

Toward Improved Intermodal Freight Transport in Europe and the United States: Next Steps

Report of an Eno Transportation Foundation Policy Forum held
November 18–20, 1998



Forum Sponsors:

European Commission
Directorate-General VII (Transport)

U.S. Department of Transportation
Office of Intermodalism and
Federal Highway Administration

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The growth of the global economy, advances in information technologies, and improved communications networks have contributed to major changes in transport and logistics. Just-in-time inventory systems, supply-chain management, outsourcing of logistics, and intermodal transport have grown hand-in-hand with these advances in technology and economic interaction. Further economic growth demands that we continue to advance international intermodal transport.

Intermodal transport—door-to-door services using more than one mode, but contracted as a single service on a combined bill of lading—are a key ingredient of the emerging global economy and new logistics environment. Intermodal transport not only is rapid, reliable, customer-oriented, and efficient, but also makes effective use of the existing infrastructure and can help provide needed transport without undue environmental costs. Governments around the world seek to reap the benefits possible through increased intermodal transport, both domestically and internationally.

The European Commission and the U.S. Federal Highway Administration recognize the potential of intermodal transport and the need to work together to advance it on a global scale. They convened a forum on this potential in Washington, DC, in October 1997, bringing together top leaders engaged as transport carriers, shippers, and government officials from both Europe and the United States. Participants found this forum valuable to understanding the issues and the perspectives of other participants. They identified a short list of specific issues for continued examination that formed the basis for a second forum, which was held in Munich, Germany, in November 1998. This report summarizes the discussions at the 1998 event.

A variety of views is reported here: shippers and carriers, government and industry, rail and truck, logistics providers and corporate outsourcers, and Europeans and Americans. Sometimes the participants shared a vision of what is needed for im-

proved international intermodal transport; often they do not. Each has a distinct and valid interest in achieving improvements, and these improvements can only be achieved through collective understanding and action. No one fully understands the intermodal transport system, and no one is empowered to manage its improvement: these are complex matters whose successful resolution hinges on many independent private and public parties. Forums like the ones held in Washington and Munich can help to identify opportunities where individuals and groups can gain the information and plan actions that lead to collective improvement of the system.

We are pleased to have initiated this discussion and are gratified to see that it has developed into the dynamic, productive dialogue reported here. The discussion has focused attention on opportunities for improvement, on topics where more information is critically needed, and on emerging developments where all partners must work together to meet the needs of the future. Everyone involved in international intermodal transport will gain by learning more about how these issues are viewed by different participants. We are pleased to have been catalysts in this process, and we look forward to continued efforts to improve broad-based understanding and cooperation to advance international intermodal transport capabilities.

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Introduction

In November 1998, a group of high-level industry and government representatives met to discuss ways to improve intermodal freight operations between Europe and the United States. The European Commission and the U.S. Department of Transportation sponsored this second such meeting. The participants' active roles in providing and guiding intermodal transport services make them uniquely qualified to identify strategic opportunities. As individuals, as organizational officials, and as members of established coordination bodies they can seize opportunities to apply the insights they gain through information exchanges like this forum.

Greater reliance on intermodal transport is crucial for economic productivity and environmental preservation. More than 70 percent of all goods transported in the European Union are moved by truck, up from 50 percent 35 years ago. This increase is creating serious problems in the European Union, including unacceptably high levels of environmental degradation and safety-related losses, as well as productivity losses due to congestion. There is simply not enough space to put new roads or rails to meet such an increase in freight. Intermodal transport offers to rebalance the system in a way that provides needed services but eases the strain on the environment.

In Europe as in the United States, governments recognize that they cannot build their way out of congestion. But the two regions are different in important ways. The geography of the United States is such that rail and road can be combined more easily. In Europe, combining modes efficiently is more difficult due to shorter geographic distances for shipments within Europe, difficulties in operating seamless rail services across national borders, and the impossibility (on many routes) of double-stacking containers. Both regions face the important challenge of finding ways to make more efficient use of existing facilities, but under different circumstances.



Dr. Wim Blonk, European Commission, Directorate General VII (left) and Kenneth Wykle, Federal Highway Administration, U.S. Department of Transportation (right)

The discussions reported here seek to enhance the efficiency of intermodal transport. This goal is shared by a wide variety of interests: firms that produce goods and firms that ship them, government agencies and private businesses, consumers and producers. Yet this goal cannot be reached by any one agency or organization. It requires an exceptional amount of cooperation—between modes, between countries, between the public and private sectors, and across different levels of government and different parts of the world. This cooperation is facilitated through informal exchanges like those discussed in the following report.

These discussions took place over two days. Separate sessions were devoted to (1) standardization of loading units, (2) liability for damage and loss of intermodal cargo, (3) economic regulation of competition in transport, and (4) best practices in intermodal transport. Background papers on these topics, which follow these

Participants in the second European-U.S. Forum on Improved Intermodal Freight Transport on November 18–20, 1998.



proceedings, were prepared and distributed prior to the discussions. These papers were summarized briefly by the authors at the start of each session, followed by an open roundtable discussion among all the participants.

Interoperability and Standardization

Standardization of Loading Units

Standards promise many advantages. They can help businesses achieve greater economies of scale. Using standardized units, companies can reduce the capital needed for investment. Standards can reduce the cost of transfer facilities. Companies can make better use of their equipment and carrying capacity. They do not need to maintain large stocks of duplicative equipment. They can improve backhaul capacity. They also can enhance their ability to communicate—to interchange business in larger organizational or physical networks that may involve other companies.

However, standardization can stifle innovation and flexibility. Standards can make a company less willing to consider modifications to accommodate specialized needs, and services may become less responsive to changing customer needs. Standards may require high front-end conversion costs, at least for some companies. Standards also can erode the competitive

edge that a firm gains from its proprietary systems and specialized equipment. Standards can create security concerns.

Introducing new standards reallocates benefits and costs, and such a transition raises the difficult issues associated with how the costs and benefits will fall on companies at different points along the supply chain, and how companies may face different competitive stakes. The shipper's expectations drive the process. Transport customers want one-stop, single-source shopping. But they also want flexibility as their markets and needs change. For example, a very large shipper can develop new systems to maximize its position in the market, and carriers must adapt.

The viability of standards in any industry is closely linked to the maturity of the industry. In more mature industries, moves toward increased uniformity are less likely to conflict with other goals. The intermodal industry, however, is far from being mature. Moving too quickly to standardize this industry could conflict with the healthy process of innovation that is the essence of a dynamic industry. For example, intermodal transport could be transformed by the introduction of megaships. More than 40 of these ships are on order and scheduled to be delivered over the next several years. The size of the cells in these ships will drive the size of containers. In turn, the size of the container will affect the prospects for standardizing loading units in intermodal transport.

European firms currently operate using a wide variety of different container sizes and types that are not interchangeable or easily combined. Greater standardization offers many benefits. Yet, the range of options is limited because the physical infrastructure in Europe limits the extent to which maximum dimensions can be changed. Tunnel heights in many areas prevent increases in vertical size. The width is also fixed. While the overall benefits are evident, and the range of options is narrow, many parties have a competitive interest in one solution or another, and an agreement on standards cannot be reached until a vast majority of affected interests see a common gain in standardization.

Otto Sonefeld, American Association of State Highway and Transportation Officials, Anders Lundberg, Swedish Railways, and Robert Martinez, Norfolk Southern Corporation (left to right)



The issue of standardization is also tied to long-run infrastructure planning: Each needs a vision of the other. As the merits of increased standardization are weighed, the infrastructure implications must be taken into account. The United States, like Europe, faces serious highway congestion, and expansion is very difficult. It takes years to go through the planning process to add new lanes, and in the end, expansion may not even be possible. Even with good planning and cooperation, it takes the public sector a long time to address additions to capacity.

A mix of opposing forces is endemic to any consideration of standardization: Proponents work toward areas where standardization is a desirable end, while independent new developments and opportunities unfold in ways that create further segmentation and fragmentation. Thus companies, trade groups, and governments working together to achieve the socially desirable benefits of standardization sometimes find, after years of effort, that the end-product is nonetheless more fragmentation. In spite of this result, many in the field recognize that greater standardization can be, in concept, an important boost to efficiency. Further, most believe that private-sector interests are best able to make judgements about where and when to increase standardization. Nevertheless, there is a need for public involvement. The large public-sector role in providing infrastructure must be considered.

Standardization of Intermodal Information Systems

A global tracking and tracing system could be extremely helpful to intermodal operators. Such a system could bring together the key elements of each transport contract and unite them on a common platform. This system, perhaps an Internet database of intermodal shipments, would integrate the tracking and tracing information for all parts of the movement.

Individual companies, modes, and countries have successfully developed or extended tracking and tracing systems. However, no standardized system is in place



that covers all modes, countries, and users. Tracking and tracing information is not currently uniformly available. Integrated information systems are essential for improved efficiency. The difficulty in getting better tracking and tracing information is not fundamentally a technological problem. Some of the greatest difficulties are tied to security concerns, and techniques to address these concerns are being developed.

Some road carriers have responded to customer needs by establishing telemetric systems, which include mobile phones and a fax machine network, to notify shippers immediately if any problems arise. European shippers can also get tracking information from railroads in a member state. But they often lose sight of their shipments at the borders. Efficiency demands having this sort of information available throughout the entire trip, and integrated

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intermodal information systems are needed to provide this.

The systems that have been developed by industry on a commercial basis need to be interconnected. The European Commission has taken steps in this direction. For example, the European Commission supports the interconnectivity and interoperability of Port Community Systems and is examining how seamless intermodal applications could be developed. U.S. companies, through the Intelligent Transportation Society of America, have established a program to increase domestic and international in-transit visibility, for both transportation assets and cargo.

Intermodal Liability Issues

Ever since the beginning of for-hire haulage, in which an independent contractor transports goods for others, liability issues have been important. How much am I liable for? How does this amount change depending upon whether the cargo is lost, missing, or damaged? Who must pay? What is my exposure? What is the exposure of everyone else in the process?

These issues became more complex with the development of intermodal transport, which, by its very nature, involves carriage on two or more modes and entails transferring cargo between modes. Much of this traffic is prepackaged in containers that are loaded before they begin their sequence of modal movements and transfers. Each mode involved in the over-

Regina Asariotis (right), University of Southampton, and Ralf De Wit, University of Brussels



all movement has different liability regimes. The intermodal customer—the shipper or the beneficial owner—does not care about how the load gets there. The customer cares that it gets there on time, in good condition, and at an attractive price. The customer is not directly interested in liability. For intermodal transport as for other modes of transport, these issues must be negotiated as a service feature.

Current Liability Regimes

A complex maze of regulations currently governs liability for international intermodal transport. No uniform regime governs liability for loss, damage, or delay during transport in intermodal transactions. No uniformity exists at the international level. Nor is there uniformity in the sense of providing one standard of liability for all stages of the intermodal transaction. The current framework consists of a complex set of international conventions created primarily to regulate unimodal transport by rail, road, air, or sea. These widely accepted international conventions have introduced mandatory minimum liability standards. For areas where the mandatory conventions do not provide a clear determination, an array of diverse national laws may apply. If damage or loss is not covered by any international or national mandatory law, then standard term contract conditions (such as those contained in the International Federation of Freight Forwarders Association (FIATA) bill of lading (FBL) or the Multidoc 95) apply.

Unfortunately, the applicable regimes sometimes overlap, and more than one regime may apply to the same haul. Historically, land, air, and sea liability regimes have been drafted to address one or another particular mode of transport at a time. Liability regimes are not designed for intermodal transport. As a result, ambiguous intermodal situations arise.

Under unimodal regimes, every time a loss occurs, what actually happened usually must be investigated. In the context of containerization, investigation is extremely difficult: How can one be sure when and

where a loss occurred, that is, on which mode the container was situated when the loss occurred? Liability varies in terms of incidence and extent depending on the applicable regime. Which regime applies, in turn, depends on whether it is possible to identify the modal stage where the loss or damage occurred. It also depends on the causes of the loss, because under all the unimodal regimes, the carrier's liability depends on fault. If a carrier can establish that other reasons were responsible for a loss, the carrier is not liable. That is, liability hinges not only on where a loss occurs, but also on how and why.

Although a shipper knows what level of coverage is provided from the maritime bill of lading, the actual settlement of claims often depends on which court the matter is brought to and the court's views on which regime is mandatory. While general coverages may be unambiguously spelled out in bills of lading, if damage or loss is localized, then the liability may be subject to other limits, no matter what the general contract terms say.

Shippers typically make separate arrangements for individual shipping contracts, carrying some of the liability and insuring part of it. Third-party logistics companies operate like a carrier, assuming liability up to set standard limits. If shippers want higher coverage, additional coverage can be worked into the contract. Liability issues can thus be resolved between the logistics firm and the client. The third-party logistics firm resolves claims on the front end with the customer and then subrogates the matter with truck, rail, ocean, or air carriers involved. The success or failure of the final resolution is transparent to the customer. In effect, third-party logistics providers in Europe have positioned themselves as part of the solution to complicated liability regulations, while in the United States they have not generally done this yet.

Prospects for a New Liability Regime

A key consideration at the base of any liability regime is the issue of whether it

would be a mandatory or a voluntary regulatory system. A mandatory regime would certainly be the most effective, but it increases the difficulties of reaching consensus. Therefore, it may be more productive to focus efforts on a voluntary regime. This could be a regime that parties must opt into by actively incorporating it into a contract. Alternatively, a voluntary regime could be established that applies unless the parties explicitly opt out or replace it.

For any regime to be cost-effective, it should be simple, clear, and transparent. It should cover delay as well as loss and damage. It should operate irrespective of the modal stage where the loss occurs and independent of the causes of a loss. Such a regime would alleviate the administrative and legal burden of establishing the relevant regime. It would reduce the need to determine factual matters to clarify who is liable and for how much. It would increase efficiency, speed claims settlement, and reduce loss-recovery costs.

Concerted international actions, in concept, appear necessary and logical. Are they possible? In principle, an international convention would be ideal. Yet, an international convention involves an unmanageably large number of parties, each of which is rightly worried about its own interests. As a result, such an approach may attempt to address



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all of the “ifs” and “buts,” leading to a very complex framework. Even if agreement could be reached, a convention may never be ratified, as experience with the Multimodal Convention illustrates.

Similarly, an interregional convention between the large European and U.S. trading blocks would have obvious advantages. But the likelihood of an interregional convention would depend on political will.

The draft amendments to U.S. Carriage of Goods by Sea Act (COGSA), now entering the U.S. legislative process, have been written with an eye to U.S. needs. But the scope of application of this act is broader. Any shipment of goods to or from the United States involving a sea leg would be subject to this mandatory regime. The sea leg does not necessarily have to be trans-Atlantic. U.S. COGSA would apply to an airfreight shipment to the United States if it included a sea leg across the Mediterranean. Under this proposal, all claims could be litigated in the same U.S. process, even if a European shipper is suing a European carrier. Any carrier involved in any leg of the shipment would be governed by this mandatory regime.

The proposed changes to U.S. COGSA appear to have come about because the original act, dating from 1936, is badly outdated. It set liability at \$500 per package. This number is clearly inadequate, but carriers and shippers have been unable to agree on an updated approach. The U.S. Maritime Law Association formed a study group to bring the various parties together and go

though the difficult process of developing a mutually acceptable solution. In the process, the drafters saw the advantages of extending the concept from more than just unimodal carriage by sea to the entire intermodal movement. What began as a national proposal for reform to the maritime regime has grown into an international, intermodal proposal that unilaterally extends U.S. law outside its territory.

Liability and the Need for Information

The lack of data on actual loss and claim experience is universal, at least on a broad, aggregate level. Individual companies may have information that applies to them. Some firms, for example, regularly analyze the premiums they pay and the claims they experience. From this data, they may conclude that it is better not to take out an insurance policy and instead self-insure the goods. But in aggregate, data on losses are lacking.

Arrangements that shift liability to the primary carrier may appear to leave shippers satisfied, simply because they can distance themselves from the underlying variations in conventions and national laws. Such practices may allow shippers to cope with or mask current liability ambiguities. Nevertheless, to manage liability efficiently, we need to know the damage history of actual loss experience in intermodal transport. A common liability regime holds the potential for cost savings. No one can be sure of this potential, because we do not know the actual exposure and claims data. But it appears plausible that we could manage risks more efficiently with better information.

These data do not exist now. In the United States alone, the Federal Bureau of Investigation estimates that more than \$12 billion a year is claimed for cargo theft, loss, and damage. This rough estimate suggests that the costs are enormous and that major savings might be realized by managing the data better.

Faced with the lack of data, no one can say how much these inconsistencies in the

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handling of liability are costing. But it appears plausible that in any system this complicated, streamlining could produce savings. Particularly within the European Union, reducing variations between modes and countries appears worthwhile. An intermodal data standard that could be applied to contracts for door-to-door transport by unspecified modes appears to be desirable. This intermodal standard could coexist with other existing standards.

Legal and Regulatory Issues in Intermodal Transport

Forum participants selected the topic of legal and regulatory impediments as a top priority for the 1998 forum to focus on economic barriers, not regulations that promote safety, improve the environment, or preserve the infrastructure. Numerous regulations involving vehicle size and weight, labor rules, environmental protection, and other aspects of transportation may have important economic consequences. But these regulations are primarily enacted for purposes other than regulating competition, and they are not the focus here. This discussion is concerned with regulations whose explicit intent is to govern the economic competitiveness of new entrants in the business.

E.C. Regulation

Intermodalism in Europe is a complicated business, governed in part by the rules of the 15 member states, the European Union, and international conventions. If these rules are found to be in conflict, E.U. law is superior to the member states' national laws, and international law is superior to E.U. law.

European law has focused on regulating rather than facilitating intermodal service. Its competition and antitrust rules seek to scrutinize and control. They impose high compliance costs and regulatory delays. Further, competition law in transport has been formulated and is applied separately for air, maritime, rail, and in-



land waterways, rather than intermodally. Intermodal arrangements must win separate approvals from each of the affected modal regulators.

The core of E.C. regulatory policy is set out in Articles 85–94 of the E.C. Treaty, administered by Directorate-General IV. Each of these provisions applies to all modes of transport equally. However, the detailed regulations applied in practice are unimodal. Article 85(3) of the E.C. Treaty grants the European Commission the exclusive authority to permit exemptions for anticompetitive arrangements that are, on balance, beneficial to the economy. These exemptions might include, for example, pricing or exclusivity arrangements to facilitate intermodalism. Article 86 of the E.C. Treaty prohibits a dominant undertaking from abusing its dominant position in the common market. This prohibition could be applied, for example, to a port, a carrier, or an intermodal operator. Articles 92–94 of the E.C. Treaty stipulate that member states may not provide financial aid in a discriminatory manner without approval from the European Commission.

The degree of E.C. intervention in the marketplace is a central issue. The commission's *1994 Report on Maritime Transport* declined to grant a block exemption for shipping lines to fix land rates, instead requiring separate review of each agreement. The commission also refused to adopt the so-called "rule of reason" approach, which is central to U.S. antitrust law, again opening the door for the commission to intervene in such arrangements.

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State subsidies to railroads severely limit the prospects for intermodalism. Any European intermodal operator faces the possibility that competitors could be receiving unlawful aid. To foster sound intermodal competition, the European Commission and multimodal operators must monitor unlawful state aid. Such aid might exist if facilities are made available at less than commercial rates or if loans are financed beneath market rates.

Heinz Sandhager, Federal Ministry of Transport, Germany, and Mary Lou McHugh (right), U.S. Department of Defense

U.S. Regulation

Over the decades, the United States has developed a set of mode-specific economic regulations, each with its own character. By the 1970s, this situation had resulted in a set of modal companies and modal regu-



latory agencies that had formed, in effect, alliances within each mode. Regulations continued to suspend antitrust laws to accommodate the unique features of transportation companies. These provisions allowed transportation companies to operate on a scale where they can achieve production-scale economies while still affording a reasonable level of consumer protection. But regulators and carriers increasingly worked together to compete for modal share of the overall market and to obtain special treatment from the government. These aims were very different from the shipper protections that had been the impetus for creating the regulatory structures in the first place. Economic forces within the transport sector led to a series of deregulation moves during the late 1970s and early 1980s, when rail and truck transport were substantially deregulated.

An integrated, multimodal system has been a rallying cry of every secretary who has ever led the U.S. Department of Transportation. But government-led efforts to plan or coordinate a national transportation system never got very far because they have been, and are, heavily influenced by private-sector decisions. In 1991, legislation was passed that applied a new strategy. The legislation that authorized federal spending for surface transportation facilities included a category that could be used for intermodal connectors to the national highway network. This authorization provided a constructive vehicle around which public and private interests could work together—a focus on strategic nodes that promised improved coordination with minimum shifts in public and private roles. The Transportation Equity Act passed in 1998 continues the focus on intermodal connections and generally encourages intermodalism.

The foundations that intermodal companies are built on are the original modes out of which the intermodal enterprise sprang. This situation has led to many barriers that are not necessarily regulatory in nature. The synergies promised by multimodal companies have often proved elusive because of discrepant labor contracts, cultural differences, unmanageable scale, and other reasons. Still, regulatory

adjustments could compensate for some of the noneconomic barriers and make it easier for intermodal services to thrive.

Deregulation of domestic freight transport in the United States is now virtually complete, inasmuch as free market entry is concerned. In recent years, domestic airfreight and intrastate trucking have been deregulated, so that few domestic barriers remain.

Cabotage

U.S. cabotage restrictions are one of the remaining barriers to intermodal transport. Europe previously had similar restrictions on maritime cabotage, but these restrictions were phased out in 1992. Greece and Spain were the most affected, and passenger operations were more affected than freight operations. The largest shipping line engaged in European cabotage is now an American shipping line. The Jones Act in the United States precludes European participation in the U.S. market. While some transportation enterprises may gain some market protection through cabotage, U.S. cabotage restrictions are part of a strategy to maintain the nation's ability to use U.S. commercial capabilities to meet contingency and wartime requirements. The aim of these restrictions is to provide incentive to U.S. carriers to provide wartime capacity by facilitating peacetime business for them. The penalty cost to shippers has been estimated at 14 billion U.S. dollars.

Third-Party Logistics Providers

The use of third-party logistics providers is an index of how free market competition really is. Third-party logistics providers have very few constraints in the United States, and growth in this sector has come hand-in-hand with expansion of intermodalism. This growth has enhanced competition in areas where it would otherwise be lacking. U.S. interests see the rise of third-party logistics providers as good for competition and good for productivity. This is also the case in Europe.



Even with the rapid rise in the use of third-party logistics providers in the United States, the market is not universally open in this respect. For example, under the recently passed Ocean Shipping Reform Act, nonvessel-owning common carriers are not granted the same ability to enter into confidential contracts as are vessel-owning firms. This is one instance where third-party logistics is constrained by regulatory barriers.

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Open Access to Rail Facilities

U.S. rail operations are essentially deregulated, except when they are seeking approval of a merger. In the case of a merger, the Surface Transportation Board reviews the competitive balance and may set regu-



Thomas Perdue, C.H. Robinson Co.

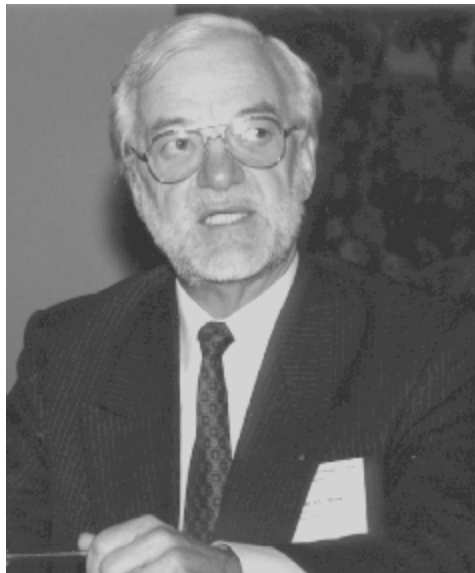


Robert Gallamore, Transportation Technology Center, Inc., Richard Biter, U.S. Department of Transportation, and Damian Kulash, Eno Transportation Foundation (left to right)

latory conditions. Europe tends to be much more regulated, often in the name of liberalization. The European Commission has been frustrated in its attempts to realize the potential of the poorly performing state railways. These railroads have been losing money and have often been unable to offer the service demanded by customers. Solutions are necessary not only for economic reasons, but also for environmental and social reasons.

The nature of regulation in Europe is very different from the United States. The rail problems are different, and the two regions have very different historical public and private roles. Deregulation in the form of open access is intended to overcome the inherent limitations of the national railroads. In the United States, open access would be difficult to impose on private companies that own their own infra-

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structure and would resist such a policy as an unconstitutional taking of private property. In Europe, this is not an issue because governments own the rail infrastructure, and governments have the authority to determine how their property will be used.

In Europe, where the rail systems have been monopolies within their own national borders, the policy has been to separate the operation of railroad services from the construction and maintenance of railway infrastructure. This policy is what U.S. participants refer to as “open access” or “competitive access.” Given the geographical boundaries and history of public rail investment in Europe, the open-access form of deregulation has been Europe’s way to increase competition among railroad operators, although not necessarily among the railroad owners. The U.S. history of private rail investment and the existence of real rail-to-rail competition create a fundamentally different context.

