencies, terminal operators, logistics providers, and shippers to gain a broad understanding of how a selected set of Latin American countries deals with trade issues and the provision of transportation infrastructure, and how shippers and producers have been responding. The following summarizes what the team learned.

Freeport, Bahamas

This visit focused on the new Hutchinson Container Terminal that began operation in 1997 and is now the seventh-leading handler of containers in Latin America. The port handles primarily transshipments of containers (99 percent of the containers moved). This terminal, located only 60 miles (100 kilometers) from Florida, is an example of the rapid growth in transshipment ports in the Caribbean. Other examples include plans to expand transshipment capacity in Puerto Rico, Venezuela's Puerto Cabello, the Dominican Republic's new port in Caucedo near Santo Domingo, and Kingston, Jamaica's, $100 million investment in its port. If all these planned improvements are put in place, the transshipment port capacity in the Caribbean Basin will exceed 6 million TEUs annually, a level much greater than can be supported by the container traffic demand expected in this market. It is likely that ports located on main trade routes that can provide low-cost and rapid transshipment capabilities will be the winners in this competition. The Hutchinson Terminal is poised to be one of these winners.

Scan Results—The growth in the number of containers transshipped in Freeport is impressive. According to Hutchinson officials, about 800,000 TEUs will have been handled in 2002 with an expected increase to 1 million TEUs in 2003 and 2.5 million in 2004 (because of a contract with Mediterranean Shipping Company.) This growth, if it occurs, will place Freeport in the upper tier of container ports in Latin America. The port handles primarily east-west traffic between Asia and the Mediterranean, as well as feeder services into the United States. U.S. ports connected via shipping services to Freeport include Baltimore, Charleston, Houston, Jacksonville, Los Angeles, Miami, New Orleans, New York, Newark, Newport News, Norfolk, Philadelphia, Port Everglades, and Savannah. No conflict appears to exist between southeastern U.S. ports and the Freeport operations (Freeport officials believe Kingston, Jamaica, and Cuba will be their major competitors in the future). When asked, Florida port officials agreed that Freeport could act as an important asset in developing connections to the major east-west services provided through the Hutchinson Terminal. In addition, because of U.S. restrictions on foreign-flagged carriers moving cargo between U.S. ports, several shipping lines bring cargo to Freeport and redistribute from there.

Maersk and Mediterranean Shipping Company were the original investors in the container port. Currently, 350 employees work at the container port, and although unionized, the labor force provides flexible hours to handle ships at any desired times. The port offers 24-hour-a-day operations, with ship arrivals scheduled in advance.

Investment in the Freeport container port, along with expansion of airport and passenger cruise facilities, has been significant. Over $168 million has been invested in the container port, with $215 million planned for future expansion. The passenger cruise facilities cost

The Hutchinson Terminal in Freeport, Bahamas, has become a major transshipment port in the Caribbean.

$10 million and the Grand Bahama Airport Company has invested $30 million in the airport and surrounding developments. The $60 million expansion of the container port includes three new super post-Panamax cranes, 16 new straddle carriers, 14 additional hectares (35 acres) of storage area, and a deeper channel and turning basin depth of 52 feet (16 meters). Because of favorable geological conditions, the container port can be expanded easily and rapidly. In fact, terminal operators are looking forward to larger container ships (in the 10,000 TEU range) visiting the terminal because they believe they have the capability of expanding to meet the needs of such ships, while many other ports will face significant environmental challenges and community opposition. The Bahamian government policy has been supportive of port expansion.

SUCCESSFUL PORTS OF THE FUTURE WILL BE MORE THAN JUST A LOCATION TO HANDLE CARGO. THEY WILL OFFER A FULL RANGE OF LOGISTICS SERVICES—CONNECTED GLOBALLY THROUGH THE INTERNET TO CUSTOMERS AND SERVICE PROVIDERS—PROVIDING COMPREHENSIVE LOGISTICS SUPPORT FROM ORIGIN TO DESTINATION.

The container port is part of a much larger economic development strategy that includes developing an international airport, free trade zone, and numerous tourist sites, including a major resort. In a departure from the primary business of transshipment, Hutchinson is examining the possibility of Freeport becoming a distribution center with longer-term warehousing for non-time-sensitive materials while the international airport serves the transport needs for time-sensitive goods.

One of the important issues raised by Hutchinson officials was the need for improved security. They plan to invest in security equipment that will satisfy whatever new U.S. requirements are put in place and to work with the U.S. Customs Service to develop acceptable procedures. Officials are concerned, however, about the impact security measures will have on the timeliness of cargo movement. A major advantage of Freeport with its state-of-the-art facilities and favorable labor conditions is the expeditious transfer of containers. Anything that slows down this transfer could hurt the port's competitiveness.

The Freeport visit provided important insights into the Caribbean Basin's rapidly evolving transshipment market. The Freeport container port illustrates the swift introduction into the market and subsequent impact that private operators can have under a concession arrangement with Latin American governments. The port, which is handling 800,000 TEUs, did not exist in 1996. Four years later, it has a major impact on trade flows. Privatization provides terminal operators with opportunities to respond to changing market conditions quickly, something that might not be available in U.S. ports facing more constrained arrangements.

Another interesting observation from Freeport was the much broader vision of a container port-airport-warehousing-resort development cluster. The developers' strategic vision is to provide a much broader range of services and to complement each with infrastructure improvements. For example, a major airport expansion is intended to provide improved service to the resort built on the island. In addition, it will provide rapid and convenient air cargo service for high-value commodities to and from major U.S. markets. The container port is viewed as a foundation of a much larger vision of a logistics service center that would capture much of the Caribbean market. With the container port, warehousing, logistics firms, and financial management institutions located near one another, Freeport can become not only a place where containers are transshipped, but also a major business center for those interested in Latin American trade. Given its connection to the major east-west trade flows of the Mediterranean, it also could become a major business location for trade that connects to this global trade flow from South America and the United States.

Brazil

São Paulo and Santos, Brazil
Brazil is the largest country in Latin America, both in land mass and population (it is the fifth most populous in the world). It constitutes 70 percent of South America's land surface and 80 percent of its population. Brazil, the eighth largest economy in the world, accounts for 70 percent of the GDP of the Mercosur countries. It has extensive natural resources and has been one of the world's leading economies among developing countries. Brazil faces significant economic and political uncertainty with an ongoing economic recession and the election of a new president. Much of the population is poor, by some estimates close to 130 million, and a growing income gap characterizes recent political events in the country. Even with such uncertainties, Brazil will continue to be a major player in hemispheric trade, if for no other reason than the size of its market. As part of its visit, the scanning team visited São Paulo and the Port of Santos, Brazil's largest port.

Scan Results—Brazil has faced significant economic and political challenges over the past decade. High interest rates, at least by North American standards, have characterized the investment market and limited capital investment. According to one official, taxes on some goods, such as a 42 percent national tax on manufacturing, has constrained the country's production capability and its ability to compete globally.

As with other Latin American countries, Brazil has used privatization strategies to provide additional transportation infrastructure, primarily highways, railroads, and port facilities. The country has 39 highway concessions. Because of the country's economic problems, the highway and railroad concessions have had significant problems achieving a return on their investment.

The railroad system is a good example of the challenges facing privatized services. Brazil has several main railroads, with more than 12,000 miles (20,000 kilometers) in private control. The railroad concessions were given to the largest bidders for a 30-year period. Given the economics of transportation, the only profitable railroads are those that transport iron ore to the northeastern ports. With recent significant growth in agricultural commodities in the western states, primarily soy and wheat, rail transportation plays an increasingly important role in this part of the Brazilian economy as well. For example, the amount of soy transported increased from 6 million tons in 1999 to 14 million tons in 2002. Most of the soy was exported through the port of Parañaqui. Brazilian railroads have had little increase in container traffic, even though the country's major ports have made substantial investments in container facilities. One reason is the cost

BRAZIL	
Population	175 million
2001 GDP	$502 billion
Exports/GDP	14%
Trade as share of GDP	19.1%
U.S. exports to:	$15.4 billion
U.S. imports from:	$14.5 billion
Canadian exports to:	C$914 million
Canadian imports from:	C$1,531 million

Top exports:
Manufactures, iron ore, soybeans, footwear, coffee

structure for moving containers by rail, which is double that for comparable rail container movement in the United States or Europe.

Private companies make investments in the rail system. The Brazilian Development Bank subsidizes capital investment at a level of $200 million a year by providing low-interest loans (in this case, 10 percent). The challenge, however, is that these investment funds can be used only to expand the system, not for maintenance. It is the need for maintenance and rehabilitation that places the most demands on the rail system.

Just over 60 percent of the total freight movement in Brazil is handled by truck. The country has 1.8 million trucks operated by just over 35,000 companies. The average age of the truck fleet is 18 years. For transportation among the Mercosur countries, trucking companies must be prequalified and have a license to operate internationally. About 47,000 Brazilian trucks and 1,000 companies have qualified for the Mercosur market. About 26,000 trucks and 1,400 companies from its Mercosur partners have been qualified to operate in Brazil. Mercosur has established size, weight, and safety standards for intra-Mercosur transport. Brazilian customs officials are implementing information databases and commercial vehicle operator technologies at border locations to speed up the processing of the prequalified truckers. This should help alleviate one of the critical problems with Mercosur trade, which has been the substantial delay at border crossings. For example, one official estimated that trucks are often delayed two to three days at the border coming into Brazil and as much as a week leaving the country.

North America is viewed as an important growth market for Brazilian goods. The agricultural industry in Brazil is looking to Asia as a major market for its products, especially if the Panama Canal is widened to allow larger ships. Meeting participants did point out that significant vehicle delays occur at the borders because of the numerous agencies involved in customs, health, and safety inspections. Little integration appears to exist among different modes of transportation, although corridor studies have been undertaken to determine the feasibility of toll roads. Although the national government provides funds to build roads, much of this investment goes to rural states. More urban states like São Paulo provide their own funding for road investments.

Port of Santos—São Paulo's Port of Santos, located only 36 miles (60 kilometers) from the largest concentration of population in South America, is the largest port in Brazil. São Paulo has 22 million inhabitants and represents 40 percent of Brazil's GDP. If the Port of Santos served just this huge consumer market, it would still be an important Latin American port. The major export is coffee, while other significant commodities include soybeans, bananas, sugar, cotton, machinery, and vehicles. The Port of Santos is also a major transshipment port for goods and commodities produced in all the Southern Cone countries (Brazil, Argentina, Chile, Uruguay, Paraguay, and Bolivia). Last year, for example, Santos overtook Buenos Aires as Latin America's second-largest handler of containers.

Handling more than 50 million metric tons each year, the port has about 8.4 miles (14 kilometers) of quay with 63 berths and 125 acres (500,000 square meters) of warehouses. It handles 11 percent of Brazil's foreign trade in volume and 24.4 percent in value. It also moves 300 million tons of domestic cargo. About 18 percent of its exports ($2.6 billion a year) go to the United States, and 25 percent of its imports ($3.3 billion a year) come from the United States.

The São Paulo Port Authority took over port management in 1993, with the state of São Paulo and other municipalities holding the majority of the capital stock. The port authority is responsible for dredging, maintaining access channels, providing landside access, and administering the port. The Port of Santos was one of the first in Brazil to implement the Ports Modernization Law instituted by the Brazilian government in the early 1990s. The law's privatization provisions have resulted in almost 80 percent of the port area being turned over to private operations under a 25-year concession agreement. A goal of the privatization was to spur private investment to make the port more efficient. Since the law's implementation, about $360 million has been invested in the port by concessionaires, with another $330 million under agreement.

A significant change in the labor market has been brought about by the privatization of many port operations. In 1997, all labor relations were consolidated into one organization, which fought for financial hardship allowances for those who stood to lose their jobs after privatization. The impact on labor has been stark. In 1993, before the modernization law took effect, the port authority had 7,372 employees. After privatization, the number dropped to 1,197 employees. In 1993, non-port authority employees numbered about

28,000, while today the number is 10,860. The result of lowered labor cost has been a significant decline in average cost-per-container moved. Before privatization, the average cost was $500 per container, while today it is just over $200. Labor costs represent 60 to 70 percent of this cost. The labor reduction also created political problems for the port. About 2,000 employees took early retirement before privatization, which the port authority had to pay for out of its annual revenues. For many years, this burden severely restricted the amount of funds available for reinvestment in port facilities.

Land access to, and distribution within, the port are two important issues. The port is served by a soon-to-be completed toll road that provides high-capacity, high-speed access to São Paulo. Almost 90 percent of the export-import cargo is carried to or from the port by trucks. Five railway companies, under concession since 2000, serve the port. The port had a goal of having 10 million tons of cargo carried by rail by the end of 2002, a goal that was met. Investment in rail services in the port property and use of concessions have dramatically increased the productivity of rail car use. Twenty percent of container traffic to and from the port is handled by rail, about 20,000 TEUs per month. Rail investment in infrastructure on port property is an important component of improved access to the port. Without corresponding investment in rail infrastructure in other parts of the country, however, the use of rail for moving goods to and from the port will be limited. Initiatives are being developed that will allow leasing of rail infrastructure for private operators, generating investment dollars. Rail services, in combination with inland water barge, represent an important access mode for agricultural commodities, especially soy.

Other strategies have been used to improve the port's productivity. The port is operated 24 hours a day with a 24-hour reservation system for trucks because of congestion on the local road network, and port planners are considering an internal truck-only road to provide more efficient truck movement. A strategic plan for the port includes channel deepening, application of intelligent transportation system (ITS) technologies, truck storage facilities, and the creation of a free trade zone. Finally, port officials are concerned about new security clearance requirements that might entail increased investment in new equipment, although they expect terminal operators to shoulder much of the burden of increased costs.

In the future, the port expects a substantial increase in visits from cruise ships, and it has built a new passenger cruise terminal in anticipation. In addition, the port is developing a concept of a super port that would be able to handle greatly increased trade volumes resulting from the Free Trade Area for the Americas.

CHAPTER 2

Argentina

Buenos Aires, Argentina was one of the leading nations in the world in the 1990s in privatizing large portions of public infrastructure. This was done primarily in response to economic difficulties and because the Argentinean government wanted to become more competitive in the international market. Although strong government policies managed to pull Argentina out of economic crisis in the early 1990s, Argentina once again faced significant economic problems over the past five years. Beginning in late 1999, foreign investors became worried about Argentina's ability to pay its large public sector debt, especially in the wake of Brazil's January 1999 currency devaluation. Argentina's economy is closely linked to Brazil's, which generates concern about the impact of the Brazilian currency devaluation on the Argentine economy. The International Monetary Fund provided a large loan in 2000 to avoid major economic collapse, but production fell from already low levels and unemployment continued to rise throughout 2001. The Argentinean peso was devalued, only to cause additional popular unrest.

ARGENTINA	
Population	37.5 million
2001 GDP	$269 billion
Exports/GDP	11%
Trade as share of GDP	18.1%
U.S. exports to:	$3.9 billion
U.S. imports from:	$3.0 billion
Canadian exports to:	C$132 million
Canadian imports from:	C$350 million

Top exports:
Edible oils, fuels and energy, cereals, motor vehicles

The state of the economy has been reflected in political instability over the past few years. A new president in 2001 announced that Argentina would default on its international debt obligations, and yet another new president in 2002 abandoned the peso's link with the dollar, a move that was followed by currency depreciation and inflation. Argentina continues to face significant economic problems that will likely require strong economic measures that will be unpopular.

Scan Results—As noted above, Argentina was one of the first South American countries to allow privatization in transportation infrastructure, especially in port and highway operations. For example, of the 22,800 miles (38,000 kilometers) of roads in the country administered by the national government (out of 230,000 kilometers), 6,000 miles (10,000 kilometers) are under concession management. Roads under concession management support 82 percent of the nation's motor freight movement.

The Port of Buenos Aires presents a good case study of how privatization policies have been implemented. The port, the most important in Argentina and one of the most important in Latin America, faced serious problems before a national port reform law. Labor costs were high and little public investment had been made in port infrastructure in previous decades. Unlike other Latin American countries, Argentina had not emphasized global trade in its national economic policy and had not invested in the transportation infrastructure necessary to support such trade. In the early 1990s, a new president began transforming the nation's economic policy to one based on private initiative and operation of key components of this infrastructure. One of the most

important aspects of this initiative was labor reform. The intent of labor reform was to eliminate restrictive labor practices, promote stable relations between labor and terminal operators, and reduce the number of laborers at the ports. The Port of Buenos Aires saw the number of port employees drop from 5,100 in 1989 to 400 in 1994.

One consequence of the privatization law was the introduction of increased competition in the Argentinean port industry. Several meeting participants noted that some of Argentina's ports appear to spend more time competing with each other than with foreign competitors, such as Montevideo. Because of fairly high labor costs and longer distances involved (and transport costs), Argentinean ports need to develop a nationally coordinated strategy that will attract trade opportunities.

Meeting participants discussed the importance of logistics for modern economies, and the critical role information systems will play in managing the transportation component of the supply chain. Quality transportation requires a much broader perspective than now exists in much of the Argentinean transportation industry. For example, many transportation companies are family-owned and have little interest in risky investments in different types of services. Multimodal transportation is not a concept that has been adopted by many service providers in Argentina. The trucking industry needs to think seriously about how it will survive economically in the future. For example, Brazilian trucking costs are a third those of Argentinean companies, while Chilean costs are half those of Argentina. In an economic market severely strained by rising costs and declining demand for services, such cost differentials can become critical to the survival of the trucking industry. In addition, cabotage (delivery of goods from origin to destination within a country) by foreign trucks is not allowed within Mercosur countries. For example, Argentinean trucks cannot deliver goods to Brazil and then turn around and deliver Brazilian goods to Chile.

It is interesting to note that one productivity improvement transportation officials have considered is increasing the size of trucks allowed on the road. In particular, they have debated introducing a 70-ton truck into the Mercosur market. One problem with this new truck design, however, is that many bridges on Mercosur roads are unable to support such a load, requiring the truck to ford the river where feasible. This would not likely provide the competitive advantages the truck's proponents desire. This issue is still being discussed.

