

SECTION E

ALLIANCE REGION INVESTMENT STRATEGIES

As noted in the initial announcement regarding the Latin America Trade and Transportation Study, the Southeastern Transportation Alliance was formed "...to assess infrastructure development required to capitalize on international trade with Latin America." Through the execution of this study, the Alliance desires to enhance economic development in the Alliance Region by taking advantage of the accelerating opportunities for trade with Latin America.

In preceding sections of this report, trade opportunities have been assessed, evaluated and forecast. Also, evaluations regarding relevant transportation infrastructure have been presented along with an identification of the infrastructure investments that would support the identified trade opportunities.

Proceeding from these assessments and evaluations, investment strategies were identified for the public sector component of each of the transportation modes. These investment strategies are presented in this section of the report with the intent that they will guide strategic decisions by the Alliance Region and its constituent states.

It may be noted in the subsequent discussions that not all of the strategies are specifically concerned with investment decisions. Instead, some of the initiatives involve institutional arrangements, partnerships, public awareness, etc. While not directly involved with capital programming decisions, these initiatives will influence the environment and processes within which investment strategies are conceived, evaluated and adopted. Use of this broader concept of "investment strategies" permits a more complete consideration of all of the initiatives that are of significant importance to the LATTS goal and supporting objectives, as discussed below.

OVERALL APPROACH

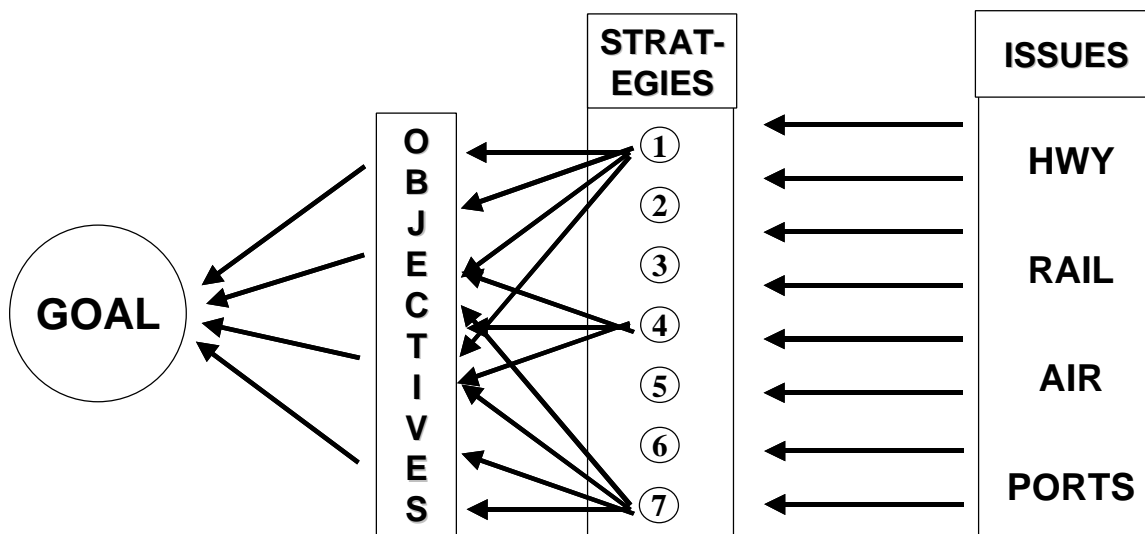
Development of LATTS investment strategies followed an orderly and structured process. The diagram presented in **Exhibit E-1** depicts the principal elements of the approach.

GOAL

The goal of the Latin America Trade and Transportation Study (noted above) framed the study task structure that was undertaken. Effectively, it also framed the goal which the investment strategies are intended to support. The overall goal may be summarized as follows.

Goal – Support economic development through improved transportation for trade.

**Exhibit E-1
INVESTMENT STRATEGY OVERVIEW**



OBJECTIVES

Several objectives must be achieved if the LATTTS goal is to be accomplished. Attainment of the following objectives, in turn, is the intent of the investment strategies which are presented subsequently.

1. **Regional Competitiveness** – Because of its proximity to Latin America, the Alliance Region has distinct geographical advantages with regard to trade with these countries. Effectively, the Alliance Region enjoys a significant advantage because of its geographical relationship to Latin America. To capitalize on this advantage, a number of measures such as a strong, well-educated labor force, favorable environment for industry and commerce, etc. is required. Provision of an adequate transportation system also will enhance the opportunities that derive from the Region’s relatively short trade distances to Latin American markets.

In particular, through the removal of bottlenecks and implementation of other freight facilitation measures, the transport cost component of the overall product cost equation will be reduced. This will yield advantages to those businesses which rely on the LATTTS Strategic Transportation System for freight transport. This advantage extends not only to the Alliance Region’s relationship to other states or groups of states in the U.S. but also to other western hemisphere countries and, indeed, global competitors.

2. **Freight Mobility** – Accommodations for freight mobility must be such that the Region is positioned to capitalize on the distinct geographical advantage it has with Latin America. The Region’s transportation system must be capable of handling the wide variety of cargo origin/destination patterns, shipment

types, and service and handling requirements that are associated with trade with Latin America. The selection of strategic initiatives which follows will provide an optimal level of freight mobility, involving multiple choices of mode and allowing freight to reach markets and customers on a timely basis and at a low cost. This will ensure that the Region continues to enjoy advantages regarding freight mobility.

3. **Interconnected Multimodal System** – Achievement and continuance of a high level of freight mobility will require an interconnected multimodal transportation system. As noted throughout this report, there is a wide diversity in the characteristics of trade flows to and from Latin America. These diverse circumstances require that there be a high degree of flexibility available to shippers so that their specific needs and changing circumstances can be accommodated. Only an interconnected multimodal transportation system will provide the type of flexibility that is required. An interconnected multimodal system will provide modal alternatives and operational efficiencies that translate into faster connections, greater flexibility and safer conditions, thereby allowing freight to move in the most efficient and timely manner that is feasible.
4. **Efficiency** - Transportation efficiency embodies a number of features including directness of routing, responsiveness to a variety of transit time requirements, capacity, accommodation of freight handling needs, flexibility to address changing circumstances, transit reliability, etc. These features determine the ability of the transportation system to accommodate the diverse and frequently changing needs of international (and domestic) freight. Additionally, they affect the transportation costs of freight which, in turn, affects the competitiveness of industries engaged in trade with Latin America. Transportation investment strategies should ensure that the various transportation efficiency features are achieved.
5. **Environment** – The provision and maintenance of a high-quality transportation system that is responsive to the needs of international and domestic trade flows cannot be at the expense of a significant reduction in the environmental qualities that are highly regarded by the public. While some impacts are inevitable just because trade volumes will increase, responsible and feasible ameliorative actions are needed to ensure that the environment is not unnecessarily degraded. Indeed, if transportation investments are appropriately planned to handle increasing trade flows, the impact of higher volumes will be minimized. Further, the design and operating features of the future transportation system must, by statute, be in a manner that responds to environmental requirements.
6. **Safety** – Implementation of the LATTs investment strategies cannot be allowed to compromise transportation safety concerns. Appropriate safety features are required in the transportation system so that both freight and personal travel are accommodated without undue risk. Indeed, some of the deficiencies noted in earlier sections of this report have safety implications.

Decisions regarding transportation investments must weigh all considerations so that safety-related projects are appropriately addressed.

7. **National Security** – Recent times (e.g., Desert Storm) have demonstrated the need for the Alliance Region transportation system to respond to major surges in demand such as those associated with emergency national security needs. Indeed, as denoted by the name National System of Interstate and Defense Highway, planning for some transportation facilities explicitly addresses national security needs. Implementation of the LATTTS investment strategies will not only improve mobility for freight and personal travel, but will also improve the capability of the nation's military forces to carry out their missions.

INVESTMENT STRATEGIES AND TRANSPORTATION ISSUES

The transportation investment strategies which evolved from the LATTTS analysis and evaluations are supportive of the goal and objectives discussed above. Development of these strategies also took into account the various issues which were identified for each transportation mode during the course of the study. These issues constitute impediments to the realization of the goals and objectives that are the focus of the LATTTS investment strategies.

Guiding Themes

The following three themes served as a guide for the development of investment strategies for each transportation mode:

- ▶ **Systems Approach** – While transportation facility planning often tends to focus upon individual facilities and services, a much broader approach is essential in planning for Latin American trade flows. As noted throughout this report, the focus of LATTTS was upon Latin American trade but it also was essential that LATTTS address total worldwide trade flows that affect the Alliance Region. Similarly, LATTTS did not focus upon individual transportation facilities. Instead, all components of the transportation system in the Alliance Region that already serve Latin American trade flows, or which potentially could serve these flows, were identified and addressed.
- ▶ **Modal Choice** – With the exception of some of the Latin American trade flows across the Texas/Mexico border, virtually all trade with Latin America involves the use of more than one transportation mode. This partially is due to geographic conditions which require a mainline movement by water or air (again, excepting cross-border traffic), with domestic distributions using a variety of modes. The multimodal pattern of Latin American trade flows also is reflective of the huge diversity in the nature of the commodities which are shipped and the roles these commodities play in the industrial production and commerce sectors. A multimodal transportation system with a large variety of transportation services (e.g., door-to-door services, express services, “time-definite” services, integrated logistics services, etc.) is required to accommodate the vast variety of commodities and service requirements of business enterprises that are engaged in trade with Latin America.

- ▶ **Dynamic Economy** – Economic conditions which drive trade with Latin America are dynamic by their very nature. Indeed, the pace of economic change has been accelerating rapidly in recent times and, in all likelihood, will continue to do so for the foreseeable future. This partially reflects the changes in industrial and commercial technology, particularly that which is associated with communication systems. Additionally, it reflects the changes which occur in the overall economy of the United States as well as all of the international trading partners, including Latin American countries. While the approach taken by LATTTS has been forward-looking, clearly it is not possible to anticipate fully the changes in economic conditions that will actually occur. The economic trends identified and forecast by LATTTS will require periodic reexamination to determine the impact of economic changes that cannot fully be anticipated.

General Strategies

The strategic initiatives which evolved from these evaluations and assessments resulted in the identification of a series of basic strategies that will aid the Alliance in achieving its goal and the supporting objectives. The strategies generally fall into the following categories:

- ▶ **Utilization of Existing Infrastructure** – Because of scarce resources, it is essential that the existing transportation infrastructure be utilized in the most effective and efficient manner. Strategies designed to achieve optimal utilization primarily will support the LATTTS objectives regarding regional competitiveness, freight mobility, efficiency and national security.
- ▶ **Add Physical Infrastructure** – In some cases, even the optimal use of existing infrastructure will not obviate the need to add capacity and connectivity to the transportation system. Accordingly, prudent investments in new physical infrastructure clearly will be required. Strategies involving additional infrastructure will support the LATTTS objectives regarding regional competitiveness, freight mobility, interconnected multimodal system, efficiency, safety and national security.
- ▶ **Increase Operating Throughput** – Strategies to increase operating throughput overlap and are significantly interrelated to some of the other strategic initiatives discussed herein. In combination, implementation of these initiatives will ensure that the LATTTS Strategic Transportation System is capable of accommodating the expected increases in trade with Latin America as well as the other transportation demands that are placed upon the system. Initiatives designed to increase throughput capacity will support LATTTS objectives regarding regional competitiveness, freight mobility, interconnected multimodal system, efficiency and national security.
- ▶ **Corridor Approach for Investing** – Study analyses have documented a pattern of freight movements which often involve significant corridor volumes. Concentration of investments in major corridors will have a major impact upon the achievement of LATTTS objectives regarding regional

competitiveness, freight mobility, interconnected multimodal system, efficiency, safety and national security.

