UNIVERSITY OF FLORIDA
BUREAU OF ECONOMIC AND BUSINESS RESEARCH

TRANSPORTATION ISSUES:

INTERMODAL TRANSPORTATION

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FDOT CONTRACT NUMBER BC-354-44, PART A

JUNE 18, 2003

Prepared in cooperation with the State of Florida Department of Transportation. The opinions, findings and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation.

INTERMODAL TRANSPORTATION

I. INTRODUCTION

While intermodal transportation is only one part of Florida's total transportation system, this report will show that it is an increasingly important aspect of that system, with the potential to boost the State's economic development while sustaining its environment. To guide the Florida Department of Transportation in its ongoing intermodal planning, the *Final Report of the Strategic Intermodal System Steering Committee* (December 2002) recommended criteria and thresholds for designating facilities and services in the State's strategic intermodal system. This report's principle objective is to complement the Steering Committee's initiative and the Department's own strategic intermodal planning efforts by means of the following:

- Define intermodal transportation and clearly articulate its relevance to Florida from economic and social perspectives.
- Provide an overview of the current status and development of the intermodal transportation network in Florida, paying attention to important changes of federal and state regulatory regimes.
- Summarize recent federal and state legislation pertaining to intermodal transportation.
- Explain an economist's view of the role of government in transportation planning and investment.
- Outline a sequential procedure for determining what projects in the Department's designated intermodal system should receive funding from the State.

II. WHAT IS INTERMODAL TRANSPORTATION?

There are multiple definitions of the term "intermodal transportation."[1] The development of containerization in the middle of the 20th century greatly facilitated the use of multiple modes of transportation for a single shipment.[2] Therefore, containerization is often associated with intermodal transportation. However, intermodal transportation extends well beyond the use of containers. Much freight is shipped intermodally without containers, such as bulk freight like coal. Moreover, intermodal transportation not only involves the movement of freight but also the movement of people between destinations. A useful definition of intermodal transportation is the movement of goods and people employing more than one form of transportation for a single delivery or trip.[3] The *Year 2020 Florida Statewide Intermodal System Plan*[4] offers the following definitions:

> **Intermodal** - Carriage by more than a single mode with a transfer(s) between modes to complete a trip or a freight movement. In passenger transportation intermodal usually refers to trips involving more than one mode. For freight and goods movement, the definition refers to transfers between all freight

modes including ships, rail, truck, barge, etc. taken as a system for moving freight. It also refers to the movement of an intermodal container.

Intermodal Transportation - Transportation movement involving more than one mode (e.g. rail/motor, motor/air, or rail/water). It has been defined as a process of addressing the linkages, interactions and movements between modes of transportation.

The greatest challenge facing intermodal transportation lies in the *inter*-mode aspect; the development and maintenance of effective connections *between* modes is integral to realizing efficient and successful intermodal transportation systems. Transportation planners often cite the *seamless* movement of goods and people between destinations as a key goal.

III. THE RELEVANCE OF INTERMODAL TRANSPORTATION

A. HOW MUCH FREIGHT TRAFFIC MOVES INTERMODALLY?

According to the *1997 Commodity Flow Survey*, intermodal transportation accounts for a small portion of freight traffic.[5] Nationally, intermodal transportation accounted for approximately two percent of the 11.1 billion tons of freight shipped in 1997. While representing approximately one percent of the 397 million tons of freight originating in Florida, intermodal freight accounts for nearly seven percent of the total in terms of ton-miles.[6] In further stark contrast to its small share of the absolute volume of freight, intermodal transportation accounted for over 17 percent of the value of all shipments originating in Florida,[7] almost a doubling of its absolute amount of shipping by value in 1993.[8]

Not surprisingly, intermodal transportation is more likely to be employed for longer distances. Only 3.4 percent of all tons shipped by a single mode were for trips greater than 750 miles. In contrast, less than 10 percent of all tons shipped intermodally was for distances less than 99 miles, whereas approximately 53 percent traveled distances of 750 miles or more.[9]

Most of the total shipments originating in Florida have destinations in Florida. Approximately 85 percent of all tons originating in Florida go to destinations within the State.[10] When shipments are measured in terms of dollar value, this percentage falls to 64.3 percent of shipments valued at approximately $214 billion. Similarly, most of the inbound shipments originated in Florida: approximately 73.1 percent of the 465 million tons of freight with Florida destinations also originated in Florida and 45 percent by value.[11] It is not surprising then that most of the freight that moves through Florida employs a single mode of transportation.

Despite the small share of freight that moves through the state intermodally, Florida's position as a major gateway for international trade makes its intermodal connections at these points of entry/exit of particular interest.[12] Although Florida's share of total U.S. international trade decreased from 4.1 percent in 1999 to 3.8 percent in 2001,[13]

Florida still ranks 9th as of 2002 in terms of the total dollar value of state exports.[14] Perhaps more significantly, international trade (imports and exports) in Florida is expected to double by 2020.[15]

B. WHY IS THERE SO MUCH INTEREST IN INTERMODALISM?

Despite the small share of all freight traffic that intermodal transportation accounts for, as intermodal freight's 13 percent share of the value of shipments originating in Florida will attest, there has been a growing interest in intermodalism during the past decade. Several explanatory factors include changes in inventory management, improvements in information and communication technologies, concern over environmental quality, and increased congestion. We explain each factor in greater detail below.

Inventory Management. Many businesses that historically had warehoused a large amount of inventory now embrace just-in-time systems that minimize inventory holdings and increase flexibility for both production and product offerings. Timely shipments are crucial for this approach to succeed.[16] Failure to receive necessary parts on time can result in costly production slowdowns. Retailers who have insufficient inventory lose both sales and consumer goodwill. However, they incur unnecessary costs if they store excess inventory and risk ending up with products that have become obsolete. Transportation providers, recognizing the importance of timely deliveries, have responded by offering just-in-time services. For example, FedEx and United Parcel Service (UPS) have their own integrated air and motor carrier fleets to provide door-to-door service with guaranteed delivery times and close tracking of shipments. CSX Transportation markets its rail service to paper shippers by offering a network of warehouses that allows it to offer just-in-time delivery.[17]

Intermodalism expands the scope of shipping alternatives by allowing shippers to weigh the timeliness and cost of the different transportation options and choose the option that best meets their needs.