Argentina is trying to develop coastal shipping to take the place of truck and rail operations serving the gateway ports. Not only would such shipping be more environmentally benign, it would present lower costs to shippers. One participant noted, for example, that the average cost per ton-kilometer was 8 to 10 cents for trucks, 3 to 6 cents for rail, and 1 cent for water. However, only recently has any significant governmental attention been given to river transportation. The key question facing government officials, given the basic approach adopted for transportation investment in the country, is how to spur private interest in improved river feeder service to the nation's ports.

Unlike Brazil and Uruguay, Argentina is clearly focusing on regional trade, and not as much on global or even hemispheric trade. This is not surprising, since Brazil is Argentina's leading trade partner. It was striking how, in comparison to other countries, discussions focused on trade in the Southern Cone countries and little on global trade. This is perhaps a result of the difficult economic times the country faces.

Argentinean officials' observations included the following:

- Transportation is not integrated with national economic or trade policy. Apparently, over the past 10 years, the national government's responsibility in transportation has shifted from one government agency to another. This constant changing appears to have resulted in a lack of commitment to an integrated transportation system.
- The national program for infrastructure privatization resulted in significant investments in highways and ports. The economic downturn has affected travel and the use of toll highways, as well as the level of imports and exports. The national government does not have revenues to invest in such infrastructure, and needed maintenance on important parts of the country's transportation infrastructure is being deferred. Meeting participants appeared to believe that efforts to privatize railways have not succeeded.
- Border crossings, especially within Mercosur, are a significant problem. Participants believe a strong disconnect exists between national customs agencies' actions and Mercosur free trade policies. They

believe this problem must be addressed before Mercosur reaches its full potential as an economic market. In addition, several participants pointed out that rail track gauge has not been standardized within Mercosur, and several rail border crossings require a transfer of goods from one railroad to another.

- Port of Buenos Aires officials are concerned about future requirements for higher security procedures for goods destined to the United States. Given the precarious economic conditions at the port and the cost of the likely required scanning devices (ranging from $3 million to $4.5 million each), officials are worried that the necessary investment resources will not be available to meet U.S. requirements. It is expected that the shipper or service provider will have to be responsible for such investment.
- Port access is a significant issue. Many of the ports are located in central city locations, so both rail and highway access must compete with normal city traffic when serving the port. This is particularly a concern for truck traffic, which for the Port of Buenos Aires carries 85 percent of the cargo going to and from the port (8 percent goes by rail and the rest by water).
- Dredging is a critical and expensive issue for the port. Because of the current in the Rio de la Plata, silt builds up continuously in the river channel that provides port access. A concession was given to a company in 1993 to dredge the channel, but government subsidies were required to keep the concession solvent. The government has had to reduce these subsidies, creating uncertainty about the feasibility of continued dredging under this arrangement. This is not an insignificant issue, since 70 percent of Argentina's maritime trade uses this channel.
- Data on traffic flows and goods movement is lacking. Little national planning occurs on prioritizing transportation investment, but several groups are working with the government to define important trade corridors.
- Several participants also stated that the transportation industry needs an increase in professionalism. This need exists at all industry levels, from the actual service provider (e.g., truck drivers) to the highest levels of government and business.

Uruguay

Montevideo, Uruguay has been one of most economically and politically stable countries in Latin America for the past decade, but the downturn in the Latin American economy has hit Uruguay hard. About 19 percent of the labor force is unemployed, with those under the age of 25 especially affected. One reason for this level of economic impact is that the Uruguayan economy depends on the economic fortunes of Argentina and Brazil, which together account for about half of Uruguay's total exports. Over the past two years, both Argentina and Brazil have faced significant economic problems. These economic problems, in connection with a declining exchange rate, have resulted in serious economic challenges to the country's coalition government. In addition, the beef industry, traditionally one of Uruguay's most important exports, was seriously affected by an epidemic in the beef herd that caused many nations, including the NAFTA nations, to restrict beef imports.

Uruguay, which has a highly educated population, has been able to establish a hemispheric presence in the software development and support market. Uruguay exports more software than Brazil and Argentina combined. This educated labor force has been attractive to several financial management firms (including Prudential and Merrill Lynch) that have located offices in Montevideo.

As a Mercosur member (the Mercosur headquarters is located in Montevideo), Uruguay plays an active role in proposing policies and infrastructure principles to enhance Mercosur trade. This is not surprising, since Uruguay is the main land corridor between Argentina and Brazil. The Uruguayan transportation system is much more developed than those of its neighbors, with over three-fourths of its road network paved. The road network represents the highest density of any Latin American country. On the other hand, the rail network, which is not heavily used, has received little investment attention.

Scan Results—Uruguayan officials see that their country's economic success depends to a large extent on what happens in neighboring countries Argentina and Brazil. Uruguay's position between two much larger economies and its location at the head of the Rio de la Plata, which serves the agricultural hinterland of Brazil and Paraguay, places the country in an advantageous position as a logistics center for much of southeastern South America. The Uruguayan government and private sector have fostered this position through a variety of policies and investment strategies. Uruguay has used national policies as a way of attracting industry and trade. Uruguay has had free trade zones since 1923. Federal legislation guarantees free trade zone

URUGUAY	
Population	37.5 million
2001 GDP	$269 billion
Exports/GDP	11%
Trade as share of GDP	18.1%
U.S. exports to:	$3.9 billion
U.S. imports from:	$3.0 billion
Canadian exports to:	C$132 million
Canadian imports from:	C$350 million

Top exports:
Beef, grain, leather, fruits and vegetables, fish

participants exemption from all corporate and national taxes, value-added taxes, customs duties and sales taxes, social security taxes for foreign workers, as well as no time restrictions for goods stored in warehouses.

Similar to other Latin American countries, Uruguay's economic development began around its main port, the Port of Montevideo. Over half of the country's population lives in the Montevideo metropolitan area, which still relies heavily on the port for the economic health of the region. The port is well positioned on the Rio de la Plata in that the river's currents deposit silt on the other side of the river along the Argentine coast and in particular at Buenos Aires. Dredging the harbor and its approach channels is not as big a problem for the Port of Montevideo as it is for the Port of Buenos Aires.

Because the port is an emerging logistics center in South America, private terminal operators are willing to provide much of the investment in port facilities. As in other Latin American countries, the national government in 1992 allowed for the privatization of some parts of port operations. Similar to Freeport, privatized port terminals have put significant capabilities in place in a short time to take advantage of the competitive market. The Group Katoen Natie terminal in Montevideo, for example, represents an investment by a global Belgian company that specializes in logistics services and port operations. This company's strategy was to invest in a container terminal in the Port of Montevideo that could act as a regional hub for container transshipment. The port's attraction to the company included its central location in the southeastern South American market, free trade zone status, competitive times to major destinations compared to Buenos Aires, low port costs, and river connection to the inland production areas of Brazil, Argentina, and Paraguay via the Rio Paraña.

In addition to the port, a major free trade zone called Zonamerica in the Montevideo suburbs is becoming an important distribution center for the Southern Cone countries. Zonamerica is designed to act as a "business platform meeting international standards that not only offers world-class infrastructure and services, but also the ideal environment to the competitive development of business and knowledge generation." (**http://zonamerica.com**). The basic concept of Zonamerica is to combine full-service resources (e.g., accounting technical support, customer service centers, and order processing) with the benefits of a free trade zone. Businesses located in the Zonamerica free trade zone are exempt from national and corporate sales taxes and customs duties. In addition, they enjoy a free exchange of foreign currency and are beneficiaries of subsidized telecommunications and energy costs. Value-added functions are being performed in Zonamerica distribution centers that customize products and goods for the Latin American market. Located 10 minutes from Montevideo's international airport and 30 minutes from Uruguay's main port, Zonamerica has become a Latin American model of an effective, full-service logistics platform for international business.

Although Uruguay has tendered concessions in the Port of Montevideo, the use of concessions for other transportation infrastructure is relatively new. The government is planning to issue a mega concession to construct and maintain 763 miles (1,272 kilometers) of roads that will be tolled. In addition, the government plans to place Montevideo's international airport under a concession arrangement. An initial bid must be at least $15 million with an annual minimum fee of $2.5 million, depending on the number of passengers using the airport. Little interest in significant investment in the rail system is apparent, although the lumber industry is interested in rail and barge improvements to get their product to the Port of Montevideo.

The visit to Montevideo afforded scanning team members an opportunity to better understand Mercosur policies on trade and transportation, and trade flows among Mercosur countries. A brief history of Mercosur is necessary to understand the status of trade and transportation in this market. The Latin American Free Trade Association was established in 1960 by the Treaty of Montevideo with the intent of creating a free trade area among the signatory countries. The extent of coverage of this free trade area and the types of commodities to be included were left to bilateral negotiations between individual countries. To harmonize land transportation rules and regulations, Argentina, Brazil, and Uruguay signed an Agreement on Land Transport in 1966 that emphasized consistent standards for granting permits, insurance requirements, and compatible customs procedures. This initial agreement has served as the basis of most land transportation agreements since. Uruguayan officials identified the major achievements as harmonization of driving licenses, medical standards

for drivers, language requirements, safety rules, rail safety, and road control devices.

The Latin American Free Trade Association did not foster the types of trade relationships the signatory countries desired, so it was replaced in 1980 with the Latin American Integration Association (ALADI). ALADI defined an economic preference zone intended to provide incentives for countries to liberalize bilateral trade. Brazil and Argentina signed commercial agreements in 1986 to implement such bilateral agreements, with the provision that other Latin American countries could join if they adopted similar policies. In 1991, Paraguay and Uruguay joined to form Mercosur. The member countries agreed to a common external tariff (CET) on 85 percent of the goods crossing the border, with exceptions granted for specific categories of goods and for country-specific products. The CET covers 96 percent of 9,414 tariff items, and full coverage is scheduled to occur in 2006. A customs union was established with specific organizational constructs for dealing with mutual issues. For example, working subgroups were established to recommend to the Mercosur Council changes in policies that member nations should adopt. One subgroup focuses on transportation and infrastructure issues.

Participants in the scanning meetings believe that the Mercosur's record of accomplishment been mixed. For example, Uruguay was the first Mercosur country to require safety standards for trucks according to Mercosur policy. Brazil did not adopt such standards because of the perceived difficulty in enforcing the requirement. Mercosur permits member countries to enforce commonly adopted policies. The basis for a fair and equitable customs union is the concept of reciprocity, in which all countries party to an agreement undertake similar actions and recognize the actions of others. Uruguay had to enter into a separate agreement with Brazil on this issue because government officials believed one-sided enforcement of vehicle safety standards would create a competitive disadvantage for Uruguayan truck companies spending additional dollars to maintain safe vehicle conditions. A similar issue with Argentina was resolved only when Uruguay applied a toll to all Argentine trucks on Uruguay's roads and in the process created a political crisis that was resolved at the highest levels of government.

Inland water transportation facilities, such the Katoen Natie Terminal in the Port of Montevideo, are underused.

Another disappointment is Mersocur's difficulty getting members to develop consistent border-crossing procedures to foster more efficient cross-border movements.

Observations made by Uruguayan participants during this visit included the following:

- Uruguay, and the Port of Montevideo in particular, wants to expand its market influence and is looking to Asia, Europe, and North America for market opportunities. Government officials and business representatives believe the southeastern United States is a particularly promising market.
- Officials suggested that increased security requirements could be viewed as a niche market for the Port of Montevideo and that high levels of security at the port would make it a desirable gateway into the NAFTA market. Private terminal operators assume they will bear the cost of security equipment necessary to compete in the global market.
- Border crossings are an important constraint to more efficient movement of trade by land. The customs, health, safety, and immigration authorities of all three countries—Argentina, Brazil, and Uruguay—have not developed common approaches to expediting movement across national borders. Argentina and Uruguay, for example, jointly built a site that would house an integrated approach to inspections and documentation. Uruguayan Customs is willing to staff the site 24 hours a day while Argentinean Customs cannot, so the site is not being used to its full potential. Another border-crossing issue is the lack of interoperability of rail services among Mercosur countries. For example, rail lines have been constructed with different track gauge, creating a need for transshipment at the border. Such a requirement seriously affects the competitiveness of rail transport for international trade.
- Montevideo, and in particular the combination of the port and free trade zones, is developing along the lines of a logistics service center. Not only does the physical movement of goods receive attention from government policy, but business is also encouraged to develop full logistics service capabilities to augment the transportation component of the supply chain.
- Ministry of transport officials are aware of the condition and performance of the transportation system. Uruguay was the only nation able to present the scanning team with a compendium of up-to-date data on all modes of transportation. The ministry also has conducted studies of different transport corridors and has identified both needed physical improvements and institutional and financial strategies necessary to make these improvements happen. It was apparent to the scanning team that Uruguayan officials are quite knowledgeable about the role transport plays in the health of Uruguay's economy and the importance of linking transportation investment to national economic goals.

Chile

Santiago and San Antonio, Chile's location on the southernmost tip of South America and its elongated shape create significant transportation challenges to Chilean business and trade. The country, about twice the area of California, extends 2,580 miles (4,300 kilometers) north to south and is on average only 108 miles (180 kilometers) wide. It has 15 million inhabitants, with the greatest concentration in the central metropolitan region of Santiago, which has about 5.2 million inhabitants. This region represents 40 percent of Chile's population and produces 47 percent of its GDP. Much of the industrial manufacturing and export services occur in this central region. Most traffic flows are along the north-south axis serving this central region, resulting in long trips.

Given these geographic challenges, Chile has developed aggressive trade policies to participate in the world market. Its market-oriented economy benefited greatly from economic reforms during the 1990s that provided greater private participation in the economy. With 2,700 miles (4,500 kilometers) of Pacific coastline, Chile is well positioned to trade with the Asian-Pacific basin. Because of its strong mining industry, Chile has developed a vibrant export business in raw materials, especially copper. With its economic and financial record, Chile is considered one of the most desirable investment opportunities in South America. One strategy to foster trade has been to establish free trade agreements with several leading trading nations. Recently, Chile and the United States completed negotiations for a free trade agreement, the only such agreement between the United States and a South American country. Canada has had such an agreement with Chile for many years.

Scan Results—Chile has one of the most stable economies in South America. Realizing that their geographic location creates significant challenges for international trade, Chilean officials have been aggressive in promoting trade relationships with countries outside of the Southern Cone. In 1996, for example, Chile entered into a free trade agreement with Canada and by 2002 a similar agreement was negotiated with the United States. In addition, Chile is an associate member of Mercosur. Chile is only an associate member because officials believe that some of the tariff policies adopted by the Mercosur countries are too high for global competitiveness and are a way to protect Mercosur industries rather than promote free trade.

CHILE	
Population	15.4 million
2001 GDP	$64 billion
Exports/GDP	31.8%
Trade as share of GDP	51.4%
U.S. exports to:	$3.1 billion
U.S. imports from:	$3.5 billion
Canadian exports to:	C$369 million
Canadian imports from:	C$641 million

Top exports:
Copper, fish, fruits, paper and pulp, chemicals

Key to the success of Chile's trade policy is having transportation and, in particular, a port infrastructure that can support trade flows. Chile has a long and dynamic history of national port policy (see box below). Before 1981, Chile's ports were state-owned enterprises with specific arrangements for labor and port operations. To increase efficiency and competition, private stevedore companies were allowed in 1981 to perform freight transfer services, removing what had been a government monopoly on such operations. Although increased competition resulted in improved port productivity, it did not achieve another government goal, which was to increase private investment in port infrastructure. With increasing trade and greater demands on port operations in the 1990s, the government reformed the system and created independent state-run companies in the 10 largest ports in 1997. The goals of this national policy were to decrease the cost of operations at the ports, increase private investment in infrastructure, transform Chile into a logistics service provider for the Southern Cone countries, and decentralize port management to regional port authorities. These new port authorities were authorized to grant concessions to private companies for operating terminals in their ports. Under a concession arrangement, private companies were responsible for operating and managing the terminals in exchange for an initial concession fee and annual

Changing Policy Toward the Maritime Industry: The Case of Chile

1836 **Sailing Law (Ley de Navegación)**—Specified, among other things, that 75 percent of a Chilean maritime company should be national, that is, "a ship is Chilean if it is built in the shipyards of the republic, or if in another nation, it becomes the property of a Chilean natural or legal citizen, for licit contract." Captains of Chilean vessels had to be naturalized or legal citizens of Chile.

1939 **Law 6415**—Reserved 100 percent of cabotage traffic, as well as 50 percent of the load of foreign trade, for Chilean ships.

1956 **Law 12041, Development of the Merchant Marine (Ley de Fomento de Marina Mercante)**—Established exceptions on imports fuel tax, etc., for Chilean merchant marine vessels.

1960 **Law 290**—Created the Port Company of Chile (EMPORCHI) as a government agency responsible for operating Chilean ports.

1974 **Law 466**—Modernized exemptions of Chilean merchant ships from certain taxes, but maintained the 50 percent reservation for international trade and 100 percent for cabotage traffic.

1978 **Law 2222, Sailing Law (Ley de Navegación)**—Conserved the principles of the 1836 law.

1979 **Law 3059, Law of Merchant Marine (Ley de Marina Mercante)**—Eliminated the requirement that 50 percent of foreign trade had to be handled by Chilean ships. Also eliminated government subsidies and tax exemptions.

1980 **Law 18042**—Modified the Law of the Port Company of Chile (Ley de la Empresa Portuaria de Chile), ending the exclusive operation of EMPORCHI at Chilean ports.

Law 18032—Ended the system of licensing for stevedoring, opening this activity to any worker.

1990 **Law 18966**—Turned over stowage services, cargo transfer, and berthing activities to private companies. EMPORCHI would administer only the port. The result was to leave property ownership and administration in the hands of a state company and make port services the responsibility of the private sector under a multioperator system.

1997 **Law 19542, Port Modernization Law (Ley de Modernización de los Puertos)**—Promoted private sector participation to accelerate modernization of Chilean ports. Ten state port companies with terminals for public use were created. These companies are responsible for administering the ports. The provision of port services is established by concession and bid, with specific berths and terminals operated by private firms.