The use of the terms “deregulation,” “privatization,” and “open access” have very different connotations in the two regions. Europeans use privatization to highlight the separation of above-the-rail operations (which they hope to be opened to greater competition) from below-the-rail ownership (which continues to require public subsidy). U.S. interests see deregulation as a policy for more productive alignment of market demands with privately owned rail resources and new investments.

As deregulation, in the form of open access to the European rail network, goes forward, liability will get more complicated. National railroads and new actors could provide through rail service through multinational corridors. Traffic control, slot allocations, and multiple independent operators using the same routes may create new factors in loss or damage claims.

The situation is fundamentally different in the United States. The railroads are private property, and businesses continue to invest and reinvest in these assets because they own and control them. Most markets are served by more than one railroad. Average rail rates have been halved

in real dollars since deregulation. Because of private ownership and investment in the United States, proposals for competitive access raise a much larger set of issues. In Europe, where governments own the national railroads, the priority given to achieving market competitiveness may not be as high as if private-sector interests controlled the assets. European transport interests are prepared to pay the full costs of the rail infrastructure, but they also want to control the infrastructure. It would help to have the full set of rail and road costs, payments, and subsidies set out factually, so that policies and decisions could be developed in a way that maximizes competition.

The separation of infrastructure management from operations is an issue for all rail operators, whether existing state railways or other operators who may seek to enter the market. Many believe that the policy of seeking additional open access for operators who would run on the national networks is a failure, because so few operators have emerged to purchase the access rights. Those that have purchased access rights have tended to be tiny special cases. The infrastructure owner faces high costs and is not responsive to operator concerns. Some operators who have attempted to contract for the use of rail facility report that their largest problem is dealing with the infrastructure owner, who has a completely different agenda and objectives from the operators.

Reregulation

The much-publicized service difficulties following the Union Pacific and Southern Pacific merger have stimulated some shippers to call for reregulation of the railroads. Carriers see this approach as unresponsive to the real situation. Since the passage of the Staggers Act in 1980, the U.S. railroad industry has 35 percent less track, 32 percent fewer locomotives, and 60 percent fewer employees, yet railroads in the United States are carrying 48 percent more freight. Productivity has increased three-fold. The industry has reduced costs by \$25 billion in constant dollars. Some 80 percent of that cost reduction has been

passed on to shippers, resulting in rail freight rate declines of 1.2 percent per year.

Carriers believe it would be very damaging if railroads lost their ability to price differentially where the market allows. Similarly, if the United States adopted an open access system as envisioned for Europe, it could have severe effects. At present, system expenses and corporate overhead benefit from the differential-pricing regime that supports traffic with little or no profit margin. Railroads allocate their very large fixed expenses to classes of traffic based on market considerations. Intermodal rates are predicated on these market considerations and could be impaired by restricting this market freedom.

Best Practices in Intermodal Freight Transport

The intermodal share of the European freight market is currently only eight percent. While a few intermodal operators have been expanding, there may be a role for additional providers of intermodal transport. For economic and environmental reasons, many have an interest in increasing the intermodal market share. To this end, the Freight and Logistics Leaders Club has been collecting actual data on intermodal, rail, and truck services to gain a better understanding of markets and opportunities. They have identified a number of innovative developments, which are outlined in the following paragraphs.



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Intermodal Rail Developments in Sweden

The Scandinavian and Nordic railroads have split infrastructure administration from operations. Operators pay the rail facilities managers a fee to use the rail plant and then run trains across these facilities. Operators can compete along the same route. Operators have shifted from being classical railroad operators, as they were 10 years ago, and are offering door-to-door solutions to their customers. This shift has resulted in enlarged intermodal market shares in some cases. There have been strong service improvements. A direct train and truck service to Italy that took five days when it began 10 years ago now takes only two days. In addition, reliability has improved.

Productivity has also improved significantly. For example, a very good rail network and an ability to operate large, 60-ton trucks in Sweden has created an ideal setting for intermodal service. Railway costs were too high, however, and for short distances, rail could not compete with direct truck. The Swedish railroad copied an idea from Japan and adopted a system that allows rail pick-ups between the hubs or rail ports. This approach makes intermodal rail service competitive for much shorter hauls because intermediate stops can be made very short. No personnel are re-

quired at the intermediate terminals. The locomotive operator does the loading at the interim stops using an on-board forklift to load containers on or off. All-in-all, this multiterminal, short-stop system is flexible, network-oriented, and very cost-effective. Capital utilization is excellent. Unions were initially concerned about safety, but the railroad has formed working partnerships with the unions to resolve this matter and to work with them to make the railroad competitive for more classes of traffic. This type of service could be expanded to many other parts of Europe.

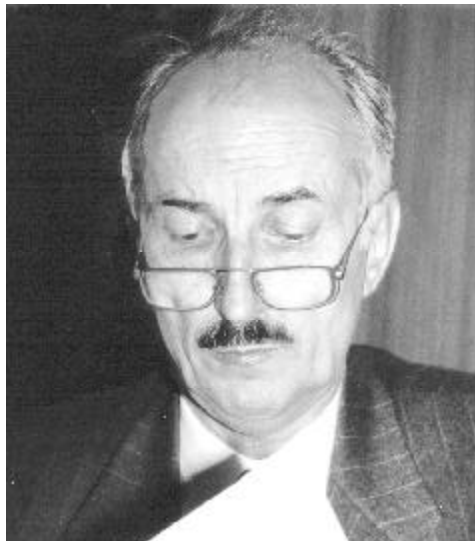
New International Rail Corridors

Rail-freight freeways must overcome many problems, particularly fragmentation. Europe now has 43 infrastructure providers. Most of these providers are integrated with operations, and they set timetables to optimize their own operations. But for the first time this past year, the volume of cross-border freight exceeded that of national freight. To expedite this growing volume, the European Commission introduced "One-Stop Shop." It coordinates the time tabling of all operators within a corridor into a single organization.

Visionary investigations are underway to explore Europe-India and Europe-far east rail corridors, as well as a Berlin-Warsaw-Minsk-Moscow corridor called the "Pan-European Rail-Corridor II." Within Russia, this concept breaks up the existing system and separates different lines of business, each with its own business plan. The Trans-Siberian Railroad Council has participated in these plans, and it has adopted One-Stop Shop coordination. The Finnish Railway now operates two direct trains per week through Russia. Using the Trans-Siberian route, shipping times can be reduced from about 25 days via ocean shipping to about 12 days by rail. Global rail has potential and is expanding. The political stability of the countries involved has been improving, and the problems of disparate gauges can be overcome.

However, missing links in the network still must be filled before it can reach far-eastern destinations. Construction is now

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underway to fill the rail gaps in the South Asian corridor through India, and this corridor may be completely connected within a year. Once this corridor is connected, it will allow rail freight to move to India from Europe. Differences in rail gauges will continue to exist, but these differences might be managed using technology that has been tested for rail equipment moving between Sweden and Finland, which has a gauge similar to that used in Russia.

Supply-Chain Management

Up to now, mobility of cargo has been characterized by the management of logistics. But logistics within a company is no longer enough to meet customer demands. Supply-chain management has emerged as an approach that brings all of the variables into perspective. Based on the rapidly expanding capabilities afforded by new information technologies, enhanced by outsourcing and partnering, supply-chain management shows great potential for reducing costs and improving services.

Supply-chain management allows executives to see and control all facets. In response, firms are changing emphasis from distribution management to network management, from road and rail management to system management, from service procurement to contract management, and from transport technique to technology management. The emphasis is on systems. There are totally outsourced systems, and there are new actors inside the corporation. The culture needs to change from a short-term focus to a longer-term reality.

Airship “Cargolifter” Service

Many innovations have evolved in intermodal unit lifting technology, and an ancient technology—the airship—may have renewed promise today. Airship transport would allow freight to go from everywhere to everywhere. It could reach parts of the globe that are difficult to access because they have been destroyed by earthquakes or other natural disasters. It could carry cargo whose size or weight is unsuitable



Johannes Fritzen, Volkswagen Transport

for other modes of transport. It could avoid rehandling of cargo along a route.

An airship service—or “cargolifter”—might fill a niche (in time and cost) between ocean shipping and airfreight service. No special airfields are needed. Airships are able to land in an area about the size of two soccer fields with special tie-down equipment. The ports also need to provide water as ballast to offset the unloaded cargo. Using helium-filled balloons to lift payloads, the cargolifters can carry 160 tons (up to 3,200 cubic meters) for distances of up to 10,000 kilometers. Market studies have estimated that 120 to 200 ships of this sort could be viable.

Kenneth Wykle, U.S. Department of Transportation, (left) with Peter Zantal, The Port Authority of New York and New Jersey



Wolfgang Flick,
United Parcel
Service, Europe,
and Dirk
Goedhart (right),
Consultant to
Philips
International



Port Investment Policies

Private operators and firms make massive investments to serve customer needs, but government has a role as well. Governments at all levels are concerned about the health and economic well-being of their citizens. As major economic forces in the region, port-related investments and policies are driven by all levels of government as well as by private decisions.

Megaship service could further shift the concentration of power. These ships will force new policy attention on intermodality and the types of intermodal systems that are really beneficial. Because megaships will only be able to serve selected ports, they could create a vastly different ocean-distribution system. Their impacts will reach far beyond the port itself. The emergence of megaships will force other transportation services and facilities to respond. Megaships will also generate changes in operating procedures, requiring investment in terminal and handling equipment.

The rise of carrier alliances in the shipping industry has forced ports to deal with three or four large alliances instead of 20 smaller customers. These large alliances have approached competing U.S. ports with an open tender to establish east coast hubs. This consolidation of carriers, as well as the introduction of megaships, will create a different balance of pricing power. Ports will lose pricing power, and ocean carriers will gain it. Competing in this new environment will require capital investments—for post-panamax cranes and dock facilities to handle megaships, for

container handling and storage facilities, for expanded truck access, and for on-dock rail, because trucks alone simply cannot handle the volumes involved.

If market forces are to determine which ports move the cargoes, then the policy must be to eliminate state, regional, and local subsidies to ports. As a first step, we need to know who is financing what. The 1997 green paper by the European Union (*Sea Ports and Maritime Infrastructure*, COM (97) 678) recognizes the vital economic role of ports and the reality of competition between the member states associated with ports. The paper provides a financial overview of how ports are actually financed.

European policy states that port finance should be transparent. Any public subsidies that are made to ports are made public. This policy would be difficult to implement in the United States. Ports do not necessarily pay for ground-access and dredging costs. They benefit from cross-subsidies stemming from cost allocation and multiple lines of business. Virtually every port in the United States receives some state or local support, and some applications of federal programs are effectively subsidies to ports. U.S. ports would probably resist the transparency in port finance being sought by the European Commission. In matters of port finance, Europe appears to be moving in a capitalistic, free-enterprise direction while the United States appears to be more socialistic.

Electronic Commerce and Intermodal Transport

Electronic commerce is the use of computer network technology to facilitate the buying or selling of goods between trading partners. Carriers serving this market use a physical network with air, ground, and ferry links in Europe. Systems are tied together by electronic tracking and tracing capabilities, allowing customers to locate their shipments at any time.

Some forecasts anticipate that electronic-commerce in the United States will reach \$500 billion in 2002. Companies are

positioning themselves to be leaders in this field. United Parcel Service (UPS), for example, has taken two steps into the world of electronic commerce. The first step was to enter into arrangements with merchandisers to advertise jointly on the Internet. This strategy integrates UPS's tracking capability with the merchandisers' ordering systems, so customers know where their orders are in the overall distribution and delivery system. The second step was to develop UPS Document Exchange. This product is a secure, online courier, using the ultimate security of 128-bit encryption, which was recently cleared for distribution outside the United States.

Electronic-commerce is finding applications in the rail sector. A new system has recently been made commercially available for electronic bills of lading, and this system seems to be working quite well. However, nations differ in terms of what courts will accept as proof that a document has been sent, and these differences could complicate international applications.

Toward Improved European and U.S. Intermodal Freight Transport: Next Steps

Improved intermodal freight transport is important for transport productivity, economic growth, and environmental progress. Many public and private concerns share an interest in achieving these gains, but they cannot make progress by themselves. Shared understanding and coordinated action are essential. The exchange of perspectives between sectors, regions, modes, and operating perspectives offers a fruitful way to develop shared insights that allow independent interests to act toward a common vision.

This useful dialogue that has been developed through forums held on European and United States intermodal Transport in 1997 and 1998 should be continued by holding a third session in the United States in the fall of 1999. The small size of these forums, their informal style, and the participation of top-level transport leaders from all sectors have contributed to the



Karel Vanroye, Unit for Analysis and Transport Policy Development, Wim Blonk, Kenneth Wykle, and Richard Biter, (left to right)

effectiveness of these forums. The 1999 forum should carry forward and build on the discussions that have been held on standardization and best practices. In addition, it should begin a similar dialogue on the effects of electronic-commerce and infrastructure investment policies. The 1999 forum should also address cargo liability, regulations governing competition, third-party logistics providers, and other topics of interest to participants, as outlined in the following paragraphs.

Standardization

Greater interoperability can bring important gains to the efficiency of transport. Policies should support achieving these productivity improvements where appropriate. The potential for increased standardization depends on the degree of maturity in the industry, carrier operating efficiencies, requirements for investment by carriers and shippers, disparities

Ron Stanley, Landstar Express America, Bert Schacknies, Federal Highway Administration, U.S. Department of Transportation, Thomas Perdue, C.H. Robinson Co. James Morgan, TNT Automotive Logistics, and David Winstead, Maryland Department of Transportation (left to right)



in physical features of the surface transportation infrastructure, and the effects on competitive positions. The nuances of these factors are subtle, and they are better understood through candid discussions. The prospects for enhanced standardization should remain on the agenda in the 1999 forum.

European and U.S. Best Practices

The European working group to discuss best practices in intermodal freight has been a source of many good ideas. It has stirred great enthusiasm to work together for improvement. Through this informal club of captains of industry, public authorities are able to tap the private-sector experience, getting useful information quickly. This working group may be an attractive model that may have value in the United States as well. U.S. participants were impressed by the energy and enthusiasm of the European best practices group and will seek to establish a similar industry-driven, best practices group in the United States.

Electronic Commerce and Intermodal Freight Transport

Important, new, unfamiliar opportunities in intermodal transport will arise as electronic commerce takes hold in the next decade. Further discussion should focus on how these developments might affect intermodal transport.

The Role of Governments in Infrastructure Finance

Public policy on both sides of the Atlantic seeks to build an economically sound infrastructure investment framework, free from the distortions caused by modal or regional subsidies. In practice, this ideal is confounded by disparities in user fees for different modes, by inconsistent treatment of external costs, by joint investments, by inconsistencies in the allocation of common costs, by companion investments in access facilities, and by state and local subsidies. Major transport terminals drive the economies around them, making it difficult to identify net public investment, let alone rationalize it across diverse local circumstances. The 1999 forum should use case materials from Europe and the United States to continue the discussion of infrastructure issues.

Liability

A proposal to reform the 1936 U.S. COGSA legislation would unilaterally apply U.S. law outside its territory. This legislation could have a damaging effect on international commerce. It may also be discriminatory, because it could give a competitive advantage to U.S. carriers when they are in head-to-head competition with European carriers to provide transport services. Such concerns need to be resolved with full awareness of their international implications, and discussions like these help to surface these concerns.

Article A: Interoperability in Intermodal Freight Transport

Executive Summary

In October 1997, the Eno Transportation Foundation held a policy forum cosponsored by the U.S. Department of Transportation and the European Commission, Directorate-General VII (Transport). This forum addressed issues in intermodal freight transport in Europe and the United States. One area identified for further consideration was standardization, harmonization, or interoperability of equipment, information, and communication technologies. This paper provides a framework and background information reflecting observations and data contained in the literature, as well as conversations with senior industry representatives.

Changes in the patterns of trade and commodity flows are leading to a rapid increase in the amount of intermodal transportation. This situation requires an increased focus on system effects and the need to modify facilities, equipment, and operating practices to provide seamless transport among modes and nations. This naturally raises the issue of standardization and the specific aspects of standardization addressed in this report—container standardization and interoperability in information technology.

Containers and information technology represent major choices that affect the form and operation of the system. These choices cannot be taken lightly. They are major investments with relatively long lives associated with the equipment. Thus, one of the most important contributions that can be made by a document like this report is to suggest a framework within which these questions and the issues associated with interoperability in containers and information flow can be considered.

Interoperability and Harmonization: A Change Process

European and North American supply-chain management and freight transport

represent a many-layered industry with (a) interdependent and interlinked markets and (b) independent and disjointed markets. These characteristics are what make harmonization of equipment and technologies so challenging. Developing a shared vision of what is to be harmonized and the resulting benefits is crucial to success.

The harmonization task is a change process, and every change process has obstacles. Three types of barriers must be addressed to successfully achieve interoperable systems, equipment, and procedures: technical barriers, business process barriers, and cultural barriers.

Technical barriers are specific to the industry or organizations. These sorts of barriers can sometimes be eliminated through team-based efforts to design new technologies or to design around the technical barriers. Many of the issues associated with harmonization of containers are technical barriers.

Business process barriers are often organization or industry specific. These barriers are frequently the result of how an organization or industry works.

Cultural barriers consist of existing habits, behaviors, and attitudes of everyone in an organization, industry, region, or nation, that is, the existing paradigms of how the world is “supposed” to operate.

Broadly speaking, improvements in transportation take two forms: a reduction in the cost of transport and improvements in services that add value to the user. Clearly, many of the gains from increased interoperability are of the cost-reduction variety, for example, improved container use resulting from investments in information technology that lead to better tracking and control or reduced costs of terminal handling resulting from standardization of sizes and locking apparatus. The consequences of these gains can be far reaching, including improving the contribution margin of intermodal services for the carriers involved and expanding the markets in which intermodal transport is competitive.

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October 1998

Equally important are changes that enhance the range of transport service options, but that may increase the direct cost of transport services. Nevertheless, these changes benefit the system's customers. Actions that increase speed and reliability of transport often fall into this category, with the increased cost of transport being more than offset by reduced shipper cost of inventory, reduced spoilage, or increased shipper competitiveness resulting from more rapid and precise customer response.

An increasingly important driver in addressing interoperability will be ensuring that customer expectations are an integral part of the equation. In the final analysis, if customers receive no benefits from harmonization, customers will not pay for the costs associated with achieving interoperability. At the same time, customers are demanding increasing flexibility and visibility in managing their supply chains. If the intermodal freight transport industry does not provide flexibility and visibility, customers will find some other service provider who will give them what they expect and demand.

Developing Interoperability: A Summary of Container Standardization

The recent history of container standards leaves a number of unresolved issues:

- Is there a need to develop a length standard longer than 40 feet (12.13 meters)? Europe is moving toward 13.6 meters (44.06 feet), which is not in harmony with any lengths developed in the United States.
- Is the existence of two width standards—2.438 meters (8 feet) and a wider 2.55 meters (approximately 8 feet 5 inches) so popular in Europe—a cause for concern?
- Is there a need to reconsider the compatibility of pallet sizes, the possible emergence of small containers (logistic boxes), and the standard container?

To answer these questions, issues of cost and ease (or speed) of moving goods through the supply chain need to be

considered. Studies that quantify the effect of adopting standards on these performance measures of the supply are needed.

Different stakeholders most likely can achieve consensus about the objectives of standardization. Where disagreement begins is in predicting the effect of standards on costs and use by stakeholders in different parts of the supply chain around the world. The European standards organization developed standards that certainly respond to European needs but at the same time may conflict with the wider requirements of international trade with the United States and other countries.

Developing Interoperability: A Summary of Information Technology

Information systems in transportation have become as important as the physical movement itself. To facilitate the smooth flow of information from one partner in the intermodal transport chain to another, information systems must work interchangeably and facilitate a diverse array of partnerships in a dynamic environment. The recent history of standards concerned with information systems is captured in the following quotation:

Products based on official standards have not been widely implemented.

On the contrary, they have often been displaced by so-called de facto standardized products, that is, products successful in the market whose technology is based on either public or private specifications (Bucciarelli 1995, p. 423).

This quotation leaves a number of unresolved issues regarding harmonization of information systems in intermodal transportation:

- How do we ensure that meeting shippers' needs is an integral part of the justification of harmonization of intermodal freight information systems?
- How do we address concerns within the intermodal transportation community regarding data confidentiality, use of information, business relationships, power, and competitive conditions?

- What role can government have in facilitating the harmonization that is occurring naturally within freight communities?
- How do we develop a shared vision of what is to be harmonized in information systems, and what will be the benefits for the various members of the intermodal community?

The following factors point to the need for interoperability of hardware and software in the intermodal transport process:

- Economies of scale can be generated in producing standardized units.
- Higher capital and operating costs can be avoided by developing vehicles or vessels that can carry different load units or combinations of load units.
- Costs for providing specialized handling equipment at intermodal transfer facilities can be reduced.
- A limited customer base for specialized units often leads to inefficient use of equipment or unused carrying capacity on vehicles.
- The ability to communicate with a wider array of partners in the supply chain with reduced costs for intermediary or translation software can be enhanced, particularly as the industry structure changes and new intermodal alliances are developed.

The main arguments against standardized equipment and software are as follows:

- The flexibility to respond to unique market challenges may be stifled.
- The systems will be less responsive to specialized product requirements, methods of handling, or customer preferences.
- Standardized equipment may not necessarily translate into lower overall systems costs, particularly if the consolidator function is not removed.
- The high initial capital costs of investing in new equipment, facilities, or software may not be offset by future cost savings to the user.
- The “competitive edge” or stabilization of partnerships that is provided by specialized equipment and proprietary systems will be lost.
- Sharing data among nonproprietary systems raises security concerns.

- Developing standards that are compatible with operations and information flows in all part of the supply chain and in different transport modes is difficult.
- The benefits and distribution of costs among different parts of the supply chain and throughout the world are uncertain.

Natural trends in production and distribution are adding complexity to supply chains and to transportation. Thus, the incentives for harmonization of information systems simply on the basis of self-interest are likely to increase. The complexity of the many issues involved requires a more thorough understanding of the costs and benefits to different segments of industry, as well as the timing of these effects. The challenge for the intermodal transport industry is to develop forums within which these questions can be resolved in a voluntary manner.

The Forces Driving and Constraining Interoperability

Rationale

The need for interoperability in transportation services is clear: Elements of the system such as vehicles, guideways, and controls must be able to operate together to provide service. Also, the geographic scope of transportation flows often leads to individual shipments being carried by two or more transportation companies, often over facilities provided by yet another organization (frequently a government infrastructure agency).

The issue of standardization is always present in a dynamic technological environment, and the current situation of continuous change in applications of new technologies certainly raises the issue. Of equal importance are changes in demand for transportation. In particular, increasing globalization and regionalization of supply chains necessitates transportation services that transcend traditional national and modal boundaries. Trends toward just-in-time inventory policies, mass customization, and rapid customer response all demand more rapid and

reliable transportation services over increasingly intermodal and multicarrier networks.

The trend toward longer supply chains leads to longer hauls and increased likelihood of intermodal movements. Modes that did not exchange much traffic, and thus developed in isolation in ways that are not readily compatible, can suddenly be logical parts of integrated supply chains. Thus, issues of compatibility across different modal transportation services arise. The trend toward new patterns (spatial and otherwise) of industrial linkages also means that national or regional transportation providers who had overlapping or contiguous service areas but did not exchange traffic may find themselves called upon to provide services in an integrated way.

Elements of Interoperability

Which elements of the transportation system are reasonable targets of efforts at harmonization to enhance interoperability? Most elements of each modal system do not operate directly with one another. In intermodal transportation, the primary elements related to seamless functioning of the system are the containers that carry the goods and the information flow on the movement of containers and shipments. Our focus is on these two areas.

Modal Ownership Patterns and Intermodal Transport

While the transport system is increasingly thought of as intermodal, the reality is that most transport is considered either (a) unimodal or (b) intermodal with only very limited interconnections. This situation reflects both the physical reality and the result of institutional arrangements that often diminish the apparent magnitude of intermodal connections.

The prominent role of various third parties or integrators in providing intermodal transport also diminishes the apparent significance of intermodal transport to participating modal carriers. Other firms are

more heavily asset based but use complementary modes and organize use so that it is transparent to the shipper. Examples include United Parcel Service (UPS), various truck lines, and national postal services. These firms also relieve modal carriers of direct responsibility for the intermodal aspects of transportation. Because so much work unique to intermodal service is provided by these various firms and agencies, the immediacy of intermodal thinking among modal carriers is further reduced.

In this environment, intermodal considerations are not of paramount importance to all transportation carriers. Their concerns for efficiency, responsiveness to markets, and profitability are likely to be driven largely by other portions of their business and activities. Thus, efforts at harmonization of intermodal systems must retain compatibility with the rest of the relevant modal systems.