Information and Communications Technologies. The growth of just-in-time delivery systems has been facilitated by the following improvements in information and communications technologies:

- Better tracking of shipments. Shippers, carriers, and recipients are able to obtain real-time information about the location of shipments in transit as well as expected delivery times.
- Reduced transit time for shipments. For example, laser technology has increased the speed with which FedEx can transport packages.[18] FedEx has installed ceiling-based lasers at loading sites to scan package bar codes, replacing the more cumbersome process of individuals using scanning guns. This new scanning procedure decreases the time spent on sorting and loading packages.
- Fewer reliability problems due to improved coordination and communication. Reliability may be compromised when the amount of handling and the number of parties involved in a particular freight movement increases. However, good coordination between modes and the efficient transfer of information can offset that

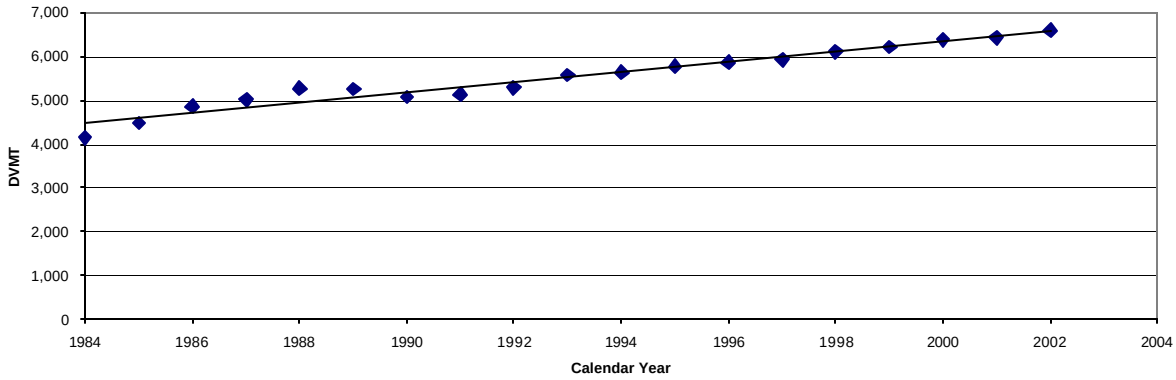
risk. Communication also improves when freight handlers and shippers use these technologies to track and transfer shipments.

Environmental Concerns. The 1990 Clean Air Act Amendments require that areas meet certain air quality standards.[19] Areas that have been identified as "areas of nonattainment"—those areas failing to meet the National Ambient Air Quality Standards (NAAQS)—must reduce the amount of pollutants in the air and, therefore, are under pressure to reduce emissions. Motor vehicle usage contributes significantly to air pollution in the United States,[20] particularly with respect to carbon monoxide, particulate matter, and ground-level ozone,[21] three of the six "criteria" air pollutants.[22] The following six Florida counties originally were designated as nonattainment areas with respect to ground-level ozone: Broward, Miami-Dade, Duval, Hillsborough, Palm Beach, and Pinellas.[23] All six counties currently are in compliance with the NAAQS and are classified as "maintenance" areas.[24]

The Clean Air Act (CAA) requires a strong connection between transportation planning and air quality control programs. Specifically, "transportation conformity" is required under the CAA; transportation plans and programs must "conform" to the State's air quality improvement plans for nonattainment and maintenance areas. Thus, metropolitan planning organizations that fall within areas of nonattainment are required to coordinate their transportation planning with their plans for improving air quality.[25] A year after the enactment of the Clean Air Act Amendments, these air quality improvement goals were reinforced with the passage of major transportation legislation, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), which included the Congestion Mitigation and Air Quality Improvement Program (CMAQ) among its provisions. CMAQ was reauthorized in 1998 under the Transportation Equity Act for the 21st Century (TEA-21). Over $14 billion (through both ISTEA and TEA-21) was allocated for states and localities with the poorest air quality to fund projects designed to improve air quality and reduce congestion.[26]

CMAQ was designed to allow nonattainment areas[27] to implement transportation control measures (TCM) in compliance with the mandates of the Clean Air Act. Eligible nonattainment and maintenance areas may use CMAQ funds to support public transportation, improve traffic flow, and develop bicycle and pedestrian programs.[28] Growing recognition of the bicycle as a viable mode of transportation has led many communities to include bicycle facilities in their transportation plans. The Long Beach Bikestation in California, for instance, serves as a transfer point for bicyclists connecting to the light rail line, and the facility provides bike lockers, rental bikes, and bicycle mechanics.[29] This type of intermodalism can play an important role in reducing motor vehicle emissions. Improving intermodal connections, for example, could increase the use of public transportation since passengers are more likely to use transit services to get to rail or air terminals when there are direct connections. With respect to freight movements, increased use of truck-rail movements instead of truck-only movements may decrease pollution since rail transport has lower emissions per ton mile than truck transport.[30]

Figure 1: Daily Vehicle Miles Traveled (DVMT) per Lane Mile on the State Highway System in Thousands



Calendar Year:	1984	1986	1988	1990	1992	1994	1996	1998	2000	2001	2002
DVMT:	4,147	4,855	5,271	5,070	5,287	5,640	5,863	6,112	6,380	6,430	6,591

Congestion. As CMAQ's name implies, congestion is a related concern. Vehicle miles traveled have increased at a much greater pace than lane miles, resulting in increased congestion. In Florida, this is evident at both the state and local level. As Figure 1 above indicates, daily vehicle miles traveled per lane mile have increased on Florida's State Highway System:[31]

As Table 1 similarly reports below, congestion generally has increased during the period of 1985-2000 in the four Florida urban areas included in the Texas Transportation Institute's *Urban Mobility Study.*

Congestion not only contributes to delays in travel times, it also wastes fuel. The Texas Transportation Institute estimates the amount of wasted fuel by calculating the annual excess fuel consumed per person due to congestion delays. In Miami, the wasted fuel was estimated to be 51 gallons per person in 2000. The comparable amounts for the Ft. Lauderdale, Jacksonville, Orlando, and Tampa areas are 44, 24, 48, and 32 gallons per person, respectively.[32]

Although one solution to the problem of congestion is to build more highways, highway construction involves large capital expenditures and would not be eligible for CMAQ funding, however, since such efforts are not likely to contribute to air quality improvement.[33] Other constraints to highway expansion plans include: insufficient land availability in densely populated areas; land-use policies and zoning restrictions; and air quality regulations and other environmental concerns, such as preserving environmentally sensitive areas and ecological diversity. Thus, policymakers and planning organizations may increasingly look to other alternatives, such as intermodal transportation, to reduce congestion on state highway systems and perhaps avoid highway expansion costs.[34]