Sources: Hoffman, January (2001), *Transporte Marítimo Regional y de Cabotaje en América Latina y el Caribe: El Caso de Chile*, (LC/L 1598-P), Serie Recursos Naturales e Infraestructura, vol. No 32, Santiago, Chile: ECLAC; Directemar, www.directemar.cl; and Nuñez, Sergio (1992) Efectos Prácticos Producidos por la Política de Eliminación de la Reserva de Carga y la Mayor Apertura del Sector Marítimo en el Caso Chileno in Políticas de Transporte Marítimo en el Grupo Andino y las Comunidades Europeas.

fee based on cargo moved. In 2000, the first ports to use concessions under this arrangement were Valparaiso, San Antonio, San Vicente-Talcahuano, and Iquique. Over $300 million was provided to the Chilean government in these initial bids.

The use of concessions is not unusual, but the Chilean model is somewhat different from those found in other countries in that the government places more restrictive ownership requirements on concessionaires. The intent of these restrictions is to avoid a monopoly operation at the port. For example, a company cannot own more than 15 percent of a concession if it holds more than 15 percent in another terminal or private port in the same region. Also, a maximum 40 percent ownership is allowed for a partner company (such as a shipper) that operates more than 25 percent of the cargo transfers at the concessioned terminal or more than 15 percent of transfers at other ports in the region. Because of the concern for achieving competitiveness in a dynamic global market, these concession agreements also include performance standards such as maximum berth time for ships and a maximum port tariff. The port authority is authorized to assess fines if the minimum performance level is not achieved. An important characteristic of this national privatization program has been the desire to keep some general access to port terminals by providing at least one terminal that is accessible to all shippers. As noted below, this provision has created some controversy.

In general, the perception among public and private officials is that this new approach to port management has been successful. Public port capacity has doubled and the costs of doing business at Chilean ports have declined. Problems have arisen, though. The ports have found that the multiple terminal operators awarded concessions have varying levels of competence in conducting business. Many ports have been slow to develop consistent and understandable logistics support procedures. Some officials consider the investment portfolio the government offers unattractive, especially given hard economic times. Many in the labor movement have not been happy with this new structure. For example, the number of workers in the state-owned port companies declined from 1,800 workers to 480 workers after a new national privatization law took effect. The private terminal operators were allowed to negotiate their own agreements with labor outside of a national labor union structure. Worker protests pressured the government to offer a $30 million severance package for those who lost their jobs following implementation of the new ports law.

Another problem has occurred between the concessionaires and the port authorities. According to the concessionaires, part of the negotiated agreement was that the port authorities would not compete with the concessioned terminals. In one case, a private terminal operator filed for arbitration stating that the port authority was investing in the public terminal of the port and allowing container traffic—which the private operator believed was reserved for the private terminal—to be handled at the public terminal. The operator claimed that his own dollars—the money he bid to get the concession—were being used to compete against his operations. The government has instituted a public-private council to mediate future disagreements over interpretations of concession contracts.

Even with these concerns, the experience with port concessions has been so favorable that additional concessions are being bid in the ports of Valparaiso and Antofagasta, the latter serving the mining regions of northern Chile. Five of the seven berths in Antofagasta will be sold to private investors. The concession agreement will require the winning company or consortium to invest $18 million to upgrade infrastructure and port technology.

The use of concessions has not been limited only to ports. Similar arrangements have been made for railroads, airports, and highways. For a nation that is long and narrow geographically, connectivity is a critical national concern. To provide this connectivity, the government has turned to the private sector. Of the 48,000 miles (80,000 kilometers) of roads in the country, 1,800 miles (3,000 kilometers) have been built and operated under concessions, with investors coming primarily from Spain, Italy, and Germany. The government is considering tendering concessions for maintaining existing roads. Maintaining the road system is critical for the nation's economy, since about 95 percent of Chile's freight moves by truck. The trucking industry, which is dominated by small owner-operator companies (only 0.7 percent of the companies own more than 10 trucks, and 91.3 percent have just one or two trucks), faced difficult economic times. With a devaluation of the currency, a downturn in the economy, and rising fuel costs, the industry does not fully

support the use of tolls, an additional cost out of its pockets, to maintain the road system.

Most railroads operate under 25-year concession arrangements, but Argentina has great difficulty attracting new rail service because of the geographic barrier created by the Andes Mountains. One 24-mile (40 kilometer) section of rail line has an average grade of 6 percent. This challenge is important not only to the railroads, but also to future economic growth. For example, the United Nations examined the possibility of developing mega-ports on Chile's Pacific coast to serve all of the Southern Cone nations. The study's conclusion was that inadequate rail and road crossings in the Andes significantly limit trade movements to and from the east. In addition, because the national rail system is electrified, doublestack rail cars could not be used, significantly reducing productivity of rail movement.

Some attention is being given to increasing the use of coastal shipping for north-south movements, which now handles just under 5 percent of internal freight movement by weight. Coastal shipping is recognized as more efficient than other modes (one unit of horsepower can move 330 pounds, or 150 kilograms, of freight by truck, 733 pounds, or 333 kilograms by railroad, and 8,800 pounds, or 4,000 kilograms, by coastal shipping).[3] Substantial institutional and financial disincentives, however, work against the use of more efficient coastal shipping for cabotage operations. For example, only national carriers can do intra-coastal shipping by law, and most carriers serving the cabotage market are not active in international shipping.

Many officials interviewed during the scanning study commented on Chile's desire to be a logistics service center for the Southern Cone countries. This role supports a national strategy for stronger trade relationships with NAFTA, the European Union, and Asia. Large freight distribution centers have been built in the outskirts of Santiago, and major improvements have been made to rail and highway infrastructure. Several officials noted, however, that border crossings are still a barrier. Standardization of forms and procedures is needed to expedite cross-border transportation, and although the Southern Cone countries have entered into an International Surface Transportation Agreement to promote more efficient flows among the countries, much remains to be done. For example, Mercosur has identified 13 transportation corridors that should receive priority on infrastructure investment and operations coordination (e.g., how to coordinate rail and highway operations in the Andes during the winter). Five border corridors were identified between Argentina and Chile with a required investment of $315 million. About $160 million was spent between 1996 and 2000, but economic problems mean continued investment most likely will be postponed. In addition, Chilean officials recommended that information technology be better used at the border to expedite movements, but no unified data management systems are in place.

Government and business representatives look to the NAFTA, European, and Asian markets as key trading partners. Chile is eager to have a free trade agreement with the United States (such an agreement was finalized a month after the scanning study), as well as to become a NAFTA member. One official noted that the commercial destiny of Chile is linked to NAFTA and Japan. One of the uncertainties associated with this linkage, however, is the role security will play in defining how goods will move between trading blocks. Chile views itself as a security gateway to the United States and plans to invest in equipment and implement procedures necessary to satisfy U.S. requirements. Because of its distance from the NAFTA market, Chile realizes that it must invest in such infrastructure if it wants to compete. The strategy appears to be one of marketing Chile's ports as the best way to gain entrée into the U.S. market. In other words, Chile views security as a market niche.

When asked to identify the major trade challenges facing Chile, in particular NAFTA, officials raised the following issues:

- Border crossings and paperwork (or the lack of information systems) are continuing problems. Officials commented that much progress has been made with surrounding countries and Mercosur in fostering trade relationships, but there are still problems with paperwork.
- Although Chile is better than most South American countries in viewing its transportation system in

[3] J. Hoffman, *Transporte maritime regional y de cabotaje en America Latina y el Caribe: el caso de Chile,* CEPAL/ECLAC, Santiago, Chile, September 2001.

national terms, no common vision exists for how this system serves the logistics process or how the pieces fit together. No national investment policy for transportation is apparent.

- Of particular concern is how customs procedures and requirements fit into the logistics process and how they link to Chile's international trade strategy.
- Chile has made great strides in fostering an increasing role for private companies in transportation infrastructure and services. Little interaction among the public and private sectors is apparent, however, when policies are being formulated.
- Port capacity is likely to be an important issue in the near future, especially if a Free Trade Agreement for the Americas is created. Similarly, providing adequate access to the ports so that transportation costs are kept under control will be an important challenge.
- The concession approach to port terminal operations has resulted in increased private port investment. Obviously, investors want to recoup investment costs and are marketing their terminals aggressively. Some officials believe this means Chilean ports are competing with one another, instead of looking at a larger strategy of how Chile fits into the global market. A presidential decree is apparently under development to address this issue. It is expected to state that ports provide social benefits to the entire country, not just single ports or regions.
- Chile collects little data on transportation movements, so few strategic analyses can be undertaken on likely future needs. Chilean officials expect a free trade agreement with the United States and an FTAA for the hemisphere to be accompanied by technology exchange and support for conducting such studies.

Port of San Antonio—The Port of San Antonio is one of newest and most modern ports in Chile. The port is located about 60 miles (100 kilometers) from Santiago and 30 miles (50 kilometers) from Valparaiso, Chile's traditional port of call. Because of its convenient location near the manufacturing center of Chile (its market area includes 60 percent of Chile's GDP-producing regions) and landside constraints to capacity expansion at the Port of Valparaiso, the Port of San Antonio has become

Congestion on strategic port access roads is a problem throughout Latin America.

Chile's leading container port in a short time. The primary markets for port exports (by weight) include North America (30 percent), Central America (24 percent), South America (23 percent), and Asia (14 percent).

The Port of San Antonio is a good example of the "concession model" of port operations.[4] The port authority, called the Empresa Portuaria de San Antonio, administers common areas of the port and coordinates cargo handling at the public terminal, which is accessible to all operators. Empresa provides the infrastructure and port equipment at this terminal, but private operators provide cargo-handling services. A six-member board directs the Empresa Portuaria. The president of Chile appoints five members, and the sixth member is a non-voting representative of labor. Private terminals are operated under a concession with Empresa. The main container terminal (San Antonio International Terminal or STI) is a joint venture between Stevedoring Services of America and the Sudamerica Agencias Aéreas y Maritimas S.A. For the use of this terminal, the joint venture paid $121.3 million and agreed to a surcharge of $7.50 per ton for the duration of the contract, which is 20 years with an option to renew for another 10.

The concession arrangement has not been without controversy. Both STI and the Empresa Portuaria entered arbitration proceedings because of disagreements over terms of the concession agreement. According to STI, the agreement did not allow the

[4] This section benefited greatly from L. Boske, *Maritime Transportation in Latin America and the Caribbean*, Report Number 138, Lyndon B. Johnson School of Public Afairs, University of Texas, Austin, Texas, 2001.

public port authority to invest in other terminals that would compete directly with STI. Such investment was made in the public terminal, however, and incentives were provided to attract container ships to this public terminal in direct competition with the STI terminal. The arbitrator's decision restored the competitive conditions to close to those that existed when the terminal concession first began.

The 1997 reform law resulted in a significant change in the role of unions that was important for the economic competitiveness of the port. After 1997, unions no longer could assign labor to terminal operations under concession arrangements. These terminal operators have now entered into their own arrangements with their employees. By the end of 2000, 1,000 workers had signed contracts as full-time employees of the private terminal operators.

It is no coincidence that the Port of San Antonio became the leading Chilean container port after privatization of some port operations. From 1990 to 2001, the number of TEUs handled by the port increased from 50,000 to 420,000 a year. This growth resulted in part from a substantial investment by STI of more than $60 million in infrastructure for its operations. Productivity has improved dramatically with this investment and with new labor arrangements—35 box moves per hour today compared to 10 to 18 per hour six years ago. From 1999 to 2001, the number of tons moved per hour has increased by 22 percent and the amount of time a ship is at the dock has decreased by 12 percent.

The port has ambitious expansion plans that will allow it to handle bigger container ships and to serve as a distribution center for all of the Southern Cone countries. The port has a capacity of 14 million metric tons and, assuming an 8 percent annual growth rate, will exceed that capacity in 2010. Part of this expansion will include improvements such as dredging to a 14-meter depth that will permit larger ships, including 4,500-TEU ships. Ships larger than this are not expected to visit the port because San Antonio serves as a feeder service to Panama, where transshipment to larger vessels occurs. Larger vessels are simply not needed in the Port of San Antonio.

Issues raised by port officials during the scanning study included the following:

- Land access is an important constraint to port growth. About 10 percent of the cargo handled by the port arrives or leaves by rail, while the rest is handled predominantly by trucks. Truck weight limits constrain how much cargo each truck can handle, so a large number of trucks access the port through the town. Accordingly, the port is planning a bypass road to provide access to the port and lessen truck traffic through the community.
- Although the institutional model for Chile's ports has been to decentralize port management to the 10 major ports, the central government still must approve budget expenditures. This approval process is viewed as perhaps occurring too far away from where the needs are for appropriate decisions to be made.
- Border crossings are an important issue for the future growth of the port and its ambitions to serve a market area extending beyond Argentina into Mercosur. It often takes half a day to cross the border to Argentina. This is too long for a logistics process that is time-sensitive and requires reliable transportation services.

• No major changes to security have occurred since the September 11, 2001, terrorist attacks in the United States. Port officials expressed concern about new mandates for security procedures, but as in Uruguay, suggested that high-quality security at their port could make them a desired gateway into the NAFTA market. Existing security procedures have been enhanced over the past three years by the use of technology (primarily new surveillance systems), resulting in a 95 percent decline in lost cargo.

Panama

Panama City and Colón, Panama
Ever since Balboa became the first European to see the Pacific Ocean in 1519, Panama has been an important crossroads of world trade. In colonial days, the Isthmus of Panama served as the major land bridge between the Spanish conquests on the western coast of South America and the sea lanes to Spain. With the completion of the Panama Canal in 1914, Panama became, along with the Suez Canal, one of the most strategic water passages in the world for both commerce and defense. By using the Panama Canal, a ship traveling from the east coast of the United States to Japan saves 3,000 miles (4,800 kilometers) over the shortest all-water route. A ship from the west coast of South America traveling to Europe saves 5,000 miles (8,000 kilometers). On December 31, 1999, the United States ceded control over the Panama Canal Zone to Panama. Panama became the gatekeeper of the east-west trade flows of more than 80 countries that use trade routes through the canal. In addition, Panama has received significant U.S. private investment totaling an estimated $35 billion, compared to $3.3 billion for the rest of Central America.

Scan Results—As one of the most important crossroads of global trade, Panama has taken steps over the past five years to become an even bigger player in international commerce. The national government has adopted policies to encourage business development and provide Panama with competitive advantages over other Latin American countries. When the United States turned the canal over to the Panamanians in 1999, the canal's role in Panama's national economic strategy changed. While the United States viewed the canal primarily from a strategic defense perspective, Panama considered it an important economic resource that could be used to attract development. Major new container ports have been built on both coasts, free trade zones have been created, and the combination of being a nexus of intercontinental fiber optic cables and a center of commerce has created an economy focused on service provision. Indeed, the Panamanian economy is 80 percent service oriented, the highest percentage of any developing country in the world.

Not surprisingly, port development became a critical component of the government's policy to increase trade-related sectors of the economy. In 1994, the national government instituted a policy of port privatization that used concessions to private companies as the major means of encouraging private investment.

PANAMA	
Population	2.9 million
2001 GDP	$10.2 billion
Exports/GDP	32.7%
Trade as share of GDP	42.9%
U.S. exports to:	$1.3 billion
U.S. imports from:	$290 billion
Canadian exports to:	C$38 million
Canadian imports from:	C$10 million

Top exports:
Bananas, shrimp, sugar, coffee, clothing

This privatization program has been successful and Panama's port facilities are considered some of the finest in the world. As in other countries, though, labor unions were not part of the new system, so compensation had to be given to those who lost their jobs.

Panama's road system has not received as much attention as maritime transportation. Not only national government officials see the need for improved road connections, but also business representatives and Panama Canal Authority officials. In particular, many of those the scanning team interviewed discussed the importance of the Pan American Highway. This road is the major north-south highway in the country and provides important connectivity in Central America. The government is investing $90 million to provide four lanes to Costa Rica, of which 87 miles (130 kilometers) still have two lanes. Government officials believe that when these scheduled improvements are finished, road connections to Costa Rica and Central America will be good. In southern Panama, the government is rehabilitating about 80 miles (120 kilometers) of highway to Colombia, but a 67-mile (100-kilometer) section through the Darien Gap has no road at all. The Darien Gap is one of the most difficult, and yet most environmentally important, terrains in the world. With dense jungles and swamps, it has been difficult to build any kind of infrastructure connecting Panama with Colombia. The Darien Gap is also considered a biological defense against organisms that thrive in South American environments and that would intrude on North American ecological systems if they could bypass the barrier the gap creates. One school of thought suggests the Darien Gap should not be penetrated with improved access to the south.

Echoing sentiments from other Latin American countries, government and business representatives complained about the long delays at the border with Costa Rica because of customs inspections. One official noted that Mexico can transport goods to Guatemala in 22 hours because of its fairly good road system and efficient customs procedures. It then takes an average of nine days to get to Panama because of road conditions and customs inspections.

As in other Latin American countries, gas tax revenues go to the general fund. No dedicated tax for transportation investment exists. The government has used concessions to build new roads in the country, most noticeably from Panama City to Colón. About 20 miles (30 kilometers) have been built so far, and although the government wants to continue expanding westward, low demand for the road and low toll revenues have been a deterrent to investors. It is estimated that a new toll road would have to be subsidized by as much as 60 percent of its capital and operating cost just to break even. In addition, the Panamanian government has explored the possibility of widening existing roads rather than building new toll roads.

Panama has also become a regional center for air cargo. The international airport at Panama City serves several air cargo providers, and a new airport is being planned as part of the Colón Free Trade Zone, the only airport in the world located in such a commercial zone. This could be an appealing inducement for industry and service providers that rely on airfreight for fast and reliable delivery of goods.

Because Panama has been so successful in providing a competitive economy for world trade, some officials are wary of what a Free Trade Area for the Americas (FTAA) would do to the country. If conditions and arrangements similar to those in NAFTA or Mercosur are part of an FTAA, Panama may have to change many laws and policies that provide great benefit to the country. For example, one business representative questioned the point-of-origin policy that requires goods from within a trade block to originate within the boundaries of that trade group. What happens if goods go through a free trade zone in Panama? Would the point-of-origin designation be lost? This would need to be spelled out clearly in any trade negotiations. Such an agreement would likely include many issues besides trade, such as child labor, environmental concerns, institutional requirements, and transparency of government actions. As one official noted, Panama was the last country to join the World Trade Organization (WTO) and it could be the last to join an FTAA, given the many requirements that might not be in Panama's best interests.