- ▶ **Agile Freight Operations** – The LATTs Strategic Transportation System must be able to cope with major surges in traffic flows and with a variety of cargo handling and transportation requirements. Enhancement of the agility of the system to adapt to these circumstances will support LATTs objectives regarding regional competitiveness, freight mobility, interconnected multimodal system, efficiency and national security (including military deployments).
- ▶ **Improved Clearance Processes at Gateways** – A major challenge confronting the freight industry is to optimally improve clearance processes at gateways such as customs inspection stations and cargo delivery through freight terminal gates. These initiatives will support LATTs objectives regarding regional competitiveness, freight mobility, efficiency, and national security.
- ▶ **Attention to Connections** – Another major challenge is the facilitation of freight movements between freight terminals and mainline facilities. Strategies which address the needs of intermodal connectors will support LATTs objectives regarding regional competitiveness, freight mobility, interconnected multimodal system, efficiency, environment, safety and national security.
- ▶ **Encourage Technology** – Transportation technological advances often have a significant impact in terms of productivity gains. Initiatives designed to achieve optimal productivity through technology will support LATTs objectives regarding regional competitiveness, freight mobility, interconnected multimodal system, efficiency, environment, safety and national security.
- ▶ **Information Integration** – Improvements in communication and data interchange within the freight industry will support LATTs objectives regarding regional competitiveness, freight mobility, interconnected multimodal system, efficiency and national security.
- ▶ **ITS Applications** – Strategies to employ Intelligent Transportation Systems (ITS) are interrelated and overlapping with other strategies which focus upon better use of existing infrastructure, increased throughput capability, agile freight operations and improved clearance processes at gateways. ITS strategies will support LATTs objectives regarding regional competitiveness, freight mobility, interconnected multimodal system, efficiency, safety and national security.
- ▶ **Increase Public Awareness** – Achievement of the LATTs goal and objectives is, in large measure, dependent upon public and political support. Only with this support will it be possible to implement the strategic initiatives which are proposed by this study. In effect, public awareness initiatives will be supportive of all of the LATTs objectives.

- ▶ **Improve Institutional Relationships** – Formation of the Southeastern Transportation Alliance for purposes of conducting the Latin America Trade and Transportation Study illustrates the benefits that can be achieved by enhanced institutional relationships. Additional initiatives to improve institutional relationships within the governmental domain will support all of the LATTs objectives.
- ▶ **Partnerships** – In addition to improved relationships between governmental institutions, there is increasing awareness of the need for partnerships between public and private interests. This is particularly true regarding the freight industry which is largely dominated by the private sector. Nevertheless, the public sector plays a major role in the provision, maintenance and operation of significant portions of the freight transportation system. Partnerships which enhance the interrelationships between the public and private sectors will be supportive of all of the LATTs objectives.
- ▶ **Improve Freight Profile** – In recent times, freight transportation has achieved greater visibility within governmental transportation agencies. This higher profile is warranted by the importance of freight transportation in the economic viability of communities, states, the Alliance Region and the nation as a whole. Accordingly, initiatives are needed to raise the profile of freight within transportation planning activities and investment decisions. Initiatives which increase the visibility and profile of freight will be supportive of all of the LATTs objectives.

Subsequent discussions present a series of strategic initiatives which broadly encompass the categories of strategies summarized above. Because there is considerable overlapping and interrelationships between these categories, subsequent discussions do not rigidly adhere to the categorical structure set forth above. For purposes of convenience and ease of understanding, initiatives are presented within those categories for which they have the best fit. Consequently, it can be noted that some categories seem to be less represented simply because of this approach. However, careful consideration will reveal that all of the categories are encompassed by the proposed strategic initiatives even if they appear to be under represented in the structure of the following presentations.

LATTs STRATEGIC PORT SYSTEM ISSUES

The issues identified in this section address the challenges and opportunities that face the maritime industry from a landside infrastructure perspective. Members of the LATTs Alliance are facing significant challenges in the next 20-years. These challenges pose several opportunities for the maritime industry to develop a viable future for the significant cargo growth projections that are anticipated. The port issues for the LATTs Alliance may be grouped as follows:

- Capacity Needs
- Efficiency
- Port Agility
- Intermodal Systems
- Hub and Feeder Concepts
- Competitive Barriers
- Environment
- Finance

Capacity Needs

The primary issue facing the LATTTS Alliance ports is revealed by the capacity analysis performed in the study. The future 2020 estimated infrastructure need of approximately 10,051 acres for all cargo types in the LATTTS Alliance Region identifies a significant issue in relation to the future capacity needs for the projected cargo growth. The needed 10,000 + acres are in addition to the existing 7,327 acres that comprise the port infrastructure that was considered in the analysis. To accommodate future cargo projections with current infrastructure and operations, approximately 10,051 additional acres are needed.

It is important to make the correlation between the projected cargo tonnage increases and a physical need such as infrastructure acreage to better understand the capacity issues facing the Alliance Region. For example, the Port of New Orleans has begun to identify and address such future needs by considering possible opportunities to accommodate the potential cargo growth. The Port of New Orleans' Millennium Port Project considers the future need of approximately 250 acres of new container terminal infrastructure by the Year 2020. However, the infrastructure need in the Millennium Port Project considers relocating the current infrastructure as well as developing additional container terminal acreage.

Additionally, it is important to understand that the LATTTS Alliance Region is not the only region within the United States that requires significant infrastructure improvements to handle projected cargo growth. For example, the Port of Los Angeles (POLA) and the Port of Long Beach (POLB) have recognized the future need for improved capacity at their facilities. A conservative estimate of the San Pedro Bay port's container growth projections shows a potential increase of three to four-fold by the Year 2020. This conservative estimate includes the continuation of the "Asian Flu" through the 20-year planning life. Such a growth in container cargo is estimated by the POLA and POLB to approximately equal an additional 9,400 acres of container terminal infrastructure to accommodate the throughput increases under current development and operating practices.

The remaining seven LATTTS ports issues were derived from the capacity needs identified in this analysis or they have a direct impact on the implementation of accommodating the need. Either way, the following LATTTS port issues are all effected or are affected by the estimated future capacity need in the Alliance Region.

Efficiency

Increasing marine terminal efficiency is the primary alternative to developing additional infrastructure. The majority of the LATTTS ports are operating at adequate throughput efficiency levels. However, these efficiency levels are dependent on current industry technology and operating practices. Most ports have not completely embraced some of the Information Technology (IT) concepts that are available. Some of the new IT concepts have the potential to increase

efficiency and productivity at marine terminals, thereby lessening the acreage development that might otherwise be needed.

For the past decade, the port industry has been experiencing the new information age through various methods of communication and data interchange such as Terminal Operating Systems (TOS), Intelligent Transportation Systems (ITS), Automatic Equipment Identification (AEI) technology and cargo tracking systems. These IT concepts have a significant impact on the operations and physical requirements associated with marine terminal development. Potential efficiency increases are being identified in the development of intermodal systems, port agility and hub and feeder concepts.

As an alternative to developing additional infrastructure, the maritime industry should consider ways to maximize the efficiency of the current terminals. New technologies and concepts will have a direct effect on equipment utilization and operations at marine terminals that will provide increased efficiencies.

Another issue that affects the efficiency with which port capacities are utilized is associated with restrictive provisions in labor working arrangements and contracts. Work rules for longshoremen and other covered dock workers at some unionized seaports limit the ability of port management to implement changes regarding the hours of operation and, in some instances, changes involving advances in throughput technologies and mechanization that would lower overall handling costs. These constraints affect the ability of ports to achieve optimum efficiency in the use of capacity associated with port infrastructure.

Port Agility

Port agility concepts are being developed and assessed by several organizations within the United States. The Center for Commercial Deployment of Transportation Technologies (CCDoTT), a DOD funded research arm of the California State University at Long Beach, is addressing the DOD perspective on port agility. Port agility involves the ability of a commercial marine terminal to provide increased throughput capacity for military cargo during times of military surge, deployment and sustainment, with minimal disruption to existing cargo flows and port operations. In addition, this definition of port agility includes the capability of a marine terminal to remain flexible enough to accommodate multiple cargo types (i.e. container, break bulk and ro-ro).

As of the time of this report writing, CCDoTT was assessing and developing port agility concepts that apply to West Coast container operations while the Maritime Administration (MARAD) is leading an effort to assess the requirements and benefits for implementing a port agility concept in the Philadelphia region. The Philadelphia work is geared toward assessing the potential productivity increases of implementing an Agile Port System (APS) in the region for container, breakbulk and ro-ro terminals. The potential productivity increases will provide additional capacity at existing marine terminals while also providing the surge capability for the military.

Intermodal Systems

The service characteristics needed to enhance economic opportunities in current circumstances has been described as follows:

"In today's just-in-time shipping environment, importers and exporters are demanding that port authorities play a more assertive role in facilitating swift movements of their shipments....increasingly, shippers say, they want a total service from ports, including everything from frequent calls by ocean carriers to modern terminals and on-dock rail yards, to efficient highway and rail infrastructure....their wish list also includes extensive truck and rail service, professional treatment by Customs, and a productive labor force....when one or more of these elements break down, shipper's loyalty to a port (or region) begins to ebb and they look for alternative gateways....we don't want any bottlenecks....(The Journal of Commerce, June 16, 1997)."

Current shipping and business practice calls for the delivery of product in inventory real-time, as needed. Nowhere is this "just-in-time" logistical supply chain for business more evident than in manufacturing and shipping. Many "value-added" manufacturing enterprises operate 24 hours per day and depend on the timely delivery of chemicals or partially assembled parts for production and the timely removal of finished product to keep operations and final assembly on-time and on-budget. Passengers transported to and from seaports for cruise travel are no different. Cruise operators also depend on "just-in-time" delivery of passengers, their baggage, as well as the provisions for their ships.

Port users, because of competition, are always looking for transportation savings when and wherever possible to maintain and grow their customer base. When transportation congestion is problematic on the routes between port and railhead or port and point of destination, transportation costs rise (labor, fuel, time) and their competitive edge diminishes. The ultimate losers in this process are the local, statewide, and regional communities that derive the economic benefit from the transport of international commerce.

The Alliance Region's continued growth in trade and its ability to attract new manufacturing and support industries are threatened if seamless, cost-efficient, intermodal transportation is overlooked. "Bottlenecks" at seaport or riverport gateways must be eliminated. Balanced system capacity is essential to maintaining the free flow of goods across port boundaries. Unless the landside intermodal system, consisting of the roads and railroads that are the "connections" to seaport and riverport gateways, match a port's own pace of throughput, the resultant bottlenecks will defeat the concept of "integrated, fast, and competitive."

Most "deficiencies" occur primarily in the shorter distances such as the immediate connections to the seaports or riverports, the congested urban streets over which trucks must move cargoes, and even the major arterials leading to somewhat distant industrial parks, warehouse, transloading facilities, and rail yards. Most of the bottlenecks impeding the integrated, fast and competitive

movement of goods occur at these locations, the on-port/off-port intermodal connections.

In the future, if these “deficiencies” are to be overcome, Alliance Region members must work collaboratively to develop a realistic estimate of the unfunded seaport-riverport related intermodal access needs on five, ten, and twenty year horizons. Once this is accomplished, then the most difficult variable, “financing” those needs, becomes the issue. This topic is also discussed in the “Highway” portion of this report section.