Table 2: Daily Vehicle Miles Traveled per Lane Mile[35] 1985-2000

	Ft. Lauderdale-Hollywood-Pompano Beach		Jacksonville		Miami		Orlando		Tampa	
Year	Freeway	PAS	Freeway	PAS	Freeway	PAS	Freeway	PAS	Freeway	PAS
1985	8,020	5,775	10,665	4,975	12,575	6,155	10,905	6,980	10,135	6,285
1986	8,990	5,990	11,105	5,200	12,455	6,185	11,560	6,335	10,685	6,250
1987	9,620	6,605	10,965	5,110	13,450	6,465	11,390	6,690	11,785	6,360
1988	10,280	6,610	12,105	5,250	14,710	6,750	11,390	7,085	11,860	6,505
1989	10,420	6,365	11,650	5,715	16,435	7,000	11,495	7,145	11,965	6,795
1990	11,000	6,400	12,215	6,045	15,985	7,145	11,145	7,000	12,305	7,195
1991	11,925	6,565	11,890	6,505	15,145	7,110	11,155	7,210	13,065	7,465
1992	13,200	6,900	12,000	6,810	16,125	7,065	10,870	7,455	13,000	7,715
1993	13,595	6,900	12,130	6,965	15,810	7,035	10,805	7,415	12,750	7,975
1994	13,605	6,525	12,300	7,225	16,795	6,910	10,985	7,110	12,705	8,110
1995	14,600	6,010	12,725	7,340	17,430	6,870	10,865	7,340	13,845	7,490
1996	14,825	6,100	13,585	6,360	16,900	6,945	11,315	7,485	13,390	7,445
1997	15,765	5,975	13,310	6,470	17,015	6,950	12,215	7,460	13,200	7,400
1998	15,735	5,995	13,370	6,430	16,840	6,865	12,650	7,415	13,455	7,245
1999	16,575	6,055	13,365	6,455	17,225	6,710	12,375	7,555	13,795	7,345
2000	17,585	6,180	13,565	6,585	18,115	6,890	12,920	8,050	13,115	7,430

IV. OVERVIEW OF THE INTERMODAL TRANSPORTATION NETWORK[36]

The major modes of transportation for freight are truck and rail for surface transportation, air transportation, and water transportation. Bordering two major bodies of water, the Gulf of Mexico and the Atlantic Ocean, Florida represents an important gateway for international trade in addition to domestic trade. Thus, in contrast to many states, Florida's transportation network includes a significant role for water transportation in addition to surface and air transportation.

A. SURFACE TRANSPORTATION

The major modes of surface freight transportation are trucks and rail, which use highways and railroads as their respective networks. Prior to the Intermodal Surface Transportation Efficiency Act of 1991 (briefly summarized in the next section), highways were the primary focus for government funding, and they continue to receive substantial funding. Motor carriers are primary beneficiaries of this funding since they do not bear the full cost of their use of the roads, including the wear and tear that they impose on highways. The trucking industry has two major sectors; less-than-truckload (LTL) and truckload. The less-than-truckload segment employs a hub-and-spoke system that is used to consolidate shipments of multiple shippers' goods on one truck. Truckload, on the other hand, refers to the door-to-door transportation of a single shipper's goods that fill a truck.[37]

Rail transportation typically involves a lower cost per ton mile than shipping by truck, and railroads are most efficient for transporting bulk commodities.[38] Railroads are

largely privately financed. The infrastructure is privately owned and maintained (freight railroads incur the expenses of maintaining their own rights-of-way on tracks and structures), in contrast to highways (and waterway infrastructure as well), which are built and maintained by public authorities.

The ability of private transportation providers to compete has been greatly influenced by regulation. The impact of both regulation and subsequent deregulation in the motor carrier and railroad industries is evident.[39] Regulation of motor carriers began at the state level in the 1920s when motor carriers were required to demonstrate necessity for their services. The Motor Carrier Act of 1935 imposed the necessity requirement at the federal level. This legislation resulted in regulation of prices and entry. Under regulation, entry into new markets by both new carriers and incumbents had to be justified on the basis of convenience and necessity. Approval included specification of both the commodities to be carried and the routes that could be employed. Incumbent firms could block entry by arguing that they would be harmed by the new competition or by deciding to offer the service themselves.[40] This route regulation effectively operated as market division among carriers, shielding them from competition.

Beginning in the 1970s, there was extensive deregulation in the transportation industries. During the 1970s, the Interstate Commerce Commission adopted a number of changes in its regulation of the motor carrier and railroad industries. These changes generally increased rate setting ability by motor carriers and railroads and eased entry restrictions. In 1980, Congress passed the Motor Carrier Reform Act, which provided significant deregulation in the trucking industry by increasing pricing flexibility and reducing barriers to entry. This legislation was designed, in part, to target the high rates in the less-than-truckload segment. This legislation also eased entry by transferring the burden of proof from entrants, who previously had to justify their entry, to incumbents who now had to justify why entry should not be permitted. Motor carrier entry increased substantially after deregulation.[41]

Interestingly, Florida also deregulated intrastate trucking in 1980 before the effects of the Motor Carrier Reform Act became evident. In fact, Florida was the first state to completely deregulate the trucking industry.[42] Before deregulation, rates had been determined by rate bureaus subject to approval by the Public Service Commission, which also heavily regulated entry to the market. Operating restrictions governed geographic service areas, and motor carriers were required to serve unprofitable markets. In an empirical analysis of the effects of Florida's motor carrier deregulation, Blair, Kaserman, and McClave found a significant decrease in rates. Specifically, they found that "the removal of state regulatory constraints on the pricing and provision of the motor transport service resulted in an average reduction in rates on the order of 14%."[43]

Similarly, regulation had adverse effects on pricing, entry, and exit in the railroad industry. Railroads were unable to adjust their rates in the face of changing market conditions. This became increasingly problematic as railroads encountered growing competition from trucks as well as from barges and pipelines.[44] The development of the interstate highway system in the 1950s greatly decreased the delivery time by motor carriers, making them much more formidable competitors. The road quality was also better, allowing trucks to carry heavier and larger loads. Thus, unlike motor carriers, railroad companies faced financial ruin because of regulation. Specifically, they faced significant exit barriers

because they were not allowed to eliminate less profitable portions of tracks and were therefore encumbered by significant excess capacity. These regulations caused the profitability of railroad companies to plummet as evidenced by low rates of return. Consequently, many railroad companies faced bankruptcy. The Staggers Rails Act of 1980 was the major piece of legislation that brought meaningful deregulation to the railroad industry and gave railroads greater pricing flexibility,[45] and made it easier for railroads to abandon unprofitable routes and to merge with other carriers.[46]

Deregulation permitted greater negotiation between shippers and carriers and substantially increased the amount of freight transported by rail under contract rates. Therefore, railroads could make better use of capacity to meet shippers' needs more effectively.[47] Railroads divested themselves of substantial amounts of tracks, often through sales to regional and local railroads. Deregulation spurred consolidations and significant reduction of excess capacity in the railroad industry.

Although railway lines and motor carriers have been longtime competitors, they also serve complementary functions. At the very least, transferring freight between the rail terminal and the shipment's point of origin or final destination requires the use of trucks. This complementarity provides the basis for intermodal relationships between the two industries.