The Panama Canal—The Panama Canal is the most important economic asset for Panama, and it clearly has global importance as well. The canal handles about 4 percent of world trade, and 13 to 14 percent of total U.S. seaborne trade. Of the 15,000 vessels transiting the canal each year, about 9,000 are either going to or coming from U.S. seaports. Japan and China are the second- and third-largest users of the canal. The Panama Canal Authority, the agency that runs the canal, expects significant increases in ship passages through the canal over the next 20 years.

The Panama Canal raises and lowers vessels through a

series of locks and inland water resources. The key to the operation is the man-made Gatun Lake, which is 26 meters above sea level. Water at this higher elevation is used to fill locks that descend to sea level on either side of the lake. Every time a vessel passes through the canal, 55 million gallons of fresh water are lost from the inland lake. Only certain-sized vessels, those with no more than a 100-foot beam and a 39.5-foot draft, can fit into the canal locks. These are called Panamax vessels. In 2002, vessels that reached these maximum dimensions represented about 38 percent of the vessel transits through the canal.

Given the canal's depth and size limitations, many of the largest container ships must off-load containers at either the ports of Balboa on the Pacific Ocean or Colón on the Atlantic Ocean onto rail cars for shipment across the Isthmus of Panama. In many cases, ships go through the canal at 70 to 80 percent capacity because of the need to off-load containers. This transfer of containers to rail is expensive for the shipper. The cost of moving a TEU by ship through the canal is about $90, while handling the TEU by rail, which includes transfer activities at both ports, raises the cost to about $270. The Panama Canal Railway Company, which has a long history of serving cross-isthmus travel, has been given a 50-year concession to provide such service. Channel and terminal constraints at the Port of Balboa have limited this transfer operation, but investments are being made to improve this capability. The rail travel time between ocean terminals is 50 minutes.

One of the most important changes over the past five years has been the degree to which Panama has become a major transshipment location for containers. From less than 300,000 TEUs a year in the late 1990s, the number of transshipments has reached over 2 million TEUs, with forecasts suggesting even larger amounts. This transshipment movement occurred largely after substantial investments were made in terminal capacity on both coasts. In Balboa, for example, $200 million is being invested by the Hutchinson-Wampoa Group to improve terminal capacity and operations to handle 450,000 TEUs. The Manzanillo International Terminal, which handles over 1 million TEUs, has improved its capacity to 1.5 million TEUs with a $300 million investment program, and the Colón Terminal can handle 400,000 TEUs.

The Manzanillo Terminal is the second-most capitalized container port in the world after Hong Kong. Only two-thirds of the vessels using this terminal go to or come from the Panama Canal. It also has become a major transshipment location for containers coming from Asia and destined for the west coasts of North or South America. Market studies for Stevedoring Services of America, the company that runs the terminal, shows a likely doubling of container flow by 2020, with most of this trade in the east-west Asia-to-Europe market. The philosophy of the terminal operators is that in a highly competitive market users will choose the most efficient ports, and they expect to be one of those ports (now averaging 40 TEUs per crane per hour).

Passage of a significant share of the world's commerce through the Panama Canal has raised important security concerns. One U.S. official noted that, after Canada and Mexico (because of the borders they share with the United States), Panama is the most important

"THE FUTURE SUCCESS OF A FREE TRADE AGREEMENT FOR THE AMERICAS IS TIED CLOSELY TO THE EXISTENCE OF AN INTEGRATED HEMISPHERIC TRANSPORTATION SYSTEM. FROM A LOGISTICS PERSPECTIVE, THE TRANSPORTATION SYSTEM OF ONE COUNTRY MUST BE CLOSELY LINKED TO THE TRANSPORTATION SYSTEM OF ITS TRADING PARTNERS."

—Panamanian businessman

security challenge for the country. Twenty-one U.S. government law enforcement agencies are represented in Panama. They focus mainly on the flow of drugs from South America, but more recently they have initiated intensive efforts to monitor cargo flow for potential terrorist attacks. It is revealing that after the September 11, 2001, terrorist attacks in the United States, the U.S. Coast Guard called all of its vessels except those deployed in Panama back to U.S. waters to protect against potential waterborne attacks at ports. The Panama Canal was considered so critical to U.S security that the Coast Guard kept its vessels on

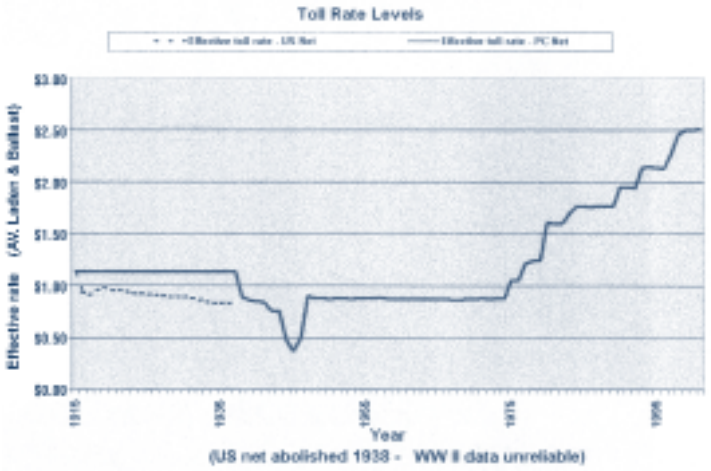
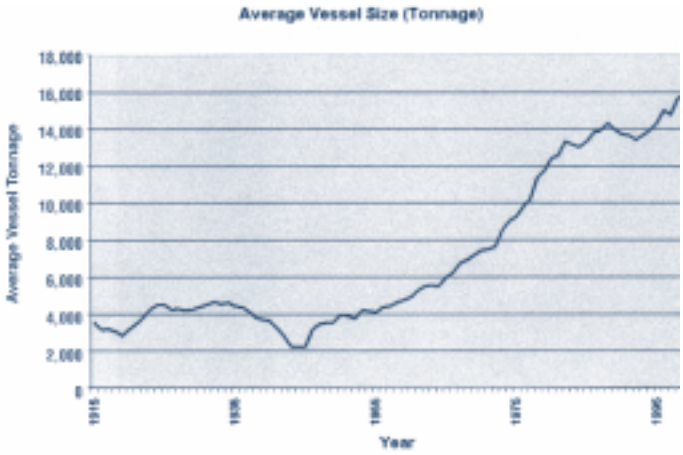


Figure 4a. Toll rates for the Panama Canal, 1914 to present.



Source: V. Lynch, *The Price Is Right! Pricing Policy at the Panama Canal*, International Association of Marine Economists, Conference Proceedings, Panama City, Nov. 11-13, 2002.

Figure 4b. Average vessel size (tons).

station. In addition to security concerns surrounding the canal, U.S. security forces must focus attention on Panama's maritime activity. Panama has the largest merchant marine in the world, with about 6,500 vessels flying the Panamanian flag. Monitoring the movements of such ships, and perhaps more important, the seamen who serve on them, is a monumental task.

The Canal Authority is planning new ways to accommodate modern demand. Enhancements to the canal are being contemplated that would allow the passage of larger ships. The authority concluded this plan was needed after experiencing several problems. In 1995, for example, nearly 120 ships waited as much as five days to transit the canal because of routine maintenance on one of the locks. In addition, recent episodes of el Niño reduced the amount of water available to operate the canal. As a result, the authority temporarily had to reduce allowable vessel draft by three feet, which affected the maximum loads that could be carried through the canal. Some of the need for expansion also relates to the larger vessels now used for international trade that cannot use the canal. For example, about 60 percent of the container ships ordered since 1999 are post-Panamax and cannot fit through the locks. The canal can now handle ships with 14 containers across, and the Canal Authority is looking at enhancing the canal to handle ships that carry 19. In fact, many of the world's ports have post-Panamax cranes that can be used to load and unload such vessels. One strategy the authority has adopted to manage demand better is to allow vessels passing through the canal to reserve a slot (with an additional fee) to guarantee a position at the front of the queue.

The canal's capital investment program over the past several years has exceeded $1 billion and includes widening of the Culebra Cut, new tugboats and locomotives, information systems, and a telecommunications network. The key investment question, however, is whether the critical choke points of the canal—the locks—should be expanded to allow larger vessels. The Canal Authority has engaged two groups to devise a strategy for new locks, one of which is the U.S. Army Corps of Engineers.

Funding for canal improvements relies on tolls paid by transiting ships. User fees that cover operating costs have been the basis for the toll structure ever since the United States first started charging for passage. The most expensive toll to pass through the canal is $208,000, while the average toll is $55,000. The canal is now being run under a profit-center philosophy that calls for financing for canal improvements to be independent from the national government and covered by tolls. The Canal Authority is considering levels of investment that range from $5 billion to $12 billion, all of which will have to come from canal user revenues.

Figure 4a shows the change in tolls for the Panama Canal since it first opened in 1914. In 2002, the Canal Authority instituted a tiered approach to tolls. Tolls are

applied in 10,000-ton increments by vessel type based on laden and ballast tons, plus a unit charge per displacement ton. This new toll structure is based on the concept that different types of vessels incur different costs. In addition, the authority is conscious of the competitive economics of the U.S. rail-intermodal land bridge (i.e., the rail connection from the U.S. West Coast to the Midwest and eastern seaports) and changing vessel size that might make transits around the tip of South America more economical.

The process of developing a new toll structure for the canal has faced not only economic challenges, but political ones as well. One Canal Authority official noted that when an initial proposal to raise tolls was suggested, ambassadors from many of the world's leading nations showed up at a public meeting to register their country's disapproval. Figure 4b indicates that the average size of vessel transiting the canal has steadily increased.

The Panama Canal Authority is monitoring closely the changing economic structure of world trade and the role of the canal. For example, officials consider the U.S. land bridge the major competition to the canal. In addition, both government and business officials believe that opening Cuba to a free market could have potentially significant impacts on container movement in the Caribbean. Officials believe that expanding NAFTA southward or developing a Free Trade Area for the Americas would increase substantially the amount of freight passing through the canal, and in many cases, processed in Panamanian ports.

Expanding the canal to allow passage of post-Panamax ships would have a significant impact on the global market. For example, several officials mentioned that larger ships passing through the Panama Canal would allow Brazil to compete more effectively in the Asian market with its growing agricultural industry (at the likely expense of the United States.)

Free Trade Zones—Panama is one of the world's leaders in the use of free trade zones to foster international trade. The concept of a free trade zone in Panama was first introduced to President Roosevelt in 1936, and enabling legislation was finally passed in 1948. A free trade zone under this legislation allows commercial activities to occur in a clearly defined location without companies having to pay taxes or fees to the host government. The best example of such an operation is the 900-acre Colón Free Trade Zone (CTFZ) located near the Colón harbor on the Atlantic coast. In 2002, more than 2,000 companies were registered to participate in the CFTZ. The highest cumulative sales occurred in 1998 at more than $10 billion. The products going through the CFTZ are aimed primarily at the Asia-to-Latin America market. Goods are shipped from Asia to Colón, taking between 14 and 21 days. These goods are modified to meet market-specific requirements through value-added activities within the zone and then are shipped by road, air, or sea to final destinations in Central or South America.

The CFTZ has evolved into a complete logistics service provider. As one meeting participant noted, the

Figure 5. Changing logistics flows in a global market.

logistics challenges now facing companies and countries include globalization of the production process, use of sophisticated technology (often Web-enabled), complete supply chain management from resource to consumer, a desire for shorter lead times in delivery, diversification and outsourcing of services, and continual emphasis on reducing costs. Figure 5 shows the concept of the changing logistics challenges facing both producers and shippers. Instead of shipping to individual countries, today's shippers are shipping to distribution centers where value-added activities can occur. With the product now well positioned to serve a regional market, the final leg of the logistics process is transporting the product over a safe, fast, and reliable system to its final destination. The CFTZ provides all of the services to act as a full-service logistics platform in such a scheme.

The management company running the CFTZ leases buildings to firms for use in conducting business. The original investment in buildings is recouped over time, with 70 percent of the lease payment going to CFTZ management and 30 percent to the government. More than $1 billion has been invested in infrastructure and buildings for the free trade zone. CFTZ officials estimate that about 15,000 jobs have been created by business operations in the zone. The CFTZ management company has signed memoranda of understanding with other companies to develop industrial parks and an airport within an expanded free trade zone boundary. This complex, referred to as the Multimodal Center of the Americas, will provide a central location for value-added activities and transportation access to the entire Western Hemisphere. With access to four ports, a rail service, highways, an airport, and customs control (located in the zone itself), the CFTZ is positioning itself as a premier logistics center in Latin America. Not only will it be able to handle goods with low sensitivity to travel time as it does now, but with an airport located in the free trade zone, it also has the potential of becoming an attractive location for high-value, time-sensitive goods as well.

Panama was one of the most important visits on this scan. The country's entrepreneurial energy in taking advantage of its location and changing logistics processes is impressive. The canal clearly represents a substantial economic asset, and the Canal Authority views it not only as a transportation facility, but also as an economic engine for the country. Expansion of the canal could have important market impacts on the United States and on global trade flows. It will be important to keep track of investment plans in Panama to assess the future impacts on both the U.S. and NAFTA economies.

Between 13 and 14 percent of U.S. seaborne trade passes through the Panama Canal.

Mexico

Mexico City and Querétaro, Mexico

Mexico is one of the most trade-oriented countries in the world. In 2000, almost 60 percent of its economy was related to trade. About 83 percent of Mexico's foreign trade is with the United States and Canada, and 69 percent of this trade (by value) is transported by truck. The economies of the United States and Mexico have become closely tied. The maquiladora plants in the border Mexican states play an important role in the manufacturing process of many U.S. industries. The maquiladora industries were created primarily because of the low-cost labor available in Mexico. Mexico's position as the fifth-leading importer in the world and the eighth-leading exporter is directly related to the maquiladora industry. With the second-largest population in Latin America, Mexico is also a large consumer market for U.S. goods. This is likely to be even more important in the future, given Mexico's young population.

Scan Results—Mexico consciously has adopted a national policy of promoting international trade as a means of raising its living standard. Proximity to the largest consumer market in the world—the United States—has provided a unique opportunity for Mexican industries and transportation providers to participate in the global market. As noted earlier, Mexico leads the world in the number of free trade agreements it has signed with other countries. The most important of these agreements is NAFTA. Even though NAFTA has been beneficial to all three member countries, Mexican officials believe that some hurdles remain, especially in transportation.

Mexico went through a successful national port restructuring process in 1993 when the national government decentralized decisionmaking to the ports themselves. A new port administration was created for each public port with the authority to provide concessions to private companies for building and operating new infrastructure on port property. Mexico now has 19 such administrations. This new institutional structure opened opportunities for investment in port facilities. For example, private business invested more than $1.5 billion in new equipment and infrastructure from 1995 to 2000, while the port administrations invested another $330 million. The number of non-petroleum terminals doubled, container terminals increased from seven to 12, grain terminals expanded from three to eight, bulk minerals terminals grew from seven to 12, and liquid bulk terminals grew from five to 11.[5]

MEXICO	
Population	103.5 million
2001 GDP	$618 billion
Exports/GDP	27.6%
Trade as share of GDP	60.8%
U.S. exports to:	$101.5 billion
U.S. imports from:	$131 billion
Canadian exports to:	C$2,721 million
Canadian imports from:	C$12,120 million

Top exports: Manufactured goods, oil and oil products, silver, fruit and vegetables, coffee, and cotton

[5] C. Peyrelongue and A. Martinez, *The Restructuring of Mexican Ports and Modal Integration of Transport in Mexico,* International Association of Marine Economists, Conference Proceedings, Panama City, Nov. 11-13, 2002.

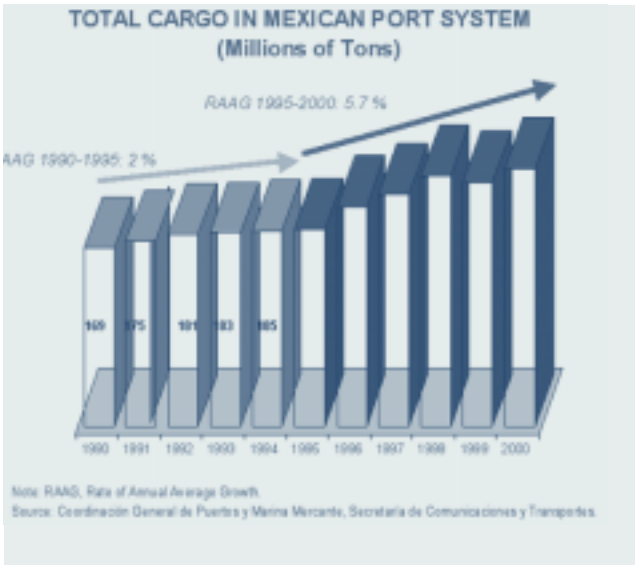


Figure 6a. Rate of growth in cargo handled through Mexican ports, 1990-2000.

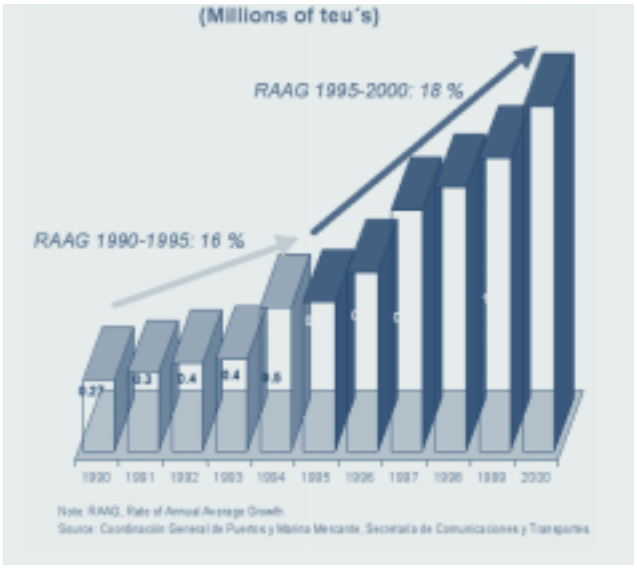


Figure 6b. Rate of average annual growth in container cargo handled by Mexican ports, 1990-2000.