Agile Port System

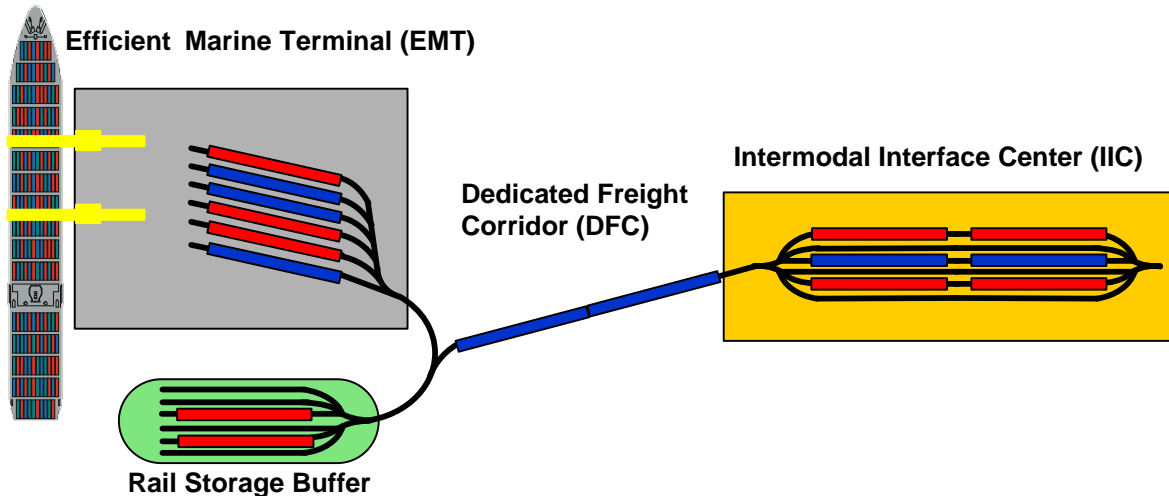
APS is being developed and assessed as one of various multimodal/intermodal concepts capable of accommodating a regional need for increased throughput capability and flexibility. In addition, all port agility attributes are applicable to APS concepts and include the integration and interoperability of all modes of transportation (i.e. marine, rail, truck, air) and their associated modal data.

By taking a systemic approach to port agility, increased productivity and additional efficiencies are attained. These are obtained by connecting multiple conventional marine terminals (no new equipment or infrastructure) to one or two Intermodal Interface Centers (IIC) with freight corridors (truck or rail). The APS concepts being developed address the need to move cargo through marine terminals at a higher velocity, thus increasing the throughput capacities of existing infrastructure. To accomplish the higher cargo throughputs, it is necessary to move the cargo storage, distribution and staging operations to the IIC at an inland location where development costs are lower and connectivity to highway and rail corridors is available.

A concept that is currently being assessed and developed by CCDoTT is called the Efficient Marine/Rail Intermodal Interface (EMRII) System (refer to **Exhibit E-2**). This patented concept envisions loading and unloading large amounts of container cargo in a rapid operation to increase cargo throughput at ports. The EMRII system uses simultaneous load and unload operations at the port between the vessel and “on-dock” rail loading tracks. Shuttle trains transfer the containers along a dedicated rail corridor between an Efficient Marine Terminal (EMT) and an IIC.

Such a systemic approach to accommodating marine cargo places a high demand on the cooperation between marine terminal, railroads, trucking companies and shippers. To successfully implement an APS it is necessary to provide the proper data for all parties involved. Therefore, the integration of various IT concepts and technologies is needed to bridge the communication gaps between all transportation modes and the terminals.

**Exhibit E-2
CONCEPTUAL DIAGRAM OF THE EMRII SYSTEM**



Hub and Feeder Concepts

The hub and feeder concept is the preference of large oceangoing carriers and many of the carrier alliances. This concept is designed to reduce port-of-calls for the carriers by utilizing larger capacity vessels and a network of feeder vessels serving a variety of ports. Like the hub and spokes of a wheel, the feeder portion of this system allows greater flexibility of service. Since the hub port provides the primary storage function for the hub carriers, much smaller vessels have access to cargo which, in turn, service smaller ocean and riverports. While the hub carrier vessels range from 3,000 to 6,000 TEU capacity, the feeder vessels carry as little as a few hundred twenty-foot equivalent units (TEU), particularly barge feeder services.

Competitive Barriers

The nature of the port industry is naturally competitive. Most ports are very competitive with their neighboring and regional counterparts. To implement systemic approaches for increasing cargo throughput with existing infrastructure, many of the competitive barriers that prohibit communication between carriers, shippers, terminals etc. will need to be eliminated or reduced.

Ports and railroads are beginning to recognize this need for communication of cargo transfer data and are benefiting from greater communication and coordination. Marine carriers and truckers will also need to join in and cooperate with all parties that are participating in the freight transportation chain. Increased communication between all transportation modes will not only benefit commercial freight but will also benefit military requirements. This type of increased cargo information sharing is a delicate process that will need to be implemented and

managed by a neutral party to ensure security and preservation of competitive advantages.

While it is very unlikely that the LATTS Alliance will develop into a large APS, regions (i.e. local, state, etc.) within the Alliance will be able to form an APS for their specific needs. This will require cooperation from neighboring ports and IIC terminals.

Environment

As the effect of industrial development and operations on the environment are better understood, new initiatives and constraints are being evolved that affect the development of port infrastructure. Recently, the California Coastal Commission (CCC) mandated that no new non-port designated area will be created in the state of California. This means that, while expansion of existing facilities is permitted, projects like the Port of New Orleans' Millennium Port would not be permitted. This type of environmental constraint has an adverse effect on the ability of a region to accommodate future cargo growth. Therefore, concepts other than developing new or additional infrastructure will need to be considered (i.e. higher efficiency and utilization of existing infrastructure).

Port development can have an adverse effect on the surrounding environment such as wetlands, riparian areas, shorelines and shallow water habitats. In many cases of environmental effects on these types of areas, appropriate mitigation is required to maintain the balance of the existing environment. In many cases, the required environmental mitigation is the minimum of a 1:1 ratio. For example, if 25 acres of wetland are claimed due to filling and constructing port infrastructure, the development of at least 25 acres of new or dedicated wetland is required.

As new technologies and additional infrastructure are developed for port activities, it will be necessary to minimize environmental impacts and their associated additional cost.

Finance

Development of marine terminal infrastructure is very costly. In most regions, new developments, retrofits and improvements to ports are typically subsidized or financed by means other than port revenue. Some of the financing sources available to ports include private funding, revenue or general obligation (GO) bonds, funding from the Transportation Equity Act of the 21st Century (TEA 21), National Corridor Planning and Border Infrastructure Programs and state and local grants and bond programs.

Innovative financing opportunities such as private/public partnerships and the Transportation Infrastructure Finance and Innovation Act (TIFIA) should be considered. TIFIA allows the U.S. DOT to provide credit assistance to public private sponsors of surface transportation projects. In addition, the possibility of combining funding opportunities between different transportation modes should be considered.

To accommodate the infrastructure and technology need of the future port industry, new and innovative financing alternatives will need to be developed and implemented. Similar to the demands on the existing port industry infrastructure and operations, current financing practices will not provide all that is required.

After appropriate sources of funding are identified, there are justifications for defining landside access projects to key intermodal facilities and port-related transportation projects as a special category for funding in the overall state and local transportation financing program. Once these projects are identified, and on the project candidate list, the state transportation agencies should collaborate with their metropolitan planning organizations to pare this list down to revenue reasonable annual funding priorities that eventually, over time, eliminate the deficiencies identified. The concept could be an entitlement work program similar to other work programs identified in the annual State Transportation Improvement Program. Although the work program for landside access and port infrastructure and for on-port infrastructure changes frequently due to market driven priorities, this type of structure has been shown to be effective by programs long underway in Florida and Louisiana.

LATTS STRATEGIC PORT SYSTEM STRATEGIES

The following strategies were developed by addressing the issues that were identified for LATTS Strategic Ports and the goal and supporting objectives adopted for the overall LATTS Strategic Transportation System.

Regional Competitiveness

The following summary of strategies consist of the maritime component of the LATTS objective regarding “Regional Competitiveness”:

Utilization of Existing Infrastructure - As cargo requirements increase, it will be important to maximize the utilization of existing port infrastructure prior to constructing new terminals. This approach will have a significant effect on how ports establish and maintain their competitive advantages between each other.

Develop Agile Freight Operations - As the systemic approach to the port industry begins to evolve, regional competition will begin to adjust to the needs of the region while maintaining competitive attributes within the ports. This is a significant hurdle for the port industry and will require a significant effort of cooperation and trust.

Encourage Technology/Integration of Information/ITS Applications -The first ports to implement a systems approach and to provide modal choice to their customers will have a significant advantage. However, it will be no small task for a port or region to provide the needed Information Technology (IT) solutions that their customers are beginning to demand.

Partnerships - Agreements between ports and other industries such as rail, truck and marine cargo carriers will become more important as the higher

demand for cargo throughput and efficiency occur. In addition, agreements between ports will become more prevalent as regional systems are developed.

Freight Mobility

The following summary of strategies constitutes the maritime element of the LATTS objectives regarding freight mobility.

Develop Agile Freight Operations - Freight mobility is becoming more dependent on the connectivity of different freight systems such as highway and rail infrastructure. By connecting the four transportation modes in a regional approach, the typical operations at marine terminals today contribute to increased productivity of freight mobility.

Improve Clearance at Gateways - To maintain efficiency and productivity within freight mobility, it will be important to increase the productivity of gateways such as customs inspection stations and cargo delivery through terminal gates.

Encourage Technology/Integration of Information/ITS Applications - The demand for IT capabilities to support requirements for cargo visibility, in transit rerouting, dynamic restowing of vessels and direct vender deliveries will help increase freight mobility. Improved information systems and equipment technologies will have a significant effect on port development and help accommodate the freight mobility needs of the port industry.

Improve Freight Profile - To support freight mobility, the freight profile or cargo type will evolve to the demand of the customer. For example, container cargo is the most agile unitized cargo in the freight system. To improve the freight profile of container cargo, the industry has undertaken innovations such as tagging for cargo tracking capabilities.

Interconnected Multimodal System

The following summary of strategies comprise the maritime component of the LATTS objective regarding “Interconnected Multimodal System”:

Utilization of Existing Infrastructure - From a multimodal system approach, it is important to maximize the utilization of existing port infrastructure prior to constructing new terminals. This approach will have a significant effect on how ports maintain and evolve their infrastructure to accommodate a systems approach.

Add Physical Infrastructure - In some cases where the cargo growth projections are fairly high, new infrastructure will be required. Implementing a multimodal system will not provide the needed cargo throughput capacity to accommodate all cargo projections. In addition, the retrofitting of existing port infrastructure and new infrastructure to connect the components of the system will be required.

Increase Operating Throughput - The primary goal for developing multimodal systems is to maintain a high level of cargo velocity within the freight system. The faster cargo passes through the freight system, the lower the burden on port throughput capability. This increase in port operating throughput will provide a significant amount of extra capacity in the Alliance ports to handle future cargo.

Corridor Approach for Investing - Investment strategies will be different as regional participation between a variety of multimodal system participants becomes more prevalent. Rather than competing between ports for investment opportunities, the industry is beginning to see ports combine efforts regarding investment strategies.

Develop Agile Freight Operations - The connectivity of different freight systems such as highway and rail infrastructure will require attention to agility as the systemic approach to the port industry begins to evolve. By connecting the four transportation modes with a regional system, the typical operations at marine terminals today will begin to change.