Standardization and harmonization will not be undertaken because they are intrinsically worthwhile, but rather because they improve the system. There is a burden of justification of any harmonization: It must be shown to improve the system, that is, the production and distribution system. This point argues for inclusion of shippers—users of the transport system—in any discussions of major changes, for standardization and harmonization will succeed only to the extent shippers find receive any benefit from them.

The Institutional Framework

Setting standards involves a variety of processes and players. The United States and all European countries have National Standards Organizations. In the United States, it is American National Standards Institute (ANSI), and the most influential ones in Europe are BSI (United Kingdom), AFNOR (France) and DIN (Germany). However, in Europe the European Standards Organization—CEN—was created to facilitate trade within Europe and to harmonize European standards. CENELEC (for electrotechnical standardization) and ETSI (for telecommunications) are sister

organizations. CEN now includes 19 members. By common agreement, all national standards bodies adopt the Euro standards as their own national standards and withdraw any existing incompatible national standards. The International Standards Organization (ISO) is an independent international agency established to provide a framework for developing international standards. Each national member carries one vote per nation in all ISO proceedings, which on many issues requires a 75 percent majority. European votes are significant and when cast as a block, can determine the outcome. All of the organizations use a set of technical committees to examine specific subject areas.

The procedures adopted by ANSI are different from its European counterparts. ANSI is a federation of more than 175 standards-developing organizations (SDOs) and companies with interests and expertise in standards development. ANSI itself does not develop standards, but facilitates the process. It sets the procedures that committees must follow, monitors the development process, officially approves the results as national standards, and publishes them. The procedures laid down by ANSI require participation of all interested parties, including manufacturers, suppliers, and users. All meetings must have widely distributed meeting notices, detailed minutes, and a clear process for dispute resolution. Much of this procedural emphasis stems from concern about not violating U.S. antitrust laws. The final standards are seen as a validation of private sector voluntary, open, and transparent standards development process.

The European national standards organizations function as quasigovernmental entities receiving a significant proportion of their funding from national governments. Usually the development process uses a combination of internal staff, paid contractors, and technical representatives from industry who write the standards. Meetings are often closed. Trade associations do not always have a formal role in the developmental process and participation in committees is often narrower than in the U.S. system. The secretariats in European organizations, including CEN

and ISO, take a more significant role than their U.S. counterparts. Direct government input into the examination of standards often takes place, and the European Commission plays a more active role in facilitating industry action.

One factor that necessitates such a strong governmental role in the development of standards in Europe is the diversity of national outlooks and priorities. In the United States, transport interests can be more focused on serving the large, relatively homogenous domestic market. In contrast, the European transport industry is inherently more outwardly focused, with an obvious need to improve links between different countries and industrial protocols. The sea change generated by European Unification carries over into the development of international (within and external to the European Union) standards in the transport industry.

The importance of Europe in setting standards can be seen in the special fast-track process that can be used by ISO for previously developed European standards. While this process has the undoubted merit of avoiding duplication of activities already undertaken, it does restrict the right of non-European inputs at limited and specific points. The recognition that European development process can be crucial to U.S. trade interests (and vice-versa) has led to joint liaison procedures between ANSI and CEN, in which the United States can comment on proposed European standards. This cooperation has concentrated, in practice, on the subject of nontariff barriers to trade, leaving the question of container size unresolved.

A private sector initiative launched in 1995—TABD (Transatlantic Business Dialogue)—is “designed to respond to the new reality of trade, namely that companies are functioning globally” Following its business-driven agenda, it has focused on standards, certification, and regulatory policy by setting up the transatlantic advisory committee on standards, certification, and regulatory policy (TACS). Concerned with a wide range of sectors—automotive, energy, chemical, medical devices, pharmaceutical, telecommunications, and information technology

sectors—TACS provides an important forum and framework for translating global business requirements into recommendations to government and standards agencies.

Developing Interoperability: Container Standardization

Containers (load units) play a pivotal role in intermodal transport. The design and variety of these basic building blocks of an intermodal transport system critically affect the system’s responsiveness to customer needs and its performance in terms of cost and speed of movement through the supply chain. The design of load units affects the capital costs of the vehicles and vessels designed to carry them, the operating costs of these carriers, the costs of handling between modes, and the costs of initial loading and final unloading. Customers have different requirements, and the ideal container for a consignment depends on the type of product (e.g., volume-density), its method of handling, its packaging, and the size of consignment.

Load Unit Standards and Intermodal Transport

A large number of container types have emerged to meet these separate needs. However, variety and the proliferation of different types of units bring extra costs. If diversity is limited in some way, economies of scale in producing load units can be gained. Variety in load units also means different designs of carrying units with

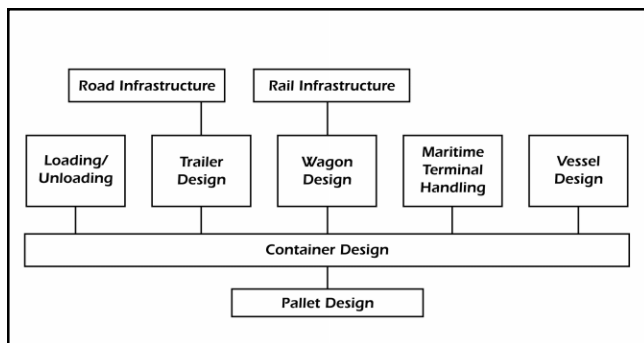
consequent losses in economies of scale. Alternatively the carrying vehicles or vessels may incur extra capital and operating costs to have the flexibility to carry different load units or, in the case of ships, combinations of different load units. A similar point applies to handling load units; greater variety means either more equipment is necessary at intermodal transfer sites or more complex, and hence costly, equipment is necessary to accommodate the variety. A proliferation of load units also has implications for the use of those load units and carrying units. When variety is low, an empty container can find a new customer in the same vicinity relatively quickly. For specialized containers, customers are rare and, in the extreme case of containers that are specific to one customer, the empty container has to return to that customer empty. In the case of trains and ships, the need to carry different combinations of load units can mean poor use of trailers or space on vessels. All elements of the cargo-handling system, from pallets to rail infrastructure, are interconnected, as illustrated in figure 1.

Standards concerning intermodal load units (ILUs) relate to different factors. While dimensions and engineering standards (regarding the integrity of the unit) are key definitions, standards also exist for the design of corner fittings (for handling), bay plan systems in vessels, methods to ensure safe handling, labeling, and remote condition monitoring of containers. Some of these standards pertain to good practice, whereas others focus on ensuring compatibility and interoperability as units pass along the supply chain from mode to mode and through handling stations. The most critical in the latter case are load-unit dimensions, associated weight limits, ability for stacking, and corner fittings.

The Emergence of ISO Series 1 Containers

The use of containers for international commerce developed rapidly in the late 1960s and 1970s. Now containers dominate international movements by sea, with more than 6 million in use throughout the

Figure 1. Factors to be considered in load unit size decisions



world. The most common sizes are enshrined in international standard ISO 668 and are referred to as ISO Series 1 containers. The two most common dimensions are 8 feet wide by 8 feet 6 inch high and either 20 feet or 40 feet long. Within this basic dimensions are various designs with end doors, side doors, and open tops. Standards also refer to dry bulk, flat, and refrigerated containers.

In international trade by sea, more than 95 percent of containers are the 20- or 40-foot standard. Turning to international trade generally, a number of other significant types of load units have emerged as substitutes for maritime containers.

European Developments

While Europe adopted the ISO standard maritime container for inward and outward movements by sea, this container's role for national and international movements within Europe is much more limited. A much larger role is played by swapbodies (caisse mobile, Wechselhalter, cassa mobile) (Institute for Logistics and Distribution Management (ILDMM) 1996). These load units, which are not normally strong enough to be stacked, come in a variety of types and sizes:

- Full length (12.2 to 13.6 meters) with tilt (tarpaulin sided), van (solid sided) or refrigerated units, referred to as Type A
- Short length (7.15 meters, 7.45 meters, 7.82 meters), referred to as Type C
- Bulk (9.125 meters and more)
- Swaptank (6.096 meters, 9.144 meters)

While the short length is by far the most numerous with more than 150,000 throughout Europe, the vast majority (perhaps 80 percent) is only used for road operations (and these might be referred to as demountables). There is also a difference within Europe in the extent swapbodies are used, with Germany followed by France and Scandinavia as the most frequent users.

In addition to swapbodies, semitrailers with reinforced lateral beams can be lifted by gantry or mobile cranes onto specially designed rail wagons (pocket wagons). Again, these containers can be tilts, vans,

refrigerated, or tank units. About 30,000 of 600,000 semitrailers are used in this format.

A number of advantages of swapbodies and semitrailers have enabled them to gain an important niche in the ILU market in Europe. The first advantage derives from not meeting engineering requirements for stacking. The body can be less costly and allow greater flexibility on loading (curtain sides).

With regard to pallets, an international standard (ISO 6780) defines standard dimensions for pallets. One of the three standards (1200 x 1000 millimeters) has been widely adopted throughout Europe. Associated with this standard is a packaging module 400 x 600 millimeters that is intimately related to this first standard. However, research among German shippers has also indicated that 80 percent are using 1200 x 800 millimeters pool pallets.

Elsewhere in the world (including the United States and Japan), this Europallet standard has not been widely adopted. The third standard of 1140 x 1140 millimeters is also widely used. The argument from Europeans is that the internal width of an ISO container does not allow efficient loading due to the inability to load two 1200 millimeters wide pallets side by side. This situation can lead to a loss of capacity of just under 20 percent for a 40-foot container and nearly 30 percent for a 20-foot container. The importance of this argument in favor of a slightly wider ILU than 8 feet depends critically on the percentage of goods using Europallet sizes that are, or could use, containers. In addition, the proportion of these containers that are constrained by weight from being loaded with the maximum number of pallets is an important factor. Estimates in Europe vary, but in some countries, as many as 36 percent of goods may use Europallets, and of these, up to a third may be constrained by weight. In addition, approximately 70 percent of all containers and swapbodies are loaded with pallets. The conclusion, therefore, is that swapbodies with a slightly wider body are more efficient in loading pallets. This incompatibility between pallet and container sizes was partly responsible for the emergence of another European standard for load units.

In the early 1990s, a new standard emerged under the auspices of the German standards organization (DIN), referred to as a land container. The land container has an external width of 2.5 meters. This width, with an internal dimension of 2.44 meters (as opposed to the ISO 2.336 meters), allows two 1200 millimeter pallets to be stacked side by side (or 3 x 800 millimeters) as in a swapbody. Currently there are about 50,000 of these containers in Europe, of which 75 percent (referred to as cellular pallet-wide containers—CPC) are designed to fit into an 8-foot (2.438-meters) ship cell slot. Recently CEN finished defining a stackable container with dimensions 7450 x 2550 x 2900 millimeters (compared with the ISO 20-foot container 6058 x 2438 x 2590 millimeters).

From the European perspective, the new container offers considerable advantages in its ability to store (and load) pallets. Yet the emergence of a different width standard for the so-called land container does mean more complications or constraints concerned with equipment throughout the intermodal supply chain. Some argue that cargoes may be transferred between different size containers at ports or other interchange points. However, this type of transfer activity runs counter to leading supply chain management practice wherein companies such as Li & Fung (Magretta 1998) move partially filled containers multiple times so as to eliminate the consolidator function entirely. While shipping costs are greater under this scenario, total systems costs are lower. Thus, to introduce a requirement for a consolidator function to be able to load pallets more readily may be counter-productive in terms of the total supply chain.

Large Containers

In the United States during the 1980s, manufacturers started to build containers longer than 40 feet in response to the requirements of shippers, manufacturers, and truck lines. The different lengths include 44-, 45-, 46-, 49-, 53- and 56-foot containers. The height is sometimes 9 feet

6 inches (2.90 meters) and the width is also increased to 8 foot 6 inches (2.59 meters). In response to this trend toward a larger family of containers, a draft document of ISO (referring to Series 2 containers) was prepared. This document was followed by a study funded under the program for European Cooperation in the field of Scientific and Technical research (COST) with a remit to examine the issue of these large containers. COST is a framework involving 25 European countries, which covers precompetitive research in a number of areas, including transport. While the program receives European Commission support, it is not a program of the commission.

The COST 315 study report (European Commission 1994), focused on a length of 49 feet and demonstrates the wide range of topics that need to be addressed in developing and possibly adopting a new standard for containers. The obvious advantage of larger containers is that they offer the prospect of moving more goods at lower cost. However, the increased volume of the proposed larger container examined in the study offers more volume with the same gross weight and thus a lower payload (of one ton). This balance between volume and weight offered a maximum density of only 276 kilogram/meter³ (kg/m³) compared with 670 kg/m³ for 20-foot and 411 kg/m³ for 40-foot containers. This configuration raises the immediate question of what proportion of trade involves such low-density cargoes that might take advantage of the new container. The report suggests (based on figures from one country) that such a configuration is only relevant to 2 percent of goods moved by containers. In addition, road weight limits in Europe constrain the total payload of containers and further limit potential use of such large containers. With this rather dismal picture of the potential use and benefits of large containers is a long list of increased costs.

It is argued that although 8 foot 6 inches (2.59 meters) is wide enough for two Europallets, it is wider than necessary. Indeed, anything wider than 2.48 meters probably requires stuffing to avoid undesirable movement in the container.

An examination of the implications for vessel costs is pessimistic. Adaptation of below decks on existing ships is prohibitively costly. On deck is feasible and should lead to no loss of capacity, but requires a new lashing system. In the case of new ships, designing for the new length in addition to existing standard lengths is no great difficulty (hindsight has proved this to be the case). Roll-on/Roll-off ships are identified as a special case where adaptation is impossible due to the restrictions imposed by elevators. The conclusion is that large containers lead to extra costs and are constrained to certain routes.

In the case of maritime terminals, any move toward larger containers requires new cranes. Rail terminals would also require new cranes due to the restricted width between the legs of gantry cranes.

In the case of using large containers on European railways, severe constraints are identified (or alternatively heavy costs of adaptation are identified). Due to a lack of harmonization, maximum dimensions masses, and axle loads of railway vehicles vary throughout Europe, depending upon local topography, date, and construction quality of the network. The increase in width from 2.50 to 2.59 meters creates problems on most routes or requires highly specialized wagons. Electrification and bridge clearances also make an increase in height (to 2.59 meters) prohibitively costly.

The move toward a longer container, with existing wagon fleets designed for 20-foot modules or 7.15-meter swap modules, would mean a poorer payload per wagon. Alternatively, introducing a fleet of specially designed wagons would mean a mix of wagons and consequent poorer overall use of the total fleet.

While U.S. legislation permits road vehicle dimensions of up to 53 feet, the case in Europe is rather different. A container of 49 feet requires a chassis that is longer than legally permitted in all European countries except Sweden. The width at 2.59 meters is (just) outside permitted dimensions for nonrefrigerated vehicles.

Turning to inland waterways (particularly significant in the Rhine valley), larger containers could be adopted without major modifications, but there would be a

severe loss of capacity. The dimensions of inland waterway vessels are closely linked to the dimensions of locks and canals. Without a change in vessel sizes, wider containers would mean only three rows rather than four, and, in certain parts of the network, double stacking of 2.90 meters containers is impossible due to bridge clearances.

Overall, the COST 315 study demonstrates the wide variety of issues implied by adopting a new standard. Some of the costs of such a move are identified (the purchase of new cranes, for example), but no attempt was made to provide a full breakdown of savings and costs deriving from the new standard. The array of costs and constraints identified in the report clearly outweighs the small benefits that might accrue to a small proportion of trade.

Any move toward standardization on container length probably needs to focus on the more popular 45-foot and 53-foot lengths. Many arguments presented in COST 315 apply just as strongly. The most recent move on a European standard for maximum truck lengths, for instance, offers no relaxation of that constraint, even for the shorter 45-foot version. The issue of a standard (or standards) for large containers is now frozen in the international arena of ISO activity. As far as Europe is concerned, CEN is developing a stackable container fully compatible with ISO strength requirements and with dimensions of 13600 x 2550 x 2900 millimeters. The width of the proposed unit is consistent with Europallet sizes, and the length is some 1408 millimeters longer than the 40-foot standard but shorter than 45 feet, so as not to violate truck length limits.

Small Containers

A recent initiative, COST 339, is to examine the issue of small containers (less than the 20-foot container length and 7.15-meter swapbody), sometimes referred to as the logistic box. The specific objective is to produce guidelines for governments, standardization organizations, transportation associations, and container manufacturers to assist in developing rules for

implementing European-wide use of small containers (European Commission 1998). The project will deliver recommendations to the competent standards authority (in this case, Technical Committee 119 of CEN). COST 339 aims to accelerate and simplify the development of new specifications and standards needed to enable intermodal transport.

The structure of the study pays particular attention to the demand side and benefits to users. It specifically addresses the rapid growth (associated in many cases with just-in-time philosophy) in small consignments of less than 10 pallets and the need to understand weight and volume relationships, commodity group composition, and desired transit time. The effects on internal organization transport (forklifting, automatic operation), loading characteristics, tracking and identification, and transshipment technology are also important elements to be addressed. The timeframe of the study (over three years starting in 1998) means that any influence on standards is some years away.

Conclusions

The recent history of container standards leaves a number of unresolved issues. For example, is there a need to develop a standard longer than 40 feet (12.13 meters)? Europe is moving toward a length of 13.6 meters (44.06 feet) that is not in harmony with any lengths developed in the United States. Is the existence of two standards—8 feet (2.438 meters) and a wider 8 feet 5 inches (approximately 2.55 meters) so popular in Europe—a cause for concern? Is there a need to reconsider the compatibility of pallet sizes, the possible emergence of small containers (logistic boxes), and the standard container? The factors that need to be considered to answer these questions are well known. They revolve mainly around issues of cost and ease (or speed) of moving goods through the supply chain. What is missing is a framework that quantifies the effect of standards adoption on performance measures of the supply chain (COST 315 does provide a partly quantified framework for the specific issue examined). Different

stakeholders can most likely achieve consensus about the objectives of standardization. Where disagreement begins is in predicting the effect of standards on the costs and the use of stakeholders in different parts of the supply chain in various countries of the world. In Europe, CEN has pursued standards that certainly respond to European needs but, at the same time, may conflict with the wider requirements of international trade with the United States and other countries.

Developing Interoperability: Information Technology

Information Technology

As with almost all sectors of society, the transportation sector has been significantly transformed by information technology use. This trend is expected to continue for the foreseeable future. Information technology in transportation has become as important as the physical movement itself. Information systems make the process more efficient by facilitating the numerous interactions necessary between the users (shipper and consignee) and the providers of the service. The providers include not only transport carriers—typically two or more in the case of intermodal transport—but also other parties such as public-sector terminal operators, customs brokers, and so forth. Information technology is also essential in ensuring that the service provided is compatible with the requirements of the supply chain of which it is a part.

Three areas of information technology are unique to transport:

- Identification of vehicles or other equipment, in particular containers (usually referred to as AEI for automatic equipment identification)
- Identification of individual shipments and their tracking in space and time (usually termed ITV for in-transit visibility)
- Exchange of information, including waybills and other documents between the parties involved in movement (frequently referred to as EDI for electronic data interchange)

While the use of information technology is highly developed in intermodal transportation, this development is also highly fragmented. This fragmentation reflects the existence of many distinct cargo communities within the industry. A community consists of firms that actually interact directly in providing and using transportation services, including shippers, carriers, agents, and so forth. These clusters of firms, related by their businesses, create interoperable systems, but give little or no attention to interoperability outside that cluster, as illustrated in figure 2. Indeed, incentives exist to ensure the lack of interoperability with firms outside the group, which create barriers to competition and new entrants.

Current Systems

Ocean Carriers

Ocean transport is inherently intermodal, although much of the burden of integrating water with land service rests with shippers' agents and others. EDI is widely used in ocean shipping, and many early efforts were made to develop standards so that firms and government agencies could readily exchange data. These efforts tended to occur within cargo communities with little regard for interoperability with the standards of other communities. Therefore, for example, in 1983 ANSI established the ANSI X12 standards for data sets and protocols. U.S. water and rail transportation carriers quickly adopted these standards. In 1987, when the United Nations Commission of Western Europe adopted a different set of standards—the EDIFACT (EDI for administration, commerce and transport) standards—they were rapidly adopted in international trade by ocean carriers, including U.S. carriers. Meanwhile, the ANSI standards continue to be used by domestic American carriers (Aylward 1995, pp. 20–22).

Software that enables translation between the two sets of standards (ANSI and EDIFACT) was developed, and documents can be readily converted, overcoming the issue of incompatibility, although at a cost

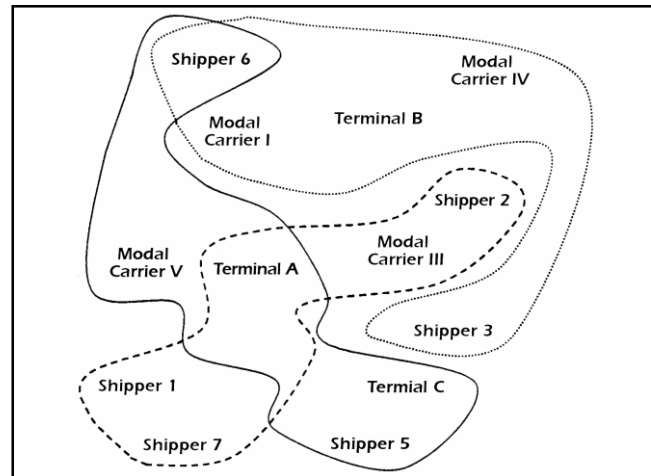


Figure 2. Islands of interoperability

of having to translate documents and data. Since then, various groups have attempted to develop standardized data formats to enable exchange of data among shippers, customs agents, brokers, ship lines, and terminals, all essentially compatible with the two widely used general standards.

AEI tags are not widely used within the maritime industry. A few carriers that operate closed systems, such as Matson to Hawaii, have installed them. Only one major international firm had planned to deploy them, American President Lines (APL). This firm was planning to use ISO-compatible tags, which are also compatible with U.S. rail industry tags. However, midway in its adoption of the tags, APL entered into a global alliance with other carriers who did not agree on the investment in AEI, and the program was terminated (Wolfe 1998, p. 18). This is clearly a case of changes in the composition of a cargo community leading to a major change in the efficacy of information technology. Interestingly, in this case it led to a decision to withdraw from more advanced technology, although in the future the question may be revisited.

Railroads

Railroads have been heavily involved in the use of information technology because the complexity and interdependencies of rail operations make timely flow of information essential to efficient operations. In Europe, the emphasis has been on developing

systems for train control, reflecting the high density of train traffic and the complex mix of local and express and freight and passenger trains. Automatic Train Supervision (ATS) and Automated Train Control Systems (ATCS) are widely used. However, European railroads have adopted the HERMES standards, which were developed through the Union Internationale de Chemins de fers (UIC, the European railway association), for carload and trainload traffic and to communicate with their customers. Separate standards have been developed for intermodal transport through various groups including the DISK system (Dispositioning and Information System for Intermodal Transport) in Germany and the INFOTAINER system in France (van Zijst 1993, pp. 97–98). However, these European systems are considered inadequate to support national and international intermodal movements (van Zijst 1993). Prompted by the deficiencies in the intermodal arena, the European Commissions' Fourth Framework research program includes projects specifically framed around intermodal requirements. These projects include CESAR (which will establish the basis for a common standard interface for information and data exchange and distribution between combined transport operators and their clients, mainly road haulers and freight forwarders), COREM (concerned with improving the management of container transport and handling equipment), and MULTITRACK (concerned with tracking, tracing and monitoring goods). All these projects have implications for standards that will develop in Europe.

In the United States, car and cargo movement have had greater emphasis. Almost all cars in interchange service are equipped with standard AEI tags, and readers are located on all main lines and near major terminals and yards. This enables tracking cars throughout the system, and most railroads provide reasonably rapid response to shippers' queries regarding shipment progress. U.S. railroads also widely use EDI for information exchange with shippers and consignees, although specific data formats and software differ

between railroads. However, progress in harmonization is being made, an example being the joint effort of the Association of American Railroads, the Railway Association of Canada, and the customs offices of both countries to develop an automated customs manifest system, which is now being deployed. Special data exchange programs also exist for various specific types of business, including some for container pools such as EMP and others for particular major customers such as truck lines. Again, the prominence of specific efforts at developing interoperable systems for specific business communities is evident.

Trucking

The trucking industry is characterized by far less concentration than other segments of transportation, in both Europe and the United States. Information technology is used far less uniformly in the trucking industry than in water and rail transport. Long distance truckload carriers on both sides of the Atlantic have been adopting the technology to track truck movements and provide two-way communication with drivers for some time, primarily at the insistence of major shippers whose business would be lost if the capabilities were not installed.

The most common systems use satellites for both tracking and communication, although other technologies are also used. These technologies enable substantial efficiencies in the use of the fleet and drivers and also provide the in-transit visibility that so many shippers now demand. Less-than-truckload carriers serve a very different market and operate between major terminals at which shipments are aggregated and disaggregated into truck-sized lots for long distance interterminal movement. The use of advanced information technology is moving much more slowly in this market segment, but in the last year or so, some carriers have been offering time-definite delivery and ITV.