Figure 6 shows the results of both Mexico's strong economic growth and the existence of this new trade-serving infrastructure. After the new ports law was passed in 1994 and private investment in port infrastructure increased, the rate of average annual growth in cargo handled (in tons) rose to 5.7 percent from 2.0 percent. If one removes petroleum, plaster, and salt (i.e., the largest volume of bulk commodities moved through Mexican ports), the annual average growth rate reached 10 percent, up from 5 percent before the privatization law. The corresponding differential for container traffic (in TEUs) was 18 percent, compared to a 16 percent average annual growth before 1994. Although the impact of privatization is hard to pinpoint, it appears likely that the new port investments and marketing activities of private terminal operators after the national law was passed had a lot to do with this impressive result. In addition, the substantial new port investment resulted in a 52 percent increase in jobs between 1994 and 2000, from 12,092 to 18,416 employees.

One reason Mexican ports became more attractive to shippers was the impressive increase in productivity that accompanied the privatization process. In the ports of Vera Cruz and Manzanillo, the turnaround time for container ships has been reduced from 51 hours to 19. The container cargo handling rates have quadrupled in Vera Cruz to a rate of 86 containers per ship-hour. Figure 7 shows the impact of port restructuring in Vera Cruz from 1990 to 1999. For both containers and bulk commodities, productivity rates have increased, and except for bulk commodities, have shown a steady improvement over this period.

Of interest in the recent record of port operations has been the shifting in market share among Mexican ports. In particular, Vera Cruz in the Gulf of Mexico and Manzanillo on the Pacific Coast have captured the greatest market share in container traffic for their markets, 64 percent and 90 percent respectively. Both ports have made significant improvements in infrastructure and information systems. In both cases, however, road and rail access has been a limiting factor in providing even better service to Mexico and the NAFTA market. In Manzanillo's case, doublestack rail service is available to Mexico City, the only such service in the country. Both ports have ambitious plans for expansion to handle both larger vessels and larger numbers of containers.

Several other ports are in various stages of defining their market niche in both Mexico and NAFTA trade. The port of Altamira in northeastern Mexico has attempted to develop coastal service with the United States and has built new petrochemical facilities. The port of Progreso in the Yucatan has positioned itself to be a gateway to the southeastern United States and could possibly serve the growing maquiladora industry

that has moved to this part of Mexico and Honduras. The port of Coatzacoalcos on the Gulf Coast has started ferry service to Tampa.

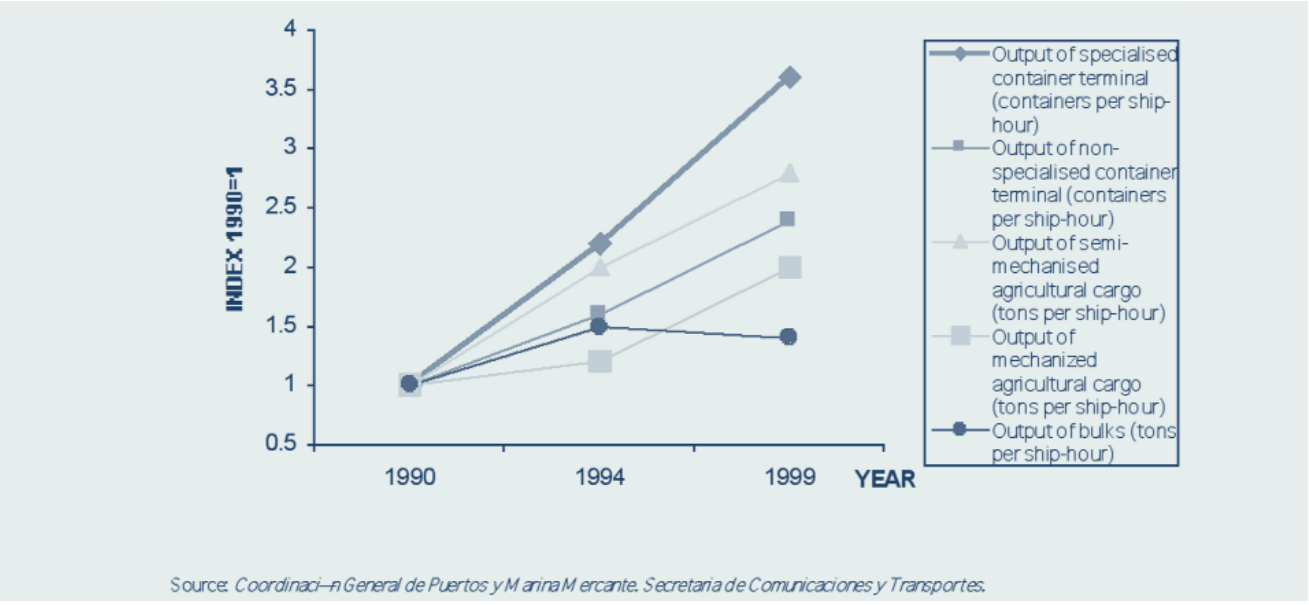
The port of Ensenada, located just south of the U.S. border on the Pacific Coast, experienced an unexpected increase in containers when the labor strike hit the U.S. West Coast ports in fall 2002. An additional 11,000 TEUs showed up over a two-week period. About 9,000 of these containers, originally destined for West Coast ports, were transported to the United States by truck. The port is trying to attract investors to develop new rail service from the port to the U.S. border and make it a viable alternative to the Long Beach-Los Angeles port complex in California.

In most cases, Mexican port officials indicated they believe great potential exists for better water transportation access to the United States, especially across the Gulf of Mexico. Most ports pointed to inadequate land access to their site as a strong limitation to such increased traffic. Port officials also noted that many shippers have a mindset geared toward trucks rather than maritime as the mode of choice to the U.S. market.

Numerous Mexican participants in the scanning team's meetings commented that Mexico's future success as a trading nation will depend on the ability of the Mexican transport industry to integrate itself into the continent's logistics system. This is especially important when considering global competitors who have developed efficient, low-cost production and transportation processes. For example, one participant noted that it is more expensive to produce and move a bicycle from Guadalajara into the United States than it is to produce and transport a bicycle from China. Many participants indicated Mexico's transportation system should be able to provide higher levels of productivity than now exist. Mexican government officials and transport operators have been looking at developing integrated intermodal corridors as a means of offering more efficient and reliable transportation service. Two examples of a corridor approach to transportation planning include the Plan Puebla-Panamá and the Trans-Pacific Multimodal Security System.

"IT IS IMPORTANT TO HAVE A GOOD TRANSPORTATION SYSTEM TO SERVE NAFTA TRADE FLOW; HOWEVER, IT IS EVEN MORE IMPORTANT TO HAVE A SEAMLESS LOGISTICS SYSTEM."

—Mexican business representative



Source: *Coordinaci–n General de Puertos y Marina Mercante. Secretaria de Comunicaciones y Transportes.*

Figure 7. Impact of port restructuring on the Port of Vera Cruz.

The Plan Puebla-Panamá is an initiative of Mexico's President Vicente Fox, who was looking for a coordinated public and private investment strategy to increase the living standard in Central America, including the southern portion of Mexico. The population of this area is estimated at about 60 million people. The transportation component of this initiative was to better connect the region's major urban and rural areas through improved highways. As shown in Figure 8, Atlantic and Pacific corridors were selected for priority investment. The goals of Plan Puebla-Panamá are to provide enhanced regional accessibility throughout Central America and improved connections to North America.

The second example of a corridor approach to planning and one that emphasizes the intermodal nature of efficient transportation is Mexico's Trans-Pacific Multimodal Security System (TPMSS). Mexico introduced this system when it hosted the Asian Pacific Economic Cooperation meeting in 2002. It is customary for the host country to develop a prototype process, concept, or technology to spotlight during the meeting. Mexico decided to focus on the efficient and safe movement of containers from Asia to the U.S. market through movement of freight. The TPMSS was designed to use advanced surveillance systems and information technologies to monitor and inspect cargo as it proceeded along its path to the final destination. From the perspective of transportation, dry runs of container movements were undertaken. Containers were transported to Mexico City via rail from the port in Manzanillo in a record 31 hours (including clearing customs). In another demonstration, a container ship was unloaded at the port of Lázaro Cárdenas on Mexico's Pacific southwestern coast with containers transported by rail to Laredo, Texas, in a total of 96.5 hours. The third demonstration moved 62 containers off a ship in Manzanillo, cleared them through customs (six containers were selected for inspection), and transported them via doublestack rail cars to Nuevo Laredo in a record 71 hours. In each case, Mexican officials believe coordination of both customs and transportation actions provided support for a world-class logistics system in Mexico. Strategies to make this happen included conducting all government inspections at the same time and location, extending operating hours for customs, and handling containers seamlessly during rail transport.

Figure 8. Transportation corridors identified as part of the Plan Puebla-Panamá.

One of the most important components of the NAFTA logistics system is crossing the U.S.-Mexican border. Almost everyone participating in the scan meetings noted the difficulty in developing a world-class logistics system when significant delays occur at border crossings. The discussions on this issue were tempered by the fact that the United States had just recently allowed qualified Mexican trucks to travel away from the border. This had been part of the original treaty, but had been delayed for a variety of reasons. Mexican officials still believe that Mexican truckers are being discriminated against, especially at State-run inspection sites (e.g., English tests administered to Mexican drivers are thought to be beyond what a U.S. driver could pass). Specific observations about the border included the following:

- The traditional process of transferring cargo at the border to trucks whose sole purpose is to transport cargo to U.S. transportation services, which then continue transporting the cargo to the final destination, adds significant time and cost to the logistics process. Now that Mexican trucks can move across the border, this transfer step will most likely be unnecessary. Strong constituencies exist, however, that might want border strategies put in place to continue this practice.
- Several participants recommended that inspections occur long before the border so that the congestion that occurs at border crossings can be partially alleviated by prequalifying truck and rail transportation services. For example, one rail official noted that trains are often stopped on the bridge that connects the two countries, tying up other trains that might

be following along the same track.

- Border inspections are limited by the hours of operation for the inspection agencies. Officials believe 24-hour-a-day operations are warranted at some locations.
- Intermodal rail service, especially from Mexico's southernmost ports (e.g., Manzanillo) has grown slowly. The market is somewhat limited by today's level of service and customs delays at the port and the U.S. border. As demonstrated in the TPMSS example, however, rail can become competitive with trucks if the right conditions are provided for the service.
- Numerous efforts are under way to use ITS technologies to improve efficiency of movement across the border. Mexican officials, in particular, thought that greater effort could be made to integrate the exchange of information between U.S. and Mexican inspection agencies with better information systems.
- Improved facilities are needed at many border crossings. Such infrastructure improvements are likely to be expensive, but funding is necessary if more efficient transportation is to be achieved. For example, several suggestions were made for providing dedicated lanes for trucks either preregistered or preinspected before reaching the border. Others noted that as far as they knew, the NAFTA bank established to fund infrastructure at the border has yet to fund a single project.
- The most important mechanism for coordinating border improvements is the Joint Working Committee, which has provided an important forum for discussing better flows across the border. Some suggested that perhaps the mission of this group should be enhanced to include a more direct linkage to private industry and to enlist its support for developing a business plan for the border. By looking at the border from a logistics perspective, with a clear mandate for improved security, a better concept for border transportation may evolve.
- Better coordination is needed in analyzing border issues. This relates to everything from data collection to development of better analytical tools for assessing the effectiveness of different strategies.
- A one-stop shopping concept should be considered in developing a rational logistics system for cross-border movements. One shipper noted that his firm deals with 15 different agencies for shipping across the border. His firm, which has a long record of dealing with such movements, is treated the same as a new owner-operator with no track record. A way of dealing more expeditiously with those who have a record of safe and secure movement of cargo is needed.

Officials working for the Secretaría de Economía stated that NAFTA has had positive impacts on the Mexican economy. Until recently, Mexico enjoyed a 17 percent annual growth in GDP, primarily because of its participation in trade-related industries. Mexican exports have quadrupled since NAFTA was signed, and export-related jobs carry a 37 to 40 percent higher wage rate than other jobs. Since 1994, about three million jobs have been created, 50 percent of which can be attributed to trade that occurred in response to the free trade agreements Mexico has signed (70 percent of this can be attributed to NAFTA). Since

Mexico's Trans-Pacific Multimodal Security System

Typical steps in this system to monitor and inspect cargo include:

- Initial security screening occurs at the shipper's origin or at transshipment in Singapore.
- Singapore sends advance notification to Mexican and U.S. Customs with "pre-clearance" information.
- When containers arrive in Mexico, they proceed through X-ray or gamma ray arc inspection, but they do not clear Mexican Customs. Any suspicious containers are removed from the "in-bond" regimen.
- Cargo is transported to the U.S. border on the doublestack unit trains tracked by a GPS system and monitored by intelligent transportation system (ITS) technologies during the entire journey.
- When the train reaches the U.S. border, the containers pass through another X-ray or gamma ray arc inspection and clear U.S. Customs through the electronic manifesting system. Any suspicious containers are inspected further.
- Under GPS tracking, cargo travels non-stop on Kansas City Southern or Union Pacific trains to inland trade processing centers. Customs inspections occur at these centers. Cargo is sent to final destinations.

Source: **www.tpmss.com**

Figure 9. Number of maquiladora firms by year.

1994, Mexico has enjoyed $147 billion in direct foreign investment. Mexico now faces strong competition, however, from Asia, and in particular China, in the low-wage market. In the Mexican domestic market, for example, Chinese textiles and toys are already cheaper than those produced by Mexican industry. Foreign investment that used to come to Mexico now goes to Asian countries. As Figure 9 shows, the number of maquiladora plants has declined for the first time. Mexican surveys of the firms that are closing indicated that a large number are relocating to Asia to take advantage of lower labor costs. This is a significant issue when one considers that the maquiladora industry represented about 41 percent of Mexico's exports in 2001.

Although the loss of maquiladora plants is a concern, some view this change as a natural evolution to a higher living standard for Mexico's citizens.

Toll roads are the major means of providing new road infrastructure in Latin America.

Developing higher value-added industries that provide higher-paying jobs necessarily will cause a shift in the low-end market. It is likely that some commodities, such as textiles, will experience a significant shift in production location, which will have an impact on transportation needs in both Mexico and the United States. Higher-value products also require more reliable and time-sensitive transportation services. Secretaría de Economía officials strongly support additional investment in ports, highways, and railroads that could provide such transportation service in light of the needs of a world-class logistics support system.

Mexico is also interested in extending the NAFTA concept south, and several memoranda of understanding have been signed with Central American companies to establish rules of reciprocity, such as exchanging truck trailers. Mexico also wants to diversify its markets and become less dependent on the U.S. economy for its own economic health. Both the United States and Panama represent important nodes of competition that will have to be considered in Mexico's future.

Security issues were discussed at length throughout the visit in Mexico. Officials understand that the border represents a potential security risk to the United States and that it is necessary to ensure all steps in the logistics chain leading to the border are secure and safe. Without security completely engrained into Mexico's economic relationship with the United States, some officials worry that Mexico will lose the competitive advantage of its proximity to the U.S. market. The key question is how to provide high levels of security while still preserving similarly high levels of transportation efficiency. This will require a smarter approach to border crossings, more use of advanced technology for monitoring and tracking cargo, and better institutional relationships among the many agencies involved in border inspections. In many ways, security is becoming a market niche that will strongly influence global trade flows in the future.

Observations and Lessons

The scan provided panel members with a broad perspective on the many challenges and opportunities represented by the Latin American market. It would be impossible in the limited space available in this report to present all of the implications of what the panel discovered during this visit. The following are the most important observations that surfaced during this visit.

Observations

The economic downturn in the global economy has created or aggravated existing economic and infrastructure challenges in Latin American countries.
Not unexpectedly, many of the Latin American countries visited still suffer from the economic downturn of the past decade, a situation exacerbated by the economic recession in the United States after the September 11, 2001, terrorist attacks. Several countries, such as Argentina, have faced such problems over a longer time period. The level of difficulty is so severe that for the first time, Latin America as a whole posted declining values of GDP per capita in consecutive years. Given the strong economic relationship with the United States, it seems likely that until the U.S. economy rebounds, the Latin American economy will continue to have serious problems. Several countries are looking to the FTAA as a way of promoting faster economic growth, but the economic vitality of such a trade market will likely by linked to the state of the U.S. economy.

One consequence of the economic downturn is that many concession arrangements—particularly those for highways and railroads—that depend on tolls or fees have experienced financial losses. Concessions are used for operation of new toll roads, road maintenance, airport management, and railroad and port terminal operations. In the absence of national dedicated revenue sources for transportation purposes, which few of the countries visited have, investment in transportation infrastructure has slowed considerably. Indeed, simple maintenance of existing infrastructure has been hurt by declining revenues. The only concession arrangements that appear to be financially stable are those in ports, but even some terminal operators are looking for better terms than those negotiated during better economic times.

Some countries view trade from a global perspective, while others focus on regional trade.
A country's perspective on international trade depends on its geographic location, the attractiveness of its products and natural resources, and the degree to which national governments adopt policies that encourage investment in trade industries and services. Every country in the world participates in international trade, but some position themselves better than others. During this scan, it became clear that Chile, Uruguay, Panama, and Mexico have much more of a trade focus than others for good reasons. Mexico's proximity to the United States has strongly encouraged the trade sector in the Mexican economy, and trade is now the country's dominant industry. Panama's position astride the major east-west sea lanes makes its focus on trade an obvious strategy. Neither Chile nor Uruguay, on the other hand, has natural trade advantages. In some ways, they both view trade as a survival strategy. Both are relatively small countries, far away from major trade flows. Both have well-developed industries, but (except for Chile's copper industry) neither are uniquely positioned to trade with the world.