Improve Clearance at Gateways - To maintain efficiency within multimodal systems, it will be important to increase the productivity and security of gateways such as customs inspection stations and cargo delivery through terminal gates. One aspect of the multimodal systems is to allow pre-clearing of cargo at the marine terminal.

Encourage Technology/Integration of Information/ITS Applications - As APS concepts begin to develop in various regions, the demand for IT capabilities to support requirements for cargo visibility, in transit rerouting, dynamic restowing of vessels and direct vendor deliveries will increase. These improved IT capabilities will have a significant effect on port development costs and requirements.

Improve Institutional Relationships - One of the most challenging obstacles facing the implementation of multimodal systems requires a rethinking of institutional relationships. Ports will not be able to efficiently accommodate future cargo growth alone. Communication with other institutions such as the railroads will play a key role in the success of developing these systems.

Partnerships - Agreements between all modes of transportation (rail, truck, air and marine) will become more important as the higher demand for cargo throughput and efficiency begin to impact the existing infrastructure.

Efficiency

The following summary of strategies comprise the maritime component of the LATTS objective regarding “Efficiency”:

Utilization of Existing Infrastructure - It is important to maximize the utilization of existing port infrastructure prior to constructing new terminals. Increased throughput capacity can be reached by more efficient use of existing infrastructure. In most cases, the increased efficiencies are related to the proper use of IT.

Add Physical Infrastructure - In some instances, new infrastructure will be required. Implementing new efficient and systemic infrastructure will require proper planning to ensure the most efficient use of new infrastructure. In addition, retrofits to existing infrastructure should be considered as an alternative to new construction.

Increase Operating Throughput - Systemic approaches to port development are key to the increase of cargo velocity within the freight system. However new innovations in equipment and technology will help increase efficiencies at marine terminals. This increase in port operating throughput will provide a significant amount of extra capacity in the Alliance ports to handle future cargo and will have an effect on operating costs as well.

Develop Agile Freight Operations - Port operations in accordance with APS concepts will help increase efficiencies at marine terminals where intermodal operations occur. In addition, the capability of surging cargo with minimal disruption to marine terminal operations will contribute to increase efficiencies.

Encourage Technology/Integration of Information/ITS Applications - Without IT capabilities and all the benefits from new technologies and ITS applications, APS concepts could not exist. The heart and soul of APS is highly dependant on the benefits from information technology such as cargo visibility and in transit adjustments to freight flows.

Environment

While the need for additional infrastructure is a constant pressure, the port industry should consider the impact it may have on its surroundings. The following summary of strategies consist of the maritime component of the LATTs objective regarding “Environment”:

Utilization of Existing Infrastructure - The initial option for accommodating cargo growth should concentrate on rehabilitating or retrofitting existing infrastructure. However, some sites are environmentally unsafe and require a significant amount of cleanup. Some federal initiatives have been implemented to assist in the cleanup and development of “Brownfield” sites. These are sites that require a significant amount of cleaning of contaminants prior to developing future infrastructure.

Add Physical Infrastructure - In considering the addition of new port infrastructure, the EPA requires mitigation for claiming wetland areas while minimizing the impact of contaminants on wildlife, foliage and land. To preserve the environment, the port industry must consider the impact of future development on the ecosystem. Some ports go as far as mitigating with recreational areas, reclaimed wetland and other developments on port property.

Increase Public Awareness - ports need to educate the public regarding their contributions to the environment. Part of public acceptance of increasing port infrastructure is the public’s education of the existing environmental conditions

and potential impacts. Mitigation requirements and regulations have guided port development over the recent years. The public needs to be aware of these events to gain their acceptance of future development projects.

Safety

Ports are very busy work environments with large machinery and complex operations. Under these circumstances, it is important to provide a safe environment for workers to perform their responsibilities and duties. The following summary of strategies comprise the maritime component of the LATTS objective regarding “Safety”:

Utilization of Existing Infrastructure - A constant effort is required to upgrade and maintain existing infrastructure to adhere to Occupational Safety and Health Administration (OSHA) regulations. These efforts include the renovation of existing infrastructure as well as new infrastructure

Increase Operating Throughput - As new types of marine terminals are being developed and new types of equipment are being used, OSHA regulations will need to adjust for the innovations. As cargo transfer becomes more rapid and freight flow begins to increase in velocity, safety issues will increase.

Encourage Technology/Integration of Information/ITS Applications - New innovations in technology for operating equipment are being developed to minimize the potential of worker injury. Better visibility of surroundings and operator friendly equipment will promote safe working areas at ports

National Security

Ports are primarily considered to be points of deployment from a national perspective of response to international instances. The U.S. military intends that future major foreign deployments will be more rapid and occur in less time than was taken in Desert Storm. This will place a significant demand on port infrastructure as troops and equipment are surged through the transportation system. The following summary of strategies presents the maritime component regarding the LATTS objective of “National Security”:

Utilization of Existing Infrastructure/ Add Physical Infrastructure - To accommodate the future military requirements for surge and sustainment of military cargo through existing and future port infrastructure, new concepts such as APS will impact the way ports are developed and how they are retrofit with new equipment. Because the infrastructure that will be used by the military is developed for commercial use, innovative changes will be needed at ports to accommodate the military cargo.

Increase Operating Throughput/Develop Agile Freight Operations - To minimize disruption of existing commercial operations at ports, new operating concepts will need to be considered. Some of these innovative operations will be developed from APS concepts and others may be developed from new

equipment and new technologies. As military cargo demands change, operating requirements at ports will require new operating systems.

Encourage Technology/Integration of Information/ITS Applications - The military has a high need to understand cargo attributes such as what is in their containers, where their cargo is, where it is going, where it is coming from and when will it arrive. These requirements will not be met by military technology and IT capabilities alone. The military will need to utilize commercial technology and resources to better manage the transfer of their cargo through the freight system.

While there are significant needs and opportunities facing the port industry due to the future cargo projections in the LATTS Alliance Region, there are several challenges facing the industry as new and innovative concepts, operations and equipment are becoming more readily available. It is important for the Alliance Region to begin considering these issues to ensure the future viability of its port infrastructure and transportation system.

LATTS STRATEGIC AIRPORT SYSTEM ISSUES

There are a number of issues which weigh upon the ability of the LATTS Airport System to fulfill its functions within the overall LATTS Transportation System. This, in turn, presents challenges to the achievement of the LATTS goal and its seven supporting objectives. The most significant of these issues are summarized below.

Miami International Airport

Over 90 percent of the Alliance Region's airborne Latin American freight passes through gateways in Florida, with most of this traffic being concentrated at Miami International Airport (MIA). This is reflective of MIA's favorable location relative to Latin America as well as the strong cultural and socio-economic ties Miami-Dade County has with Latin America.

This high concentration of Latin American airborne freight at a single airport has certain advantages as it relates to domestic distribution. MIA serves as a major hub for this traffic and the distribution pattern is of a hub and spoke nature.

Unfortunately, congestion at MIA is causing some concern, especially since there are limits as to what can be done to increase capacity by operational improvements and new facility construction.

Congestion at MIA is one of the reasons that other LATTS airports are beginning to serve growing volumes of Latin American airborne freight. In some cases, the growth in Latin American airfreight also reflects the geographical relationships of other LATTS airports to Latin America as well as the domestic distribution patterns that exist at these airports.

There are good reasons for the Alliance to encourage the growth of Latin American airfreight at other LATTS airports. This would help moderate the growth pattern of Latin American airfreight at MIA, thereby helping with

congestion problems at this major hub. It also would retain the Alliance Region's role as the major gateway for Latin American airfreight flows.

Constraints on Airport Expansions

As noted above, there are constraints at MIA which limit its ability to accommodate all of the growth in Latin American airborne freight which has been forecast by the LATTs analyses. Constraints also exist at other LATTs airports where congestion is becoming a concern such as Atlanta, Cincinnati, New Orleans, Charlotte, Dallas-Fort Worth, etc.

A long-term Alliance Region strategy must take into account the congestion levels that exist (and which are forecast) at those LATTs airports which are experiencing high traffic volumes and increasing congestion. Constraints on capacity expansion at these airports must be weighed against the benefits that would derive from promoting alternative LATTs airports to accommodate some of the future increase in air traffic. Of necessity, these evaluations will require consideration of total air passenger and airfreight flows since Latin American air traffic tends to be a small proportion of the total. Still, in improving Alliance Region's total airport system, this will benefit Latin American airfreight and further achievement of the Alliance's goal and supporting objectives.

Dominance of Air Passenger Traffic

Latin American airfreight tends to be a small portion of the traffic at most LATTs airports. Further, airfreight (including all trade sectors, not just Latin American air freight) typically involves a relatively small portion of total traffic at these facilities. The fact that commercial passenger airlines derive only 16 percent of their total revenue from air cargo partially indicates the secondary role of airfreight in the total aviation sector.

These and other factors sometimes result in airfreight being a secondary consideration in the planning and operation of airport facilities. While all-cargo operations typically receive reasonably high profile consideration, the largest airfreight segment (i.e., the 55 percent of air cargo carrying capacity which is in the bellies of passenger aircraft) appears to be getting diminishing attention. This is in part due to the higher overall profile of air passenger traffic and the many challenges airports and airlines are facing in their efforts to accommodate the growth in air passenger flows.

Consequently, except at a few airports like MIA, it is unlikely that the Latin American air cargo shipment of all air traffic will receive significant attention relative to other air traffic sectors. Special efforts will be required to raise the profile of this traffic segment and it is not clear that this is necessarily warranted given the many challenges which exist in the aviation sector.

Just-in-Time Shipments

While air passenger services continue to play a dominant role in the aviation sector, there are various changes in industry and commerce that are resulting in increasing volumes of airfreight. One phenomenon is the change in production philosophy to reduce inventory, storage and other costs via just-in-time

operations. For instance, Dell computer reportedly has adopted an operating philosophy to not manufacture products until the product is already sold. Saturn, the automobile manufacturer, tries to maintain an inventory of parts that does not exceed 18 hours of production.

Coupled with this type of production philosophy is the tendency for companies (or divisions of companies) to out source their logistics function rather than maintain an in-house logistics unit. Companies often determine that there are cost savings when they out source logistics services to integrated express carriers. The companies which do so often handle high-value, time sensitive products, i.e., products that are most suitable for transport by air. Also, these companies often have high inventory turnover, short product life cycle and rapid stock rotation. They typically require high levels of service such as that which is offered by the aviation sector.

Continued expansion of industries of this type will lead to further growth in airfreight. While a goodly portion of this has little to do with Latin American trade, it can be expected that this segment of airfreight will be impacted to some degree.

International Carriers

Another matter of concern is the expansion of the “open skies” policy. As this occurs, it is probable that more air freighters will be operated by international charters. The nature of international charter carriers tends to differ from domestic freight operators. These differences involve such things as available ground support equipment such as top deck loaders, availability of ground handling staff, customs processing, etc. This, in turn, places additional requirements on LATTIS airports to handle international charters.

Multiple Types of Air Freight Operations

International charters as discussed above constitute one type of airfreight operations with which airports must cope. In fact, there are several different types of freight operations, all with their own requirements.

For example, regional airlines typically operate aircraft such as turbo-prop and regional jets that cannot accommodate large, bulky air shipments. On the other hand, airlines which operate wide-body aircraft, such as the B747, B777 and A300, have containerized lower decks. This allows greater speed in loading and off loading and provides the capability to handle larger, more bulky air shipments.