Another important information technology element in trucking has been a joint government-industry effort to enhance trucking efficiency through intelligent

transportation system (ITS) programs. In Europe this is through the PROMETHEUS and DRIVE) programs, while in the United States it is through the ITS commercial vehicle operations (CVO) program. Common elements include providing (a) real-time traffic condition data, (b) optimal route guidance applicable to all traffic and initiatives directed specifically toward the trucking industry, (c) facilitation of border crossings, and (d) collection of road use charges.

In contrast to information technology efforts in tracking and mobile communication, which connect transport operators and in many cases their customers, the private-public ITS activities are directed almost exclusively toward the relationship between truckers and governmental road authorities. While the use of specific new technologies is in most cases voluntary, the use of the roads is not, and thus the conditions under which the technology is considered are very different from those applying to partners in the supply chain. However, the development of systems for CVO applications involves government and the private sector in the form of both the users (truckers) and technology vendors, all of whom are involved in developing open architecture and standards for interoperability.

The standard for truck trailer AEI tags was developed through the American Trucking Associations. However, almost no truckers are using tags. Instead, they emphasize tractor tracking and use databases to associate trailer movements with tractor movements.

Air

Air cargo is inherently intermodal. Low door-to-door transit time and high reliability are the primary justifications for using air service, and hence integration of air with its feeder service (usually truck, though rail is beginning to be used for postal connections) is essential. The International Air Transport Association has created a program titled Cargo Media to develop and promote the use of electronic communication for shipment tracking between airlines,

freight forwarders, and feeder truck services. Almost 20 proprietary systems have been developed to exchange air cargo waybill data, customs data, and payments, each serving particular regions, shippers, and carriers. Efforts to create a single electronic air waybill have failed, in part because they failed to recognize unique features of different segments of the air cargo market and the interest of the various players—from integrators to carriers to users—in preserving current relationships and business practices (Forster and King 1995). The view that standards must be compatible with the interests of the players is widely echoed in the literature on standardization.

Express

Small-package transport is singled out because (a) it is such a large and growing business, (b) it is truly intermodal, and (c) it illustrates the benefits of information integration. Federal Express and UPS are archetypal examples of this type of carrier. Both have developed their own proprietary systems for identifying packages (using bar codes) and for entering shipment and other information electronically, including data entry and retrieval at mobile units (delivery trucks). This information is key to real-time tracking of packages and to ensuring that the service guarantees are met. It is also essential in the integration of air, long-distance truck, rail, feeder truck, and terminal activities necessary to deliver the service.

Regions and Ports

A somewhat unique and noteworthy information infrastructure has been created in Singapore to link all modes of transport, terminals, and agents involved in land, air, and sea trade in that area. It is called TradeNet. It essentially replaces about 20 different paper documents with 1 electronic form. TradeNet has been reported to have reduced processing times for trade approvals from between two and four days to a few minutes or hours and reduced

documentation costs by about 20 percent. However, as successful as it is, TradeNet has not been adopted elsewhere. The cost of imposing such a system on various players is high and requires a degree of governmental authority that is not duplicated in many other places.

An example of the difficulty is provided by the recent project WISDOM (Waterborne Information System, Distributed to Other Modes). This project developed a prototype architecture for data sharing among participants in container flows through ports, including ship lines, trucking firms, freight forwarders, and port terminal operators (Cap Gemini et al. 1998, p. 19). This project was funded in part by the European Commission and reached the stage of pilot applications in Rotterdam and Bremen. While the various participants were quite enthusiastic about potential gains, continuation of the WISDOM project is uncertain. Three reasons stand out: (a) concern about sharing of data among competitors or others with competing interests, (b) high initial costs, and (c) uncertainty of achieving cost savings or other benefits.

Common Themes and Conclusions

A number of lessons and common themes emerge that appear to be very important in thinking about the harmonization of information systems in intermodal transportation.

First, perhaps most significant is that often the user of the system, the shipper or owner of the goods being transported, provides the impetus for such advanced technology. This point is particularly evident in technology's history and use in trucking. Thus, understanding the needs of shippers is crucial if such benefits are to be part of the justification for harmonization of information systems.

Second, harmonization benefits clusters of firms who work together, firms that form particular communities within the overall freight transportation arena. Intermodal transportation encompasses

many such communities. These communities are largely distinct from one another, and they are continually evolving. Careful consideration must be given to how various members of the community will use the information, and how it will reinforce or change current business relationships, power, and competitive conditions. If information is perceived as a threat to some players, then efforts at harmonization will be resisted, as they were in the air cargo industry.

Third, harmonization is occurring naturally within freight communities, compelled by a combination of market forces (on firms) and geopolitical self-interest on the part of governments. Efforts appear to have been primarily private sector, with government entering as a facilitator, and in some cases, a convener.

Fourth, many of the largest players in intermodal transportation operate in both a single modal community as well as an intermodal community. Railroads and trucking companies are obvious examples. In this context, whatever is done in connection with intermodal transport must be compatible with operations and information flows within the remainder of the community with its single mode outlook.

Fifth, there are noteworthy public sector-private sector partnerships such as the ITS, European Commission Fourth Framework programs, and Singapore's TradeNet System. To take advantage of some opportunities in the intermodal freight arena, governments may have to take the lead, for example, in cases where there is great fragmentation in the industry. However, developing a shared vision of what is to be harmonized, and what the benefits will be, is crucial to success.

Finally, natural trends in production and distribution are adding complexity to supply chains and transportation. These naturally lead to opportunities to use information technology to advantage. Indeed, it is often essential for transportation companies to provide the required information technology service to their customers. Furthermore, the more complex the network, the greater the potential gains to the carriers themselves in the form of better equipment use, reduced investment re-

quirements, more rational pricing, and better service. Thus, incentives for harmonization are likely to increase simply on the basis of self-interest.

Questions

In closing, three basic questions get at core issues in information technology harmonization:

- Can areas be identified where increased use of information technology will improve the efficiency of the system? If so, is the impediment a lack of interoperability among information systems of the various players within the community, or is the impediment of a different nature, for example, benefits are not seen by all of the players?
- How will the needs of shippers (customers of the transportation system) change, and what are the implications of these changes for providers of transportation services? Direct mandates from customers are arguably the most powerful incentives for change. These mandates will provide both specific requirements for harmonization and major opportunities to look forward and provide for interoperability in ways that go beyond immediate needs.
- What specific steps will move the process forward? This work involves identifying firms and public agencies who are critical members of the community and who are expected to benefit from the effort. Benefits must be identified and quantified to evaluate the effort, energize the process, and lead senior management to make a commitment to change.

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Article B: Intermodal Transportation and Carrier Liability

This paper presents the need for developing an integrated liability system is established and potential regulatory options, as well as possible key elements of such a system.

Summary and Main Conclusions

The present legal framework determining an intermodal carrier's liability for delay, loss of, or damage to goods consists of (a) a confused jigsaw of international conventions designed to regulate unimodal carriage, (b) diverse national laws, and (c) standard term contracts. Liability is fragmented and unpredictable, thus generating unnecessary costs. Past attempts at developing a uniform liability system have been unsuccessful. Increasing proliferation of national solutions further complicates the situation and illustrates the urgent need for uniform regulation at the international level.

Any potential solution must take into account the key features of current practice and provide satisfactory means of avoiding or reducing current problem factors. Liability rules should be simple and predictable and operate in a straightforward and cost-effective way. At the same time, any new liability system must be compatible with existing international law, that is, address the issue of overlap and conflict. Uniform rules could be successfully adopted by way of international convention. However, any such solution would take considerable time to develop and may eventually fail to be accepted by national parliaments.

The successful development of an interregional convention (European Union–United States) would establish an effective uniform liability regime and provide a significant political impetus for an international agreement. This convention, however, would require reconsideration of recent U.S. proposals for national legislation (draft U.S. Carriage of Goods by Sea (U.S. COGSA 1998)), which are of con-

cern to Europeans. At the European Union level, the adoption of an intermodal liability system by way of European Commission (E.C.) legislation would provide a viable regulatory option.

Special consideration needs to be given to the issue of substantive conflict with existing conventions. All conventions establish minimum levels of liability. At the same time, carriers are entitled to limit or exclude their liability under certain circumstances. Under most of the conventions, contractual increase of the carrier's liability is admissible.

To be both acceptable to industry and compatible with states' international obligations under existing transport conventions, any new liability regime should be voluntary. A voluntary regime that operates as a default-system, allowing contracting parties to "opt out," but otherwise overriding any conflicting contractual provisions, would ensure more widespread availability of this regime than traditional "opting in" systems.

The liability system should be applicable (by default) to all intermodal transport and should also enable contracting parties to any unimodal transport contract to adopt its provisions (in which case it would replace all otherwise applicable law).

Any new intermodal liability regime should provide for carrier liability in excess of established minimum levels. At the same time, the liability rules should be simple and transparent, minimizing uncertainties and avoiding the need for costly litigation. The rules should cover liability for all types of losses (damage, loss, or delay) and operate irrespective of (a) the modal stage where a loss occurs and (b) the causes of a loss.

The most cost-effective solution appears to be a system that concentrates the transport risk on the contracting carrier (the intermodal operator procuring or undertaking to procure carriage). This system would provide for strict and full (e.g., invoice value plus 10 percent or market value) liability throughout the intermodal

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transaction. The liability would be allocated to the contracting carrier as a matter of agreed commercial risk, thus making the need for separate cargo insurance largely redundant and avoiding costs associated with legal uncertainties and evidentiary inquiries.

As the regime would not be mandatory, operators who do not wish to assume extensive liability would be able to opt out of the regime. However, the system should provide an attractive option for both the customer, who would enjoy a higher standard of service and better protection, and the intermodal operator, who would be able to offer a competitive service. Through voluntary incorporation into unimodal contracts, this type of regime may attract, in time, widespread use and could eventually play a role in developing an international regime.

Any new regime should take developments regarding the use of electronic communication and documentation into account.

The Need for an Integrated Liability System

Intermodal Transport at the Turn of the Century

Globally and at the European level, trade is increasingly conducted by way of intermodal transportation. According to the latest annual United Nations Conference on Trade and Development (UNCTAD) Review of Maritime Transport, the volume of world seaborne trade in containerized cargo is forecast to more than double over the next few years and to rise to 1 billion tons by the year 2006. Most of this containerized cargo will involve transportation by more than one mode before reaching its final destination. Constructing road networks and land-bridges, developing block train services, and undertaking international joint ventures between operators continuously increase the potential for the expansion of intermodal transport. At the same time, intermodal and port operators are heavily

investing in technological developments, improving the systems for transferring cargo between different modes and making this a sophisticated industry.

Over the past decade, the market for transport services has undergone a dramatic change due to deregulation, time-based competition, and the resulting focus by many transport users on just-in-time manufacturing strategies. These developments, along with globalized production and supply-chain management, have turned the traditional transaction-based relationship between cargo owner and operator into what is now being reported by many manufacturers as a choice of partners. As many more firms pursue downsizing and outsourcing in the interest of improved competitiveness, innovative contractual arrangements continue to develop. The move by transport users to contracted logistics supply is often accompanied by a carrier-reduction strategy, which focuses on selecting a few trusted carriers for longer-term use.

The current intermodal liability framework does not reflect developments that have taken place in terms of cargo volume, transportation patterns, technology, and markets. Operators providing modern and cost-effective transport logistics should have the opportunity to make their liability compatible with their otherwise sophisticated services; currently, this is not the case.

Current Legal Liability Framework

No uniform regime governing liability for cargo loss or damage is in force. The present legal framework determining a carrier's liability consists of (a) a confused jigsaw of international conventions designed to regulate unimodal carriage, (b) diverse national laws, and (c) standard term contracts.

As every intermodal transaction is made up of unimodal stages, a number of mandatory international liability regimes potentially apply, depending on the scope of application and the stage of transport where a damage or loss occurs. Accordingly, two different regimes may apply to the same claim or the regime that applies

can only be identified when it is clear during which stage of the transport a loss or damage occurred. Where the stage of transport during which a loss or damage occurred cannot be identified, where loss or damage occur gradually, or in the course of (value-added) services ancillary to transportation (e.g., warehousing), a carrier's liability will often depend on national laws or the contractual agreement. As a result, both the applicable liability rules and the degree and extent of a carrier's liability vary greatly from case to case and are unpredictable. Liability for delayed delivery is not always covered by the same rules as liability for loss of or damage to the goods.

The current state of affairs is of particular concern in view of current intermodal transport practice, which increasingly shows the following features:

1. One operator: One party, the intermodal transport operator (ITO), procures or undertakes to procure the carriage of goods (often including ancillary services) by unspecified modes of transport. This party may or may not carry out all or a part of the transport.
2. Anonymity: The consignor is neither aware of nor, in many instances, interested in the choice of modes or the identity of modal subcarriers. Cargo owners may not control transport arrangements themselves (e.g., when contracting on a number of international commercial terms (INCOTERMS)). Transport is increasingly becoming a commodity.
3. Sealed units: The use of containerized transportation leads to difficulties in attributing a loss to a particular mode or carrier and in establishing the regime under which liability is to be determined.
4. Changing demands: Certain transport users are increasingly concerned about delays in delivery in connection with effective supply-chain management.

Uncertainty and Diversity

Uncertainty raises costs and discourages trade. Uncertainty about the time of loss or damage makes it difficult to allocate

responsibility and impossible to accurately preassess liability.

Uncertainty concerning the contract and the identity of the carrier, in particular the role and liability of the entity ITO with which the consignor deals (agent, forwarder, carrier, third-party logistics provider) gives rise to a number of problems. For example, if the ITO is not a carrier, the consignor has difficulty identifying and pursuing the actual carrier responsible for loss or damage. By the time the consignor does so, evidence may be hard to obtain or a suit may be time barred. In particular, the consignor may find that the liability of the actual carrier is governed not by an international regime, but by local law with a short limitation period, the content of which is unknown to the consignor. If the time and place when damage occurred cannot be established, what then? Currently, there is no uniform answer to this question in the case of an ITO. A variety of contractual standard term documents, such as the International Federation of Freight Forwarders Association (FIATA) bill of lading (FBL) 1992, provide varying liability rules, but these documents are always subject to mandatory laws.

Substantive uncertainty as to the applicable legal regime and its effects (e.g., financial limits of liability, time limits for making a claim) affects the speed and cost of claims handling and may lead to litigation. Provisions in standard term documents are often difficult to understand and give precedence to mandatory national and international law without providing further guidance as to which regime is mandatorily applicable. Which mandatory laws will be applied depends not only on whether the stage of transport where a loss occurs can be established, but also on the courts in the country in which proceedings are brought—a matter that can only be partly foreseen at the time of contracting.

Existing regulation is fragmented and incomplete because potentially relevant regimes were often drafted for commercial practices that are less widespread today. Whether a particular regime covers a loss in any given instance is often subject to nationally different rules and views.

The diversity of contractual liability rules, as well as mandatory national and international liability rules, make comprehending central issues difficult, particularly the differing liability systems, the differing burdens of proof, and the differing requirements for the successful institution of legal proceedings. The proliferation of potentially relevant regimes encourages “forum shopping” and costly multiple proceedings.

At present, applicable legal regimes, their content, and interpretation are often uncertain, and potential liability cannot be assessed in advance. Standard contract terms are based on systems that are far too complex for operational efficiency. This situation is undesirable and costly. Too many factors require clarification before a simple question can be answered: Who is liable (and to what extent) for delay, loss of, or damage to the goods?

Although it is not possible to accurately assess the degree to which unnecessary costs are generated, clearly substantial costs associated with claims handling and litigation could be avoided by both cargo interests and operators (or their liability insurers) if the legal liability framework was simpler and less fragmented. Current regulation of liability is not cost-effective, nor does it provide adequate protection for the customer. In view of the uncertainties about incidence and extent of a carrier’s liability, separate cargo insurance is a necessity. This insurance, however, does not cover all risks, such as delay. It also invites recourse actions against carriers caught by mandatory liability and results in a peculiar and costly reshuffling of the costs of incurred losses to the benefit of no one.

Conclusion

The present liability system is inefficient and requires change. Because carriers and shippers have found ways to cope with the inadequacies of the system, change will appear attractive only if it translates into tangible benefits. For transport users, a

predictable and cost-effective liability system that eliminates much of the present uncertainty and cuts costs associated with loss-recovery would have clear advantages. At the same time, such a regime may have marked benefits for operators, particularly those cooperating with large commercial customers; in this relationship, an improved claims-handling service, ensuring speed and certainty and reducing the potential for contention and litigation, may be a significant benefit. For both users and operators, an improved legal framework may be considered an investment in the future, facilitating the sustainable development of intermodal transportation.

Past Attempts at Unification

Over the years, there have been several attempts to solve the problem by a uniform law text of some kind, but none of these attempts has provided a satisfactory result.

The 1980 United Nations Convention on Multimodal Transportation of Goods

The United Nations Convention, which in principle operates a uniform system of liability for claims arising out of multimodal transport contracts, has failed to attract sufficient signatures and ratifications to enter into force. One of the reasons appears to be that the convention is largely based on the 1978 United Nations Convention on the Carriage of Goods by Sea (Hamburg Rules). Although in force, the Hamburg Rules have not been ratified by any of the major shipping nations. This situation is unlikely to change. The Multimodal Convention does not provide a truly uniform (i.e., mode-independent) system for liability arising out of intermodal transport. If the particular stage of the transport where a loss occurs is known, the convention gives precedence to applicable international conventions or national law providing for a higher limit of liability (Article 19). Accordingly, the need (or incentive) to establish the stage where a loss occurs and to determine whether diverse mandatory national or

international law applies remains. Moreover, the convention provides for a different financial limit if a contract does not include carriage of goods by sea or inland waterway (Article 18 (3)).

The UNCTAD/Interstate Commerce Commission Model Rules for Multimodal Transport Documents

The UNCTAD/Interstate Commerce Commission (ICC) Model Rules, which came into effect on January 1, 1992, do not have the status of mandatory law, but will override any conflicting contractual provisions if they are incorporated into a contract. Like the Multimodal Convention (Article 4), the rules give precedence to mandatory law (Rule 13). The rules are based on the “network principle.” That is, the rules provide that when the unimodal stage of the transport where a loss occurs can be established, the liability is limited according to the national or international law that would have applied mandatorily if a separate (uni-modal) contract had been made for that stage (Rule 6.4). Again, the need (or incentive) to examine whether a unimodal regime would have applied remains.

Because of the failure of international attempts to provide a uniform solution, a certain “drafting fatigue” has occurred. At the same time, individual states are opting for national measures to resolve the problems created by the lack of a coherent liability system. Some European states have adopted the 1956 Convention for Carriage of Goods by Road (CMR) (i.e., international road-carriage) regime for domestic carriage or have closely modeled their legislation on it. In the United States, a draft bill (draft U.S. COGSA 1998) proposes to extend the mandatory application of a modified Hague-Visby liability regime to intermodal contracts (which include partial carriage of goods by sea) to or from the United States. The proliferation of such unilateral, national solutions further complicates the current liability situation and illustrates the urgency of achieving uniformity at the international level. At the same time, national developments need to be

considered when drafting a uniform international regulation, both in terms of the substantive solutions offered and in terms of the legal (possibly mandatory) effect.

Possible Future Regulation

The Aims of Any Future Regulation

Any potential solution must take into account the key features of current practice and provide satisfactory means of avoiding or reducing current problem factors. Liability rules should be simple and predictable and operate in a straightforward and cost-effective way. At the same time, any new liability system must be compatible with existing international law, that is, address the issue of overlap and conflict. To be successful, a new regime should therefore be—

- Compatible with existing unimodal regimes
- Uniform
- Cost-effective
- Acceptable to the transport industry

Compatibility with Existing Unimodal Regimes

A central and problematic issue in developing an intermodal liability system is the existence of mandatory conventions that govern the carriage of goods by sea, air, road, and rail. All of these transport conventions establish minimum levels of liability. At the same time, carriers are entitled to limit or exclude their liability under certain circumstances. Under most of the conventions, a contractual increase of the carrier’s liability is admissible.

As every intermodal transaction is made up of different modal stages, it is unclear whether existing conventions have a mandatory effect in connection with intermodal transport. This has been a contentious issue for many years. The answer depends partly on the convention at issue (i.e., its individual scope of application) and partly on the type of undertaking contained in a contract for intermodal transportation (i.e.,

whether or not the contract specifies the respective modes of transport).

In considering options for an intermodal liability system, the issue of conflict needs to be addressed. This is relevant regarding both the type of regulatory framework and substantive issues, such as existing minimum levels of liability on the one hand and existing limitations or exclusions of liability on the other hand.

Regulatory Options for a Uniform Liability Regime

A potentially effective means of achieving uniformity is by way of international or interregional convention or, at the European level, by way of E.C. Convention or E.C. legislation. In principle, an international convention would be the best means of ensuring the application of a unified system at an international level. However, as the example of the 1980 United Nations Multimodal Convention shows, the success of any attempt at agreeing on a universally accepted regime is uncertain.

A regional convention, such as an E.C. Convention would be subject to the same caveat, albeit to a lesser extent: there are potentially fewer state parties with potentially more common interests. National legal systems are less diverse and, in some areas (such as conflict of laws, jurisdiction, and enforcement of judgments), uniform. A regional solution would establish, in the short to medium term, a predictable liability regime at the European level, but could provide, in the longer term, an incentive and key elements for an international consensus. Any regional solution would need to ensure the global competitiveness of European operators.

An interregional convention agreed to by two important trading blocks (European Union–United States) would establish an effective uniform liability regime and, very likely, lead the way toward a broad international consensus by providing a significant political impetus. In view of the increasingly chaotic legal framework and the urgent need for action, this step would clearly be the most promising and effective way forward. The development

of an interregional regime would entail, however, reconsideration of recent proposals for national legislation in the United States (draft U.S. COGSA 1998). The proposed legislation consists of a modified version of the Hague–Visby (i.e., maritime) liability regime and would be mandatorily applicable to all intermodal transports involving sea-carriage to or from the United States. Europeans are concerned about the unilateral nature of the proposed legislation and its compatibility with existing transport conventions.

E.C. Legislation

At the E.U. level, a regional uniform regime could be created by way of secondary E.C. legislation. Directives and regulations are possible instruments. While a directive is binding on member states and requires implementation by way of national legislation, a regulation is directly applicable and effective.

Special care would need to be taken in drafting such legislation to ensure the competitiveness of operators and to adequately take into account the transportation of goods within the European Union, as well as into or out of the European Union. Consideration would also need to be given to the compatibility of this regime with those applicable in neighboring and other major trading partner states.

Mandatory or Nonmandatory Regime?

A mandatory international or regional regime that applies by force of law creates uniformity. At the same time, such a regime may be rejected by some sectors of powerful national industries lobbying their governments during the negotiation, drafting, and ratification processes and thus fail to attract sufficient support. Fear of change, suspicion of mandatory law, or uncertainty as to possible implications may lead to drafting more complex provisions that in turn create new insecurities and eventually perpetuate a cycle of rejection and ineffective attempts at achieving a satisfactory result.

Clearly, any viable solution must be acceptable to the affected industries. Model rules, which are by definition only applicable if the parties to a contract so agree, would not encounter any significant resistance. However, past experience shows that such voluntary solutions may fail to lead to widespread application of a regime because contracting parties fail to opt for this solution. Reasons for this failure may be inertia, lack of awareness, or uncertainty as to the legal implications. Moreover, model rules (other than those contained in legislative instruments) lack the legal status of mandatory national or international legislation, which take precedence in the event of overlap or conflict.

One possibility of achieving widespread application of a nonmandatory new regime would be to adopt a default system, which applies unless the parties agree otherwise. Such a system would be voluntary, as parties would be able to “contract out,” but would be more likely to achieve widespread application, as parties need not “contract in” (e.g., the 1980 United Nations Convention on the International Sale of Goods). To ensure transparency of regulation and predictability of liability, such a regime, although not mandatory, would need to be overriding, that is, take precedence over any conflicting contractual provisions and not be subject to modification (i.e., partial application).

Substantive Key Features of a Possible New Liability Regime

Compatibility with Existing Regimes

To avoid substantive conflict with existing mandatory liability regimes, a new nonmandatory regime should provide for liability in excess of established minimum levels. This provision would allow the regime to be incorporated into unimodal subcontracts, ensuring effective use of the liability rules in back-to-back contracts.

Cost-Effectiveness

The liability system needs to be simple and transparent, thus avoiding uncertainty and costly litigation regarding the applicable rules, terminology, and evidentiary matters, such as the place and cause of damage or loss. The rules should cover liability for all types of losses (damage, loss, or delay) and operate irrespective of the modal stage where a loss occurs and the causes of a loss.