Intermodal connections between motor carriers and railroads are typically *piggyback*, which refers to loading highway trailers on flatcars (trailer on flat car, or TOFC), or *container* (container on flat car, or COFC). The surface transportation connections have developed in many areas into hub operations with the TOFC/COFC transfers being consolidated in a few areas.[48] In Florida, TOFC/COFC facilities are located in Ft. Lauderdale, Jacksonville, Miami, Orlando, and Tampa.[49] The other major type of intermodal connection is the bulk transfer facility, which—as the name implies—is used to transfer bulk materials. Florida has seventeen bulk transfer facilities.[50]

There has been substantial growth in intermodal rail-truck service. According to the Association of American Railroads, intermodal rail traffic grew from 3.1 million trailers and containers in 1980 to 9.3 million units in 2002. Intermodal transport is the second largest generator of rail revenue at almost 20 percent of rail revenues and is expected to soon surpass coal transport, which generated 22.7 percent of rail revenues in 2001.[51]

Alliances between traditional motor carriers and railroads in the 1990s contributed to this growth. Consolidated Freightways Corp., J.B. Hunt, and Schneider National all formed alliances with railroads during the early 1990s.[52] J.B. Hunt, for example, now has alliances with eight rail service providers and touts its intermodal service to its freight customers.[53]

Intermodal rail-truck service can take advantage of high-volume, long-haul economies of scale achieved by railroads while still enjoying the convenience of door-to-door service offered by motor carriers that transport the products between the rail terminals and the origin and destination points.[54] This allows shippers to experience both the convenience offered by motor carriers and the cost savings from employing rail for longer trips. In this way, the intermodal movement capitalizes on the advantages of the two modes

of transportation, and motor carriers and railroads complement each other in the production of transportation services.

Despite these advantages and the growth in intermodal rail-truck freight shipments, intermodal rail-truck service providers must overcome several difficulties:[55]

- The intermodal transit time may be slower than truck-only service due to poor connections, infrequent train scheduling, and indirect routing.
- The additional handling increases the likelihood of damage, and having multiple carriers complicates the determination of liability in the event of loss or damage.
- Some types of commodities do not lend themselves as well to intermodal movements; for example, bulk freight, which accounts for a large proportion of freight, does not transfer as easily as containerized freight.

In general, many shippers often perceive intermodal transportation to be inferior to using a single mode, particularly motor carriers, for the above reasons.[56]

Intermodal transportation providers are working to overcome these barriers. For example, Schneider National recently introduced a "TruckRail Express" service that explicitly targets shippers' concerns with slower time transit and handling concerns associated with truck-rail service relative to truck-only service:

> *TruckRail Express includes a national network of on-site representatives who help ensure Schneider trailers are moving quickly through rail yards; more than 40,000, 53 foot trailers available to move shipments; the flexibility to load trailers for both over-the-road and intermodal shipping; and 24/7 customer service availability.*
>
> *The target market for this service is shippers who want to use intermodal for its cost savings but who choose not to because of service or transit considerations. Now customers can achieve both cost savings and in many cases save a day or two in transit time compared to standard intermodal transit.*[57]

Improvements in the timeliness and quality of service will help intermodal service providers to overcome negative shipper perceptions.

B. SEAPORTS

Florida's seaports are important points of entry and exit for international trade. Collectively, Florida's 14 seaports handle liquid, bulk, containerized, and non-containerized general cargo in addition to agricultural products.[58] Of the 14 seaports, seven—the Port of Miami, Port Everglades, the Port of Palm Beach, Port Manatee, the Port of Tampa, Port Canaveral, and the Port of Jacksonville—handle annually over 98 percent of waterborne cargo.[59] During the 2001-2002 fiscal year, all Florida's seaports handled 114.6 million tons of cargo. The number of containers traveling through Florida's seaports increased from just under a million (twenty-foot equivalent units (TEUs) during the 1989-1990 fiscal year to approximately 2.5 million TEUs during the 2001-2002 fiscal year.[60]

Most general cargo terminals are publicly owned but many bulk commodity terminals are privately owned.[61] General cargo refers to a variety of consumer goods, typically manufactured or processed. General cargo is frequently containerized and shipped on liners.[62] Bulk cargo is typically raw materials and may be either dry or liquid, such as grain or oil, shipped in lots.[63] Because bulk materials typically have low value per ton, transportation costs make up a greater proportion of the overall cost than for other types of freight; therefore, the cost of transportation is an important consideration when choosing the method of shipment. In addition to playing an important role in domestic and international commerce, seaports play a critical role in military equipment and the deployment of troops.[64]

Seaports inherently involve intermodal transportation since goods and people must be transported to the port and then transfer between modes at the port. Motor vehicles and railroads provide these connections. The major intermodal issues facing ports are congestion of connecting truck routes, numerous at-grade crossings of local streets (where rail lines intersect local streets), and the acquisition of available land.[65] Ports face difficulty in increasing access and expansion because they compete with other highly-valued commercial uses for the land, and the ports may meet resistance from various local interest groups. For example, environmental groups may object to port expansion efforts that encroach upon wetlands, and historical preservation groups may oppose port expansion efforts that encroach upon historic districts. These access issues are cited as key intermodal concerns both nationally and in Florida.[66]

C. AIR

Air freight may be carried on cargo-only carriers, integrated carriers—such as FedEx and UPS—which own and operate their own fleet, and passenger airlines that carry some cargo.[67] The intermodal connections at airports involve cargo transfer to and from trucks. Thus, the major intermodal issues deal with highway access and congestion. In Florida, seven airports accounted in 1998 and 1999 for 98 percent of the State's air cargo: Miami International, Orlando International, Fort Lauderdale-Hollywood International, Southwest Florida International, Jacksonville International, Tampa International, and Palm Beach International.[68]

IV. RECENT LEGISLATION

Although intermodalism has existed for over half a century, it has not been a primary focus of transportation policy until recently.[69] Legislation at both the federal and state levels has made the development and enhancement of intermodal transportation policy a priority for policymakers and planning organizations.

A. FEDERAL LEGISLATION

Historically, federal transportation programs concentrated largely on providing funding for highways.[70] The passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), however, increased the flexibility of states in their selection of transportation projects eligible for federal funding.[71] Moreover, ISTEA, as its name suggests, specifically identified intermodalism as a priority. Section 2 of ISTEA states:

> *It is the policy of the United States to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the Nation to compete in the global economy, and will move people and goods in an energy efficient manner.*
>
> *The National Intermodal Transportation System shall consist of all forms of transportation in a unified, interconnected manner, including the transportation systems of the future, to reduce energy consumption and air pollution while promoting economic development and supporting the Nation's preeminent position in international commerce.*[72]

As the above passage indicates, ISTEA encompassed many goals. The Act sought to improve the interconnectedness of transportation systems in order to enhance economic competitiveness. However, as noted previously, the Act also required that transportation planning take into account the environmental impacts of transportation systems with an eye towards meeting the mandates of the 1990 Clean Air Act Amendments. On a related note, the wording of ISTEA also places importance on developing transportation systems that decrease energy consumption to promote both fuel conservation and energy independence.

ISTEA also took a more decentralized approach by assigning responsibility for transportation planning policies to states and localities and by requiring coordinated planning efforts between the states and their respective metropolitan planning organizations. ISTEA required states to develop statewide transportation plans and planning processes.