Another trend that has to be addressed is the increasing separation of air cargo operations from passenger airlines operations. The use of belly space in passenger aircraft is decreasing while the use of all-cargo aircraft is increasing. In part, this reflects changes in the weight and space accommodations for passengers and their baggage with a concomitant reduction in air cargo capacity. Further, airlines are trying to increase the amount of time aircraft spend in the air by reducing gate turnaround times. Shorter turnaround times reduce the window of time available for loading and unloading cargo.

Integrated express operators are another phenomenon that is changing the landscape for air cargo operations. Integrated express operators such as FedEx, UPS, Airborne Express, DHL Worldwide Express, USPS, Emery and Burlington Air Express provide next day, small package (two to 70 pounds) services. Increasingly, these carriers also are transporting “heavy” airfreight, i.e., shipments that exceed 70 pounds. Indeed, Emery and Burlington Air Express have always marketed themselves as express “heavy freight” carriers.

In addition, most “overnight” express operators now offer deferred service or second-day and third-day “time-definite” services. The lower cost deferred delivery market mostly is “time definite,” meaning it is guaranteed to be delivered at the required time. This service is increasingly being used to move freight over 70 pounds. This change is significantly altering the dynamics of the air cargo industry. Forecasts suggest that deferred service will, at some time, surpass overnight delivery of letters, documents and packages, especially since facsimiles and electronic mail are cutting into the overnight letter and document market.

As these changes occur in the airfreight industry, they are having significant impacts that must be taken into account in planning for the LATTS Airport System. While the role of Latin American air cargo in these changes may not be a predominant consideration, the Alliance needs to keep this traffic in mind as it plans its airports to meet the needs of a changing world.

Trucking Growth in the Integrated Express Industry

There is a significant number of choices currently being offered to shippers by the air cargo industry for time critical shipments consisting of an expanding array of same-day overnight, deferred and time-definite options. In the U.S. domestic market, the LTL trucking industry, which is becoming increasingly automated, is also competing with the air cargo industry for time-critical, time-definite shipments on routes less than 1,000 miles. Substantial amounts of cargo shipped by second-day airfreight are in fact entirely transported on the ground, some by trucking companies owned or affiliated with air cargo carriers.

This situation has led to a blurring of the distinction between modes of transport. Integrated express carriers, passenger airlines and trucking companies use trucks and/or aircraft to serve the same market, although, with different products and different ways. In some cases, trucks and aircraft support each other, while in other cases they compete.

FedEx, UPS, and other integrators use trucks to smoothly interface with aircraft to provide “seamless”, door-to-door service through their national sorting hubs. As the primary sort hubs reach capacity, however, the integrators are developing regional hubs to accommodate the growing volume. Depending on distances and product mix, the same destination city may be served as effectively by truck from a regional hub as by air from the national hub. Moreover, as non-overnight volume grows, the integrators also are increasing the amount of time-definite traffic that does not touch an airplane, but moves entirely by truck (at a fraction of

the cost) from origin to final destination. It is little wonder that UPS is now the largest trucking company in Europe and FedEx is one of the fastest growing trucking companies in the U.S. Two certificated airlines, LandAir International Airlines and Link America Airlines, do not own any airplanes, and transport all of their freight by long-haul trucks using their own two-letter airline identifier code and airbills. All shipments flow through a truck hub-and-spoke network operated to airline on-time performance standards.

Airport Access Roadways

Adequate on-airport and off-airport roadway access is as important to airfreight as it is to air passenger services. Good access is becoming even more important as the time-critical delivery of the freight industry continues to grow. In planning for airport roadways, due consideration should be accorded to the needs of freight operations, especially since they differ markedly from those associated with air passenger operations. Further, road freight vehicles vary from vans to tractor-trailer rigs. Accordingly, it is important that roadway access and staging area design include provisions for sufficient turning radii for large trucks while also addressing the needs of smaller cargo vehicles.

LATTS STRATEGIC AIRPORT SYSTEM STRATEGIES

The analyses of needs for the LATTS Strategic Airport System and the issues presented above have, in large measure, framed a series of strategies which will further achievement of the LATTS goal and its seven supporting objectives. These strategies are presented below and are organized on the basis of the LATTS objective for which they will have the greatest impact.

Regional Competitiveness

The proximity of the LATTS Strategic Airports to Latin American markets has been a major reason that the vast majority of Latin American air cargo gateways in the Alliance Region. Achievement of the LATTS objective to maintain and even increase the Alliance Regions share of these flows will be enhanced by the strategies discussed below.

Use of Existing Facilities

As previously highlighted, Florida handles over 90 percent of the Alliance Region's airborne gateway Latin American trade. Much of this is due to the proximity of Miami International Airport to Latin America as well as the cultural and socio-economic ties of Miami-Dade County with Latin America. Nevertheless, capacity at Miami International Airport is not unlimited and this constraint could result in more Latin American airborne cargo gatewaying elsewhere in the Region or even possibly outside the Region.

Accordingly, the optimal use of existing airport facilities is a useful strategy for maintaining and enhancing the Latin American trade advantages enjoyed by the Alliance Region. Clearly, there are a host of challenges and opportunities to improve the use of existing LATTS airports. While some of these are generally common to most LATTS airports, the very nature of each airport means that

usage optimization necessarily involves actions uniquely designed to fit the circumstances at each airport. Therefore, no single Region-wide approach is available. Nevertheless, it is important that, on an individual basis, each of the airports identify and implement measures which will ensure that past airport investments are used optimally. The basic aim should be to increase operational throughput, particularly at those LATTs airports which (1) are significant gateways for airborne Latin American trade and (2) which currently are experiencing operational challenges that could act as a restraint in accommodating the substantial increase in Latin American trade flows which are forecast to occur.

Additional Capacity at Existing Airports

While better use of existing airport facilities is an important initial strategy, it is obvious that the major increases in airport usage that have been forecast by the LATTs study cannot, in every instance, be accommodated by simply optimizing the use of existing facilities. Master planning at individual LATTs airports has addressed the unique needs of each airport to add capacity through expansion of existing facilities and/or the construction of new facilities. Strategies to implement the necessary capacity enhancement projects need to be developed (if they have not already been developed) to ensure that the additional capacity is in place in advance of the actual needs. This approach is necessary because failure to do so could result in the diversion of Latin American airborne cargo to other facilities. Once this is done, it will be difficult to recapture airborne cargo because carriers will have made investments and operational changes that create inertia to change.

Given the varied institutional environment in which airports exist, there does not appear to be much of an opportunity for the Alliance Region as a whole to undertake, on a regionwide basis, investment initiatives that address capacity additions. Consequently, this puts more of a burden on each Alliance member to undertake initiatives for LATTs airports within their state that require capacity expansions. In doing so, the unique ownership and funding relationships that exist in each Alliance state will be a major influence on the type of initiatives which are most appropriate.

Secondary Airports

A number of factors are giving rise to significant separations between operations which primarily serve air passengers and those which serve air cargo. Because of the rapid growth in air passenger travel, air cargo operations are increasingly being separated from air passenger services. Even though some 55 percent of air cargo capacity currently is in the bellies of passenger aircraft, the use of belly space is decreasing. Partly this is due to higher passenger load factors, which diminishes cargo capacity, particularly on long-stage flights where additional fuel is required. Also, faster turnarounds for operations which primarily serve passengers are decreasing the amount of time available for loading and off loading air cargo. Further, the share of the airborne cargo market held by integrated carriers is growing and those operators often use their own all-cargo aircraft.

Because of this growing separation, there is perhaps an opportunity to move some all-cargo operations to a secondary airport. There are, of course, significant benefits if this can be achieved. In the first instance, it would free up some operational capacity for passenger services at the primary airport. Secondly, in some instances, it possibly could free up space and facilities currently used for air cargo at the primary airport so that they could be used for expanded passenger operations. Thirdly, shifting some air cargo operations to a secondary airport would reduce the amount of conflict on the primary airport property and on primary airport ground access facilities caused by the different operational needs of passengers and airborne cargo.

Of course, development of secondary airports as the principal locations for all-cargo operations also faces numerous challenges. First and foremost is the fact that significant improvements are likely to be required at a secondary airport to accommodate all-cargo aircraft operations. Financing of those improvements likewise will be a challenge for a variety of reasons. In particular, air cargo operators are unlikely to willingly pay for all or a portion of such improvements if they can avoid such costs by continuing operations at a primary airport. To justify their participation in financing of such improvements, they would have to identify very major reductions in their operating costs sufficient to offset the cost of secondary airport facility improvements for which they might be asked to pay.

Despite these challenges, a number of secondary airports have successfully attracted cargo operations. Within the Alliance Region, Huntsville, Alabama is a notable example. Also, DHL has chosen to operate out of Page Field, a general aviation airport located in Fort Myers, rather than the Southwest Florida International Airport which serves commercial passenger airlines for the Fort Myers area. DHL made this choice because Page Field is less congested and is closer to DHL's customer base.

Freight Mobility

Air cargo, by its very nature, commands a high level of transportation mobility. The air mode often is the preferred modal choice for high-volume and time-sensitive freight. Accordingly, strategies are required that will enhance the mobility characteristics of airborne cargo.

Hub and Spoke Operations

Planning for the accommodation of increasing flows of airborne cargo needs to take into account the hub and spoke pattern that has emerged in recent times. This is particularly true for integrated express carriers which utilize a hub and spoke system similar to that which now characterizes passenger airline services. The FedEx operation at Memphis is a prime example of this type of operation.

Further, it is important to note that this hub and spoke pattern is changing to include regional or secondary hubs. For instance, as the volumes of cargo grew, FedEx established regional hubs in Alliance TX, Kansas City, Oakland, Indianapolis and Newark. Secondary hubs are dependent upon there being

sufficient volumes of cargo to justify such operations. Because a significant increase in airborne traffic has been forecast by the LATTTS study, there is a strong possibility that the pattern of hub and spoke operations, coupled with secondary hubs, may result in more of the LATTTS airports becoming major players. While it is not possible as a part of these LATTTS analyses to determine the likelihood that additional LATTTS airports may become air cargo hubs, Alliance members should be attentive to such possibilities because of the impacts it could have on the way LATTTS airports function.

Improved Air Freight Profile

Planning for airports tends to focus upon passenger services because of the higher visibility they have. That is not to say that airfreight is ignored but it certainly is not a primary consideration. After all, only 16 percent of passenger airline revenues come from cargo.

Nevertheless, the substantial increases in air cargo that are forecast by the LATTTS analyses deserve more than a casual consideration in planning for LATTTS airports. Alliance members, functioning in their overall role for the airports in their respective states, need to ensure that airport master planning fully and adequately account for the growing volume of airborne cargo.

Interconnected Multimodal System

In most cases, very little air cargo originates at or is destined for the airport property itself. While commercial airlines generally provide airport-to-airport service, most air cargo is brought to and/or picked up at the airport from some off-airport sites. Consequently, a good interconnected multimodal transportation system is essential if the aviation sector is to fulfill its functions in freight transportation.

Integrated Services

Air cargo is sometimes brought to the airport by the shipper or the shipper's freight forwarder. At the destination airport, it sometimes is picked up by the receiver or the receiver's freight forwarder. The growing volume of air cargo has, however, resulted in an increasing portion of air cargo being handled by integrated carriers. It is important that airport master planning give an appropriate level of consideration to the facilities needed to accommodate these differing types of operations. Parking, maneuvering space, and freight handling facilities are needed to accommodate both small vans and large tractor-trailer units.