The most cost-effective solution, dispensing in many instances with the need for separate cargo insurance, would be to concentrate the transit risk on one party and provide for strict and full liability of the contracting carrier (the intermodal operator procuring or undertaking to procure carriage). Unlimited liability of the contracting carrier would not be realistic and probably would be uninsurable. However, liability should be higher or at least as high as the insurable value under cargo insurance, that is, the invoice value plus 10 percent, or the market value of the goods, in the claimant’s option. The contracting carrier would be liable for delay, loss of, or damage to the goods, regardless of fault and the stage of transport where the loss occurred. This scheme would make costly inquiries into the applicable legal regime and the causes and place of a loss largely redundant. These matters may remain relevant in connection with feeder contracts and in the context of recourse actions by the contracting ITO against subcontracting unimodal carriers. However, with regard to subcontracts entered into by a contracting ITO, the regime could be adopted voluntarily by contractual incorporation. From the transport user’s point of view, a clear set of mode-independent liability rules concentrating the risk of delay, loss, or damage to the goods throughout the intermodal transaction on one party would provide better protection than existing standard term contracts and thus mean enhanced quality of service.

Acceptability to Industry

If a nonmandatory (but overriding) “default” system were adopted, a carrier who did not wish to assume extensive liability would be able to opt out of the regime. Adherence to the regime would be a matter of commercial decision making. However, a cost-effective regime that offers a high degree of protection would be particularly attractive to cargo interests and thus be competitive. Unimodal carriers could opt into the regime (by contractual incorporation), thus making their services more competitive. Such voluntary adoption would extend, in effect, the application of the liability system to a wider spread of contracts, that is, to transport contracts generally.

Insurance Implications

Any substantial increase of carrier liability has implications for the structure of insurance coverage and may affect the existing market. In particular, the position and market share of present insurance providers may be changed.

Under any of the unimodal conventions, carrier liability is based on fault and subject to a financial ceiling. Although in most instances, contracting parties can agree on an increase of the carrier’s liability (e.g., by including in the transport document an express declaration of value), this does not usually happen for fear of a disproportionate rise in the freight rate. Moreover, even where full liability is agreed upon, the need for separate cargo insurance remains, as a carrier is only liable for damage or loss arising from its own fault.

Simplifying the liability rules by shifting the risk of cargo loss, damage, or delay to the carrier would make the need for separate cargo insurance largely redundant and thus reduce costs. However, this shift presupposes that the regime covers the whole period from start to end and that the savings made in dispensing of double

cargo insurance will not lead to a disproportionate increase in the carriers’ liability insurance premiums and thus in freight rates.

Electronic Documentation

Any new legal regime for carriage of goods should allow for electronic documentation on a voluntary basis (cf., 1996 United Nations Commission on International Trade Law Model Law on Electronic Commerce; INCOTERMS 1990, A8).

For a more detailed account of the matters raised in this paper, see—

Asariotis, Bull, Clarke, Herber, Kiantou-Pampouki, Moran-Bovio, Ramberg, de Wit, Zunarelli. 1998. *Intermodal Transportation and Carrier Liability*, Draft Report submitted to the European Commission, July 1998.

United Nations. 1997. *UNCTAD Review of Maritime Transport*. (UNCTAD/RMT(97)/1). New York/Geneva, Switzerland: United Nations. Paragraph 5 at p. 13, 74–76.

Kindred, Hugh M, and Mary, R. Brooks. 1997. *Multimodal Transport Rules*. The Hague/London/Boston: Kluwer Law International.

No studies have been carried out to give a reliable indication of how much money is being lost as a result of the inadequacies of the fragmented liability framework. This is illustrated by the fact that the recent U.S. Department of Transportation Cargo Liability Study (August 1998) uses figures from 1975. Obviously, these data do not take into account the dramatic changes that have taken place in terms of cargo volume and transport patterns and practices over the past two decades.

Any potential conflict with Article 41 CMR could be resolved by amending that provision so that contractual increase of liability is admissible.

Article C: U.S. Intermodalism: Cargo Liability Issues

Introduction

In seeking to understand the U.S. laws and regulations governing cargoes moving to, from, or within the United States, the most basic statements that can be made are as follows:

- No single regime of rules or uniform liability system for addressing loss and damage issues exists.
- Few reliable sources for data allow detailed analysis of the problem.

At present, the terms and conditions of shipment are key to determining how liability is apportioned among the various parties to the intermodal transportation at issue. In the almost two decades of substantial economic deregulation of the transport modes, the marketplace forces of competition have proliferated the ways shippers and carriers resolve these issues. These variations fall generally into three approaches:

- Contract law, where the terms of the agreement govern loss and damage
- Released value rates, where the shipper assumes all or a portion of the liability in return for a more favorable transportation rate
- Common carrier liability, where the carrier has full responsibility for loss and damage

In the United States, most commercial transportation occurs under contract. This is especially true for intermodal shipments. Shippers generally include liability provisions in their contracts. A 1997 survey of about 100 shippers indicated approximately one-half had long-term contracts with their carriers.¹ Other estimates indicate 80 percent or more of total domestic rail tonnage moves by contract.²

Where large volumes of goods are involved, such as major retail stores and Fortune 1,000 companies, the terms and conditions of liability are a matter of negotiation between the parties. Under these arrangements, liability can range from the traditional common carrier arrangement

where the carrier has full responsibility for the goods in its care to the shipper or consignee assuming all or some portion of the liability for the goods in return for a more favorable transportation rate. Where transportation involves small shippers, such as a local gift shop or an individual needing to send goods or priority business letters occasionally, carrier liability terms are stipulated in the bill of lading and offered on a take-it-or-leave-it basis.

Released value rates are used in both contract and common carrier arrangements. Under these arrangements, the shipper or consignee agrees to assume all or a portion of the liability in return for a more favorable transportation rate. When assuming cargo liability, the shipper or consignee can self-insure or secure third-party insurance to protect against loss or damage.

Common carrier liability has two distinct portions: domestic liability, where the carrier has full responsibility for the goods while in its care and international liability, where there are a variety of defenses, especially for the maritime carrier. In addition, several international liability treaties governing goods moving by sea and air are active or pending. Exhibit 1 shows the complexity of the common carrier liability system of the United States and monetary implications for each regime. Appendix A shows the complexity worldwide, breaking out the requirements for most of the world.

In domestic transportation, carriers sometime “interline” shipments with other carriers or with owner-operators, that is, act so that multiple carriers are involved in a move. If loss or damage occurs, the shipper or consignee files a claim with the original carrier who, in turn, seeks to reclaim those amounts from the other carrier(s) once the point or source of damage is identified or allocated.

In terms of statistics, within the United States, cargo theft (reported and unreported) is estimated at \$10 billion a year with damage totaling about 25 percent of that

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November 1998

Exhibit 1
Limits On International Multimodal Cargo

Treaty	Per Package	Per Unit of Weight	
		Per Kilo	Dollars per Pound
U.S. Carriage of Goods by Sea Act	\$500 per package or customary unit on which the freight charges are based	None	None
Visby Amendment	667 SDRs \$667 A \$760 B \$853 C \$912 D \$933 E	2 SDRs \$0.91 A \$1.04 B	\$1.15 C \$1.23 D \$1.27 E
Hamburg Rules	835 SDRs \$835 A \$952 B \$1,068 C \$1,143 D \$1,169 E	2.5 SDRs	\$1.14 A \$1.30 B \$1.44 C \$1.54 D \$1.59 E
International Multimodal Transport Convention	<ul style="list-style-type: none"> • If a sea leg is involved <ul style="list-style-type: none"> \$920 A \$1,049 B \$1,177 C \$1,284 D \$1,288 E • If no sea leg is involved <ul style="list-style-type: none"> 920 SDRs NA 	2.75 SDRs \$1.25 A \$1.43 B 8.33 SDRs	\$1.58 C \$1.69 D \$1.75 E \$3.79 A \$4.32 B \$4.80 C \$5.13 D \$5.30 E

A (When 1 SDR = \$1.00) Summer 1985 D (When 1 SDR = \$1.37) April 1988
 B (When 1 SDR = \$1.14) February 1986 E (When 1 SDR = \$1.40) February 1992
 C (When 1 SDR = \$1.27) June 1987 SDR = Special drawing right

Source: Transportation Consumer Protection Council

total or \$2.5 billion. The Federal Bureau of Investigation sets the theft loss at \$3.5 billion but supports estimates that 60 percent of cargo theft is unreported.³ The value of goods shipped in the United States is roughly \$6 trillion domestic and \$1 trillion international for a total of about \$7 trillion.⁴ On a value basis, theft and damage affects less five percent, and possibly less than two percent, of all goods moving to, from, or within the United States. However, actual numbers vary by commodity, with the higher-valued goods being targeted much more often (see appendix B).

This paper outlines the laws creating today's liability regimes and explores the issues influencing any international liability regime for intermodal cargoes.

History

The concept of common carriage developed in Europe during the middle ages. Basic to common carriage is the notion of treating all customers in the same way.⁵ Besides the duty to avoid discriminating among customers, the other two elements of common carriage are the duties to provide service and to be subject to strict liability.⁶

In 1887, Congress adopted the Interstate Commerce Act. The act originally applied only to railroads. It established the Interstate Commerce Commission (ICC) and gave the ICC the function of ruling on the reasonableness of rates. Public access rates at the commission were an essential element of ICC rate regulation.

Carrier liability became the subject of federal legislation in 1906 in the Carmack Amendment to the Interstate Commerce Act.⁷ The Carmack Amendment established a codified strict liability regime with established common carrier defenses to liability. The regime provided for full-value compensation, except to the extent that carriers were able to limit liability by filing released rates.

The 1915 Cummins Amendment abolished the practice of limitations on liability;⁸ the second Cummins Amendment in 1916 allowed limitations on liability

through filing of released rates,⁹ if those rates were just and reasonable. For various reasons, several types of carriage remained outside of this liability regime. In addition, the Pomerene Bills of Lading Act of 1916 gave further statutory status to the bill of lading and also defined the extent of carriers' liability in relation to the conditions stated in the bill of lading.

Motor carriage was brought under the ICC's jurisdiction in the 1935 Motor Carrier Act and thus became subject to the Carmack Amendment's liability regime.¹⁰ Subsequently, freight forwarders were also brought under ICC jurisdiction and the Carmack liability regime.¹¹

In addition to its jurisdiction over released rates, the ICC regulated the processing of claims for loss, damage, injury, or delay to property transported in interstate commerce by railroads, express companies, motor carriers, water carriers, and freight forwarders. The ICC established requirements for the filing, acknowledgment, and disposition of claims and required that a claim be investigated and paid, declined, or compromised. However, the ICC did not itself adjudicate claims.

Market Forces and Contracts

The Motor Carrier Act of 1980 partially deregulated motor carriage. Released rates were only required to be reasonable and became easier to obtain.¹² The Staggers Rail Act of 1980 provided substantial deregulation of the railroad industry.¹³ In addition, it allowed carriers and shippers to enter freely into contractual agreements on limitation of liability without regard to reasonableness.

Most domestic U.S. intermodal shipments, perhaps in excess of 90 percent,¹⁴ are moved under contract, and the terms of that contract determine responsibility for loss and damage. In other words, these shipments fall outside the traditional common carriage system. They are transported in a marketplace environment where a carrier may enter into a contract "to provide specified services under specified rates and conditions."¹⁵

Under U.S. law, the carrier and shipper negotiating for contract carriage may make any reasonable contractual stipulations, except that they may not waive provisions governing the carrier's registration, insurance (other than cargo), or safety fitness. Contracts of carriage determine liability according to the desires of the parties to the contract. Depending on contract terms and conditions, disputes normally are resolved either in the courts or by arbitration.

Widespread commercial use of released value rates has its genesis in the economic deregulation acts of 1980.¹⁶ These acts allowed shippers and carriers to mutually agree to limit or remove a carrier's traditional common carrier responsibility to be fully liable for goods it was transporting. Although released value rates were legal for decades, they required prior approval from the ICC, which rarely granted such requests.

These arrangements, in which shippers can self-insure or secure insurance at rates or coverage levels that are more favorable than could be obtained by their carriers, became commercially popular among larger shippers. They became popular among carriers serving medium and smaller business because transportation services could be offered at rates that served market needs. Released value rates can be offered in either contract or common service.

Common Carrier Liability

Finally, there is the traditional framework of full common carrier liability. In the United States between 1906 and the 1970s, Congress created an economic regulatory framework that made the common carrier—railroad, freight forwarder, or trucking company—fully responsible for the goods in its care. This liability regime has only five general defenses available to the carrier or forwarder: act of God, act of public enemy, act of shipper himself, act of public authority, and inherent vice or nature of the goods.

Given the high use of contracts and released value rates in today's operating environment, a reasonable rough estimate is that

less than 25 percent of all truck shippers use the arrangement known as the "Carmack Amendment."¹⁷ This means the majority of U.S. freight is handled without loss and damage requirements being mandated by law. Even where common carrier service is provided, there are categories or classes of freight that are exempt from liability provisions or are treated specially by other sections and subsections of transport law. These include the following:¹⁸

- Agricultural Carriage—Exempt¹⁹
- Household Goods—Special Treatment²⁰
- Express and Package Carriage—Special Treatment²¹
- Incidental to Air—Exempt²²
- Other Exemptions—Intrastate carriage even when performed by interstate carriers;²³ wood chips; broken, crushed, and powdered glass; transportation in a municipal zone; occasional carriage; and emergency towing²⁴

Where common carrier obligations for loss and damage still exist, they consist of a complex mosaic of regulatory structures, each with their own requirements and liability. Exhibit 2 compares the different modal liability regimes.

United States Domestic

Truck

The Trucking Industry Regulatory Reform Act of 1994 (TIRRA) eliminated the ICC tariff filing requirement for motor carriers acting independently in setting their rates.²⁵ When the Interstate Commerce Commission Termination Act of 1995 (ICCTA) was adopted, much of the Interstate Commerce Act was eliminated.²⁶

Without ICC oversight of the reasonableness of released rates, the Carmack Amendment has been significantly changed. Under the ICCTA, neither the Department of Transportation (DOT) nor the Surface Transportation Board (STB) has authority to compel a carrier to pay or settle a claim. The function of compensating for loss and damage now rests with the courts.

United States motor carriers are liable to the person entitled to recover under the

bill of lading or receipt for the goods.²⁷ The carriers' liability is for the actual loss or injury to the property caused by (a) the receiving carrier, (b) the delivering carrier, or (c) another carrier over whose line or route the property is transported within the United States (or from a place in the United States to a place in an adjacent foreign country) when transported under a through bill of lading.

A carrier also may limit liability if that limit is reasonable under the circumstances surrounding the transportation. The statute is not specific as to who should determine reasonableness of a liability limitation. The statute does not assign to either DOT or STB the function of determining reasonableness, and it appears that this issue may be left to the courts to determine in a claim for damages.

The motor carrier (other than a household goods carrier) need not file tariffs with the STB. However, the ICCTA provides that the carrier, upon request of the shipper, supply the shipper with a written or electronic copy of the rate, classification, rules, and practices (including limits on liability) upon which any rate applicable to a shipment is based. The copy provided by the carrier must clearly state the dates of applicability of the rate, classification, rules, or practices.

In addition, a carrier and a shipper may enter into a service contract governed by specified rates and conditions.²⁸ This kind of contract is not governed by the standard liability regime.²⁹ In a service contract, the shipper and carrier may waive any rights and privileges relating to motor carriage.

Civil actions may be brought in either federal or state courts against the delivering carrier in a court in a state where the defendant carrier operates. Action may also be brought against the carrier that caused the loss or damage in the judicial district where the loss or damage is alleged to have happened. Claims must be filed within nine months, and lawsuits must be brought within two years.

Household goods carriers may petition the STB to modify, eliminate, or establish transportation rates. Consequently, the

board may limit liability to a value established by written declaration of the shipper or by written agreement between the parties.

Internationally, there seems to be little call for a motor carrier liability convention between the United States and Europe since virtually no direct link trucking occurs between our nations aside from some limited RO/RO (roll-on/roll-off) maritime trade.³⁰ However, U.S. and European motor carrier liability regimes do become an issue when a shipper or contracting carrier directly arranges and contracts for connecting modal movements as part of an overall through movement between the United States and Europe.

Rail

Rail carriage liability is not governed by the ICCTA. Like a motor common carrier, a rail carrier is liable to the person entitled to recover for the actual loss or injury to property caused by it.³¹ However, a rail carrier may establish rates for transportation of cargo under which (a) the liability for carriage is limited to a value established by written declaration of the shipper or by written agreement between the shipper and the carrier; or (b) specified amounts are deducted, pursuant to written agreement between the shipper and the carrier, from any claim against the carrier with respect to cargo carried.

The Staggers Rail Act gave rail carriers the freedom to limit liability contractually, without governmental oversight of the reasonableness of established rates. Actions may be brought only (a) against the originating rail carrier at the point of origin, (b) against the delivering rail carrier in the judicial district where the claimant has its principal place of business if the delivering carrier also operates in that district, or (c) against the delivering rail carrier at the point of destination.

Claims also may be brought in the district where the loss or damage is alleged to have occurred. Claimants have at least nine months to bring claim and up to two years to file suit. Rail carriers' liability for loss and damage of goods transported

between points within a given country is governed by the law of that nation. There is no international liability regime for rail shipments.

Air

When using air bills of lading, shippers may consign the goods to a bank at destination, directing the bank to retain control of the goods until the consignee pays the required amount. The liability of U.S. air carriers, with respect to loss, damage, and delay of air cargo moving in U.S. domestic carriage, has been deregulated. The federal government no longer regulates carrier tariffs for carriage of domestic air cargo. The air carriers are subject to liability regimes based on the air common carrier liability regime.³² Thus in U.S. domestic air carriage, air carriers are liable for loss and damage if caused by the negligence of the carrier or its agents. The terms of liability, including limitation, are presented by the carrier to the shipper in the air waybill and are contractually accepted when shipment is made on that air waybill.

International

Air

Internationally, the Warsaw Convention of 1929, applicable to international air commerce, became effective for the United States in 1934. The Hague Protocol was adopted in 1955 as an amendment to the Warsaw Convention, but it has not been ratified by the United States. Most other nations have adopted this revision of the Warsaw Convention.

Under the Warsaw Convention, the air carrier is liable when loss or damage is caused by negligence. Here, the burden is on the carrier to prove that it was not negligent, tending to create a de facto strict liability regime. Liability is limited to \$20 per kilogram (approximately \$9.07 per U.S. pound). When the limitation is less than full value, for an additional charge,

air carriers will provide the opportunity for the shipper to declare higher value. Furthermore, the liability limit does not apply if the damage is caused by the willful misconduct of the carrier, in which case the claimant may seek full damage restitution, or if the air waybill fails to contain essential information.

The air waybill requires 17 documentation details. Absence of some of these details from the air waybill may cause forfeiture of the limitation on liability provided to cargo carriers under the Warsaw Convention. A lower limitation may not be negotiated, but the shipper and the carrier may negotiate a higher limit. A carrier is presumed liable for loss, damage, or delay unless it proves that it has taken all necessary measures.

Like maritime carriers, air carriers also use contractual extensions of the air regime to related surface transportation. Such contractual extension is allowed to the extent allowed by applicable surface transportation law. Most countries have adopted an updated version of the Warsaw air waybill.³³ The United States has not done so.

The U.S. Departments of State and Transportation have urged Congress to ratify the 1975 Montreal Protocol No. 4, which addresses air cargo transport liability. The protocol does not affect the current limit of liability, but would make a major contribution in air cargo facilitation by allowing for electronic data transmission. It would eliminate several archaic requirements under the Warsaw Convention, particularly the requirement that a copy of the air waybill accompanies the goods and that the air waybill be completed before the carrier accepts the goods.

Maritime

The Harter Act and 1936 Carriage of Goods by Sea Act (U.S. COGSA) are the two primary U.S. statutes governing water carrier liability. U.S. COGSA is the U.S. enactment of the provisions of the 1924 Brussels Convention (Hague Rules) on the maritime bill of lading. The Harter Act, enacted in 1893, has been superseded by

U.S. COGSA for shipments between U.S. ports and foreign ports. To limit liability, maritime carriers almost universally stipulate in their bills of lading that the U.S. COGSA liability regime applies in domestic carriage.³⁴ Absent such a stipulation, the unlimited liability of the Harter Act applies.

The Harter Act governs the time before the goods are loaded or the time after they are discharged from the ship. Many maritime contracts stipulate that road transport to and from the ship is governed by the U.S. COGSA regime.³⁵

U.S. COGSA holds the carrier responsible for liability from loss or damage arising from the carrier's failure to exercise due diligence to provide a seaworthy vessel at the inception of the voyage and to properly load, stow, carry, care for, discharge, and deliver the goods entrusted to be transported. It also provides 17 defenses against loss and damage claims, including negligence.³⁶

U.S. COGSA specifies the essential contents of the bill of lading, including the identification and weight of the cargo. The statutory liability limitation is \$500 per package. A lower limitation is not permitted, but the parties may negotiate a higher limit. In some disputes over loss and damage, it has been argued that a container is a package and thus subject to the \$500 limit. This is a point of contention between shippers and carriers. A number of countries have adopted updated versions of the Hague Rules, also known as the Visby or the Hamburg Rules. The United States has not.

Third-Party Intermediaries

Under the ICCTA, domestic surface freight forwarders assume the same liability for loss and damage to cargo as do U.S. rail and motor common carriers. A freight forwarder is considered both the receiving and the delivering carrier. Domestic air freight forwarders, also called indirect air carriers, are subject to Federal Aviation Act, but exempted from DOT regulations. They tend to publish the same liability as the underlying air carriers. International

airfreight forwarders subject to DOT jurisdiction almost universally adopt the rules of liability of the Warsaw convention in their tariffs.

The Nonvessel Operating Common Carrier (NVOCC) by water is treated as an indirect common carrier by water in the foreign commerce of the United States. The NVOCC is generally subject to the same liability applicable to ocean carriers but assumes greater liability for movements between foreign ocean ports and foreign inland points.

Intermodal Transportation

Although it may appear that the transportation of cargo constitutes a continuous process, much U.S. domestic and most international cargo shipments use two or more transport modes. Legally, however, each of these modes constitutes a distinct segment where the contractual relationship with the cargo interest is concerned.

Intermodal transport is characterized as "through carriage." One of the participating modal carriers or freight forwarders usually arranges for all transportation and related services from origin to destination. The parties to a contract of carriage may stipulate that the originating carrier's liability regime applies to the entire journey. Otherwise, the liability for such transport is usually governed by the liability regime that applies to the mode of carriage at the time of loss or damage. Thus, the shipper, unless adequately protected, often is exposed to differences in liability regimes, although the goods may be in through transport under a through bill of lading.

As a rule, the originating modal liability regime is often extended by contract to successive modes of transportation used to deliver the goods. The parties to the first contract of carriage stipulate that the originating carrier's liability regime applies to the entire journey. In the absence of such a stipulation, the different modal liability regimes apply.

While the United States is not a party, the Multimodal Liability Convention of

1980 is an international treaty whose premise is that compensation for loss, damage, and delay should be in harmony among other modes of carriage. It is based on the belief that harmonization benefits all parties. Further, it contends that shippers are not surprised by significant disparities in compensation systems; insurance companies and carriers can better assess the risk of carriage and are not surprised by extraordinary claims; and courts are aided in applying established case law to other modes of carriage.

The Multimodal Liability Convention seeks to establish a harmonious liability regime among all the modes. It also carefully preserves the individual shipper's option of shipping exclusively under a modal liability regime. However, with regard to liability limitation, this convention distinguishes between maritime and surface transportation. For example, when a maritime leg exists in multimodal transportation, it is usually the dominant leg, and therefore only harmony with the maritime liability limitation is necessary. If there is no maritime leg, then the limitation prevalent in other (surface) transportation is the guide to harmony. The convention adopted the limitation of the Contract for International Carriage of Goods by Roads Convention (8.33 special drawing right (SDR) per kilogram, approximately \$5.00 per U.S. pound for surface carriage when there is no maritime leg or 2.75 SDRs per kilogram, approximately \$1.80 per U.S. pound when there is a maritime leg).

It is within this legal framework that any policy discussions about uniform international loss and damage regimes would occur. Further shaping this debate are other forces such as a recent DOT study on loss and damage issues and changes in operating environments.

The Department of Transportation Study

When it closed the ICC, Congress mandated an analysis of the current loss and damage liability regimes and the need for

legislative changes. This August 1998 study concluded that the current liability system "functions reasonably well and that it requires only modest adjustment to assure fairness to all parties." The study made eight recommendations³⁷ and identified only one issue requiring a legislative remedy: Senate ratification of the 1975 treaty amending the Warsaw Convention on aviation liability (Montreal Protocol No. 4).

DOT urged carriers to improve the information provided to common carrier shippers about the applicable liability regime. The department saw two ways to accomplish this goal: shippers and carriers voluntarily agreeing to a better notice process or a technical amendment to existing law.³⁸

The study also identified one area for possible regulatory action: a uniform bill of lading containing minimum identifying information. "Shippers and carriers," DOT said, "should establish a uniform bill of lading containing minimum identifying information. In the event that the parties cannot agree, then DOT's Federal Highway Administration should designate minimum requirements along the lines of proposed rulemaking of October 21, 1996."³⁹

The department saw no need for legislative action on the following:

- Requiring a shipper to purchase additional insurance to cover cargo loss and damage
- Reestablishing regulatory procedures for dispute settlement (However, it did call for increased use of methods such as mediation and arbitration to accelerate settlements and relieve pressure on the courts.)
- Imposing a more uniform liability system for U.S. domestic transportation. "The current system of full value recovery with flexibility to vary liability by released rates or contract [should] be continued until the parties come closer to agreement on an alternative liability regime."