ISTEA's emphasis on intermodalism presumably changes the focus of transportation planning. Rather than focusing on particular *modes* of transportation, the Act focuses on the efficient and safe *movement* of people and goods. An emphasis on intermodalism suggests a more comprehensive approach to transportation planning as does the breadth of requirements contained in ISTEA—enhancing economic competitiveness, improving air quality, reducing energy consumption, and increasing coordination between state and local planning efforts.

In May 1998, Congress approved the Transportation Equity Act for the 21st Century (TEA-21)—the ISTEA reauthorization act for 1998-2003, which builds upon ISTEA's principles. TEA-21 is scheduled to expire on September 30, 2003 and proposals for its reauthorization are under review in Congress.

B. STATE LEGISLATION

Prior to the enactment of ISTEA, Florida had passed its own intermodal legislation in 1990, establishing an Intermodal Development Program.[73] The purpose of this program was, and continues to be, to provide funding for intermodal facilities and projects and to encourage the development of stronger intermodal networks within the State. Consistent with the requirements of ISTEA and TEA-21, Florida legislation currently requires that the Florida Department of Transportation develop a statewide transportation plan with a planning horizon of at least 20 years. This plan is based upon the principles outlined in ISTEA:

> *preserving the existing transportation infrastructure; enhancing Florida's economic competitiveness; and improving travel choices to ensure mobility. The Florida Transportation Plan shall consider the needs of the entire State transportation system and examine the use of all modes of transportation to effectively and efficiently meet such needs.*[74]

In addition, the legislation encourages projects that will "[e]nhance the integration and connectivity of the transportation system, across and between modes throughout Florida, for people and freight."[75] The statewide plan is developed in conjunction with the transportation plans of Florida's metropolitan planning organizations and in consultation with officials from nonmetropolitan areas. The legislation similarly requires metropolitan planning organizations to develop long-run plans with these broad principles in mind, including a focus on intermodalism.[76]

The Strategic Intermodal System Steering Committee recommended in its final report that an intermodal strategic plan be developed and subsequently updated. Among the activities to be included in the plan is the development of a finance strategy that would leverage available transportation revenues.[77] The Florida Legislature's amendments in 2002 to the State-funded Infrastructure Bank statute provide another financing option for project funding. That legislation expressly authorizes the Bank to lend capital costs or provide credit enhancements for transportation facility projects that meet criteria of the Intermodal Development Program.[78] TEA-21 established a pilot program that authorized four states—California, Florida, Missouri, and Rhode Island—to enter into cooperative agreements with the U.S. Department of Transportation to capitalize their infrastructure banks with federal funds authorized in TEA-21 for 1998-2003. Of the states currently authorized, only Florida and Missouri have done so.[79]

VI. THE ROLE OF GOVERNMENT—AN ECONOMIST'S VIEW

Government involvement in transportation planning and investment should proceed thoughtfully and cautiously. Specific project proposals should be evaluated based on a set of clearly specified criteria. Policymakers must determine when it is appropriate for the government to be involved in markets—transportation or otherwise. Government intervention in economic activity is typically justified on efficiency or equity grounds. In either case, government may be called upon to correct what economists call a *market failure*, which occurs when private markets do not achieve an efficient allocation of resources.

For example, externalities are a source of market failure. An *externality* occurs when the actions of one entity affects the welfare of another in a way that is outside of the market, but these external effects are not reflected in market prices. Externalities can be either negative or positive. With respect to transportation, two examples of externalities, one positive the other negative, are evident.

In a sense, highway beautification represents an economic activity that enjoys a positive externality. Most automobile drivers like looking at well maintained road medians, but the benefit that accrues to each driver is too small to compel an individual to personally undertake the expense of time and money to beautify a highway, or even a large stretch of one. The total benefits that would accrue to society from the beautification of its highways, however, might be significant—beside their direct enjoyment of the beautified highway, drivers might be less irritable, leading to more conscientious driving, fewer accidents, and reduced emergency spending. In this respect, beautification represents a good that benefits the entire driving segment of society. But since the private benefits are so small and dispersed, the private sector might under-produce beautification. Government might then intervene to plant flowers and shrubs in medians and along the roadside, shouldering the costs of beautification in place of the private sector, but still allowing society to benefit.

Pollution is a common example of negative externalities that occurs from production and consumption processes. Regarding transportation specifically, one significant source of pollution is motor vehicle emissions. Businesses and individuals tend to take into account only the costs that they explicitly incur in motor vehicle usage, such as the cost of purchasing or leasing the vehicle, maintenance and repair costs, and the cost of fuel. The external pollution costs are either ignored or underestimated when transportation decisions are made. Thus, motor vehicle usage will be inefficiently high from a social welfare standpoint. Government actions may help to move the market towards a more efficient level. For example, government subsidization of transportation alternatives that result in lower emissions can induce business and consumers to substitute these alternatives for individual motor vehicle usage. Alternatively, the government might levy taxes to raise the cost of motor vehicle usage and thereby decrease the amount of use (and the resulting emissions).

Government may also involve itself in economic activity for equity reasons; e.g., to redistribute income and wealth. For example, the government might subsidize the cost of transportation services to low-income households in order to increase access to jobs or medical services. Government involvement in markets might also reflect the influence of special interest groups. Importantly, government involvement in markets usually has some redistributive implications—some individuals and groups will benefit and others will bear the costs.[80]

As noted previously, government funding for transportation projects had originally been restricted to specific modes of transportation or for narrowly-designated purposes, and the emphasis typically was on highway funding. Recent federal legislation, notably ISTEA and TEA-21, has increased the scope of transportation projects that are eligible for federal funds. This increased flexibility, combined with the explicit emphasis on intermodalism, expands the range of projects that might be eligible for federal funds. Moreover, projects eligible for federal funding can now address a broader range of transportation concerns,

such as the external costs imposed by motor vehicle emissions. They also may be funded from a wider array of funding mechanisms, such as state infrastructure banks.

In considering government involvement in the development of intermodal projects (as is the case of any government intervention into a market), policymakers might ask why the public sector should be involved rather than relying on the private sector. Is there a market failure to be corrected? Is there an inequity that needs to be addressed? If they determine that government involvement is the best way to correct a market failure or an inequity, then alternative methods for achieving the proposed public policy goal should be identified and evaluated. They could employ a cost-benefit analysis to compare each different project's net benefit. For example, is the cost of the project offset by the potentially substantial benefits of having fewer trucks on the road, less congested traffic, and cleaner air? In determining projects appropriate for government funding, they also should take into account the needs of the private sector, changes in market conditions and in technologies. After they have implemented a selected project, they could perform a post-investment evaluation to determine whether the anticipated benefits were realized in a cost-efficient manner. They could use findings of these follow-up evaluations to inform future investment decisions and improve the processes and outcomes of subsequent projects.