Access Roads

Airport access roads present a special challenge because airport authorities typically have no jurisdiction over such facilities. Instead, airport access roads are addressed in the overall metropolitan planning process. As a major road traffic generator, it is essential that the planning process adequately respond to airport access road needs.

Because of the high profile of all passenger operations, it is typical that little consideration is given to the need to accommodate the distribution needs of air cargo. Consequently, Alliance members have a responsibility to ensure that these freight distribution needs are appropriately addressed, especially in light of the significant increase in air cargo forecast by LATTTS.

Partnerships with the Freight Industry

Metropolitan planning processes increasingly are addressing freight matters and are reaching out to the freight industry in various ways. Because of the unique interests of those who are engaged in the distribution of air cargo, it would be appropriate to ensure that they are included so that all freight needs can be identified and addressed.

Efficiency

If the aviation sector is to adequately fulfill its role in freight transportation, including that which involves Latin American trade flows, the system has to operate in an efficient manner. Nevertheless, a fair amount of attention is being directed at various matters which impede efficient aviation operations. Most of this attention is focused upon air passengers and the delays, frustrations, etc., which they encounter. Hopefully, LATTTS analyses and findings will result in additional attention also being directed to matters which affect air freight.

Data Interchange

Airports with significant volumes of air cargo need to accommodate data interchange needs between various segments of the freight interchange. Provision of an easily accessible telecommunications system on site is an important component of the data interchange system.

Warehouse Space

Normal overnight delivery shipments tend to move through warehouses/sorting facilities rapidly so that delivery can be made within a 24-hour service window. Such shipments require a minimum of storage space.

On the other hand, there is continuing growth in delayed delivery services (i.e., two and three day services). This trend, in turn, is increasing cargo carrier's requirements for warehouse space. Air cargo facilities may need to increasingly consider options regarding multi-story buildings to accommodate this trend.

Environment

The LATTTS objective regarding the environment must be supported by initiatives in the aviation sector. Airports are a point source of noise and air pollution that tends to receive high-profile attention by the public.

The initiatives for addressing these concerns apply equally to air passenger and airfreight operations. Because of the higher profile air passenger services tend to receive, these concerns usually are addressed in this context. Nevertheless,

the hub and spoke operations of integrated carriers have elevated the attention to high-volume airfreight operations, such as those at Memphis, TN. As Alliance members address the potential for the establishment of more hubs, or an increase in freight operations at existing hubs, the environmental impacts this would cause must be appropriately addressed. This is especially true since operations of integrated carriers at hubs leads to a high concentration of flights in certain time periods. This can have significant impacts on residential neighborhoods in the vicinity of such airports.

Safety

Air safety is a high profile issue and, as air traffic continues to grow, it is certain that it will receive increased attention. Many of the issues associated with air safety are out of the jurisdiction of Alliance members. Nevertheless, Alliance members need to pay appropriate attention to the safety aspects of aircraft movements at airports. Further, attention must be continually directed to property developments under flight paths, a matter of concern to both air passenger and air cargo operators.

National Security

While the LATTs Airport System fundamentally addresses the need for domestic and international airfreight and air passenger scenarios, it also plays a role with regard to national security. Joint use of airport facilities is a relatively common practice at many airports as the military conducts its defense readiness functions. Consequently, the peacetime joint use needs of civil and military operations are addressed on a routine basis.

Planning for major military deployments during times of emergency also needs to be addressed as airport planning is performed. This requires interaction with appropriate military units to understand fully the needs they might have to utilize LATTs airports to accommodate major surges in deployment of troops and equipment.

LATTs STRATEGIC RAIL SYSTEMS ISSUES

A number of general transportation and rail issues were identified during the course of the study and they are discussed in the following pages. Many of the issues are interrelated and some have a cause-and-effect relationships. They include the following general categories:

- ▶ Physical Capacity
- ▶ Operational
- ▶ States have Limited Jurisdiction
- ▶ Grade Crossings
- ▶ Megaload Centers
- ▶ Private Operations
- ▶ Funding

Capacity/Operations

Rail line capacity constraints today is a general issue virtually industry wide. Some of it is infrastructure related, and some of it is related to train operations. Currently in the LATTTS Region, much of it is merger-related with the large carriers having just undergone major consolidations. The two principal railroads serving the western portion of the region, BNSF and UP, have worked out many problems since their 1995 and 1996 mergers, respectively, and the merger impacts are not as prevalent as those of CSXT and NS further east. The year-old split-up of Conrail is still impacting service in the East, and the additional traffic in the region has affected both routes and terminals. The robust economy of the last several years has further impacted service provision.

A side issue is the increased interest in rail passenger service at all levels – high speed, conventional intercity and local or commuter. The different levels of service have different requirements and thus, different impacts on the rail infrastructure, but all impact rail operations.

Grade Crossings

At-grade rail-highway crossings create safety and operational problems for both the railroads and highway vehicles. Separations and closures are the preferred solutions, but one is expensive and the other often politically unacceptable at the local level. The Federal Railroad Administration has set a nationwide goal of closing 25 percent of all existing at-grade crossings. Many parties have reservations regarding achievement of such a large number of closings.

Megaload Centers

The advent of the megaships using selected load centers will aggravate operational and capacity problems. The concentration of traffic at fewer points will impact rail systems at the intermodal connector and terminal level probably more than on through routes, although problems may develop on the latter also.

Funding/Jurisdiction

The railroads, for the most part, are privately owned and operated. Many states are constitutionally prohibited from providing public funds for any private enterprise, with railroads often specifically identified. Federal funding programs contained in TEA-21 are loan/loan guarantee oriented and contain terms and conditions that limit their use. Railroad funds are limited now due to resources being devoted to solving merger problems, although many of these expenditures are capacity related.

Private ownership, combined with limited public funding, translates into limited public influence on railroad operations. The passage of the Staggers Rail Act of 1980 changed the nature and limits of public regulation at both the state and federal level. Many states, when confronted with the federal requirements to maintain what state regulatory powers were permissible, opted not to continue those functions and left such matters up to the federal government.

LATTS STRATEGIC RAIL SYSTEM STRATEGIES

Strategic initiatives designed to deal with the Region's rail transportation issues are presented in the following discussions. These initiatives are organized on the basis of the LATTS objectives which they support the most. Despite this structure, it should be noted that initiatives often support more than one LATTS objective.

The largely private sector nature of the rail system limits the scope of initiatives that can be undertaken by the public sector. Nevertheless, there are some important strategies that can be employed to enhance the ability of the rail system to support the LATTS goal and its supporting objectives, as discussed below.

Regional Competitiveness

There are several rail system initiatives that will support the LATTS objective regarding "Regional Competitiveness," as noted below:

Better Utilization Of Existing Infrastructure

At one time the railroads in the U.S. had extensive physical plants. As rail traffic eroded with improvements in highways and trucking equipment (tractors and semi-trailers), capacity requirements diminished, the physical plant was rationalized to reduce costs, and much of it was lost forever. Several examples of means which increase utilization of the existing plant have already been employed in the LATTS region. Examples of applicable strategies follow.

Replace Double Track

Many existing rail routes at one time were double-tracked. Second tracks were sometimes removed, all or in part, during the period that rationalization was popular as a means to reduce costs. Nevertheless the roadbed and, in many cases, the bridges (or at least the abutments and piers) still exist. This reduces the effort (physical, environmental, and monetary) that would be required to increase capacity as opposed to construction of new alignments.

Improvement of Train Control Systems

Utilization of a rail line can be dramatically improved with various train control systems (signalization). Centralized Traffic Control (CTC) is being installed on the UP's Laredo line for that very purpose. Improved signalization was a common practice when physical plant was being downsized on main lines, i.e., reduction of double-tracked lines to single track with passing sidings with CTC and /or alternating sections of double track.

The latest development, with the promise of both improvements in capacity and safety, is the Positive Train Control (PTC) system. Now under development and field testing, it uses a number of intelligent transportation technologies, e.g., global positioning systems, onboard computers, computer route databases, and digital radio networks.

Directional Running on Paired Lines

Opportunities exist with merged rail systems in cases where different predecessor companies had parallel (but geographically separated) routes between major markets. Capacity is increased when trains are run in one direction on a single track rather than both directions requiring trains holding on sidings to effect meets with trains running in the opposite direction. This strategy is being employed in Central Texas on the UP.

Reuse of Dormant/Underutilized Routes

Many railroads have lines which have always been secondary routes, became surplus routes in mergers, or over which service has been discontinued or abandoned. Many of these routes have been upgraded and assigned new or former roles in the recent capacity crunch which clearly demonstrates the value of rail line/right-of-way preservation. In the LATTTS Region, the former Central of Georgia (predecessor NS company) mainline from Macon, Georgia to Birmingham, Alabama, void of service for many years, but still in place, has been put back into service by NS as an Atlanta bypass. NS is promoting development of a secondary route through western Virginia as a principal route to handle Gulf Coast and western traffic to the Northeast. The route parallels I-81 and the involved states are being asked to participate financially as they stand to benefit from the diversion of highway traffic to rail.

Two dormant rail lines in Texas also are involved in proposals for alternate routes for cross-border traffic. One is the South Orient Railroad, a Santa Fe spinoff, which connects with the Mexican rail system at Presido. The other is a former SP line which the TM is trying to acquire from the UP in order to avoid use of a busy UP line over which it has trackage rights to reach its KCS connection.

Rail Passenger Service

Concern over the impact on capacity for freight movement from new passenger services dictates a variety of improvements to the affected rail infrastructure as part of the implementation program. If adequate assessments and planning are conducted, the improvements can also benefit freight operations. If this is to be achieved, it is imperative that future freight traffic be considered in the process as well as existing traffic.

Grade Crossings

At-grade rail-roadway crossings are operational and safety hazards for railroads. Where there are multiple frequent crossings, such as in most communities, this often results in operating speed restrictions. They are also safety hazards for roadway vehicles and vehicular delays which intensify with frequent and slow trains.

Closures/Separations

The ideal way to mitigate crossing impacts is to eliminate them either through separations or closures. With the average separation costing between \$3 and \$5

million, and many times more than that in urban situations, this strategy can be applied only in limited situations. Closures are difficult to implement at the local level, but the chances for success can be enhanced through community-wide examinations and plan development. Closures combined with improvements in warning devices at the remaining crossings, development of connecting roadways and perhaps a separation, make a more palatable plan.

Technological Improvements

Means to improve safety are available or being developed in improved warning devices, barrier systems which keep vehicles from reaching the crossing, and ITS solutions relating to the use of global positioning systems (GPS) and PTC as mentioned earlier in the discussion regarding train control.

Corridor Approach

A variation of the community-wide crossing approach is the corridor approach. Most state grade crossing improvement programs are based on an accident prediction equation that prioritizes individual at-grade crossings to be addressed. This method results in the expenditure of funds throughout the state on a crossing-specific basis. Some states are beginning to address crossing improvements in selected corridors, which permits expenditures to be made in a more focused and coordinated fashion.

Corridors typically selected are those with passenger trains and their higher speeds, heavily used lines, and others where the probability of crossing incidents is highest. The coordinated approach provides the opportunities to address closures as well as make more efficient use of available funding.

Given the nature of LATTs and worldwide trade flows as addressed in this study, a corridor approach has considerable merit as an investment strategy for grade crossings.

Institutional Relationships/Partnerships

Attitudes vary among the states in regard to the public role in regard to railroads and the provision of funding. A public role is accepted regarding rail-highway crossings, although they are usually addressed from the highway side. A public role often is identified regarding the preservation of light density lines and retention/expansion of rail passenger service. Railroad main line freight services, however, are most commonly regarded as for-profit private-sector ventures.