However, DOT did find areas that could benefit from federal involvement: international harmony, intermodal harmony, and better shipper and carrier understanding. To promote international harmony, the department said, "Nations should consider

proceeding on an Inter-American Convention on international carriage of goods by road.” DOT noted that while carriers and shippers tend to view domestic U.S. motor carriage in isolation from other modes of transportation, carriers and insurers tend to favor a uniform Inter-American liability regime for international motor carriage.

Another step to promote harmony, the department said, would be to encourage shippers and carriers to work toward multimodal harmony, including possibly reexamining the Multimodal Liability Convention with the goal of making the proposed multimodal regime more flexible and adaptable to each mode and to both domestic and international transportation. “However,” DOT cautioned, “if air is involved in intermodal transport, a uniform liability limit should not be less than the \$20 per kilogram (\$9.07 per pound) applicable for international air cargo transport under the Warsaw Convention.”

The study also proposed greater shipper-carrier dialogue on liability issues and noted that any resulting consensus would be a prerequisite for government action. The department found that the shipper-carrier dialogues that occurred as a result of this study’s calls for comments and public hearing helped the parties clarify their positions. Thus, the process in itself tended to promote better understanding. “Understanding would be enhanced in the future if the study stimulated shippers and carriers to continue their own dialog and activities in the field of cargo liability.”

Operating Environment

Today, the United States operates in a world of ever-increasing change, where the lines of traditional transportation roles blur; technology strives to yield total in-transit visibility; and the interests of shippers, carriers, and third parties are not synonymous.

U.S. loss and damage rules are patterned on the precept that the two parties to the transaction—shipper and carrier—have a common economic self-interest. Shippers own the freight and carriers pro-

vide equipment. However, in the past two decades, another entity has evolved that owns neither the freight nor the equipment but makes its profits from its transportation expertise beyond that of the traditional freight forwarder. Known by many names, this third-party intermediary currently accounts for 20 percent of the freight industry and is expected to account for 50 percent within the next decade or so as a result of increased corporate outsourcing of transportation services.⁴⁰

Some firms act as independent brokers. Others created by carriers compete more effectively by offering a full range of transportation services. Those created by shippers keep the corporate focus on the primary mission. Seen as a carrier by the shipper and as a shipper by the carrier, the participation of third parties in the process complicates questions concerning responsibility for loss and damage, including who is in control of the goods or the equipment, who is the damaged party; and what level of damage is incurred by the various participants to today’s more complicated logistics processes.

Technology is now providing virtually real-time information not only about a shipment’s location but also about the condition of the cargo, such as temperature. Computers and robots are assembling goods, processing them through warehouses, and loading them into vehicles for transportation. These higher levels of controls by shippers and carriers call into question older assumptions about assigning fault for loss and damage. As technology improves, it raises questions about traditional defenses and responsibilities for safe handling and transportation of international cargoes.

The diverse interests of shippers, carriers, third parties, insurers, and others involved in loss and damage disputes create an environment where it is easier for government not to act than to risk the controversy that would result from any action. It has been almost 30 years since the United States has endorsed an international treaty on this issue. This inaction is primarily due to the inability of the domestic stakeholders to come to consensus on a course action.

Certain U.S. motor carriers are currently advocating adoption of a uniform

liability limit of \$2 per pound. There is limited support among their customers. Certain shipper advocates are calling for new legislation that modifies COGSA by adopting a “compromise position” developed by the Maritime Lawyers Association.⁴¹ This compromise is meant to end almost two decades of conflicts among U.S. shippers, carriers, and others over the current international treaties: Hague, Hamburg, and Multimodal. Congress has held hearings on the plan, and legislation is expected to be introduced next year. However, it is not clear whether there is sufficient multiinterest support to enact it into law. Certain European interests have opposed the plan.⁴²

According to newspaper reports, European opposition is based on three issues: (a) the proposal covers door-to-door rather than port-to-port moves and defines intermediaries and other support such as stevedores as carriers, (b) the proposal could affect non-U.S. trucking companies and railroads while exempting U.S. rail and motor carriers, and (c) the proposal limits court and arbitration procedures to U.S. entities.

Another issue is the need for better information on loss and damage, both in terms of actual incidents and in terms of the benefits that could result from a more coordinated approach to the problem. In seeking reliable figures for this paper, as well as for its *Cargo Liability Study*, DOT learned that there were few sources of detailed information that would help to build the business case for standardization.

In fact, the figures for the *Cargo Liability Study* were essentially extrapolations of the numbers developed and used in DOT’s original 1975 review of the issue. The National Cargo Security Council, a private sector trade association, is seeking legislation to compel the parties to begin keeping more detailed data that would allow better analysis of the issue.

Developing an Action Plan

Despite the differences in our loss and damage claim regimes, U.S. and European governments share a common understand-

ing on two important issues: the increasing globalization of commerce and the benefits that result from harmonization. A good example of this understanding is the U.S. Congress’s instructions to DOT to consider international harmony in undertaking the *Cargo Liability Study*.⁴³ If there is a unifying premise in the claims and liability debate, it is the need for governments to consider and promote international intermodal harmony in our laws, regulations, and business practices. However, as noted in the DOT liability study, this harmony presently exists only when the contract or bill of lading stipulates that the liability scheme of the originating carrier is extended to the other carriers in the logistics chain or when transportation occurs between nations that are signatories to the Multimodal Convention.⁴⁴

The challenge for U.S. and European governments is to develop the tools and techniques to make international intermodal harmony a reality in a way that recognizes the increasing sophistication of technology and logistics in a global marketplace. Any U.S.-E.U. cooperative efforts must recognize the differences between and among national liability systems. These efforts must focus on generating the information essential to making the business case for harmonization. They must also facilitate dialogue between the public and private sector entities whose cooperation is essential to spanning these differences and creating a single international liability regime.

In the United States, there is no single uniform liability system, only a collection of uniform liability regimes for some of the transport modes (air and maritime) that often are extended by agreement among the parties to the other modes. Domestic surface common carriage traditionally has made the railroads or trucking companies fully liable for the goods they transport. Contracts also have played a role by relegating loss and damage to the list of service issues subject to negotiation between business parties.

One essential factor that is key to prompting all the stakeholders to seek a common international intermodal liability regime is a broad-based and commonly

accepted database of freight liability experience. However, whether in the United States or Europe, easily assessable, reliable data on international loss and damage is lacking.

If a database of shared liability experience is desirable and important to any effort making the business case for uniform liability limits, then the next step is to resolve questions such as who will collect the information, how the data elements will be defined and analyzed, how the system will be administered, who will disseminate the information and how often, and so forth. Once these matters are settled, there is the issue of developing a framework in which to assess the benefits of a uniform liability regime's effect on international transportation costs.

Making a strong business case on the benefits of international harmonization would be an important tool in any facilitation effort to create a meaningful liability regime capable of meeting the needs of a 21st century logistics system. Cargo security interests in the United States are lobbying for legislation that would require mandatory reporting of loss and damage date. This legislation would provide more accurate information on our national loss and damage experience.

Facilitating dialogue among and between the public and private sectors is another important process for realizing international intermodal harmony. The goal of any facilitation would be an emerging agreement among shippers, carriers, third parties, insurers, and others on important elements that might be covered in future legislation, regulation, conventions, or voluntary agreements. Exploring the U.S. and European perspectives on the compromise with all of the affected parties could be one way to help resolve differences and move closer to our long-term goal.

Another starting point for dialogue could be the Multimodal Convention, which provides an intermodal framework for addressing these issues. Can and

should this convention establish a harmonious liability regime across all the modes and between the United States and the European Union, while carefully preserving the individual shipper's option of shipping exclusively under a modal liability regime?

The product of international cooperation, the convention could serve as a way of framing the debate between shipper, carriers, third parties, and insurers about the difficult and contentious limitation issues, such as whether to limit liability per package or per shipment, whether a container is a package or a shipment, or whether limitation should be broken in case of intentional torts. The convention could provide a template or model for determining liability limits that are fair to all shippers and carriers, regardless of type or size of operation or frequency of use. Essential components of a fair liability regime include mutually understood terms of liability, appropriate sharing of responsibility among parties, and ease of administration of the system. Such a dialogue also has the advantage of extending the regime to air carriage.

Having government serve as the stimulus for further discussions among the parties can be beneficial. The DOT study noted dialogues that occurred as a result of its calls for comments and public hearing helped the parties clarify their positions. Thus, the process in itself tended to promote better understanding. "Understanding would be enhanced in the future if the study stimulated shippers and carriers to continue their own dialog and activities in the field of cargo liability."⁴⁵

Today we can begin a process to reach the goal of international harmonization. It will take a variety of skills and processes, all of which rest on government's willingness to help provide (a) the necessary information to make the business case for harmonization and (b) the leadership through facilitation to bring the parties together for a consensus solution to this long-standing public policy issue.

Appendix A
A Survey of the Cargo by Sea Conventions
as They Apply to Certain States

Country	Hague	Visby	Hamburg	Limit
Algeria	Yes			
Angola	Yes			
Antigua/Barbados	Yes			
Argentina	Yes	Partial		C100 gold
Aruba	Comm Code			
Australia	Revoked	Yes	Conditional	667/2 SDR
Austria		Yes	Landlocked	835/2.5 SDR
Bahamas	Yes			
Barbados	Yes	Yes		835/2.5 SDR
Belgium	Yes	Yes		667/2 SDR
Belize	Yes			
Bermuda	Denounced	Yes		667/2 SDR
Bolivia	Yes		Landlocked	
Bonaire	Comm Code			
Botswana			Yes Landlocked	835/2.5 SDR
Brazil	Comm Code		Signature only	per B/L
Burkina Faso			Yes Landlocked	835/2.5 SDR
Cameroon	Yes	Signature only	Yes	835/2.5 SDR
Canada	Revoked	Comm Code	Conditional	667/2 SDR
Cape Verde	Yes			
Cayman Islands	Denounced	Yes		667/2 SDR
Chile	Signature only		Yes	835/2.5 SDR
China				667/2 SDR
Colombia	Partial			None
Croatia	Yes	Yes		667/2 SDR
Cuba	Yes			\$100 Cuban
Cyprus	Yes		Signature only	
Czech Republic			Signature only	
Denmark	Denounced	Yes	Signature only	667/2 SDR
Dominica	Yes			
Dominican Republic		none		
Ecuador	Yes	Yes	Signature only	10,000/30pgf
Egypt	Yes	Yes-1998	Yes	667/2 SDR
Fiji	Yes			\$236-Fiji
Finland	Denounced	Yes	Signature only	667/2 SDR
France	Yes	Yes	Signature only	667/2 SDR
Gambia	Yes			
Germany	Yes	Domestic	Signature only	
Ghana	Yes	Signature only		

Source: Transportation Consumer Protection Council

Country	Hague	Visby	Hamburg	Limit
Gibraltar	Denounced	Yes		667/2 SDR
Goa	Yes			
Greece	Yes	Yes		667/2 SDR
Grenada	Yes			
Guinea	Yes	Yes		835/2.5 SDR
Guyana	Yes			
Holy See		Signature only	Signature only (Vatican)	
Hong Kong	Denounced	Yes		667/2 SDR
Hungary	Yes		Yes Landlocked	835/2.5 SDR
Iceland		Comm Code		667/2 SDR
India	Revised	Comm Code		667/2 SDR
Indonesia		Comm Code		Dfl/Idr 600
Iran	Yes			
Ireland	Yes			L100
Israel	Yes			
Italy	Denounced	Yes		667/2 SDR
Italy	Denounced	Yes		667/2 SDR
Ivory Coast	Yes			
Jamaica	Yes			
Japan	Denounced	Yes		667/2 SDR
Kenya	Yes		Yes	835/2.5 SDR
Kiribati	Yes			
Korea (S)	Revoked	Comm Code		500 SDR/pkg
Kuwait	Yes			
Lebanon	Yes	Yes	Yes	835/2.5 SDR
Lesotho			Yes Landlocked	835/2.5 SDR
Liberia	Revoked	Comm Code		667/2 SDR
Macao	Yes			
Madagascar	Yes (as Malagasy Republic)	Signature only		
Malaysia	Yes			P-100 gold
Malawi			Yes Landlocked	835/2.5 SDR
Mauritania		Signature only		
Mauritius	Yes			
Mexico	Revoked	Yes	Signature only	667/2 SDR
Monaco	Yes			
Montserrat	Denounced	Yes		667/2 SDR
Morocco			Yes	835/2.5 SDR
Mozambique	Yes			
Nauru	Yes			
Netherlands	Denounced	Yes		667/2 SDR
New Zealand	Revoked	Yes		667/2 SDR
Nigeria	Yes		Yes	835/2.5 SDR
Norway	Denounced	Yes	Signature only	667/2 SDR
Oman		Comm Code		667/2 SDR
Pakistan			Signature only	
Panama	Comm Code		Signature only	per B/L
Papua New Guinea	Yes			

Country	Hague	Visby	Hamburg	Limit
Paraguay	Yes	Signature only	Landlocked	
Peru	Yes			P-100 gold
Philippines	Yes	Signature only	Signature only	\$500
Poland	Yes	Yes		667/2 SDR
Portugal	Yes		Signature only	
Romania	Yes		Yes	835/2.5 SDR
Sabah	Comm Code			MSR 850
Sao Tome	Yes			
Sarawak	Comm Code			MSR 850
Senegal	Revoked		Yes	835/2.5 SDR
Seychelles	Yes			
Sierra Leone	yes		Yes	835/2.5 SDR
Singapore	Yes	Yes	Signature only	SDG 1563.65/4.69
Slovakia			Signature only	
Slovenia	Yes			\$4.00
Solomon Islands	Yes			
Somalia	Yes			
South Africa	Revoked	Comm Code		10,000/30pgf
Spain	Yes	Yes		667/2 SDR
Sri Lanka	Yes	Yes		10,000/30pgf
St. Kitts-Nevis	Yes			
St. Lucia	Yes			
St. Martin-Netherlands Antilles	Comm Code			
St. Vincent and the Grenadines	Yes			
Sweden	Denounced	Yes	Signature only	667/2 SDR
Switzerland	Yes	Yes	Landlocked	667/2 SDR
Syria	Yes	Yes	Landlocked	10,000/30pgf
Taiwan	US COGSA			9000/pkg TWD
Tanzania	Yes		Yes	835/2.5 SDR
Thailand		Comm Code		10,000/30 THB
Timor	Yes			
Tonga	Yes	Yes		10,000/30pgf
Trinidad/Tobago	Yes			
Tunisia			Yes	835/2.5 SDR
Turks/Caicos	Denounced	Yes		667/2 SDR
Turkey	Yes			
Tuvalu	Yes			
Uganda			Yes Landlocked	835/2.5 SDR
United Kingdom	Denounced	Yes		667/2 SDR
United Kingdom Virgin Islands	Denounced	Yes		667/2 SDR
United States	Yes		Signature only	\$500/pkg
Uruguay		Signature only		None
USSR	Comm Code			
Venezuela			Signature only	per B/L
Vietnam		Comm Code		10,000/30gf
Yugoslavia	Yes	Comm Code		667/2 SDR
Zaire	Yes	Signature only		
Zambia			Yes Landlocked	835/2.5 SDR

Appendix B

1993 Commodity Flow Survey: Shipment Characteristics by Mode of Transportation for the United States

Mode	Value in millions of dollars	Tons in thousands	Ton miles in millions	Value in percent	Tons in percent	Ton miles in percent	Value per ton in dollars	Value per pound in dollars	Ton miles per ton
<i>CFS plus ORNL estimates</i>	\$6,123,832	12,157,105	3,627,919	100.0	100.0	100.0	\$503.7	\$0.25	298
Parcel, postal, courier service	\$563,277	18,892	13,151	9.2	0.2	0.4	\$29,815.6	\$14.91	696
Truck (for-hire, private, both)	\$4,403,495	6,385,915	869,536	71.9	52.5	24.0	\$689.6	\$0.34	136
Air (including truck and air)	\$139,087	3,139	4,009	2.3	0.0	0.1	\$44,309.3	\$22.15	1,277
Rail	\$247,394	1,544,148	942,561	4.0	12.7	26.0	\$160.2	\$0.08	610
Water	\$64,077	518,912	271,981	1.0	4.3	7.5	\$123.5	\$0.06	524
Pipeline	\$89,849	483,645	—	1.5	4.0	—	\$185.8	\$0.09	—
Truck and rail	\$83,082	40,624	37,675	1.4	0.3	1.0	\$2,045.1	\$1.02	927
Other intermodal combinations ¹	\$13,382	148,883	185,030	0.2	1.2	5.1	\$89.9	\$0.04	1,243
Other and unknown	\$242,691	544,335	96,972	4.0	4.5	2.7	\$445.8	\$0.22	178
<i>ORNL estimates</i>									
Water (not in CFS)	\$187,085	1,609,309	614,104	3.1	13.2	16.9	\$116.3	\$0.06	382
Pipeline (not in CFS)	\$90,413	859,303	592,900	1.5	7.1	16.3	\$105.2	\$0.05	690
Intermodal ² total	\$659,741	208,399	235,856	10.8	1.7	6.5	\$3,165.8	\$1.58	1,132

— Data do not meet publication standards.

¹This includes truck and water, rail and water, and other combinations.

²Intermodal is a combination of parcel, postal or courier; truck and rail; truck and water; rail and water; and other intermodal. It excludes truck and air, which are added to air transportation.

U.S. Department of Commerce, Bureau of the Census, *1993 Commodity Flow Survey: United States*, TC92-CF-52, and Oak Ridge National Laboratory estimates (Washington, DC: 1996).

Appendix C

Summary of U.S. National Freight Policy

The U.S. National Freight Policy defines the United States's national interest as ensuring "a safe, reliable, and efficient freight transportation system that supports economic growth and international competitiveness both now and in the future, while protecting and contributing to a healthy and secure environment. The goal of this statement is to provide guidance for making the nation's transportation system serve its citizens better. To achieve this goal, new partnerships must be formed among public agencies, the freight transportation industries and shippers." This policy was adopted in 1996, and it contains eight tenets:

1. Provide funding and a planning framework that establishes priorities for allocating federal resources to cost-effective infrastructure investments that support broad national goals
2. Promoting economic growth by removing unwise or unnecessary regulation and promoting the efficient pricing of a publicly financed transportation infrastructure
3. Ensuring a safe transportation system
4. Protecting the environment and conserving energy
5. Using advances in transportation technology to promote transportation efficiency, safety, and speed
6. Effectively meeting our defense and emergency transportation requirements
7. Facilitating international trade and commerce
8. Promoting effective and equitable joint use of transportation infrastructure for freight and passenger service

Endnotes

¹U.S. Department of Transportation, *Cargo Liability Study* (Washington, DC: U.S. Department of Transportation, 1998), 7.

²*U.S. Freight Economy In Motion*, (FHWA-PL-98-034), Federal Highway Administration, U.S. Department of Transportation, May 1998, p. 16.

³Information provided by the National Cargo Security Council.

⁴Bureau of Transportation Statistics, *1993 Commodity Flow Survey* (Washington, DC: U.S. Department of Transportation, 1993).

⁵*Niagara v Cordes*, 62 US 41, 46 (1858).

⁶Basedow, *Common Carrier Continuity and Disintegration in U.S. Transportation Law*, 18 at 280).

⁷49 U.S.C. §10707, now 49 U.S.C. §14706.

⁸38 Stat. 1196.

⁹41 Stat. 475.

¹⁰49 Stat. 543.

¹¹56 Stat. 285 (1942) and 64 Stat. 1113 (1950).

¹²94 Stat. 798.

¹³94 Stat. 1995.

¹⁴Estimate provided by the Intermodal Association of North America.

¹⁵49 U.S.C. §14101(b).

¹⁶Motor Carrier Act of 1980, Public Law 96–296 and Staggers Rail Act of 1980, P.L. 96–448.

¹⁷49 U.S.C. §14706.

¹⁸U.S. Department of Transportation, *Cargo Liability Study* (Washington, DC: U.S. Department of Transportation, 1998), 6–7.

¹⁹49 U.S.C. §13506.

²⁰49 U.S.C. §14706(f).

²¹49 CFR 14706(c)(A).

²²49 U.S.C. §13506(a)(8).

²³Federal Aviation Administration Authorization Act of 1994, P.L. 103–305.

²⁴49 U.S.C. §13506.

²⁵P.L. 103–311.

²⁶P.L. 104–88.

²⁷ICCTA, §14706.

²⁸49 U.S.C. §14101(b).

²⁹ICCTA, §14706.

³⁰U.S. Department of Transportation, *Cargo Liability Study* (Washington, DC: U.S. Department of Transportation, 1998), 45.

³¹49 U.S.C. §11706.

³²*American Airlines v. Wolens*, 115 S.Ct. 817, 824 (1995).

³³1955 Hague Protocol.

³⁴Gilmore and Black, *Law of Admiralty*, 2d ed., at 148.

³⁵Gilmore and Black, *Law of Admiralty*, 2d ed., at 148.

Endnotes

³⁶Neither the carrier nor the ship shall be responsible for loss or damage arising or resulting from the following:

- Act, neglect, or default of the master, mariner, pilot, or the servants of the carrier in the navigation or in the management of the ship
- Fire, unless caused by the actual fault or privity of the carrier
- Perils, dangers, and accidents of the sea or other navigable waters
- Act of God
- Act of war
- Act of public enemies
- Arrest or restraint of princes, rulers, or people or seizure under legal process
- Quarantine restrictions
- Act or omission of the shipper or owner of the goods, his agent, or representative
- Strikes or lockouts or stoppage or restraint of labor from whatever cause, whether partial or general, provided that nothing herein contained shall be construed to relieve a carrier from responsibility for the carrier's own acts
- Riots and civil commotions
- Saving or attempting to save life or property at sea
- Wastage in bulk or weight or any other loss or damage arising from inherent defect, quality, or vice of the goods
- Insufficiency of packing
- Insufficiency of inadequacy of marks
- Latent defects not discoverable by due diligence
- Any other cause arising without the actual fault and privity of the carrier and without the fault or neglect of the agents or servants of the carrier, but the burden of proof shall be on the person claiming the benefit of this exception to show that neither the actual fault or privity of the carrier nor the fault or neglect of the agents or servants of the carrier contributed to the loss or damage

³⁷U.S. Department of Transportation, *Cargo Liability Study* (Washington, DC: U.S. Department of Transportation, 1998), 57–61.

³⁸49 U.S.C. §14706(c)(1)(B).

³⁹61 *Federal Register* 54707.

⁴⁰Federal Highway Administration, *U.S. Freight: Economy In Motion* (Washington, DC: U.S. Department of Transportation 1998).

⁴¹This compromise, which is not similar to any other regime now in force, would institute the Hamburg Rules liability limits (see page 42) and eliminate the traditional maritime “negligence” defense against loss and damage claims.

⁴²*Journal of Commerce* (1998):1.

⁴³49 U.S.C. §14706(g)(2)(B).

⁴⁴U.S. Department of Transportation, *Cargo Liability Study* (Washington, DC: U.S. Department of Transportation, 1998), 46–48.

⁴⁵U.S. Department of Transportation, *Cargo Liability Study* (Washington, DC: U.S. Department of Transportation, 1998), 61.

Article D: Legal and Regulatory Issues Affecting Intermodalism in the European Union

Executive Summary

The purposes of this paper are as follows:

- to describe the laws and regulations that make up the “playing field” for intermodal transport
- to identify the European Union (E.U.) legal and regulatory issues impeding intermodal freight transport
- to describe the effect of these issues on stakeholders
- to identify potential opportunities for resolving these issues
- to propose potential mechanisms for regulatory change

The thrust of E.U. law is toward *regulation* rather than *facilitation* of intermodalism. This approach is typified by the E.U.’s competition and antitrust rules, which seek to scrutinize and control rather than facilitate intermodalism. Operators involved in intermodalism have high compliance costs, reduced legal certainty, and increased regulatory delays in terms of their arrangements.

Intermodalism is regulated within the European Union at different levels and in different ways. In the context of the European Union, it is important to remember that anyone who is engaged in intermodalism in the European Union must comply with a set of three different rules that may conflict with one another:

- the rules operating on the international level,
- the rules adopted by the European Union, and
- the rules adopted by the member states.

Unfortunately, not only is there this three-leveled impediment, but also the E.U. regime operates on three further levels: competition in intermodalism is regulated by three different regimes (one for road, rail, and inland waterway; one for maritime transport; and one for air transport).

A key problem associated with the application of E.U. competition law to intermodalism is that E.U. competition law in the transport sector has been formulated, and continues to be operated, on a

unimodal basis rather than on an intermodal basis. This is a regulatory impediment to the facilitation of intermodalism.

The current E.U. antitrust regime is built around the unimodal transport model, and therefore, it is not possible to have arrangements across different modes without specifically notifying the regulators.

The European Union could stimulate and facilitate intermodal transport by liberalizing or restructuring its own regime and by coordinating the way in which member states regulate intermodalism at the national level.