Although recent federal legislation has reoriented the focus of transportation towards a greater emphasis on intermodalism, the fundamental questions regarding the government's role in transportation planning have not changed. The Transportation Research Board has noted that:

> *[I]ntermodal movements use the same infrastructure, equipment, and organizational systems as single-mode freight, with the exception of certain terminal and transfer facilities. Thus, for example, a well-functioning highway system is an asset to truck-rail intermodal freight as well as to all truck transport. Analogously, the questions concerning government programs and investment decisions that are most important for intermodal freight efficiency are, for the most part, the same questions that are most important for the efficiency of all freight services.*[81]

Randall Eberts argues that "[i]t is not simply the issue of whether the private sector or the government should take sole responsibility for intermodal freight activity. The private sector has taken the lead in intermodal development, and partnerships between the two sectors have already been formed."[82] Rather, he frames the question as "whether the government needs to modify its established transportation programs to further accommodate and enhance the private sector's move towards intermodalism as the demand for less costly, more efficient freight shipments increases."[83] In other words, since, as demonstrated above, the private sector is addressing the growth of intermodal transport by acting in ways that are economically and environmentally beneficial, is there really a need for government intervention? Only if the answer is yes should legislators and regulators ask the following question: Will governmental action on intermodal transport make Florida a more economically efficient and environmentally sound place to do business, and by virtue of that, a better place to live?

VII. SUGGESTED COURSE OF ACTION—A VERY BRIEF PROPOSAL

In the previous section, we addressed the general economic principles that guide decisions on government funding for intermodal transportation projects. In this section, we outline a specific course of action. Policymakers and planning organizations might consider the following steps in determining the appropriate role of government involvement in intermodal transportation planning:[84]

1. Determine whether there is a market for the proposed project. For example,
   - Does the proposed project address the specific needs of the State?
   - Does it create capacity where there are congestion/bottleneck problems?[85]
   - Does it create new transportation linkages that will facilitate a more efficient movement of freight or people?
   - And if so, is it the best way to address the transportation needs that have been identified?

If the answer to one or more of these questions is yes, then determine whether the project is self-financing by estimating the private benefits and costs. If the private benefits exceed the private costs, then why is government involvement needed? In the event of a deficit, it is necessary to determine whether there are external benefits that merit government involvement.

2. Determine whether there are external benefits or costs that are not reflected in the above calculations.
   - Will the project reduce negative externalities associated with transportation, such as pollution and congestion? (A project that results in a lower level of emissions in an area reduces a negative externality, thereby conferring an external benefit.)
   - Does the project confer *unique* and *external* benefits to local economic growth and development (as opposed to a redistribution or rearrangement of resources)?
   - Does the proposed project contribute to the transportation system's role in national defense or other public safety (e.g., evacuation routes)?

If the answer to one or more of these questions is yes, then estimate the external benefits (including reductions in external costs) associated with the project.[86] In the event of a deficit in (1) above, how does the magnitude of these external benefits compare to the shortfall under private financing?

3. Compare the proposed project to other uses of public resources.
   - How does the proposed project compare to other local infrastructure projects or public services in terms of the net benefits?
   - Are there less costly ways to achieve the desired benefits?

- What opportunities would be lost in order to use public resources for the proposed project?

4. Identify the distributional effects of the project.
   - Who are the primary beneficiaries of the anticipated benefits?
   - How are the costs of the project distributed?

5. If government financing is justified, determine:
   - What level(s) of government should provide the financing?
   - What method of finance will be employed — user fees, general tax revenues, or bond financing?

6. Undertake post-investment analysis:
   - How do the actual results compare with the projections?
   - Use the findings of the post-investment analysis to guide future decisions.

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[1] See W. Brad Jones, C. Richard Cassady, and Royce O. Bowden, "Developing a Standard Definition of Intermodal Transportation," in: *Symposium on Intermodal Transportation*, 27 *Transportation Law Journal* 345 (Summer 2000).

[2] For an overview of the development and growth of containerization, see John H. Mahoney, *Intermodal Freight Transportation* (Westport, CT: Eno Foundation for Transportation, Inc., 1985) at pp. 13-24. Paul Dempsey credits the "container revolution" as having "done more to foster the growth of international trade than any other single intermodal breakthrough." See Paul S. Dempsey, "The Law of Intermodal Transportation: What It Was, What It Is, What It Should Be." *Id.* at pp. 368-369.

[3] Both narrow and broad characterizations are included in the following definition of *intermodalism* provided by the U.S. Department of Transportation's Bureau of Transportation Statistics:

> 1) [M]ost narrowly, [intermodalism] refers to containerization, piggyback service, or other technologies that provide the seamless movement of goods and people by more than one mode of transport. 2) [M]ore broadly, intermodalism refers to the provision of connections between different modes, such as adequate highways to ports or bus feeder services to rail transit. 3) In its broadest interpretation, intermodalism refers to a holistic view of transportation in which individual modes work together or within their own niches to provide the user with the best choices of service, and in which the consequences on all modes of policies for a single mode are considered. This view has been called balanced, integrated, or comprehensive transportation in the past.

Available at: http://www.bts.gov/btsprod/expr/expsearch.html.

[4] *Year 2020 Florida Statewide Intermodal System Plan: Interim Final Report*, Florida Department of Transportation (March 1, 2000), p. G-4.

[5] *1997 Commodity Flow Survey*, Bureau of Transportation Statistics and Bureau of the Census, Table 1.a, p. 9, available at: http://www.bts.gov/ntda/cfs/cfs97states/97tcf-fl.pdf.

[6] *Id.*

[7] *Id.*

[8] *Id.*

[9] The comparable figures for the U.S. overall are as follows: 58.3 percent of all tons shipped by a single mode were for distances less than 50 miles, 68.4 percent for distances equal to 99 miles and less, and 6.8 percent for distances of 750 miles and greater. For all tons shipped intermodally, approximately 15 percent was shipped less than 100 miles and approximately one-third was shipped more than 750 miles. *Id*, at Table 3, p. 11..

[10] *Id*, at Table 7, p. 33.

[11] *Id*, at Table 8, p. 34.

[12] The Transportation Research Board has commented that "intermodal freight is critical in international trade." See Transportation Research Board, *Special Report 252: Policy Options for Intermodal Freight Transportation* (Washington D.C.: National Research Council, 1998), p. 14.

[13] See *Comparison of Florida's Merchandise Trade Volume and Overall U.S. Trade Volume, 1998-2001*, available at: http://www.eflorida.com.

[14] The total dollar value of Florida's exports in 2000 was $26.5 billion. In 2001, it was $27.2 billion and in 2002, it decreased to $24.5 billion. This reduction from 2001 to 2002 caused Florida to slip in state ranking from 8th to 9th place in terms of total dollar value of state exports. These data were obtained from MISER: Massachusetts Institute for Social and Economic Research, available at: http://www1.miser.umass.edu/trade/strank.html.