Some states, however, have determined that it was in their best interest to become involved in railroad mainline operations. Several examples follow.

Washington State - Mainline congestion began to develop in Washington State which threatened the efficiency of its ports. As key players in Asian trade, the busy ports also comprised a major component of the Washington economy. Port activities, based on studies conducted at the time, 1993, accounted for 160,000 direct, indirect, and related jobs and \$3 billion in wages. It was also determined

that 20 percent of all jobs in Washington State were related to import/export business at the ports.

This concern led to the preservation of the former Northern Pacific mainline over Stampede Pass which was declared surplus by the BN (now BNSF) as it already had two other routes to the Pacific Coast in Washington State. The BN placed the line on its System Diagram Map (SDM) as a potential abandonment candidate. The Washington State Department of Transportation, recognizing the route to be a corridor of statewide significance, obtained funding from the Legislature to acquire the line. The BN subsequently removed the line from its SDM, rehabilitated it and put the route back into service.

Several studies relating to port traffic congestion led to mainline connection improvements and the FAST (Freight Action Strategy for the Seattle – Tacoma Corridor) project, a series of grade separation projects in the I-5 Corridor between the Ports of Seattle and Tacoma. The FAST project is a joint activity of the WSDOT and the Puget Sound Regional Council (PSRC). The project involves the north-south rail lines running between Everett and Tacoma although the focus lies between Seattle and Tacoma. A project task is to develop a Corridor strategy, and to integrate proposed grade crossing and port access improvements. A goal is to develop public-private funding partnerships.

A series of rail-highway grade separations (bridges, viaducts, underpasses) totaling \$350-400 million in cost are currently proposed in and around the port terminals at Seattle and Tacoma and along the I-5 corridor in between the two urban areas. Funding from the state (\$354 million) was approved in 1999 for Phase 1 of the project. Federal funding was contained in TEA-21, and ports, railroads and other parties are also contributing to the projects.

Pennsylvania Clearance Project - Recognizing the evolution in intermodal transportation that was occurring, the need to have adequate clearances for double-stack containers, and that Philadelphia was the only major port in the middle Atlantic that did not have double-stack service, Pennsylvania commissioned a study to determine the possibilities and related costs and benefits of clearing (developing adequate clearances) selected routes in the state. Line segments of three railroads which together created an east-west and a north-south route to access the Port of Philadelphia were evaluated.

Total costs of \$80.9 million, to be shared between the Commonwealth and the rail carriers, were found to generate cost savings with a present value of \$382 million. The savings include both transportation costs and the reduction of non-transport shipper logistics costs to shippers and receivers located within the state. These cost savings translate into increased economic activity and more jobs for Pennsylvania residents, the latter projected at 22,000 in the Year 2000.

In 1993, a partnership was formed between Conrail, CSXT and CP to provide double-stack clearances from the Ohio and New York borders to the Port of Philadelphia. Bridge and tunnel clearances were completed in 1996.

Interstate 81, Virginia - A recurring theme in the LATTS discussions and in many public forums lately is a desire to place as much truck traffic on rail as possible. Intermodal is the typical medium for accomplishing this, but truck traffic also can be converted to rail carload traffic as well. The proposal comes about with ever shrinking highway construction and maintenance dollars compared with needs, an issue discussed in other sections of this report.

Faced with driver shortages and high recruitment and training costs, many of the large truckload carriers also have considered rail intermodal as a potential solution. Some of them, such as J.B. Hunt, even invested in domestic containers rather than trailers to take advantage of double-stack economics. United Parcel Service has always been one of the largest users of rail intermodal service. Recent railroad service problems, however, have diminished the attractiveness of this alternative.

Several criteria have to be met for rail intermodal to work. First, there has to be sufficient volume at any one point to justify the investment in a terminal and efficient loading/unloading equipment. Similarly, there has to be a like location some distance away that meets the same criteria, with demand for movements between it and the first point which creates a traffic "lane". Ideally, the two locations should be at least 500 miles apart (many would argue for an even greater distance such as 750-1,000 miles), in order that the savings in transportation overcome the cost of double-handling.

A number of such flows have been identified, and one example proposed is the Virginia I-81 corridor, a subject of forecast heavy Latin American traffic. The Commonwealth of Virginia is planning a 20-year, \$3.5 billion project for capacity and safety improvements on Interstate 81 through western Virginia. Norfolk Southern has proposed that expenditures be made on its parallel rail line instead, suggesting that it could, with capacity and speed-enhancing improvements, divert enough truck traffic to rail to either dramatically delay or eliminate planned highway improvements. Trucks account for 40 percent of the traffic on some sections of I-81 and are blamed for many of the roadway's congestion and safety problems. The Virginia Legislature has mandated that the proposition be investigated (SJR-55), and the study is just commencing.

Interconnected Multimodal System

The advent of the megaload center will concentrate rail traffic on even fewer routes, thereby exacerbating existing rail capacity problems. The problem will more likely impact intermodal connections and terminal operations than main lines. Port access lines and intermodal connections will need special attention.

Some of the more promising landside strategies to address the sudden surge in demand upon docking of a megaship are contained within the port section presented earlier (i.e., under port agility and multimodal/intermodal concepts). Nevertheless, the rail solutions are worthy of note.

Summary Of Rail System Initiatives

A number of rail strategies have been presented, and, in reality, one highway strategy, i.e., truck-to-rail diversion. A common thread runs through all of the strategies – additional rail capacity and efficiency. All solutions will require the infusion of capital, some more than others.

By its very nature, the rail industry is capital intensive, and currently much of the industry is in poor financial condition from recent mergers, acquisitions and service problems. Public investment in rail projects is likely to be needed in many cases to implement proposals which, given the continuing pressure on public finances, not to mention the inherent problems with the use of public funds for private ventures, will not be easy to effect. There are some accepted public roles, such as grade crossings, and the potential exists to generate a variety of public benefits in other ventures such as truck-to-rail diversions. As an investment strategy, each Alliance state, through its rail planning process, could work with its railroads to identify and explore opportunities that offer the promise of mutual benefits, especially those that might reduce the demands on public resources for other approaches.

LATTS STRATEGIC HIGHWAY SYSTEM ISSUES

As noted earlier in this report, the LATTS Strategic Highway System embodies two principal elements. The first comprises the mainline routes which accommodate long distance travel. The second element is the intermodal connectors which connect major intermodal facilities (ports and airports) to mainline facilities. Evaluations regarding these two categories of LATTS highway facilities revealed a number of important issues which are summarized below.

- ▶ **Capacity** – The most prominent mainline deficiency, and costliest to address, is capacity. From a mainline perspective, the investment analysis concludes that nearly 7,900 additional miles of the LATTS network will be capacity deficient by 2020, in addition to the 2,722 that are congested now. Congestion slows travel speeds, adds truck speed cycling (gearing down, then up again, as congestion levels vary), and increases wear and tear on the vehicle. All this adds to transportation cost.

Rural capacity additions are easier to implement than their urban counterparts. However, the addition of capacity to a rural interstate-type facility is usually lower in priority than other basic pavement and bridge preservation projects. This is because rural facilities usually operate at better levels of service than other highways and often are already access-controlled, which means they are safer.

The process of adding capacity is an obvious remedy to many urban congestion problems. However, the context of capacity additions must be properly framed to fully appreciate spin-off impacts. The addition of capacity, especially to urban fully-access controlled facilities, is expensive. Major expressway projects that add capacity are typically beyond the reach of many state DOTs, and usually require special financing beyond traditional revenues

in order to implement. There are other problems that transportation agencies face when considering urban capacity improvements:

- ▶ **Environmental Issues** – These issues have become pervasive in many urbanized areas, especially in those nonattainment air quality areas that struggle to achieve a conforming Transportation Improvement Plan (TIP). A large capacity project may add traffic (VMT), thereby making it difficult to include it the project mix and keep the TIP in conformity. Capacity projects must be implemented with other positive air quality measures (carpooling, vehicle inspection, ITS, transit, TDM, etc.) to make them viable.
- ▶ **Right-of-way** – Space to expand existing highways is becoming a scarce commodity in many built-up areas. If right-of-way acquisition involves condemnation, the added cost, time, and adverse social impacts can fatally impact implementation of major highway improvements. Transport agencies are becoming more socially conscious of such takings, and are striving to avoid residential/business displacements. New environmental justice (EJ) regulations may have a significant impact on the process for implementing large scale improvements that take residential property.
- ▶ **LATTS and Other Traffic Benefits** - Traffic of all varieties benefits from capacity improvements. Thus, it should be recognized that LATTS freight traffic represents only a portion of the entire traffic mix, and an allocation of special LATTS funding for capacity improvements would benefit the entire traffic stream.
- ▶ **Operations** – Many highways, especially those with less than full access control, do not operate at optimum efficiency. Outdated signal systems, restrictive geometrics, entry (access) conflicts, narrow/unstabilized shoulders, rail/highway crossing problems, etc. limit traffic movement, reduce travel speeds, and introduce safety hazards. Though these deficiencies are more common on LATTS Intermodal Connectors, they are also issues for LATTS mainline network roadways.
- ▶ **Preservation** – The LATTS investment analysis yielded important information regarding the physical condition of LATTS mainline facilities. Generally, they are in good condition, and it can be argued that the impact of LATTS truck traffic is small when compared with all pavement and bridge deterioration. While there are several sections of the LATTS mainline Strategic Highway System (SHS) where the remaining pavement life is noticeably shortened due to LATTS traffic, these are sections which were built originally to standards that cannot withstand heavy truck traffic.

It must be noted that bridge conditions can impact trucking operations. Narrow bridges on lower-type highways are a safety hazard, and bridges with load restrictions can cripple truck operations. The Alliance members are very aware of the impact of load restrictions and are very diligent about keeping bridges on the higher systems in good condition. However, a bridge posted to less than legal loads is a serious impediment to freight movement, adding travel delays and cost due to detours.

Pavement and bridge preservation is an issue that affects the entire traffic stream. On mainline LATTS facilities, this type of improvement presents more benefit to passenger traffic than freight, simply due to the disparity between passenger and freight volumes.

- ▶ **Finance** - The lack of funding is an issue that all state transportation agencies face. Federal aid has continued to increase, but most States face difficult capital programming choices. Mainline capacity improvements are expensive and often face public opposition, so many agencies do not seriously consider them.

LATTS MAINLINE HIGHWAY SYSTEM STRATEGIES

Several mainline LATTS Strategies have evolved from these evaluations. They are presented below and are organized on the basis of the LATTS objectives for which they will have the greatest impact.

Regional Competitiveness

Initiatives regarding the LATTS Strategic Highway System which will greatly impact upon the LATTS objectives regarding “Regional Competitiveness” include the following items. These initiatives also will advance LATTS objectives regarding “freight mobility” and “efficiency.”