E.U. antitrust law could assist in facilitating and operating intermodalism by widening the type and form of relationships and arrangements automatically that are exempted as a matter of E.U. law and that do not need to be notified to, and cleared by, the European Commission (E.C.).

Clearly the differing rules, conflicting time limits, and absence of a comprehensive regime to cover all of the modes mean that anyone concerned with intermodalism has a much more difficult task. It would be easier to have a single regime that deals with intermodalism in a structured and ordered manner. Stakeholders in the current system must cope with conflicting rules and rules that do not sit easily with one another.

Intermodalism must not be impeded by some member states artificially assisting or supporting state companies (such as state railways) or state champions in a way that distorts competition. A state-supported railway could automatically become a dominant player in the intermodal market. This impediment can be removed or reduced only by regulation and vigilance. Many of the regulations are in place, but they will be useless if there is no vigilance. It is up to the commission and particularly industry to monitor and brief the commission on such impediments.

There is strong support for the view that E.U. law is not well suited to deal with multimodalism because the rules are

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structured on a unimodal basis. The E.U. regulatory procedures involve compliance cost for businesses. The regulatory structure needs to be able to allow intermodal arrangements to be made and implemented with the minimum of delay or complication. Any system that causes unnecessary delay and complication is, by definition, an unattractive and inefficient one. The unimodal approach is inefficient because only unimodal arrangements may benefit from the current block exemptions. The current competition regime is thus an impediment to intermodalism in terms of increased compliance and regulatory costs. The Council of Ministers and the European Commission could assist in removing this regulatory impediment by repealing the specific unimodal regulations and adopting more generous and wider regulations, which transcend modes. Moreover, the E.U. regime, which is currently focused on regulation rather than stimulation, should become more of a facilitator than a regulator.

Introduction

This paper examines selected aspects of the law of the European Union as it relates to intermodal freight transport in the European Union.

Purpose

The purposes of this paper are as follows:

- to describe the laws and regulations that make up the “playing field” for intermodal transport
- to identify the E.U. legal and regulatory issues impeding intermodal freight transport
- to describe the effect of these issues on stakeholders
- to identify potential opportunities for resolving these issues
- to propose potential mechanisms for regulatory change

Intermodalism

The term *intermodalism* is defined, for the purposes of this paper, as the carriage or transport of goods between two points by two or more modes or means of transport (such as air, sea, rail, and road or inland waterway).

European Union

The term European Union is defined, for the purposes of this paper, as the international organization consisting of 15 member states in western and central Europe. This union of states is the largest trading bloc in the world. The European Union has sought to internalize its market to eliminate barriers to the free movement of goods, persons, capital or the establishment of businesses.

Scope of the Paper

This paper concentrates on the legal and regulatory issues adopted by the European Union itself. It is not possible, in this paper, to examine the law of each of the 15 member states. It should be noted, however, that (a) if there is any conflict between the law of the European Union and the law of a member state, then the law of the European Union will prevail in accordance with the principle of supremacy of E.U. law, and (b) if there is an impediment placed by a member state in the way of intermodalism, then such an impediment may well be capable of removal by virtue of being incompatible with E.U. law.

Regulation of Intermodalism in the European Union

The E.U.’s competition and antitrust regime is aimed more at regulating and controlling than stimulating and facilitating intermodalism because its rules are aimed at scrutinizing and regulating rather than exempting en bloc a wide range of agreements involving different modes.

The European Union could stimulate and facilitate intermodal transport by liberalizing or restructuring its own regime and by coordinating the way in which member states regulate intermodalism at the national level.

Intermodalism is regulated within the European Union at different levels and in different ways. In the context of the European Union, it is important to remember that anyone who is engaged in intermodalism in the European Union must comply with a set of three different rules that may conflict with one another:

- the rules operating on the international level,
- the rules adopted by the European Union, and
- the rules adopted by the member states.

Unfortunately, not only is there a three-leveled impediment but also the E.U. regime operates on three further levels: competition in intermodalism is regulated by three different regimes (one for road, rail, and inland waterway; one for maritime transport; and one for air transport).

This means, for example, that in the context of an arrangement between businesses for the transport operator planning to move goods from New York to London by air and onwards to Edinburgh by road and rail must comply with the following:

- the international rules relating to the international transportation of goods by air
- the Council of Ministers Regulation 1017/68 on competition in the road, rail, and inland
- waterway sectors, as well as the Council of Ministers Regulation 3975/87 on competition in the air transport sector; and
- the United Kingdom's own laws on the transport of goods.

This situation is further complicated by the fact that intermodal transport passing through two or more E.U. member states will have four or more sets of laws with which to comply. The situation can also be complicated by virtue of conflicts between these member state laws and the fact that the member state laws are at different stages of development and in different forms. The problem facing those operating in the E.U.

intermodal market is this matrix of laws and each of these sets of laws having different rules relating to different modes. This situation naturally creates a regulatory impediment for intermodalism, and the only solutions are harmony at the E.U. level and either harmonization or mutual recognition at the national level.

E.U. Antitrust or Competition Law

It is useful to dwell, for a moment, on E.U. antitrust or competition laws to more fully understand the relationship between competition law and intermodalism.

The competition rules are primarily embodied in Articles 85–94 of the European Commission (E.C.) Treaty. These rules are largely administered by the European Commission (in particular, Directorate-General IV). Directorate-General VII (Transport) does not administer the competition rules even in the transport sector. However, aggrieved persons may decide to institute proceedings in the member state courts or complain to the commission about the behavior of others.

Each of the fundamental rules of E.U. competition law (i.e., Articles 85, 86, 90, and 92–94 of the E.C. Treaty) apply to all modes of transport equally. However, the detailed rules relating to the way in which competition applies in practice are designed largely on a unimodal basis.

Anticompetitive Arrangements: Article 85 of the E.C. Treaty

Article 85(1) of the E.C. Treaty prohibits all arrangements that prevent, restrict, or distort competition in the common market or any part of the common market. In this context, “arrangements” means—

- all agreements between undertakings,
- decisions by associations of undertakings, or
- concerted practices involving undertakings.

Article 85(2) provides that such arrangements are void. Article 85(3) permits

the European Commission (but no other institution) to grant an exemption in respect of arrangements which are, on balance, beneficial to the economy. The type of arrangements covered by Article 85 would include pricing arrangements or exclusivity arrangements in the context of intermodalism. Many intermodal arrangements fall within the scope of Article 85. This means that Article 85 represents an impediment to intermodal arrangements that breach Article 85(1) being implemented and operated quickly and cheaply unless the arrangement has been exempted by the Commission.

Abuse of Dominance: Article 86 of the European Commission Treaty

Article 86 of the E.C. Treaty prohibits a dominant undertaking abusing its dominant position in the common market or in a substantial part of the common market. (A port may be a substantial part of the common market.) For example, an intermodal operator or a group of operators could be dominant (either on an individual or collective basis) and be deemed to be acting unlawfully because it was abusing the dominant position. This is not so much an impediment to intermodalism as it is a measure of control on intermodalism.

Public Authorities: Article 90 of the E.C. Treaty

Article 90 of the E.C. Treaty provides that state authorities in the European Union are subject to the competition rules except in the most limited circumstances. Article 90 is of limited relevance to many intermodal operators but is relevant to port operators. Article 90 means that even state-owned and state-controlled port operators are normally subject to competition law and may not engage in anticompetitive arrangements or abuse dominance.

State Aid: Articles 92–94 of the European Commission Treaty

As a general principle, Articles 92–94 of the E.C. Treaty provide that member states may not provide financial aid (whether direct or indirect) in a discriminatory manner without prior approval by the European Commission.

Consequences of Breaching E.C. Competition Law

A breach of E.U. competition law has serious consequences. First, the agreement may be void (i.e., unenforceable) in whole or in part where it breaches competition law. This would cause serious consequences for anyone who is party to an anticompetitive agreement because the arrangement would be unenforceable. Second, the parties to an anticompetitive agreement may be liable to fines of up to 10 percent of worldwide turnover. Third, parties may be liable to actions for damages before the courts of the member states. It might be argued that the existence of such draconian sanctions means that some businesses may be deterred from even concluding intermodal arrangements where there might be some doubt about their compatibility with E.U. competition law. It is important that intermodal arrangements can be concluded with legal certainty because stakeholders should not be exposed to risk of nonconformity because the rules are not clear or are cumbersome.

The Interventionist Nature of the European Commission

Many have criticized the European Commission for being somewhat interventionist in the marketplace. An example of this approach is the statement by the European Commission in its *1994 Report on Maritime Transport* that it would not grant a block exemption for shipping lines to fix land rate, but it would consider each agreement individually. (A block exemption would not have given the European

Commission the opportunity to scrutinize the arrangements because they would not have been notified.) In particular, some believe that the European Commission has refused to adopt the so-called “rule of reason” approach, which is so much a part of U.S. antitrust law, so that arrangements would have to be notified to the European Commission to allow the commission to intervene in such arrangements. In this respect and others, it is important to recall that U.S. and E.U. antitrust and competition laws are not identical. They evolved in response to different economic and geographic conditions. Therefore, it is often dangerous to apply the rules laid down by one side of the Atlantic to the other side of the Atlantic.

Subsidiarity

The European Commission is eager to delegate the enforcement of competition policy and some of the rules to member states in some circumstances. This act may have advantages in some circumstances, but it may well lead to different approaches between member states, which is an impediment in its own right. This situation is far from ideal in an international intermodal environment.

Deregulation, Liberalization, and Privatization

The European Commission has made significant progress in deregulating and liberalizing large tracts of the European economy. Examples include the telecommunications and the air transport sectors. Despite considerable progress, however, there has not been sufficient liberalization or deregulation in the transport sector as a whole. Individual modes have been liberalized to a greater or lesser extent, but there is a need to facilitate a more integrated approach.

E.U. Competition Law and Intermodalism

One of the key problems associated with the application of E.U. competition law to intermodalism is that E.U. competition law in the transport sector has been formulated, and continues to be operated, on a unimodal basis rather than on an intermodal basis. This is a regulatory impediment to the facilitation of intermodalism.

Application of Articles 85 and 86 to the Transport Sector

Articles 85 and 86 of the E.C. Treaty apply to transport and have always applied to the transport sector since the entry into force of the E.C. Treaty. However, it was not always easy to apply Articles 85 and 86 to the E.C. Treaty because of the absence of implementing regulations. This absence of rules to facilitate the application of the competition rules to transport meant that transport generally (and intermodalism in this context) was effectively left unregulated for many years.

The absence of implementing regulations in the transport sector was resolved on only a phased and a modal basis. First, in 1968, the Council of Ministers adopted Regulation 1017/68 to deal with competition in the road, rail, and inland waterway sectors. Second, in 1986, the Council of Ministers adopted Regulation 4056/86 to address competition in the international maritime sector. Third, in 1987, the Council of Ministers adopted Regulation 3975/87 to address competition in the air transport sector.

It is very welcome that the European Union has been implementing regulations to facilitate the application of E.U. competition law to the transport sector. However, from the specific perspective of intermodalism, as opposed to one particular mode, this unimodal approach is inefficient and ineffective because intermodal agreements cannot benefit from the individual regulations.

Regulation 1017/68

Council of Ministers Regulation 1017/68 enables the European Commission to apply the competition rules in Articles 85 and 86 in the road, rail, and inland waterway transport modes. It also contains some block exemptions under Article 85(3) of the E.C. Treaty.

Regulation 3975/87

Council of Ministers Regulation 3975/87 enables the European Commission to apply the competition rules in Articles 85 and 86 in the air transport mode. It also contains some block exemptions under Article 85(3) of the E.C. Treaty.

Regulation 4056/86

Council of Ministers Regulation 4056/86 enables the European Commission to apply the competition rules in Articles 85 and 86 in the international maritime transport mode. It also contains some block exemptions under Article 85(3) of the E.C. Treaty.

Regulation 4056/86 was a Council of Ministers regulation and block exemption. This is unusual. Some commentators believe that the European Commission has always been suspicious of this regulation because of its origin, but this has been strenuously denied by the Competition Commissioner, Karel Van Miert.

Regulation 4056/86 is narrow. It only applies to *international* maritime transport. The block exemption is limited to the maritime leg and not the inland leg. This situation causes problems for intermodal agreements because they cannot be automatically exempted under the regulation. Instead they have to be notified to and cleared by the European Commission, which involves compliance costs, commercial uncertainty, and regulatory delays for the intermodal operators involved.

Ehlermann's Views

Claus-Dieter Ehlermann is a former Director-General of DGIV. In a leading article in 1992, Dr. Ehlermann recognized that it was inconvenient and undesirable to have separate transport regulations. He recommended that Regulations 1017/68, 4056/86, and 3975/87 be combined into one transport regulation. This proposal is both practical and desirable. Anyone who believes that there should be reform should canvass hard for such a change! Within each regulation, some measures will need to be specific to a mode, but this it is not entirely unusual or difficult to achieve.

Carsberg Group

The Carsberg Group was established in 1995. It recommended in 1997 that there be no impediment to a block exemption for collective inland price-fixing by liner shipping conferences.

Essential Facilities Doctrine

It is useful to recall the so-called "Essential Facilities" doctrine in competition law. This doctrine may be useful to some operators in the intermodal sector because it could remove impediments in terms of access to essential facilities. The doctrine allows one to use competition law to open up markets and facilities. The doctrine posits that a dominant undertaking that has a facility (e.g., a port) must provide access to the facility where it is vital or essential for someone to obtain access to compete in the market. The consumer will have to take access subject to any grandfathered rights that others may have accumulated over time. The European Commission has been willing to assist the claims of various supposed competitors (normally, shipping companies and airlines) who wished to obtain access by invoking Article 86 of the E.C. Treaty. In this regard, E.U. law can be used to assist rather than hinder those engaged in intermodalism.

Merger Control Regulation

The European Council's Merger Control Regulation regime provides that any merger of a particular type of a large enough financial size must be notified and cleared by the European Commission. Various arrangements in the transport sector (such as the Acquisition by Stinnes of BTL from Finnlines) have been notified and cleared by the European Commission.

Vertical Arrangements

Vertical arrangements that could prevent, restrict, or distort competition must be approved by the European Commission under Article 85 of the E.C. Treaty in appropriate circumstances. Notwithstanding that the agreement may have an anticompetitive element, the agreement may nonetheless be exempted by the European Commission where the arrangement is, on balance, beneficial to the economy.

E.U. Transport Law and Intermodalism

Institutional Perspective

The European Commission's Directorate General for Transport, DGVII, is based on different directorates dealing with specific modes. Attempts have been made within DGVII to look at transport in a multimodal manner. This is very welcome. Nonetheless, many of the laws and rules have been adopted in regard to specific modes rather than on a multimodal manner (but this is not the fault of DGVII).

The Modal Nature of E.U. Transport Law

E.U. transport law generally has evolved on a modal basis with rules being developed on specific modes. In part, such an approach is inevitable and even desirable because it allows measures to contain only what is necessary and relevant.

Maritime Cabotage

The restrictions on maritime cabotage that operated in some E.U. member states have been phased out by virtue of Council Regulation 3577/92. These restrictions impeded integration and competition in the same way as the Jones Act in the United States. The elimination of cabotage restrictions in the European Union has been a phased process (apart from those coastal states that never had or simply abolished the restrictions). However, the issue has been of great significance in only two member states (Greece and Spain), and the issue has been greatest for passenger traffic rather than freight traffic. It is likely that cabotage restrictions that were impediments to intermodalism in the European Union will be phased out or eliminated over time. Short sea shipping should be assisted in no small way by Council Regulation 3577/92. Where impediments remain, those involved in the industry can eliminate them by bringing these impediments to the attention of the European Commission (in particular, DGVII) as a matter of urgency.

Facility Access and Construction

It should be recalled that the European Union has assisted enormously in constructing and improving infrastructure throughout Europe particularly by means of so-called structural funds, cohesion funds, and regional funds. The improvement in facilities is particularly notable in the peripheral or less developed states. The E.U.'s contribution should be borne in mind when one is criticizing the fact that E.U. laws are not well-suited to intermodalism and that all future funding arrangements should be vetted for their contribution to intermodalism.

State Aid and Intermodalism

The E.C.'s Treaty controls the ability of E.U. member states to grant state aid or assistance that distorts competition in the market place and would not be the type of financial assistance that would not be given by rational investors or rational operators in the marketplace. Articles 92–94 of the E.C. Treaty provide that member states must notify the European Commission of any proposal to provide aid and that they must not provide the aid until the commission has approved the aid package. Unlawful aid could include unfair advantages to railway companies. Reduced or waived taxes may well be considered state aid where the measures are not simply measures of general application.

Anyone operating in the intermodal environment in the European Union must be aware of the possibility that competitors could be granted unlawful aid. This means that the European Commission and multimodal operators must vigilantly monitor unlawful state aid. Operators who believe that competitors are being provided with unlawful state aid must consider complaining about it to the European Commission. The unlawful state aid could include providing facilities at less than commercial rates, providing finance at less than commercial rates, or providing other subsidies.

Intermodalism must not be impeded by some member states artificially assisting or supporting state companies (such as state railways) or state champions in a way that distorts competition. A state-supported railway could automatically become a dominant player in the intermodal market. This impediment can be removed or reduced only by regulation and vigilance. Many of the regulations are in place, but they will be useless if there is no vigilance: It is up to the commission and particularly industry to monitor and brief the commission on such impediments.

Do the E.U. Rules Impede Intermodalism?

Intermodalism is commonplace in the European Union. It is therefore clear that the European Union has not curbed the existence of intermodalism. However, have E.U. laws and regulations made it more difficult to operate, or are the rules too difficult to apply in practice? Have the rules caused difficulties for those operating within the system—whether as E.U.-based operators or operators based outside the European Union?

Clearly, the differing rules, conflicting time limits, and absence of a comprehensive regime to cover all of the modes mean that anyone concerned with intermodalism has a much more difficult task. It would be easier to have a single regime that deals with intermodalism in a structured and ordered manner. Stakeholders in the current system must cope with conflicting rules and rules that do not sit easily with one another.

Eliminating Impediments: Ways to Facilitate Trans-Atlantic Freight and Intermodal Transport

One of the concerns of the intermodalism debate is how to increase or improve the level of transatlantic freight transport. Whether it is desirable to eliminate or more practically, minimize, the barriers that exist is indisputable. Minimizing such barriers will generally increase the level of intermodal transport. It is therefore appropriate to ensure that the barriers are reduced as much as possible.

Moving Away from the Unimodal Approach to Transport Multimodalism Regulation

The E.U. regime is structured on the basis of individual modes. It would be very helpful for the European Union to enact a single comprehensive measure to embrace all of the transport modes. This action

would help to reduce the E.U.'s "internal" problem within the European Union.

Embracing the Global Dimension

Adopting a competition measure that would address transport and the marketplace generally rather than address specific modes would help to ease the burden for multimodal operators in the European Union. However, this solution would not address the broader issue of facilitating trade and multimodal transportation between (a) the European Union and the United States and Canada and (b) the European Union and the rest in the world. So, what would be the lever to help open further this trade pattern? Clearly, greater international dialogue and legislation will assist.

Unifying National Laws May Be Difficult: Would It Be Worth the Effort?

The ideal future may not necessarily be abolishing rules and regulations (which is not entirely desirable anyway). Rather, adopting common or near-common rules across the European Union would probably be more useful for the intermodal sector. Indeed, abolishing rules or regulations might actually create a vacuum that could lead to complications that would cause more problems to the industry.

Recognizing Differences That Cannot Be Eliminated

It would be ideal for a single antitrust and competition law system to operate on both sides of the Atlantic. However, it would be impractical and unrealistic to imagine that a single system will be created even in the medium to long term. There are historical and political reasons for the differences and the ways in which the systems operate mean that unification would be next to impossible. Instead, the aim is simply for meaningful cooperation and

dialogue. It would be wrong to imagine that there would ever be an identical approach.

Shortening the Approval and Cooperation Processes

Like all industries, the intermodal industry needs to trust that it can establish joint ventures or other alliances quickly and easily within a specific and relatively short time scale. The European Commission has made enormous strides at shortening the clearance process for joint ventures, but perhaps the intermodal industry is still not aware of these improvements.

In essence, we are discussing how the European Union and the rest of the world can sort out the differences that arise between them due to differing rules and rules that are not ideal for meeting the challenges of evolving situations. This is not an entirely new problem. It is a regular issue in the field of antitrust (particularly in regard to merger notifications that are made in Europe and the United States). The solution has been for the United States and the European Union to adopt a cooperation agreement to address matters of potential conflict so that there can be early warning signals leading to early dialogue, agreed timetables so that there are no regulatory problems, and common standards so that there are no divergent results. Consideration should be given to a formal agreement between the United States and the European Union on how best to deal with transport and, in particular, intermodal transport.

There is strong support for the view that E.U. law is not well suited to address intermodalism because the rules are structured on a unimodal basis. The E.U. regulatory procedures involve compliance costs for businesses. The regulatory structure needs to be able to allow intermodal arrangements to be made and implemented with minimum delay or complication. Any system that causes unnecessary delay and complication is, by definition, unattractive and inefficient. The unimodal approach is inefficient because only unimodal arrangements benefit from the current block exemptions. The current competition

regime is thus an impediment to intermodalism in terms of increased compliance and regulatory costs. The Council of Ministers and the European Commission could assist in removing this regulatory impediment by repealing the specific unimodal regulations and adopting more generous and wider regulations that transcend modes. Moreover, the E.U. regime, which is currently focused on regulation rather than stimulation, should become more of a facilitator than a regulator.

Article E: Legal and Regulatory Barriers to Better International Intermodal Transport

Abstract

This paper examines how the U.S. regulatory system for transport evolved, particularly features of that system that affect intermodal transport. It concludes by sketching a few areas of pending change that may pose opportunities for improved intermodal freight transport between Europe and the United States. It represents the second step of a dialogue between European and U.S. leaders, which began with a forum in Washington, DC, in October 1997, seeking improved intermodal freight service between these two regions.

U.S. transport regulations evolved separately as each mode developed. This process began with the regulation of railroads in the mid- to late 1800s; then steamship lines in the early 1900s; followed by pipelines, motor carriers, and airlines in the mid-1930s. Legislation was generally patterned after that previously applied to other modes, but was enacted through separate statutes applying to each mode without consideration of intermodal coordination.

By the 1970s, it was generally accepted that these modal regulatory structures had outlived their initial purposes, were not effective in protecting the public interest, were creating price and service inefficiencies, and were impeding the advancement of improved transport services, including intermodal transport. Regulatory inefficiency and the lack of system coordination gave rise to a deregulation movement in the regulatory commissions, as well as in the Congress. Airfreight services were deregulated in 1977, interstate motor carriers in July 1980, railroads in October 1980, and ocean shipping in October 1998.

The effects on intermodal transport were significant: The deregulatory steps of the last two decades have—

- Allowed companies operating in one mode to buy carriers in other modes
- Greatly extended the circumstances under which carriers in all modes are free to negotiate rates
- Made it easier to license railroad motor carrier start-ups
- Gave carriers broad latitude to set rates for rail piggyback service
- Made it easy for railroads to spin off short lines and branch lines
- Deregulated interstate trucking (and later intrastate trucking)
- Allowed the Ocean Rate Shipping Conference to set joint rates that covered both the inland and water transport links

These steps have revolutionized transport in the United States. They have generally kept rates down and have not produced widespread service abandonments. The result has been a rapid rise in third-party logistics providers and increased vertical integration. Deregulation has spurred the growth of intermodal transport.

Economic growth can be helped by further advances in both domestic and international intermodal freight transport. These advances may occur by continuing to remove regulatory barriers, promoting fuller competition, and facilitating new entrants. Several pending issues and recently concluded actions may offer special opportunities for such advances. First, the U.S. Congress passed legislation this year to reform ocean shipping and allow carriers to negotiate confidential contracts with shippers. As the provisions of this law are translated into regulations, they will affect many aspects of international intermodal freight transport. Second, long-standing restrictions on cabotage by water will be difficult to change, but some

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October 28, 1998

†Section II of this paper draws from Gerhardt Muller's excellent book, *Intermodal Freight Transportation*, published jointly by the Intermodal Association of North America and the Eno Transportation Foundation. The fourth edition of this book was published in May 1999. Although I have borrowed heavily from Muller's work, I am responsible for any errors that may have been introduced in recasting it in the current context.

progress in this direction might arise as reciprocal rights provisions are considered in connection with the Passenger Vessel Act. Third, the rapid growth in third-party logistics providers is closely linked to a fertile market for intermodal service, and the treatment of nonvessel owning common carriers (NVOCCs) may remain on the policy agenda following other ocean shipping reforms. Finally, continued growth of multimodal and intermodal companies appears to promise synergy, although a host of cultural, technological, labor, and management complications has made this potential somewhat elusive thus far. Pending changes to rules and regulations should be reviewed from an intermodal vantagepoint to see if they are contributing to this difficulty.

Leaders from Europe and the United States met at a second forum in Munich in November 1998 to consider, among other things, opportunities to improve the legal and regulatory structures of both regions as they affect intermodal transport. The past experiences and future opportunities sketched here are presented as a starting point for that discussion.