[15] See *Steering Committee Final Report: Recommendations for Designating Florida's Strategic Intermodal System*, Florida Department of Transportation (December 2002) at p. 2-2.

[16] See Marilyn M. Helms and Lawrence P. Ettkin, "Time-Based Competitiveness: A Strategic Perspective," 10 *Competitiveness Review* 1 (Summer-Fall 2000) for a discussion of the importance of time management as a competitive advantage in each stage in the production-distribution supply chain.

[17] For more detail, see http://www.csxt.com/com/pap/partners.htm.

[18] See Mary Hayes, "Mobility is Up, Costs are Down – Creative IT Shapes Transportation's Future," *Information Week* (September 14, 1998) at p. 251.

[19] For more information, see "Clean Air Act," U.S. Environmental Protection Agency, available at: http://www.epa.gov/oar/oaq_caa.html.

[20] See "The Problem," *Congestion Mitigation and Air Quality Improvement Program*, Federal Highway Administration, U.S. Department of Transportation, available at: http://www.fhwa.dot.gov/environment/cmaq/problem.htm.

[21] Although upper-atmosphere ozone protects the earth by shielding it from ultraviolet radiation, ground-level ozone causes harm to human health and the environment. See "Ground-Level Ozone: What is it? Where does it come from?" and "Health and Environmental Impacts of Ground-level Ozone," U.S. Environmental Protection Agency, available at: http://www.epa.gov/air/urbanair/ozone/index.html.

[22] The other three criteria pollutants are nitrogen oxides, sulfur dioxide, and lead. See "What Are the Six Common Air Pollutants?" U.S. Environmental Protection Agency, available at: http://www.epa.gov/air/urbanair/6poll.html.

[23] Ground-level ozone was the only criteria pollutant for which Florida had nonattainment areas. See "Green Book: Nonattainment Areas for Criteria Pollutants," U.S. Environmental Protection Agency, available at: http://www.epa.gov/air/oaqps/greenbk/index.html. Duval county was classified as a Section 185A, or "transitional" area, with respect to ground-level ozone, which is an area designated as a nonattainment area as of the date of enactment of the Clean Air Act Amendments of 1990 but did not violate the national primary ambient air quality standard for ozone for the 36-month period beginning on January 1, 1987 and ending on December 31, 1989. See "Sections of the Clean Air Act," U.S. Environmental Protection Agency, available at: http://www.epa.gov/air/oaqps/greenbk/caa-t1p.html.

[24] A maintenance area is an area that was formerly a nonattainment but has subsequently attained the NAAQS and was officially redesignated to attainment by the U.S. Environmental Protection Agency.

[25] See *United States Code*, Title 23 (Highways), Section 134 (Metropolitan Planning), available at: http://www.access.gpo.gov/uscode/uscmain.html.

[26] See "CMAQ Funding," *Congestion Mitigation and Air Quality Improvement Program*, Federal Highway Administration, U.S. Department of Transportation, available at: http://www.fhwa.dot.gov/environment/cmaq/funding.htm.

[27] TEA-21 expanded CMAQ eligibility to "maintenance" areas. The requirements to apply for CMAQ funds vary by metropolitan area and state. See "What's New," *Congestion Mitigation and Air Quality Improvement Program*, Federal Highway Administration, U.S. Department of Transportation, available at: http://www.fhwa.dot.gov/environment/cmaq/whatsnew.htm.

[28] See "Eligibility," *Congestion Mitigation and Air Quality Improvement Program*, Federal Highway Administration, U.S. Department of Transportation, available at: http://www.fhwa.dot.gov/environment/cmaq/eligblty.htm.

[29] *Id.*

[30] See Transportation Research Board, *supra* note 12 at p. 16.

[31] Source: *Draft 2002 Florida Highway Data Source Book*. Attachments merged from Gordon Morgan, Florida Department of Transportation; received March 14, 2003.

[32] *Id*, Exhibit A-6.

[33] See "Eligibility," *Congestion Mitigation and Air Quality Improvement Program*, Federal Highway Administration, U.S. Department of Transportation, available at: http://www.fhwa.dot.gov/environment/cmaq/eligblty.htm.

[34] Investing in intermodal facilities may be less costly than expanding highways. See Transportation Research Board, *supra* note 12 at pp. 15-16.

[35] Source: *2002 Urban Mobility Study*, Texas Transportation Institute, Exhibit A-17, available at: http://mobility/tamu.edu/ums/. PAS refers to "principal arterial streets."

[36] Although intermodal transportation is applicable to both freight movement and passenger travel, the focus here will be on freight movement. Many of the issues confronting intermodal freight transportation, such as bottlenecks and congestion at major intermodal connections, are also applicable to intermodal passenger travel. Because policymakers and planning organizations have typically understood the issues associated with freight movement less well than those associated with passenger travel, there have been calls for more emphasis on freight movement issues.

[37] See Clifford Winston, "U.S. Industry Adjustment to Economic Deregulation," 12 *Journal of Economic Perspectives* 89 (Summer 1998) at p. 94.

[38] For an overview of the railroad industry, see General Accounting Office, "Railroad Competitiveness: Federal Laws and Policies Affect Railroad Competitiveness," GAO/RCED-92-16 (November 1991), available at: http://www.gao.gov/.

[39] For overviews of the economic effects of regulation (and deregulation) of surface freight transportation, see Clifford Winston, Thomas M. Corsi, Curtis M. Grimm, and Carol A. Evans, *The Economic Effects of Surface Freight Deregulation* (Washington, D.C.: The Brookings Institution, 1990) and W. Kip Viscusi, John M. Vernon, and Joseph E. Harrington, Jr., "Economic Regulation of Transportation: Surface Freight and Airlines," in *Economics of Regulation and Antitrust*, 2d ed. (Cambridge, MA: The MIT Press, 1995), pp. 551-602.

[40] See Winston et al., *id.*, at pp. 7-8.

[41] *Id.* at pp. 11-12.

[42] See Roger D. Blair, David L. Kaserman, and James T. McClave, "Motor Carrier Deregulation: The Florida Experiment," 68 *The Review of Economics and Statistics* 169 (1986).

[43] *Id.* at p. 163.

[44] See Winston et al., *supra* note 39 at pp. 1-6.

[45] Previous legislation included the Regional Rail Reorganization Act (the 3R Act) of 1973, which was designed to address bankruptcies in the industry, and the Railroad Revitalization and Regulatory Reform Act of 1976 (the 4R Act). However, these acts were inadequate to dismantle the bulk of regulation facing the industry. See Winston et al., *supra* note 39 at p. 3.

[46] The effect of mergers on social welfare is not always clear. Mergers that enhance efficiency through economies of scale and scope and through elimination of excess capacity represent welfare improvements. Mergers that result in increased market power are welfare decreasing. Many mergers, however, simultaneously improve efficiency and significantly increase industry concentration. The welfare effects in such cases are ambiguous.