What makes both Chile and Uruguay interesting from a trade perspective is that both have adopted fairly aggressive trade policies to provide some competitive advantage to their home ports. Uruguay is sandwiched between Brazil and Argentina and depends on trade with these two countries for survival. The government has adopted a liberal approach to free trade zones and private concessions to position the Port of Montevideo as a gateway to southeastern South America. In similar ways, Chile's government has actively sought trading partnerships with other countries, the most recent

being a free trade agreement with the United States, to strengthen its economy and position in the global market. In both countries, port investments have played a key role in the national trade strategy.

Chile, Panama, and Brazil view NAFTA from a strategic perspective. Chile and Panama are interested in increased trade, while Brazil is concerned about a trade pact that could be dominated by the United States.

Ports are major centers of international trade for Latin American countries.
This observation is not surprising, given the geographic and topographic challenges facing Latin America and the historical evolution of national development in port cities. Unlike NAFTA countries, much of the international trade of Latin American countries occurs by sea. Internal road and rail systems are not well developed, and rough terrain makes it difficult and expensive to make improvements. The ability of Latin American countries to participate in trade, in particular in the increased trade expected to result from an FTAA, will depend on the relative productivity of their ports and internal distribution transportation systems. Over the past 10 years, significant investments have occurred in all the ports visited during this scan. Some ports, such as Freeport, San Antonio, and Manzanillo, have modern equipment and information systems that suggest they will compete effectively. Plans for future investment exist everywhere.

Several aspects of this observation merit additional attention. Two distinct types of ports were visited during this scan. Transshipment ports, best represented by Freeport, primarily transfer containers from one vessel to another, and do not handle many exports of imports to the host country. The economic benefit to the country is linked directly to the jobs at the port, the revenues generated for the national government, and ancillary businesses connected to port operations. Import-export ports can handle transshipment traffic (and, in fact, many view this as a growth market), but primarily they provide the major means for a country to market its goods to the world. The economic impact of these ports is much more integrated with the economic activities of the country. The multiplier effect of the economic-generating benefits of hub ports is much greater than that for transshipment ports.

These different roles for ports often reflect their position in global trade flows. One of the paradigms in the trade literature is the major east-west global movement of trade that connects the developing Asian markets, North America, and Europe. Ship movements reflect the Pacific to the Atlantic (via the Panama Canal) to the Mediterranean to the Indian Ocean (via the Suez Canal) to the Pacific circumvention of the globe that represents trade flows. Some ports are situated ideally to participate as major players in this flow (e.g., Freeport and Manzanillo). These ports have increased their cargo-handling capabilities dramatically over the past five years, and anticipate major expansions over the next five years to handle post-Panamax vessels. Economies of scale dictate that the largest vessels operate on the east-west sea lanes. Other ports will act as feeders to these major global ports. San Antonio, for example, will likely feed into the Panama ports for connections to the global market or connect directly with the Long Beach-Los Angeles port complex in California.

Finally, although the phenomenon varied from port to port, it was striking how port complexes are becoming logistics service providers, not simply locations where cargo is physically transferred from one mode to another. Logistics services, financial support, and, in the case of free trade zones, value-added activities occur on or near port facilities. To compete globally, such a full-service logistics concept will be an important part of business.

Land access to ports was a problem everywhere.
Because most of the ports visited are located in or near city centers, ports are often accessed through congested roads and rail lines. Because most cargo arrives by trucks (except for bulk cargo), highway congestion is a particularly serious problem. This is often exacerbated by the lack of freeway systems that provide high-speed, high-capacity movement through large metropolitan areas.

Ports have adopted interesting strategies for providing more efficient access. Every port visited operates on a 24-hour basis, seven days a week. By doing so, deliveries and pick-ups can be scheduled during off-peak hours. Two ports are looking at new access roads that would be either truck-only or at least designed with truck access in mind. Officials in every port suggested that shifting more cargo to rail would be an appropriate strategy for providing enhanced accessibility. In the case of Santos, improvements have been made to rail service, and more cargo is being served by Brazil's rail network. In many cases, however, officials noted the difficulties that often accompany efforts to encourage rail access. These include inadequate rail capacity, lack

of distribution modes in the hinterland, poor track maintenance, little experience with handling containers, and no doublestack capacity for containers.

Privately operated terminals have been able to enter the market quickly, much more rapidly than in comparable situations in the United States.
One of the most interesting observations from this scan was how fast some countries are able to put in place new facilities that within a short time became major influences in market share. For example, the Freeport Hutchinson terminal took little more than two years to become a fully operational port that today handles more than 1 million TEUs a year and is expected to handle twice that in two years. The Katoen Natie terminal in Montevideo took 16 months to construct and is now a major location for container movement in the Rio de la Plata basin serving Uruguay, Brazil, and Paraguay. In addition, many terminal operators are major international logistics and transportation firms with strong global trade relationships, so they are in a position to market their new facilities internationally and connect into established freight shipping networks. In some cases, these entrepreneurs have also invested in distribution systems that tie into their port facilities. For example, the Katoen Natie group has invested in river port facilities along the Rio Paraña and the Rio de la Plata to serve as feeder terminals into the major port in Montevideo.

In each case where concessions have been used to foster private investment, labor rules and relationships have been changed dramatically. Because existing labor rules were changed, new labor arrangements have been made that are much more flexible than those under government management. In most cases, the number of employees has declined, but terminal productivity has increased.

Private terminal operators have been the major initiators of the use of ITS technologies in Latin America.
Intelligent transportation systems (ITS) technologies are in limited use in Latin America for toll collection and tracking trucks through global positioning systems (GPS). Few examples exist of regional ITS applications aimed at regional traffic management. Ports are the only places where officials expressed interest in applying ITS in a more systematic way. Figure 10 shows how a terminal operator is using information technology in the Port of San Antonio to monitor the flow of cargo through its terminal operations. Many port officials believe that increased security procedures in surveillance and interception of suspected materials will rely heavily on ITS-type technologies. They expect that investment in such approaches will become necessary in the near future.

National strategic transportation policies that link transportation investment to economic or trade policies are not apparent.
Transportation investment is a critical factor in a nation's success in international trade. Ports, airports, roads, pipelines, and telecommunications are necessary preconditions for participating in global trade, so one would assume that a national transportation policy would articulate how transportation links to this economic sector. This is not the case in Latin America (which is an observation that, in many ways, could be applied to the United States as well). Each mode is viewed independently, and no multimodal perspective on future transportation system development appears to exist. In the case of Argentina, it was unclear from the scanning team's meetings with officials where national transportation policy is even formulated. With rapid turnover in the presidency, the responsibility for transportation has changed regularly. No country appears to have a close relationship between its customs agency and other federal transportation agencies. As many meeting participants noted, little communication exists between such agencies, given the number of problems that occur at the borders.

None of the nations visited has a dedicated revenue source for transportation investment, and they face

Highway Networks of Selected Latin American Countries

Argentina	231,019 kms	30.1% paved
Bolivia	53,259 kms	5.6% paved
Brazil	1,658,677 kms	9.3% paved
Chile	79,360 kms	19.0% paved
Mexico	329,532 kms	32.8% paved
Panama	11,591 kms	35.2% paved
Peru	78,127 kms	13.0% paved
Uruguay	8,679 kms	76.4% paved

difficulty building transportation infrastructure without providing some guarantee to potential concession partners. Any revenues collected from gas taxes or fees go to the general fund to be apportioned as part of the political process. Most officials believe the amount of investment coming back to transportation from this transportation revenue source is much less than is contributed.

In addition, many officials complained that little data is available on the performance of the transportation system. In the United States and Canada, for example, transportation statistics are collected by national agencies. Such a process is spotty in Latin America.

To the extent that some systems-level perspective is provided in planning and decisionmaking, it takes the form of corridor planning.
Corridor planning appears to be one of the few approaches used to examine the intricacies of transportation flows in a nation. Brazil has used logistics corridors to investigate trade flows for certain commodities (e.g., soy) from farm to port. Mexico has looked at intermodal corridors from the perspectives of NAFTA trade and improved access to Central America. The Mexican-led Plan Puebla-Panamá is an effort to use transportation investment in key corridors running through Central America to enhance the quality of life of the people in this region.

The characteristics of corridor planning vary from one context to the next. It can have a commodity or market orientation as in the above example of soy. Alternatively, the context might orient toward trade routes. A representative of the Katoen Natie group showed Figure 11, for example, to the scanning team to illustrate that the port terminal in Montevideo is located in a major corridor for trade between Brazil and Chile. In addition, because of the importance of concessions for providing intercity transportation, corridor studies have been undertaken to determine the economic feasibility of tolled facilities serving that corridor. Finally, Mercosur has identified several transportation corridors that provide Mercosur-wide transportation capabilities important for intra-Mercosur movements. Several

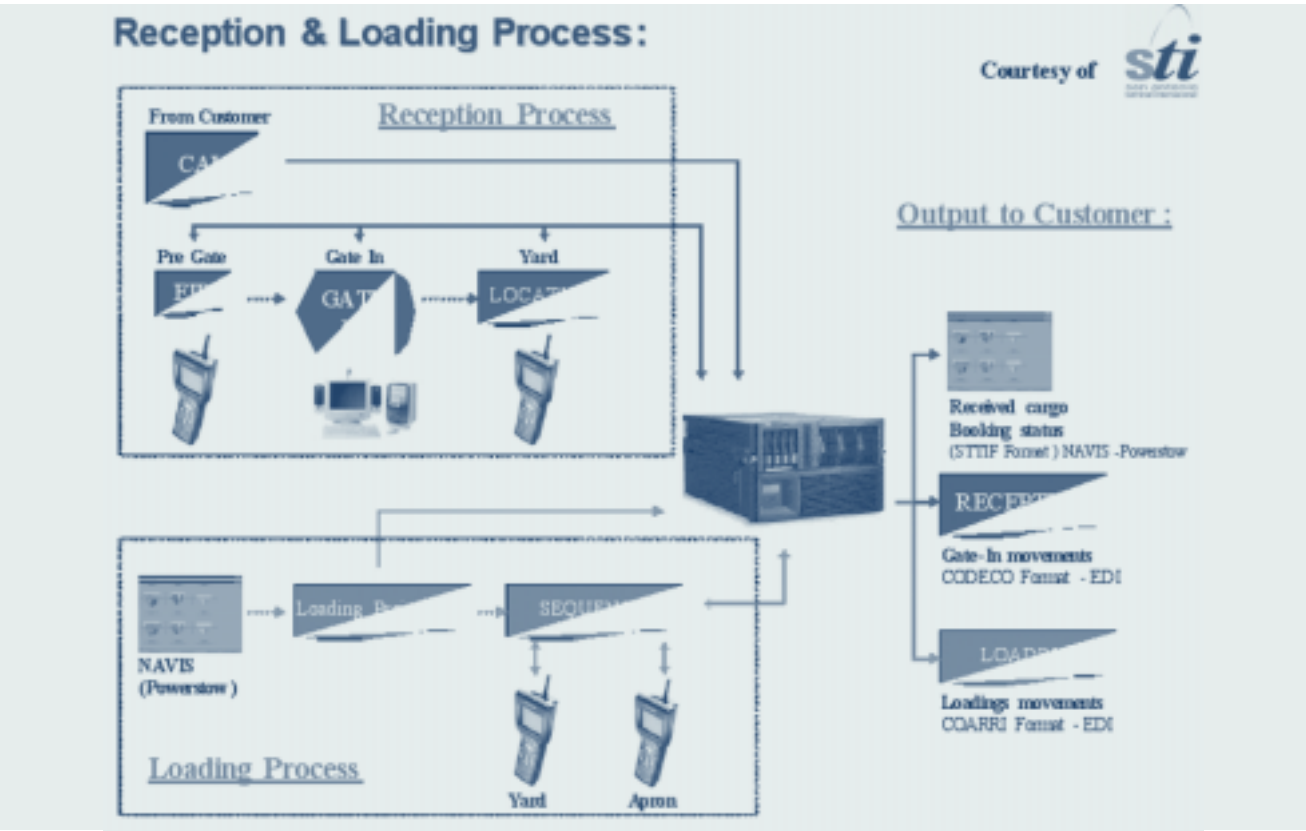


Figure 10. Information system in Port of San Antonio used to track cargo.

corridors have received investment to upgrade facilities and improve operations.

Use of river transportation as a feeder to ports is developing.
South America has extensive river systems, of which three are the most important: the Amazon, Rio de la Plata and Orinoco Rivers. The Amazon, the third-longest river in the world, covers a surface basin in excess of 5.8 million square kilometers. The navigable portions of the Amazon and its tributaries provide an extensive inland water distribution system used primarily for transporting materials to develop the land of the basin. The Rio de la Plata River system includes the Rio de la Plata, the Paraña, Paraguay, and Uruguay Rivers. More than 100 inland ports are found in this river system, handling a total volume of 110 million metric tons per year. Of this amount, about 30 percent relates to grains and 20 percent to general cargo, including 1.4 million TEUs. The Orinoco River, which flows through Venezuela and Colombia, primarily transports natural resources such as iron, aluminum, bauxite, and petroleum.

The further improvement of navigable rivers and their use for accessing seaports is likely to be an important investment for many South American countries. Not only is river transportation often more economical, but inland water distribution systems also can provide access directly to seaports without having to use overburdened inland surface transportation systems. For undeveloped areas of South America, such as the inland parts of Brazil and Paraguay, efficient use of river transportation could allow even more rapid development of mineral and agricultural (especially soy) resource industries. With direct access to the ports in Argentina, Uruguay, and southern Brazil, such commodities will have much-improved connections to the world market. With an expansion of the Panama Canal, these products could compete more effectively in the Asian market.

National officials and port and terminal operators are concerned about security, especially anticipated additional costs and their impact on competitiveness.
Everywhere the scanning team went, new security measures and procedures that could be imposed on international freight was a major topic of conversation. Although new security measures generally were assumed after the events of September 11, 2001, port operators in particular are concerned about how new surveillance and monitoring procedures would be paid for. Additional costs, which they assume will be significant, could greatly hurt the competitiveness of some ports. Some expectation exists that the private terminal operators would incur the cost of any new equipment and labor necessary to move freight through the terminal. It was interesting to note that no port could point to any significant changes in security resulting from the terrorist attacks in the United States. Everyone appeared to be waiting for requirements expected to be adopted internationally to provide better security in freight movement.

Three countries, and two ports in particular, view themselves as becoming security gateways to the U.S. market. Chile, Mexico, and Uruguay consider height-

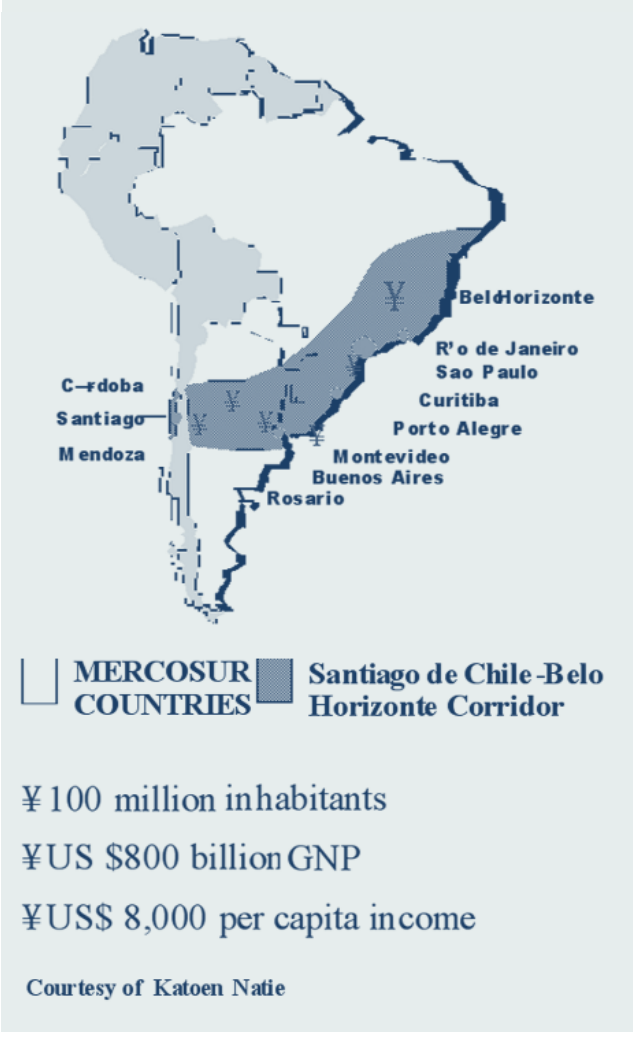


Figure 11. Corridor perspective in South America.

ened security at their ports a way of distinguishing themselves from other competitors. Port officials in Montevideo and San Antonio believe security could easily become a niche market for their ports.

Mercosur faces serious economic and transportation-related problems.
Economic problems exist in the Mercosur countries, especially Argentina. It is not likely that these problems will be solved soon, so a common market in southern South America may take longer than expected to achieve. Border-crossing issues were raised in every country visited, especially in Mercosur countries. Lack of coordination among border agencies has continued to cause what some consider inordinate delays at the border. Although infrastructure development is a top priority with Mercosur and national officials, dependence on concessions for providing new infrastructure has greatly constrained investment in new roads and railroads. Indeed, existing concessions arrangements, in light of economic problems, have limited maintenance of infrastructure.

Mercosur is reaching out to other trading partners to develop more global trade partnerships. It recently formed an agreement with the Andean Community countries to develop more consistent trade policies. Mercosur officials continue to seek new relationships with Europe and Asia. With the size of the market represented by Mercosur countries, they individually and as a trade block will be important markets for global trade, but when this will happen in a significant way is uncertain.

Critical trade-related transportation facilities are extremely congested and vulnerable to disruption.
Given the state of the transportation networks in most Latin American countries, it is not surprising that critical trade-related transportation facilities are vulnerable to disruption. In two cases, the scanning team saw truck accidents that caused significant delays on the only highway serving a major port and a major NAFTA trade route to the United States. With ports located in center cities, highway access is often congested for much of the day. Poor condition of the railroads and underutilization of river and coastal water transportation for trade movement result in unreliable and often unsafe road conditions. Some ports and countries are trying to mitigate these problems by expanding operations to 24 hours a day to spread peak demand, expanding roads, or developing inland water distribution systems.