- ▶ **Capacity** – Of necessity, additional capacity in the locations of highest benefit must be a prominent strategy for improving mainline freight movement. Nevertheless, major capacity projects need to be considered on balance with needs of the LATTS Strategic Highway System for condition preservation, operational improvements and bridge projects. Each Alliance member will need to make these decisions in a manner which is consistent with its own capital programming philosophy.
- ▶ **Corridor Approach** – Even though each Alliance member must abide by its own policies for capital programming, a multi-state coordinated approach to corridor planning can increase the benefits derived from investments made in the LATTS Strategic Highway System. Study analyses have demonstrated that a large portion of freight flows involving trade with Latin America is concentrated in a number of major corridors (as denoted by the “Rivers of Trade” characteristics discussed in an earlier section of this report). Considerable benefits could be derived by the removal of major bottlenecks that are local in nature but which affect the mobility of Latin American freight and other traffic on an overall corridor basis.
- ▶ **Institutional Relationships** - The Southeastern Transportation Alliance has provided a forum for the investigation and assessment of matters of mutual interest to Alliance members as it pertains to trade opportunities with Latin America and the accommodation of the resultant freight flows. Continuance of the Alliance, or something akin to it, would be useful in providing an institutional framework that allows the Region to “speak with one voice”

regarding matters of mutual interest. This framework also would facilitate corridor investment planning and other matters.

- ▶ **Trade Corridor Funding** – One of the “other” matters that could be usefully addressed by the Alliance is the pursuit of trade corridor funding as exemplified by the TEA-21 Section 1118 National Corridor Planning and Border Infrastructure Programs. Admittedly, this program has been heavily oversubscribed with applications far exceeding the level of funding which currently is available. Nevertheless, there is hope that the U.S. Congress has or will take notice of the significant interest in this program and the substantial economic development benefits that can be derived from investments which foster international trade (like the LATTs Strategic Highway System).
- ▶ **High Priority and Discretionary Project Funding** – Another matter that could be addressed by the Alliance is the possible pursuit of high priority and discretionary project funds from the federal government. These funds are earmarked for particular projects. While this practice by the U.S. Congress and U.S. DOT reduces the availability of formula – derived federal funding apportionments, it nevertheless has certain merits. This is particularly true for high cost projects which simply would be financially impossible if they are to be undertaken using more traditional funding sources. The importance of various components of the LATTs Strategic Highway System in terms of economic development and international trade, coupled with the travel benefits which would be gained by all personal and freight traffic (not just Latin American trade flows), would make projects on these facilities attractive candidates for high priority project funding.
- ▶ **Greater Priority for LATTs Projects** – This study has identified and documented the importance of the LATTs Strategic Highway System to trade with Latin America, other nations and domestically. It has also highlighted the significant impact of Latin American trade on the economic future of the Alliance Region. Highway deficiencies which impede efficient freight movements detract from the ability of the Alliance Region to serve growing volumes of Latin American trade and this, in turn, detracts from the inherent advantages the Alliance Region has to grow economically. Accordingly, all other considerations being equal, there is a strong justification to accord a high priority to projects on the LATTs Strategic Highway System.

Freight Mobility

The initiatives discussed above regarding the “Regional Competitiveness” objective will also support the LATTs objective regarding “Freight Mobility.”

Enhancement of freight mobility through investments in the LATTs Strategic Highway System will result in substantial “pay backs” to the Alliance Region. To ensure that freight mobility receives the appropriate level of emphasis in capital programming for the highway system, it should be accorded explicit consideration in the investment decision-making process. Alliance members have, in recent years, begun processes which specifically address freight mobility considerations. These efforts should be continued and be enhanced as

appropriate so that freight projects, and the economic developments they engender, continue to receive the appropriate level of emphasis.

Interconnected Multimodal System

Freight transport is a large, complex and diverse industry. While LATTTS has focused attention upon the Latin American component of freight flows, the study has shown that the highway system must serve much wider freight needs. In fact, only eight percent of the total needs on the LATTTS Strategic Highway System are attributable to freight movements serving Latin American trade. As investment decisions are made regarding freight transportation, they must take into account all international and domestic freight needs.

An excellent way for Alliance members to address freight industry issues is to maintain continuing dialogue with the freight industry. Indeed, some of the Alliance members have formally established organizations which either focus upon the freight industry (e.g., freight advisory councils), or which include representatives from it (e.g., MPO advisory councils). Efforts which enhance dialogue with the freight industry will continue to be needed at all levels of interest (state, corridor, MPO, etc.) This will improve opportunities to determine the best things that can be done to the LATTTS Strategic Highway System to ensure fulfillment of its role as a transportation mode and as a component of an interconnected multimodal system.

Efficiency

The efficiency of the trucking industry will be enhanced by the implementation of the strategic initiatives noted above. Additional initiatives such as those presented below will also support the LATTTS objective regarding “Efficiency.”

- ▶ **Operational Improvements** – The efficiency of the trucking industry is significantly impacted by the operational features of the highway system. Therefore, traffic operations improvements should be considered in the overall mainline project mix. Highways with little or no access control can greatly improve freight traffic movement through upgraded intersection geometrics, signal phasing, wider/stabilized shoulders, at-grade rail crossing upgrades, access revisions, etc. These projects are less costly than adding capacity and usually require little or no additional right-of-way.
- ▶ **ITS Applications** - High-type facilities (e.g., interstate-type highways with access control) can benefit from the application of Intelligent Transportation System (ITS) technologies. An entire industry has developed around the development and application of ITS strategies, which focus on making better use of the existing facility through technology. This includes such initiatives as HOV lanes, incident detection/management, driver information systems, reversible lanes, ramp metering, weather/pavement condition monitoring, and commercial vehicle operation (CVO) facilities (weigh-in-motion, automated credential verification, etc.).

A more complete discussion regarding ITS in the LATTS Region is presented in the Appendix to this report. The LATTS review of ITS suggests that the full potential of ITS applications for Commercial Vehicle Operations (CVO) requires a coordinated approach that some of the Alliance members are just beginning to appreciate.

It is recommended by the LATTS ITS review that the Alliance work together to create a seamless CVO network throughout the Alliance Region (and eventually the nation as a whole). This would enable commercial vehicles to move freely across state borders through programs which involve sharing of weigh stations, use of the same screening technologies and a standardized commercial vehicle identification system.

- ▶ **Improved Communications** – Improved communications can provide benefits which are at the very heart of improved trade and freight transportation efficiency. Measures that could be undertaken include:
 - B Improved communications between Alliance members;
 - B Improved communications between all of the state, federal and local agencies which are responsible for portions of the freight transportation infrastructure;
 - B Improved communications between the public agencies and the freight transportation industry; and
 - B Improved communication with the general public, special interest groups, civic organizations, trade and commerce organizations, etc.

The level of communication which is needed will not happen of its own accord. Instead, efforts must be directed at establishing and maintaining communication channels and continuing dialogue. If this is to occur, it must be at the initiative of the state transportation agencies comprising the Southeastern Transportation Alliance. These agencies will need to make specific staff resource allocations to ensure that the needed communications are achieved.

- ▶ **Improved Freight Profile** – There is a serious need to inform the general public, elected officials and various governmental organizations regarding key matters raised by LATTS. This would include the role of trade with Latin America in relationship with economic development potentials, the current status of the LATTS freight transportation system and its ability to cope with existing and projected demands, the implications of inefficient movement of freight (including damage to the Alliance Region's competitiveness for industry and trade), and the justifications for more emphasis upon the concerns and issues raised by this study. These efforts will increase the visibility of freight as an important element in the economic well-being of the Alliance Region and thus achieve greater levels of support for the strategic initiatives identified by this study.

Environment

The planning processes employed by the state transportation agencies which comprise the Southeastern Transportation Alliance include processes for

appropriately considering environmental impacts associated with transportation projects. Further, the initial element of this report section proclaimed that preservation of environmental qualities was one of the seven objectives that would support the Alliance goal to achieve economic development through improved transportation for trade.

By their nature, some of the investments needed on the Strategic Highway System will have a positive impact on the environment, most notably regarding vehicle emissions. Improvements in vehicle emissions will accompany investments (e.g., operational improvements), which reduce congestion and reduce the level of vehicle speed cycle changes.

Safety

Transportation agencies are systematically addressing safety issues as they conduct their capital programming processes. These efforts need to be continued since this study shows that truck volumes will increase for a number of reasons, including increased trade with Latin America. The considerable differences in the vehicle mass of automobiles and large trucks inherently involves safety risks. In planning investments for the LATTTS Strategic Highway System, vehicle speed, size and weights should not be allowed to compromise the safety of travelers on the highway system. While the focus of the LATTTS highway components was on truck mobility and efficiency, care must continue to be exercised to account fully for the impacts of trucks on the total traffic stream.

National Security

Although the LATTTS Strategic Highway System focuses upon the need to serve trade with Latin America, this extensive system serves many other functions as well. One of these involves support for national security through the provision of an interconnected and agile transportation system that provides significant capability to serve major surges in freight (and personnel) movements and flexibility to adjust to changes in the nature and pattern of national security deployments. Consequently, implementation of the proposed investment strategies, while directly intended to foster economic growth, will also serve the needs of the nation's military forces in the fulfillment of their missions.

INTERMODAL HIGHWAY CONNECTOR STRATEGIES

The importance of Connectors to the efficient movement of freight has been demonstrated through several studies and is underscored by the FHWA's recent emphasis on this set of roadways. Unfortunately, Connector issues typically have a low overall public profile. Some actions could be taken to gain a better understanding of Connector issues and bring them to more prominence.

The strategic initiatives regarding intermodal highway connectors are principally associated with the LATTTS objectives regarding an "Interconnected Multimodal System."

- ▶ **Capital improvements** - Capital improvements on Connectors tend to be lower in cost than mainline projects and generally are of higher benefit to

freight than passenger traffic. Connector improvements are less costly because of *scale* (the roadways are not access-controlled, thus less complex to engineer) and *scope* (projects usually focus on geometrics, safety, signalization, etc. that are on the low end of the cost spectrum). In general, these lower-cost projects are easier to implement and can be delivered faster than large-scale major urban projects. It has been argued that more efficiency gains for freight traffic can be realized through Connector improvements (“bang for the buck”). While this notion may be generally accepted, additional study is needed to reveal benefits vs. costs on a case-by-case basis.

- ▶ **Partnerships** - Most Connector miles are not owned by the State (Alliance) government, a situation which complicates implementation of improvements. As a general statement, local agencies often lack the engineering staff to prepare projects for letting, have fewer financial resources upon which to draw, do not have eminent domain (authority to condemn right-of-way for public purposes), and face intense stakeholder pressure to allocate scarce resources to more heavily-traveled roadways. Thus, the improvement of local jurisdiction Connectors will, to a greater extent, necessitate the formation of partnerships between state and local governments to effect change.
- ▶ **Needs Study** - The full scope of Connector deficiencies is unknown, as only a partial inventory of Connectors is available (and the data is not detailed enough to perform a complete needs assessment). Specific recommendations concerning intermodal connectors can begin to be developed only after the extent of the problems, current and future, are quantified after a full inventory is conducted. This should take future LATTs truck growth into account.
- ▶ **Costs** - Once all deficiencies are quantified, an estimate of capital improvement costs as measured against a common set of minimum tolerable conditions should be generated. This estimate should focus on both current and accruing improvement costs.
- ▶ **Process** - Using the principles developed under “best practice” Intermodal Management Systems (IMS), a capital improvement prioritization process model could be developed for use by the Alliance, as well as other state and local governments. Such a model could be “customizable” to allow entities to modify weightings and other factors to recognize local characteristics.
- ▶ **Financing for Intermodal Connectors** - State and local governments need ways to bring new kinds of capital resources into the process, as well as finding methods to utilize existing resources. A fiscal study could help begin this process, as well as provide a means for Congress to justify special consideration for intermodal connectors. Major progress was achieved by making the connectors eligible for NHS participation, but more needs to be done.

At least one Alliance state has taken specific steps to address the funding needs of intermodal connectors through the establishment of a special funding category and set-aside monies. This approach ensures that the state's capital programming process specifically addresses these facilities and provides funds for them.