[47] See Winston, *supra* note 37 at p. 96.

[48] See "Chapter 2: Freight Intermodal Transportation," *Year 2020 Florida Statewide Intermodal System Plan: Interim Final Report*, Florida Department of Transportation (March 1, 2000) at pp. 10-11.

[49] *Id.* at p. 11.

[50] *Id.*

[51] See "Rail Intermodal Transport," Association of American Railroads (January 2003) and "Class 1 Railroad Statistics," Association of American Railroads (January 10, 2003), available at: http://www.aar.org.

[52] See Mitchell E. MacDonald, "The New Intermodal Alliances," 31 *Traffic Management* 60 (October 1992).

[53] See J.B. Hunt, "What We Do: Intermodal," available at: http://www.jbhunt.com/what_we_do/intermodal/index_intermodal.html.

[54] See Donald V. Harper and Philip T. Evers, "Competitive Issues in Intermodal Railroad-Truck Service," 32 *Transportation Journal* 31 (Spring 1993).

[55] *Id.*

[56] *Id.* For related work, see Philip T. Evers, Donald V. Harper, and Paul M. Needham, "The Determinants of Shipper Perceptions of Modes," 36 *Transportation Journal* 13 (Winter 1996).

[57] See http://www.schneider.com/newsAndEvents/sninews/truckrail_express_service.html.

[58] See "Chapter 2: Freight Intermodal Transportation," *Year 2020 Florida Statewide Intermodal System Plan: Interim Final Report*, Florida Department of Transportation (March 1, 2000) at pp. 13-20.

[59] See *Steering Committee Final Report: Recommendations for Designating Florida's Strategic Intermodal System*, Florida Department of Transportation (December 2002) at p. 6-8 .

[60] See *Five Year Plan to Accomplish the Seaport Mission*, Florida Department of Transportation, Seaport Office.

[61] See Transportation Research Board, *Special Report 238: Landside Access to U.S. Ports*, (Washington D.C.: National Research Council, 1993) at p. 30.

[62] Liners refer to shipping services provided by regular line operators that have predetermined itineraries and sailing schedules. *Id.* at p. 191.

[63] *Id.*

[64] *Id.* at pp. 1-3.

[65] *Id.* at pp. 4-7. Note that at-grade crossings increase congestion on local streets.

[66] See *id.* at pp. 3-10 and "Chapter 2: Freight Intermodal Transportation," *Year 2020 Florida Statewide Intermodal System Plan: Interim Final Report*, Florida Department of Transportation (March 1, 2000) at p. 20.

[67] See "Chapter 2: Freight Intermodal Transportation," *Year 2020 Florida Statewide Intermodal System Plan: Interim Final Report*, Florida Department of Transportation (March 1, 2000) at p. 34.

[68] See *Steering Committee Final Report: Recommendations for Designating Florida's Strategic Intermodal System*, Florida Department of Transportation (December 2002) at p. 6-5.

[69] For a detailed overview of U.S. transportation regulation and law with a focus on intermodal transportation, see Dempsey, *supra* note 2.

[70] Paul Dempsey notes that "the Intermodal Surface Transportation Efficiency Act of 1991 was the first highway bill in the nation's history to have expunged the word 'highway' from its title." See Dempsey, *supra* note 2 at p. 391.

[71] ISTEA authorized federal programs from 1992 to 1997. The Transportation Equity Act for the 21st Century (TEA-21) is the successor legislation that effectively reauthorized ISTEA and continues many of the federal transportation programs begun under ISTEA for fiscal years 1998-2003. The Department of Transportation's Office of Intermodalism also was created pursuant to ISTEA. Information about the Office of Intermodalism can be obtained at: http://www.dot.gov/intermodal/.

[72] See "Laws and Regulations Pertaining to the Bureau of Transportation Statistics," Bureau of Transportation, U.S. Department of Transportation, available at: http://www.bts.gov/lawlib/docs/istea1.htm.

[73] Florida Statutes, § 341.053 (Intermodal Development Program): "There is created within the Department of Transportation an Intermodal Development Program to provide for major capital investments in fixed-guideway transportation systems, access to seaports, airports and other transportation terminals, providing for the construction of intermodal or multimodal terminals; and to otherwise facilitate the intermodal or multimodal movement of people and goods." See the *2002 Florida Statutes*, available at: http://www.leg.state.fl.us/Statutes/index.cfm.

[74] See Florida Statutes § 339.155 (Transportation planning), Section 1 (The Florida Transportation Plan).

[75] *Id.* at Section (2)(e).

[76] See Florida Statutes § 339.155 (Transportation planning) and § 339.175 (Metropolitan planning organizations).

[77] See *Steering Committee Final Report: Recommendations for Designating Florida's Strategic Intermodal System*, Florida Department of Transportation (December 2002) at p. 7-2.

[78] See Laws of Florida, Ch. 2002-20, Section 84.

[79] See Testimony of Jay Etta Z. Hecker, General Accounting Office, to the Committee on Finance and Committee on Environment and Public Works, "Transportation Infrastructure: Alternative Financing Mechanisms for Surface Transportation," GAO-02-1126T (September 25, 2002) at p. 17 (Appendix II), available at: http://www.gao.gov/.

[80] User fees can be employed to make the beneficiaries be the bearers of cost. Designing optimal user fees, however, is difficult; thus, redistribution necessarily will occur. Moreover, user fees often are not employed. For example, many projects are financed through general tax revenues.

[81] See Transportation Research Board, *supra* note 12 at p. 17.

[82] See Randall W. Eberts, "Principles for Government Involvement in Freight Infrastructure," in: Transportation Research Board, *Special Report 252: Policy Options for Intermodal Freight Transportation* (Washington D.C.: National Research Council, 1998) 117-152 at p. 122.

[83] *Id.*

[84] These considerations are adapted from Transportation Research Board, "Principles for Government Involvement," in *Special Report 252: Policy Options for Intermodal Freight Transportation* (Washington D.C.: National Research Council, 1998) 20-45 at pp. 38-44.

[85] To assist policymakers and planners in their analysis, the Department of Transportation released in October 2002 a new database -- the Freight Analysis Framework (FAF)-- that examines the key transportation modes of highways, railroads, water, and air. To evaluate the effect of expected volumes of shipments on the transportation networks, FAF includes economic forecasts for 2010 and 2020. Economic data from the forecasts are translated into transportation demand and that demand is assigned to the networks. The freight transportation profile for Florida, based on the FAF, is available at: http://www.ops.fhwa.dot.gov/freight/state_profiles.htm.

[86] External benefits can be difficult to estimate, and their magnitude is often uncertain. Thus, it is important that policymakers carefully evaluate the likelihood that claimed benefits will be realized and their magnitudes. Otherwise, there may be a great deal of inefficient public investment in projects that fail to produce net benefits.