Lack of redundancy in transportation networks leads to a high potential for significant disruption if something happens to a critical link in the network. This can occur unexpectedly, such as an accident or terrorist attack, or repeatedly over time, such as congestion. Increased trade flows from an FTAA will most likely stretch the capability of many Latin American countries' transportation networks to provide reliable and economic service.

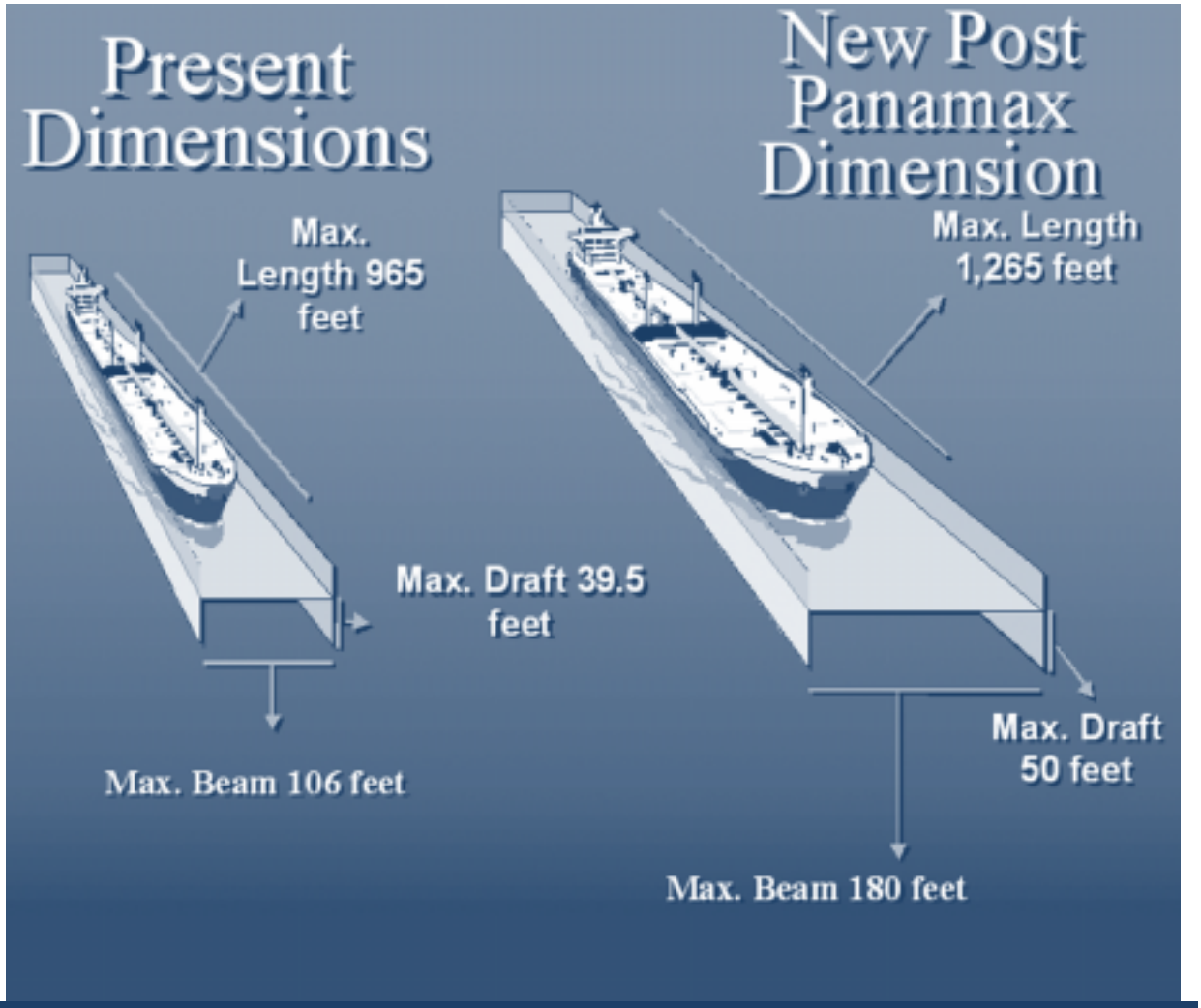
The Panama Canal is the most strategic facility Latin America for NAFTA.
The Panama Canal has been an important waterway since it first opened in 1914. With much of world's trade occurring via maritime transport, however, it has become even more critical to the economies of Latin America, the United States, and Canada. Although the land bridge across the United States can compete for many types of commodities, the canal still handles much of the trade coming to and exported from U.S. ports. Efficient operation of the canal is an important element for successful trade in the Latin American market.

Although today's trade markets are strongly influenced by the savings in travel time the canal offers, the shipping industry has developed faster, bigger ships to handle future freight movement. How the Panama Canal Authority responds to these challenges will influence future trade prospects. If larger vessels are able to transit the canal (see Figure 12), greater economies of scale will be realized for the movement of certain types of commodities. Agricultural products from South America, for example, could be much more competitive than they are today if they are transported on post-Panamax ships. Future plans for expanding the canal bear watching.

Panama is rapidly becoming a major logistics service support and transshipment point for Latin America.
Both government policies and business plans jointly reinforce Panama's plans to become a major hemispheric center for logistics. The Panama Canal, major transshipment centers, free trade zones, liberal tax laws, and strategic position on the east-west global sea lanes provide Panama with world-class advantages. The Multimodal Center for the Americas is a good example of how Panamanian business views the future. Fast and reliable multimodal transportation and value-added commercial activities in a free trade zone provide an appealing business environment.

The European Union and China are investing heavily in Latin America.
Chinese and European companies are investing in businesses and infrastructure in Latin America. Business and government officials believe this is happening not only because of the large consumer market, but also to gain entrée into a potential FTAA. Goods and services provided by companies within the FTAA boundaries will presumably benefit from the low tariffs and fees associated with open borders. Similar goods and services coming from overseas will not have similar advantages.

Mexico is investing in port facilities and transportation corridors to develop integrated intermodal service opportunities that could compete with U.S. services.
Mexico has successfully adopted a national program for privatizing port operations. This program has produced substantial new investment in port facilities and, to some degree, in supporting transportation infrastructure. Because Mexico's economy is so dependent on trade, such a focus is not surprising. In some cases, this infrastructure investment will complement that found in the United States. Improvements at the bor-



Source: Lynch, V. *The Price Is Right! — Pricing Policy at the Panama Canal,* International Association of Marine Economists, Conference Proceedings, Panama City, Nov. 11-13, 2002.

Figure 12. New vessel dimensions accommodated by the expanded Panama Canal.

der or improved rail service will provide more efficient movements into and out of the United States. In some cases (e.g., the port of Ensenada), improvements to the port and rail service connecting to the U.S. border would provide direct competition to the Los Angeles-Long Beach port complex in California.

Additional gateways into the United States also represent transportation redundancy for the U.S. market. During the West Coast port strike, goods were diverted to Mexican ports and then transported to the border primarily in trucks.

Mexico's economy is slowly changing.
Many U.S. manufacturing and industrial processes, now based on global supply and logistics chains, rely on production processes in Mexico. Products and materials move across the border in large amounts, creating transportation demands in both countries. As noted earlier, the maquiladora industry is a major player in border industries and in resulting transportation demands. To be competitive, much of this industry relies on low- cost labor, but other countries now offer lower labor rates than Mexico for certain types of industries. Figure 9, for example, shows that for the first time, the number of maquiladora firms has declined. The textile industry is a good example of the impact of this phenomenon on the United States. The textile industry, which originally moved from the southeastern United States to Mexico, is now moving from Mexico to Honduras and Asia. The United States, which remained part of the process by growing cotton and transporting it to the finishing plants in Mexico, developed transportation services to support this interchange. Such transportation flows between the United States and Mexico clearly will change over time to reflect a new economic reality.

In addition to changing labor costs, many Mexican officials believe it is to their country's benefit to encourage development of higher value-added products in the Mexican economy, which means higher-wage jobs. By increasing workers' take-home pay, the Mexican economy can develop a much more vibrant domestic consumer market and raise the living standard. The government appears to have a policy of placing greater emphasis on high-level manufacturing and finished products. This change could have important implications to the U.S. economy and to demands on the transportation system.

Although the scan's focus was freight movement, it was striking to see the number of infrastructure improvements and high expectations for passenger cruise ships.
Every port visited either had new facilities for passenger cruise ships, or plans to build such facilities in the near future. Port managers and local officials clearly prize the economic benefits of having such ships dock in a port. The passenger cruise industry is expected to show impressive growth over the next decade. Whether every port expanding its facilities to accommodate this growth will actually benefit from cruise visits remains to be seen. One implication of larger numbers of cruises will be the security challenge of monitoring tourists as they enter the United States and protecting them on the high seas.

Lessons for North America

The following lessons for the context of NAFTA and the United States result from this scan.

1. The global market and logistics chain respond to many influences, only some of which relate to infrastructure owned and operated by public agencies. **Understanding the motivation of logistics decisions and their local implications are critical points of departure for a national or multinational effort on fostering and preparing for trade.** Panel members heard from both shippers and government officials about the need for a global systems perspective in understanding trade flows. The countries that adopt this vision—Chile, Panama, Brazil, and, to a lesser degree, Uruguay—will be more successful than those that do not.

2. **Perhaps the most significant observation from this scan is the changing nature of Panama as an emerging hemispheric logistics center, based on its location as a major maritime crossroads.** In the short time since Panama Canal ownership was transferred to the Panamanians in 1997, Panama has built new major container terminals and created new free trade zones as inducements to foreign investors. From information gathered during this scan, it appears likely that Panama will be even more influential in global trade flows serving NAFTA countries. It is unclear what impact proposed improvements to the canal to allow bigger ships to pass will have on NAFTA countries, in particular the United States. Such a development might create the demand for more transshipment ports outside U.S. territory to provide feeder services to the United States, the need for increased capacity at U.S. ports, or a shifting in market characteristics that will hurt NAFTA interests (e.g., making Brazilian

agricultural products more competitive with NAFTA products in the Asian market). More attention should be given to this issue.

3. **Major players in the transshipment business consider Cuba a potential threat or opportunity within the context of global east-west container movements and the need for transshipment locations in the Caribbean or along the Gulf-Atlantic Coast.** Havana and other Cuban ports are located ideally to provide such service and have excellent port potential. Although it is unclear what will happen with a change in administration, it is possible that Cuba will be a major gateway to the Caribbean in several decades.

4. Levels and patterns of trade are directly related to patterns of economic growth, production, and consumption. The recent economic downturn has affected global trade, and it is unclear what the immediate future holds. **Over the long term, the LATTS forecasts, which indicate a tripling of Latin American trade, should be reexamined at a commodity-specific level, particularly because of changes under way in the Mexican economy (e.g., losing maquiladora plants to Asia).** In addition, real potential appears to exist for enhanced Gulf of Mexico and Pacific Coast maritime services into the United States for certain commodities.

5. Because government policies on planning, environmental, and investment requirements differ in the countries visited than in NAFTA countries, private entrepreneurs have been able to establish a substantial market presence in hemispheric trade quickly. **NAFTA countries need to understand that the time needed to respond to market opportunities will most likely be much less than that allowed by government rules and regulations.** As the global market expands and becomes more dynamic (i.e., more time sensitive to changing market demands), the response time for providing needed infrastructure could become a serious constraint to NAFTA countries. This suggests a need for better, continual, and more strategic efforts to understand global trade patterns and the shifting context of economic centers to produce, consume, and handle commodities. This need exists at the NAFTA, national, State, metropolitan, and port levels (where trade movement is an important part of transportation system performance).

6. **One of the most important concerns identified by freight shippers, port operators, and national transport officials during this scan was the level of effort and funding required to provide security for maritime freight movement to satisfy international mandates.** Specific mandates have yet to be determined, so much of this concern relates to worst-case scenarios that assume the most extensive types of security procedures. The panel's perception is that many of the ports visited do not have the level of security that would likely satisfy new requirements. Working with Latin American countries and ports in developing acceptable procedures and approaches for secure freight movement could be an important task for NAFTA countries. Of some interest was the suggestion by several port and country officials that private terminal operators most likely will be responsible for providing the required security, and that having an approved security gateway into the NAFTA market could become a major competitive advantage to some countries.

7. **The Latin American experience illustrates the importance of having a national transportation policy that reflects the needs of trade flows and the global positioning of the NAFTA market.** None of the countries visited has a comprehensive, systems-oriented national transportation policy. Little integration or coordination is evident among investment programs for different modal systems. Accordingly, the response to increased trade volumes with the NAFTA market most likely would be in the hands of private shippers and port terminal operators.

8. Public budget and financing mechanisms for funding freight projects were not found in many of the countries visited. Latin American countries have relied on concessions to private companies to provide the necessary port access and port terminal infrastructure. In several countries, the national government has no dedicated transportation funding source for public investment. In the case of port terminal operations, concessions have been used to turn over to private operation those aspects of logistics services that a private business is best able to provide. Private concessions for port terminal operations have largely been successful in the countries visited, but economic challenges facing the region and heavy reliance on investment returns for privately funded infrastructure for roads and railroads are holding the necessary provision and

maintenance of infrastructure captive to the confines of a weak market. **This model of finance holds important lessons for investment strategies that rely too heavily on private provision of transportation.**

9. **Increasing NAFTA connections to Latin America will likely focus a great deal of attention on alternative financing schemes for providing the infrastructure necessary to handle increasing trade volumes.** Providing hemispheric exchanges and consensus-building activities on innovative financing strategies could be an important part of a NAFTA-driven effort to develop necessary trade-related infrastructure. European and Asian investment in Latin America has occurred at significant levels in the past five years, and much of it has focused on transportation infrastructure.

10. Mercosur faces significant challenges in providing a stable trade market. Economic challenges in Mercosur countries, uncertainty about a new government in Brazil, and problems with standardizing procedures at Mercosur borders have slowed progress in achieving major productivity gains that should occur with a trading block. The Mercosur countries are focusing much of their attention internally, with a major emphasis on protecting production and commodity groups, rather than growing trade through an open-boundaries strategy like the European Union. A major development worth watching is the prospective alliance between Mercosur and the Andean Pact countries. **If Mercosur can find a way to make internal transportation more efficient and promote trade growth, it may become a much larger player in global trade.** It appears that many significant issues must be resolved for this to happen in the short term.

11. **Increasing port access is an important issue in the ports visited.** The use of port terminal concessions has been successful in providing needed investment in dockside operations. For historical reasons, however, many ports are located in central areas of large cities, and they face significant congestion in port access. With limited investment resources available, governments have used concessions for access projects, with limited success. Most ports visited operate 24 hours a day, seven days a week, to handle rising congestion and provide better customer service. The Port of Santos is considering a truck-only road that would provide better internal circulation to the port, Latin America's largest. Both concepts are worthy of investigation in NAFTA countries.

12. **The Mexican-U.S. border remains a critical barrier to improving NAFTA trade.** Delays are caused by the inspection procedures used by numerous government agencies, inadequate physical infrastructure at border crossings, lack of data sharing among governmental agencies, and incompatible vehicle technology. Enhanced logistics, which Mexican government and private sector officials view as a key to economic prosperity in the global economy, will depend on fixing border problems. Improvements are being made at Mexican ports and in inland transportation corridors to provide better service to the U.S. border. Such improvements need to be augmented with new ways of expediting trade across the border in an efficient, security-conscious manner. Improving gateways, borders, and international trade corridors through coordinated planning, investment, and technology deployment can improve trade transport efficiency and security.

13. **Although not the focus of this scan, it is important to note that every port visited had plans for, was constructing, or had just opened cruise ship terminals.** The cruise ship business is something that every port expects to benefit from. This raises interesting questions about the economics of such a large and expansive investment in this industry. Also, if the level of maritime tourism reaches the desired levels, security for onboard passengers and entrance into U.S. waters will become a concern.

Recommendations

Based on its observations and findings, the scanning team developed a number of recommendations. The observations, conclusions, and recommendations are those of the scanning team and not of FHWA.

Recommendations for Further Studies

1. International trade—Latin American trade in particular—has a dynamic relationship with the economic health of national economies and the global trade patterns that result. Studies of Latin American trade have usually examined the historical trends in trade by commodity and product type, but have not often reflected changing global and hemispheric market factors that will likely have significant impacts on the future volume and composition of this trade. For example, the Mexican maquiladora industries face significant competition from China and other Asian countries. In the textile industry, Mexico is losing competitive advantage (i.e., its position as a low-wage country) to Honduras, China, and India. In addition, Mexican government officials want to evolve to a higher-value manufacturing economy that will raise the living standard for its citizens. These changes will have important consequences for trade forecasts with Canada and the United States. They also could have significant impacts on the hemispheric logistics system and the need for corresponding transportation infrastructure. **The scanning team recommends further study of these dynamics and the related impacts on the performance of the transportation system. This, and related information, should be incorporated into professional and organizational development activities for State DOTs.**

2. Scanning team members were impressed by the rapid change in trade flows and market presence that has occurred in several Latin American locations, perhaps represented best by the new container port in Freeport, Bahamas. **The team recommends that monitoring of the Latin American market continue, given the rapid introduction into the market of new players. The team recommends that institutional mechanisms be developed to guarantee that the best available information is provided to State DOTs, which typically play a large role in domestic transportation systems development.**

3. Many forms of international trade agreements have been implemented throughout the world, ranging from strategies to simplify tariffs to efforts to develop a borderless common market. In the context of Latin America, free trade agreements have been used by many countries to establish trade advantages within the global market. The private sector and, in particular, global corporations in the transport industry drive trade patterns to a great extent. A better understanding is needed of the different types of trade agreements, the impact of these agreements on trade, and the implications for transportation infrastructure. **The team recommends that a clearer picture of the players in these agreements and their roles be developed and incorporated into the efforts of transportation agencies to engage more effectively with Latin American trade.**

4. The scan did not examine in detail the trade dynamics of the Central American and Caribbean market, but this is an important market, especially for the United States. **The scanning team recommends that a similar study be undertaken to understand the dynamics and potential of this market and the role the Caribbean plays and will play in filling a transfer function for freight from all quadrants.**

5. The Central American and southern and eastern Mexican markets appear to have potential for creating a sea bridge with the U.S. Gulf Coast. Some services have been tried already, some successful and others too early to say. **The team recommends a feasibility study of using the Gulf of Mexico for serving NAFTA trade that explores factors that would make such services successful.**

6. Enhanced security was an issue discussed by both

government and private sector officials at every site visited. Better understanding of supply chain logistics and more intense security provisions are important points of departure for understanding likely future trade flows. For example, some countries (e.g., Chile and Uruguay) view themselves as security gateways to NAFTA because of their ability to provide better levels of security for cargo heading to North America. If this turns out to be the case, it could have important implications not only for these countries, but also for the types and levels of infrastructure provided at the destination ports. **The team recommends that the NAFTA countries work closely with Latin American countries, port authorities, and shippers to make sure they are aware of security requirements and to coordinate responsive strategies.**

7. Border issues were an important component of every discussion that focused on providing greater efficiency and productivity in international freight movement. This was especially true in Mexico. The United States and Canada have had a long and effective relationship in making the border safe, secure, and efficient, allowing for important inspections and security checks to occur while at the same time providing for efficient movement of vehicles and passengers. This experience of deconstructing the border with Canada should be examined for lessons learned that could be applied to the U.S.-Mexican border. The NAFTA countries clearly face institutional, financial, and technological border challenges. **The team recommends that a study be undertaken on what has worked on the U.S. border and how these lessons could be applied elsewhere.**

8. The U.S.-Mexican border provides unique challenges for international trade and security. Numerous government agencies are involved in managing the border. With the creation of the U.S. Department of Homeland Security, some of these agency functions may be consolidated and thus cause fewer delays at inspections. Shippers and private providers of transportation, however, are much more in tune with planning, operations, and logistics needs of customers, and therefore of important transportation network needs. **The team encourages private sector involvement in developing border strategies, including a business plan for the border. This initiative could be supplemented with best practice case studies that could be incorporated into freight professional capacity-building programs.**

9. The scanning team visited two types of ports—those that focus primarily on export and import flows and have important positive economic impacts on a national and regional economy and those that focus on transshipment of cargo. As container ships become larger, new transshipment ports (such as Freeport) will most likely gain in importance because larger ship sizes cannot be handled in existing ports without major improvements. **The team recommends a study that examines the national, regional, and local economic impacts of such transshipment ports and provides observations on the benefits and costs of such facilities.**

10. The use of performance measures in transportation planning and decisionmaking is an important element of cost-effective transportation investment. The NAFTA countries have evolved over the past several years to a strategic corridor-gateway concept for enhancing the productivity of NAFTA trade. **The team recommends that the performance measures that can best reflect the logistics and transportation problems of such corridors and gateways be identified and incorporated into the operations of State DOTs.**

11. In every country visited, strategic data collection and analysis were lacking (the same could be said of the United States). **The team recommends that the NAFTA countries provide advice and support for developing organizational capabilities in Latin American countries similar to Statistics Canada or the U.S. Bureau of Transportation Statistics.**

12. **Given the importance of the Latin American market to the NAFTA countries, technical exchanges on topics such as finance, professional development, and multimodal transportation planning would be an important means of building institutional capacity with Latin American trading partners.**

Other Issues

Although the purpose of this scan was to examine the characteristics of trade flows between NAFTA

and Latin American countries, the scanning team identified many other transportation-related issues of interest to the North American transportation community. In some cases, these issues relate to freight and trade movement, but they go beyond this topic. Issues of interest include the following:

Truck size, weight, and safety characteristics—Several countries are struggling with providing consistent regulations on truck size, weight, and safety characteristics. This is especially true in the Mercosur countries, where the member nations have attempted to provide such consistency. This has been a challenge because the national trucking firms have resisted any attempts to require, in their opinion, more costly equipment for cross-border transport.

Highway safety—The scanning team heard a great deal about the high accident levels on highway networks. This was attributed to limited highway designs through difficult terrain; poor drivers' license requirements, education, and enforcement; and inadequate traffic control strategies and devices.

Intelligent transportation systems—Almost every transportation official the scanning team met with mentioned the potential application of ITS technologies to improving transportation system performance. Little application has occurred, however, except in the limited case of several ports and in the use of electronic fare collection on toll roads.

Data collection and analysis—Only a small number of the government agencies the team met with had national data on trade flows. In fact, several commented that insufficient data collection and analysis are hindrances in their attempts to develop a more rational transportation policy that reflects market conditions.

Urban congestion—Because many Latin American cities evolved around their seaports, much of the distribution of international freight must occur in highly congested urban conditions. Many Latin American cities are large and have inadequate road and public transport systems. Although these cities have done an admirable job of providing public transport services to handle huge passenger flows, there is likely a fruitful market for better transportation planning and engineering in these locations.

Finance—Transportation finance is a critical concern to Latin American officials. Unlike the United States, many countries do not have a dedicated funding source for roads or other transportation modes. Transportation investment must compete with the many other formidable needs facing these countries. In most cases, transportation investment does not come out on top in this competition. A much broader perspective is needed on the different types of strategies that can be considered for transportation finance.

Professionalism—The scanning team met with talented and knowledgeable representatives of both private operators and the government. In many cases, however, these officials lamented the lack of professionalism in the transportation industry and in public service. This had a lot to do with the low level of importance attached to transport in Latin American government circles and, to some extent, the lack of training opportunities and transportation-related educational programs.

Human resources—Many participants in the scanning team's meetings commented on the need for better-trained transportation professionals, especially younger engineers and managers. Although it reflects the region's culture and protocol, it was striking that most government officials the team met were over 50 years old, and most port and terminal operators were in their 30s and 40s. Human resource development is an important need.

International Customs Cooperation: Toward Secure Trade

- Harmonization of hours of operation
- Information exchange
- Industry initiatives
- Exchange of low-risk importer lists
- Electronic exchange of information
- Electronic locks
- Rail imaging
- Electronic tracking devices
- Port security programs

Source: *Trans-Pacific Multimodal Security System*, Ministry of Transportation and Communications, Mexico.

APPENDIX A

Amplifying Questions

Questions for Mercosur Officials

1. Please discuss how Mercosur policies are formulated and implemented. What are current freight policies as they relate to freight movement within the Mercosur market area? As they relate to trade with non-Mercosur nations? As they specifically relate to trade with North America?

2. What were the major freight-related challenges faced by the Mercosur during its creation (e.g., institutional relationships, regulatory consistency, financial needs, environmental policies, operational strategies, etc.)? Has the existence of Mercosur changed policies or operating considerations for freight movement among member nations? If so, how?

3. What do you see as common points of interest between the Mercosur and NAFTA nations? Are new or stronger hemispheric relationships needed to deal with future freight needs?

4. Since the September 11, 2001, terrorist attacks in the United States, much discussion has been generated about container security in particular and ports security in general, not only in the United States but also throughout the world. What measures have been taken or are being considered in maritime security within Mercosur?

5. What has been the effect of Mercosur policies (e.g., the removal of trade barriers and tariffs) on the amount and type of freight shipped and on the method of shipment?

6. What regulatory or operational reforms have been considered and/or implemented at high-volume freight border crossings? Does Mercosur monitor what other countries are doing about new approaches for handling freight movements across borders? Does Mercosur have interest in the application of intelligent transportation system technologies for improving border crossings?

7. What issues do you see challenging freight movement within the Mercosur market? What major changes from the freight trends of the past 25 years are you expecting over the next 25 years? What are the major driving forces (for example, time-sensitive delivery and e-commerce) behind these trends?

Questions for National Government Officials

1. What have been the trends in your governmental financing of freight-related transportation infrastructure? For example, what has been the investment history in ports, airports, inland waterways, roads, freight terminals, etc.?

2. How are freight facilities that have international significance financed? What types of government subsidies are provided for capital improvements and operations of freight facilities (rail, aviation, water, trucking, freight intermodal, etc.)?

3. What has been the effect of globalization of the marketplace on the freight industry in your country? What have been the corresponding effects on your country's transportation system?

4. Since the September 11, 2001, terrorist attacks in the United States, much discussion has been generated about container security in particular and ports security in general, not only in the United

States but also throughout the world. What measures have been taken or are being considered in maritime security by your country?

5. How are investments in freight facilities evaluated in the context of their role in international trade? For example, are benefit-cost analyses used in such evaluations? If so, how are benefits assessed?

6. How are local, provincial, national, and international communities and groups incorporated into the planning process for freight facilities improvements that have international impacts (such as port facilities)? How is planning and implementation done for multination transportation corridors?

7. Do binational, trinational, or multinational committees or task forces that have official authorization from their respective governments exist to deal with freight issues such as standardization, regulations, customs, etc?

8. How are freight movement considerations incorporated into the planning for major highways and rail infrastructure? Does your government monitor the performance of the transportation system to see how the system performs with respect to freight movement? If so, what performance measures or indicators are used?

9. Have increasing freight volumes led to innovative and creative uses of transportation infrastructure, e.g., freight-only highway lanes, pricing schemes, time-of-day use and bans, etc.? How are competing interests between passenger and freight use of the transportation system dealt with? Do passenger railroads have a long-term strategy that includes a potentially larger role for freight movement?

10. What major changes from the freight trends of the past 10 years are you expecting over the next 10 years? What are the driving forces behind these trends?

Questions for Transportation Facility Operators

1. How has the movement of freight movement through your facility changed over the past 10 years (by mode, if appropriate)? Specifically, has the creation of common trade markets (such as NAFTA or Mercosur) caused significant changes in freight movement and/or in the way you view your business? If so, how?

2. What has been the effect of the changes in trade barriers and tariffs on the amount and type of freight shipped and on the method of shipment? How do differing regulatory and taxation policies among nations affect logistics decisions?

3. What types of problems in handling freight do you experience at your facility?

4. How are local, provincial, national, and international communities and groups incorporated into the planning process for freight facility improvements that have international impacts (such as port facilities)? What is your involvement in planning national transportation investments?

5. How are investments in freight facilities evaluated in the context of their role in international trade? For example, are benefit-cost analyses used in such evaluations? If so, how are benefits assessed?

6. What advanced technologies have proven most useful in enhancing the productivity of freight movement at your facility? In particular, how have such technologies been used to improve landside access to your facility? What has been your role and that of the national government in fostering such technology applications? What future technology applications will receive increasing attention from government and industry?

7. How are the rapid changes in Internet-based logistics affecting the movement of freight in your market area, and in particular the freight using your facility?

8. What major changes from the freight trends of the past 10 years are you expecting over the next 10 years? What are the major driving forces behind these trends?

9. What has been the effect of larger and deeper draft ships on port business? Has this effect changed the distribution of freight movement among various ports?

APPENDIX A

Questions for Industry/Shippers

1. Has the existence of trade common markets (e.g., NAFTA or Mercosur) changed your (or your industry's) policies or operating considerations for freight movement? If so, how?

2. What has been the effect of policies such as the removal of trade barriers and lowering of tariffs on the amount and type of freight shipped and on the method of shipment? What do you consider the single biggest benefit from trade common markets for freight operations? What do you consider to be the most significant remaining barrier to more efficient freight operations within Latin America?

3. What major changes from the freight trends of the past 10 years are you expecting over the next 10 years? What are the major driving forces behind these trends?

4. How are freight facilities having international significance financed? Does the national government play a role in securing necessary financing? What types of government subsidies are provided for capital improvements and operations of freight facilities (rail, aviation, water, trucking, intermodal, etc.)?

5. What role does the private sector play in identifying important investments and desired policies and in funding projects?

6. What advanced technologies have proven most useful in enhancing freight productivity? What future technology applications will likely receive increasing attention from government and industry?

7. What effect do road congestion and transportation bottlenecks have on logistics and equipment usage? Does congestion on the road network act as a pricing mechanism to encourage the use of alternative modes for access to ports?

8. What has been the effect of globalization of the economy on your business? What has been the effect on Latin America's transportation system?

9. How are the rapid changes in Internet-based logistics affecting your business? The movement of freight in the Western Hemisphere? Has the rapid integration of Internet-based logistics into business decisionmaking had any impact on the location of your business activities?

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APPENDIX B

Team Member Biographies

THE FOLLOWING BIOGRAPHIES WERE WRITTEN BEFORE THE SCANNING STUDY TO PROVIDE INFORMATION ABOUT THE TEAM MEMBERS TO THE HOST DELEGATIONS.

Harry B. Caldwell (Co-Chair) is Chief of Intermodal Freight for the Federal Highway Administration. He advocates concerns of carriers and shippers in U.S. transport policies and programs, and develops legislative strategies to enhance freight and international trade transport. Caldwell speaks frequently throughout North America on trade transportation, economic development, and institutional reform. He managed the Strategic Investment Analysis for all U.S. highways and bridges from 1988-1998. He wrote the 1994 "Readiness Assessment" of North American transport systems for international trade. He also managed the U.S. Borders and Corridors Program to enhance trade transport with Mexico and Canada. He is developing a comprehensive multimodal program to enhance North American freight productivity (scheduled for completion in 2002). Caldwell developed the Highway Economic Requirements System for infrastructure assessment, as well as the Freight Analytical Framework, a multimodal systems analysis tool to understand freight flows and analyze mitigation strategies. He is developing dynamic border simulation software to facilitate freight flows across North American borders. A professional geographer, Caldwell has been with FHWA for 28 years. He frequently represents the U.S. Department of Transportation in international policy and technical discussions.

Larry L. (Butch) Brown, Sr., (Co-Chair) is Executive Director of the Mississippi Department of Transportation. He administers all transportation policies approved by the State Transportation Commission and provides input and reports directly to the governor and legislature. His duties include supervising the department's operating offices—Highways, Administrative Services, Intermodal Planning, Information Technology Services, and Enforcement. He is responsible for all administrative and technical matters relating to airport and port development, highway construction and maintenance, weight enforcement, public transit, and rail safety. Previously, he was mayor of Natchez, Mississippi, and a businessman in the areas of transportation, warehousing, and real estate. A graduate of the University of Southern Mississippi, he was an instructor in the school's Department of Marketing and Management. Brown has served on the executive board of directors of the Mississippi Business Finance Corporation, the White House Conference on Small Business, and the U.S. Department of Commerce Industry Sector Advisory Committee on Trade Policy.

Gary Gallegos is Executive Director of the San Diego Association of Governments (SANDAG). SANDAG is the regional Council of Governments and Metropolitan Planning Organization for the San Diego region. Gallegos also serves as chief executive officer of the Airport Land Use Commission, San Diego County Regional Transportation Commission, Regional Growth Management Review Board, and Congestion Management Agency. He is head of SourcePoint, the non-profit public benefit corporation chartered by SANDAG. Previously, he was District Director for Caltrans District 11, representing California on binational transportation issues and serving on various committees. He is recognized as a leader in the areas of transportation and binational cooperation. He holds a bachelor's degree in civil engineering from the University of New Mexico.

Arno Hart is project manager for the Latin America Trade and Transportation Study, which is evaluating the potential for trade with Latin America and evaluating the need for transportation investment, strategies, and policies to accommodate trade. He has more than a decade of experience in freight transportation planning and economic development, specifically focused on institutional, financial, planning, and market aspects of highways, ports, airports and rail systems. He has managed and participated in a variety of comprehensive freight transportation and logistics studies. They include the I-10 National Freight Corridor Study (project manager), Wilmington-Harrisburg Freight Corridor Study (deputy project manager), METROPLAN Orlando Freight Goods and Services Mobility Strategy Study (project manager), Northeast Ohio Freight and Logistics Study (project manager), Latin American

Trade and Transportation Study (project manager), Thailand Global Transpark (project manager), Nevada Statewide Intermodal Goods Movement Study (deputy project manager), and the Western Trade and Transportation Study (freight data development). A recurring issue in his studies is the need to develop multimodal solutions to accommodate future growth in freight traffic. Hart holds a master's degree in economics from the University of South Carolina.

Marion Hart, Jr., is the State Public Transportation Administrator for the Florida Department of Transportation (FDOT) in Tallahassee, Florida. Hart directs policy development and statewide implementation for aviation, transit, rail, high-speed rail, seaport, and intermodal development. Previously, he served as FDOT State Transit Manager in Tallahassee and as District Public Transportation Manager (District 2) in Jacksonville. Hart graduated from Edward Waters College and holds a master's degree in education from Florida A&M University. He is a member of the American Public Transportation Association State Affairs Committee, and the American Association of State Highway and Transportation Officials Standing Committee on Public Transportation.

Dr. Michael D. Meyer (Report Facilitator) is Professor and former Chair of Civil and Environmental Engineering at the Georgia Institute of Technology. From 1993 to 1998, Meyer was Director of Transportation Planning and Development for the State of Massachusetts, where he was responsible for statewide planning, project development, traffic engineering, and transportation research. Before that, he was a professor in the Department of Civil Engineering at the Massachusetts Institute of Technology (MIT). Meyer has written more than 120 technical articles and has authored or co-authored numerous textbooks on transportation planning, policy and education, environmental impact analysis, and intermodal transportation. Meyer received a bachelor's degree in civil engineering from the University of Wisconsin, a master's degree in civil engineering from Northwestern University, and a Ph.D. in civil engineering from MIT. He is a registered professional engineer in Georgia.

Dr. Kam Movassaghi is Secretary of the Louisiana Department of Transportation and Development (LADOTD) in Baton Rouge, Louisiana. Movassaghi directs a staff of 5,600 employees and an annual budget of more than $1 billion. LADOTD's scope of operation includes all modes of transportation, as well as ports, flood control, water resources, and an offshore oil terminal. The department's research activities are housed at the Louisiana Transportation Research Center at Louisiana State University. Before joining LADOTD in 1998, he was professor and head of the Department of Civil Engineering at the University of Louisiana in Lafayette. His research areas of interest included transportation planning and operations, GIS-T, and network analysis and logistics. Movassaghi is a graduate of the University of Louisiana in Lafayette and holds a master's degree and a Ph.D. in civil engineering from Louisiana State University. He is a licensed professional engineer in Louisiana and has served on several technical and professional committees of the American Society of Civil Engineers. He is president of the Southeastern Association of State Highway and Transportation Officials and a member of the executive committee of the American Association of State Highway and Transportation Officials.

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