Introduction

The purpose of this paper is two-fold: (1) to examine how the U.S. legal and regulatory system for transport evolved, particularly features of the system that affect intermodal transport, and (2) to set out a few areas of pending change where forum participants might find opportunities of common interest—areas where they could work within their respective systems for related improvements in intermodal freight transport between Europe and the United States.

In October 1997, European and U.S. leaders convened a forum on Intermodal Freight Transport in Europe and the United States. This forum explored ways to improve intermodal freight transport between the regions. In these discussions, legal and regulatory issues were singled out as top-priority areas for future attention. Disparate regulations and subsidies create

distortions of competition that give an advantage to specific modes within the intermodal chain. For example, ownership restrictions, antitrust laws, mode-specific taxes and user fees, and hours-of-service regulations can be administered in ways that favor specific modes or carriers to the detriment of intermodal service.

While a broad range of laws and regulations are enacted for many purposes unrelated to economic competitiveness, virtually every regulation has economic implications that affect modal competitiveness to a greater or lesser extent. For example, regulations governing the size and weight of trucks, which are driven primarily by concerns about safety and pavement wear, profoundly affect the economics of motor carriage. Broadly construed, the term “legal and regulatory” could be interpreted to cover almost any of thousands of laws affecting safety, the environment, infrastructure management, competitiveness, antitrust protection, labor, and every other aspect of transport.

The 1997 forum recognized this unwieldy range when it noted “... the scope of such an effort could easily grow beyond a manageable effort. Such a search must be focused if it is to be productive.” To focus future dialogue between European and U.S. leaders in the most productive direction, the 1997 discussions narrowed the term “legal and regulatory” to mean a focus on economic competitiveness, namely—

- General statutes that govern the openness of competition, the ability of new entrants to compete in markets, and the capacity for vertical integration across modes
- Mode-specific regulations that limit a modal firm’s involvement in intermodal or international supply chains

A key concern is the extent to which current regulatory structure blocks new entrants from competing in intermodal transport markets—start-up companies seeking to provide transport or logistics services, equipment, or infrastructure. These companies are developing innovative supply-chain management strategies to reduce costs, improve service, and gain

competitive advantage. Transport is an important aspect of the supply-chain management process as manufacturing and distribution firms create new partnerships to meet these objectives. As a result, shippers are making transport choices that are neutral in their reliance on specific modes, but that concentrate instead on cost and reliability.

The transport industry has responded to these challenges by developing new capabilities across modes, whether through strategic alliances or through the acquisition of other transport firms. For example, integrated operators such as American President Lines (APL), Federal Express (FedEx), and United Parcel Service (UPS) have emerged as highly integrated, full-service operators, providing a harbinger of the industry's future.

In Europe, new entrants must contend with various rules governing competition and must seek to build integrated services around a set of state-owned railroads. Some highly integrated firms—such as APL and UPS—are acquiring multimodal assets and providing new customer-oriented, door-to-door services. This market could grow faster if competition rules and regulatory structures were revised to be more amenable to efficient vertical integration.

While major deregulation of all modes has occurred in recent decades in the United States, an uneven set of modal regulations remains in force, and other statutes prevent the ability of non-U.S. carriers serving international routes to compete in domestic distribution.

Complete international harmonization of legal and regulatory regimes is an unrealistic goal, but piecemeal actions leading in this direction can play a valuable role in building up improved intermodal transport markets. Specifically, as regulatory changes and other actions are being considered on either side of the Atlantic, they can be used as opportunities for the participants in this forum to discuss common interests and then use the results to provide background to decision makers in Brussels and Washington. Two lines of inquiry show promise as productive next steps to promoting international intermodal freight transport:

- Examine the regulatory context and actions that have been taken to deregulate transport on both sides of the Atlantic.
- Identify and study existing barriers to free entry and vertical integration, as they affect international intermodal transport.

During discussions at the 1997 forum, European firms indicated that they have not yet realized the same benefits brought about by deregulation as their U.S. counterparts. Reducing the legal and regulatory impediments to efficient intermodal transport—particularly through further deregulation—was deemed a high priority.

Regulation and Deregulation in the United States

In the United States, regulations have historically evolved separately, mode by mode, with little explicit consideration of their intermodal effects. As each mode came on the scene and developed markets, regulations were attached to it, usually to limit economic power that appeared threatening to specific shipper groups, geographic regions, or established services. This process began with the regulation of railroads in the mid- and late 1800s; then steamship lines in the early 1900s; followed by pipelines, motor carriers, and airlines in the mid-1930s. Legislation was patterned along the lines of earlier models applicable to other modes, but established as separate statutes applying to each mode without consideration of intermodal coordination.

One feature of these rules was to prohibit carriers of one mode from owning or controlling carriers of another. For example, railroads could not own water carriers, and freight forwarders could not directly own carriers. Such ownership restrictions impeded coordination, vertical integration, and the provision of intermodal services.

Separate commissions—the Interstate Commerce Commission (ICC), the Federal Maritime Commission (FMC) and the Civil Aeronautics Board (CAB)—were set up under different acts to regulate specific modes. Each commission was charged

with promotion and welfare of its particular mode or modes. This charge sometimes put even the commissions in competition against each other, rather than working together toward an integrated intermodal system. This modal fragmentation was less pronounced in the ICC, which regulated economic issues of domestic inland waterways, trucklines, pipelines, and railroads, but which nonetheless had separate legislative authority and separate regulatory responsibility for each.

During the period of regulation, modal companies, reinforced by separate modal regulatory rules, sought policy provisions and rights that furthered modal divisions. They competed against other modes for government grants, tax easements, labor rules, subsidies, and grants in their own direct interest and had little incentive to promote intermodal service.

Throughout most of the period of regulation, especially prior to 1940, antitrust laws were intended to ensure free and open competition within and among modes to give the consumer an opportunity to get the lowest price. Commissions had the authority to suspend antitrust laws if they found cooperative agreements among carriers to be in the public interest. Thus, for example, limited antitrust immunity has been a feature of ocean shipping regulation since 1916. While the commissions could have encouraged intermodal agreements, their decisions mostly favored through routes. Rates and interchange points were almost, without exception, intramodal, not intermodal. Each commission believed, with justification, that intermodal facilitation was beyond its scope. Each believed its powers were limited to regulating its designated mode or modes.

The inefficiencies and inequities of this system became increasingly apparent. One of the early calls for reform came in 1940 when a congressional statement of national transport policy called for economical and efficient service that fostered “sound economic conditions in transportation and among the several carriers.” It called for “fair and impartial regulation of all modes of transportation,” recognizing that the modes were all parts of a system

whose coordination was in the national interest. The statement was limited to those modes regulated by the ICC, however, and it was a general policy statement, not a detailed regulatory code.

Another major step toward deregulation came with the creation of the U.S. Department of Transportation (DOT) in 1967, which placed certain authority—mostly related to noneconomic matters—for all modes under a single department. This action reflected growing recognition that intramodal regulation and administration were inadequate. The new department made a series of statements to articulate and advance a more unified multimodal vision of transport policy. These statements provided a framework to support and coordinate a series of modal deregulation laws.

In 1976, a National Transportation Policy Study Commission was created by the Congress to formulate broad themes for future transport policy. In 1979, this Commission issued its final report, *National Transportation Policies through the Year 2000*, which recommended—

- Multimodal systems planning rather than an intramodal approach
- Reduced government economic regulation
- Equal government treatment among modes
- More competition and improved efficiency by placing maximum reliance on market factors
- Economic analysis of all policy
- More streamlined government organization
- Greater coordination of government efforts
- Maximum use of the private sector

All these developments reflected a growing consensus that modal regulatory structures had outlived their initial purposes, were not effective in protecting the public interest, were creating inefficiencies, and were impeding the advancement of improved transport services, including intermodal transport. Concerns about regulatory inefficiency and the lack of system coordination created a mood in the regulatory commissions and in Congress that strongly favored deregulation in the

late 1970s. Some commissions took steps to deregulate without waiting for statutory direction from Congress.

A wave of deregulatory activity swept through the various modes, their regulators, and their congressional overseers. Airfreight services were deregulated in 1977, interstate motor carriers in July 1980, railroads in October 1980, and ocean shipping in October 1998. The remainder of this section sets out a few of the highlights of this history:

- Air cargo deregulation
- Railroads deregulation
- Vertical integration and multimodal companies
- The potential for increased piggyback carriage
- Inland waterway transport following rail deregulation
- Maritime regulations and intermodal transport
- Motor carrier deregulation
- The North American Free Trade Agreement (NAFTA) and possible transport ramifications
- Priority for intermodal transport in recent U.S. legislation

Air Cargo Deregulation

Airfreight was the first mode to be deregulated by formal legislation in the wake of the National Transportation Policy Statement of 1975. Amendments to the Federal Aviation Act implementing deregulation of airfreight were made effective in the Air Cargo Act of 1977. This act deregulated airfreight almost entirely in terms of rate making and freedom to enter or withdraw from service. Air deregulation was a precursor to deregulation in other modes, in that the CAB made spontaneous moves toward deregulation in parallel with action by the Congress.

Airfreight deregulation, effective November 1977, was implemented in two phases. The first phase was immediately applicable to so-called “grandfather” carriers already engaged in airfreight operations. The second phase was implemented a year later, opening the field to all applicants and completely liberalizing airfreight rate making.

The number of airfreight forwarders grew from 300 in 1976 to more than 1,200 in 1979. By the late 1980s, their numbers decreased to about 700 because of mergers, consolidations, and bankruptcies. However, by 1997, the International Air Transport Association’s cargo arm, Cargo Network Services, estimated that the air freight forwarder industry experienced a resurgence—growing to 1,400 companies. The busiest 45 of those 1,400 firms controlled 60 percent of the business, and the largest 85 firms controlled 95 percent of the industry’s business.

Single-document intermodal air waybills have been common for many years. The effect of deregulation on airfreight has been the same as in other modes: to give shippers a wider choice of modes and carriers, combinations of modes and carriers, and combination and joint rates.

Air carriers, airfreight forwarders, courier services, small commuter airlines, and nonscheduled airlines have taken advantage of deregulation by expanding into each other’s areas. Some larger airfreight forwarders have purchased or leased planes and have, in effect, become airlines to a large portion of their business. This occurred at the same time that the number of U.S. air forwarders was expanding explosively. Today, a small number of large forwarders operate their own aircraft. In response to airline-type activities of airfreight forwarders, many scheduled airlines have taken on consolidation and door-to-door transport activities formerly considered the preserve of airfreight forwarders.

Overall, the industry has grown dramatically. In the past 20 years, total industry revenue has grown 16-fold. Within this market, forwarders and third parties account for much of the growth: They have marketed intermodal capabilities to shippers, while most airlines have continued to concentrate on port-to-port movements.

Airfreight deregulation led to a rapid rise in express package delivery operations. Small package, integrated carrier traffic has increased 250-fold since deregulation. By making it easier to acquire larger, more efficient aircraft, deregulation has helped

express delivery operators such as UPS, FedEx, DHL Worldwide Express, TNT, and others develop more rapidly.

Hand-in-hand with air cargo deregulation, carriers quickly expanded into other services, and the number of express delivery operators rose rapidly. More recently, a variety of partnerships, mergers, alliances, and other marketing and operational agreements have formed. They have blurred the conventional distinctions between scheduled carriers, forwarders, and express-package operators.

The Motor Carrier Act of 1980 further spurred the growth of intermodal air cargo by exempting from regulation "... transportation of property (including baggage) by motor vehicle as part of a continuous movement, which, prior or subsequent to such part of the continuous movement, has been or will be transported by an air carrier" This act allowed more air-truck transport. The CAB had previously specified a 35-mile radius limit around airports for surface transport pickup and delivery services in connection with air transport, and required carriers to file separate tariffs describing their pickup and delivery services beyond this 35-mile zone. These restrictions were eliminated following the 1980 Act.

Deregulation of international air cargo has not advanced as rapidly as it has in the U.S. domestic market, although the United States has taken several deregulatory steps on its own. These steps include (1) eliminating requirements for filing air cargo rates, dropping enforcement of cargo rate agreements set by the International Air Transport Association (IATA), (2) freeing cargo agency commissions from regulation, (3) releasing airfreight forwarders from regulation, and (4) allowing motor carriers operating as part of international air movements to be substantially free of regulation, subject to international reciprocal provisions and other limitations.

Since a foreign airline must have prior approval of its route authority to operate scheduled services to and from the United States, exemptions from the Motor Carrier Act and the approval to provide air-motor intermodal service are based on such route authority.

Railroad Deregulation

The ICC had regulated railroads in the United States since 1887. The ICC was the first independent regulatory agency established by Congress, and it became a model for many others. At the time it was established, the public—"business men and farmers"—demanded protection from what were perceived to be excessive railroad rate-setting powers. The act that created the ICC outlawed pools and rate discrimination and required that rates be published and "reasonable and just." An independent commission was established to oversee these requirements.

Over the years, the ICC's power and scope was modified repeatedly. By the 1970s, few would argue that it had been a failure, although the reasons for failure were—and continue to be—a source of debate. Some argue that the railroads themselves captured control of the ICC and manipulated it to their advantage. Some argue that railroad-hating progressive politicians set up barriers that led to the railroad industry's economic starvation. Some argue that the type of cartel structure behind the ICC was doomed to failure from the start. Others claim that weak commissioners and a bureaucratic staff led to a stagnated and ineffective ICC. Whatever the reason, there was little disagreement in the 1970s that the regulatory structure created by the ICC had run its course, and a new approach was needed.

In 1979, the ICC deregulated rail rates on fresh fruit and vegetable shipments, resulting in a 26 percent increase in rail produce traffic the first year. With their new-found freedom, railroads sometimes changed rates on produce traffic daily. The ICC also gave railroads the freedom to establish special contracts with large shippers based on volume and service. Much produce and contract rate traffic was diverted from through truck haul to an intermodal truck-rail-truck haul. Before deregulating rail shipments of produce, railroads carried one percent of this traffic; today the rail market share is more than five percent, due to increased use of intermodal rail services.

Across-the-board rail deregulation came in 1980 with the passage of the Staggers Rail

Act. This act made it easier for railroads to sell abandoned, nonrevenue-producing lines and operations and to eliminate or price competitively nonremunerative services. It allowed railroads to sign confidential contracts with shippers. It allowed the ICC to exempt certain classes of traffic (an authority that rapidly led to the exemption of piggyback traffic, discussed in a separate section below) as well as motor vehicle parts and other goods. It set a threshold (namely, a 180 percent ratio of revenues to variable cost) beneath which rates were not subject to challenge by shippers.

The Staggers Act has had far-reaching effects. The ICC reported that only about 10 percent of all rail traffic is now subject to rates that it regulates; the other 90 percent moves under exemptions, contracts, and rates below the 180 percent threshold.

In the face of continued opposition to ICC surface transport regulations, which are perceived as no longer necessary, and in concert with a general move toward reduced regulation, Congress passed the ICC Termination Act of 1995. This act eliminated many ICC functions, primarily motor-carrier-related functions, and turned others over to the newly created Surface Transportation Board (STB). Most of the role assigned to the STB focused on railroad-related functions, although the board also retained all regulation of domestic water carriage, except for noncontiguous domestic trade jurisdiction and tariff filing for pipelines. DOT took over the remaining motor carrier functions, except for common carrier obligations, exemptions, registration of carriers, reasonableness of rates (especially those that involved residential household goods movers), joint motor-water rates in noncontiguous domestic trades, pooling, and shipper undercharges.

The abolishment of the ICC does not mean a complete end to the regulation of surface transport in the United States. As long as the ICC existed, the modes remained regulated to one extent or another. As the regulator, the ICC had the power to exempt certain activities or operators from regulation. In effect, what the ICC gave in the name of deregulation, it still had authority to take back or modify later.

To some extent, this power remains with the STB. The railroad industry, for example, continues to have a common-carrier obligation to serve and is subject to maximum rate regulation for traffic falling under the STB's jurisdiction. Nevertheless, the policy trend over the past two decades has been to substantially loosen the regulation of freight transport and to open the door for growth in intermodal transport services.

Vertical Integration and Multimodal Companies

The ability of firms to integrate vertically was spurred largely by the massive deregulation of the transport industry that occurred in the 1970s and 1980s. In the process, many ownership restrictions and regulatory requirements have been lifted, particularly in the trucking and railroad industries, paving the way for the emergence of multimodal transport companies.

Deregulation helped to liberalize permission for carriers of one mode to own and operate carriers of another. In 1983, the ICC eliminated most regulatory restrictions enacted in 1935 to protect the then-infant trucking industry from railroads. Additionally, railroads and trucklines were granted more freedom to merge with each other.

In establishing motor carrier operations in the past, railroads had to adhere to a "special circumstances" test, requiring proof that there was overwhelming reason to grant motor carrier operating authority to a railroad. When granted, this authority frequently restricted railroads to radial patterns of truck service from important intermodal terminal "gateways." Taken together, these restrictions placed an almost insurmountable burden of proof on railroads to demonstrate that trucking service was required and severely constricted the economics of such operations. As a result, the only railroads that had sizable motor carrier operations were those that had been previously granted "grandfather" authority by the 1935 Motor Carrier Act.

In 1984 (Ex Parte No. 156) the ICC eliminated the "special circumstances"

doctrine for licensing new railroad motor carrier startups. New rail-affiliated trucking services were merely required to meet standards of fitness that applied to any other new motor carrier. The special circumstances doctrine still applied to rail acquisition of existing trucking firms. Ex Parte No. 438, however, gave three conditions that must be met by a railroad purchasing an ongoing trucking business:

1. The proposed transaction must be in the public interest.
2. The motor carrier must be integrated into the railway's operation.
3. There must be no adverse competitive effects on the motor carrier industry.

A number of rail carriers showed their eagerness to become totally integrated transport providers. Some acquired new motor carriers, such as Norfolk Southern and North American Van Lines and the Union Pacific and Overnite Transportation. Norfolk Southern's subsidiary, Triple Crown Service, operating the RoadRailer fleet, became a jointly owned subsidiary of Norfolk Southern and Conrail. There have been some moves by railroads in recent years, however, to divest themselves of these motor carriers.

Other railroads formed alliances with motor carriers in which railroads handled the long-distance hauls (often recognized in the United States as being more than 500 miles) and truckers concentrated on shorter distances, including drayage. J.B. Hunt and Schneider National are two of the many long-haul truckload motor carriers who joined forces, through contracts or partnerships, with U.S. railroads to move their motor carrier trailers and containers long distances. Contracts to move fixed volumes of cargo over a specified time period helped to solidify these alliances. Motor carriers are now ordering equipment in 45-, 48-, and 53-foot lengths and 102- and 110-inch widths. Most of these units are capable of being carried by railroad and ocean carrier doublestack equipment.

Transport deregulation, its effect on improved efficiency, and its spurring of intermodal transport have had positive environmental effects. Motor carrier trailers and containers carried by rail remove traffic from the highways with substantial reductions in fuel consumption and emissions.

The Potential for Increased Piggyback Carriage

An important deregulatory boost to intermodal transport came with the freeing of the rail portion of piggyback or trailer-on-flatcar (TOFC) carriage from all ICC regulations. This was accomplished by legislation and an exemption promulgated in an ICC rule-making procedure under the umbrella of the Staggers Rail Act. The ICC proceeding (Ex Parte No. 230) resulted in a rule late in 1980, after both the Motor Carrier Act and Staggers Rail Act had become law. It gave railroads greater ability to price piggyback or TOFC competitively with truck hauls and increased flexibility for routing traffic on joint rail TOFC or container-on-flatcar (COFC) hauls involving rail-owned trucklines.

Deregulation of rail piggyback, combined with new intermodal technology and operating economies, is changing long-haul shipping practices. Prior to rail piggyback deregulation, long-haul truckers were able to price services below rail piggyback. Now, however, with the combination of rail rate-making freedom and new types of tractor and container/tractor equipment, the trend is moving toward increased intermodal service, with trucks providing primarily the initial and final portion of the haul.

In this newly deregulated intermodal market, freight forwarders are returning. Helped in part by the Surface Freight Forwarders Deregulation Act of 1986, which eliminated the ICC's jurisdiction over most of the industry, freight forwarders face new competitive threats. With their newly found door-to-door intermodal capability, railroads have the ability to supplant trucklines and forwarders in consolidating and moving freight. Intermodal facilitators who have invested heavily in electronic data interchange are competing vigorously against forwarders for business.

Several important mergers have occurred since 1980 that have consolidated the rail sector to only four or five Class I carriers. There has also been a notable increase in nonunionized regional carriers and short lines since the Staggers Act. More than 500 of these lines are now

operating, at least 350 of which were created following the Staggers Act. Rail carriers are not compelled to provide labor protection when they spin off parts of the system such as branch and light density lines. Rail carriers would prefer to reorganize unprofitable railroads as a short line, than abandoned service so that they can retain at least a portion of the traffic. Indeed, as railroads have transferred branch lines, sometimes to former employees, they have often erected “paper barriers” in the form of agreements by which the short line company agrees to an exclusive traffic arrangement with the former parent railroad. New regional rails and short line operators often can turn a profit on lines that Class I and II carriers did not believe to be viable because of the lower cost structure. In September 1998, Class I railroads and the American Short Line and Regional Railroad Association reached an agreement to address “paper barriers” and other issues of concern to smaller railroads. This agreement should enhance the partnerships between the large and small railroads.

Inland Waterway Transport Following Rail Deregulation

Transport by inland waterway traditionally has been a low-cost option for shippers of bulk commodities. Fierce competitive battles for traffic have occurred over the years between water carriers and railroads.

The Staggers Act gave railroads the ability to cancel joint rates and through routes, coupled with greater freedom to merge. Bargelines fear this act gives railroads every incentive to close off the intermodal rail–barge interchange. This fear was brought to a head in 1984. Coincidental to the purchase of El Paso Natural Gas, the CSX Corp. acquired American Commercial Barge Lines, one of the largest waterway operators in the United States. The Coal Exporter Association expressed alarm, fearing a lack of competition if CSX was able to control both rail and barge rates and services.

To date much of this concern seems unnecessary, as there do not appear to have

been any competitive problems following the CSX–American Commercial Barge Lines acquisition. No other rail carrier has acquired a bargeline since then. CSX subsequently sold off its majority interest in American Barge Lines. Perhaps even more significant, with nearly a decade of experience under the Staggers Act, barge carriers were not active in filing complaints under Section 707 of the act, which prohibits any practice that is “unfair, destructive, predatory, or otherwise undermines competition.”

Maritime Regulation and Intermodal Transport

The roots of maritime regulations reach far back. The Shipping Act of 1916 provided limited antitrust immunity, allowed carriers to form open conferences, and created a U.S. Shipping Board to regulate and promote ocean commerce. The name of the U.S. Shipping Board was changed several times, finally becoming the FMC, which in 1961 was established as an independent regulatory agency.

The FMC regulates ocean carrier rate making on foreign routes; investigates discriminatory rates and practices among shippers, carriers, terminal operators, and freight forwarders; licenses ocean freight forwarders; and ensures that carriers serve the public interest. It regulates liner trade to and from the United States and provides limited antitrust immunity to shipping conferences to the extent it finds conference activities to be in the public interest. In this connection, the FMC requires all liner tariffs to be filed. The FMC prohibits rebating, pooling, or “rationalization” of services, unless approved by the commission.

The most important reforms in maritime regulation came with the Shipping Act of 1984, which established the basis for streamlining FMC procedures, especially in the area of rate regulation and agreement processing. Antitrust immunity for carriers, conferences, and ports was redefined to allow for greater rationalization of resources and services. The act also allowed shippers and carriers to negotiate service contracts or volume pricing outside the tariff system.

The Shipping Act of 1984 gave smaller shippers the right to form associations to increase their influence on carriers similar to those larger shippers had been able to form previously. This right allowed them to consolidate members' freight and obtain volume rates or service contracts. Such associations have existed for many years in Europe and Canada for maritime shipments that did not involve U.S. cargoes or ports.

The Shipping Act of 1984 promoted rail-ocean cooperation to its fullest potential. More importantly, the act gave a boost to single-bill intermodal rates by allowing ocean conference members to agree on inland rates without violating the provisions of antitrust laws. A movement in this direction had already begun when carriers were required to publish such rates on an individual basis. The service considerations and economics of doublestack movement made point-to-point rates inevitable.

Deregulation legislation and rule making did away with the need to file intermodal rates and the divisions of those rates with the government. The Shipping Act of 1984 allowed the Ocean Rate Conference to file joint rates covering both the inland portion and the water movement of an intermodal movement, which could apply to many carriers on several routes. This freedom allowed carriers to establish through routes on an ad hoc basis, adjusting them daily if desired. All participants are allowed to contract for rates and services, particularly rail and steamship operators. These rates and contracts, if filed by an ocean-borne carrier, must still be filed with the FMC. Rail and motor carriers are not required to file contract rates with the government. The amount of rail traffic actually moving under contract rates is between 40 percent and 60 percent, with the proportion increasing each year. This 1984 act has increased the amount of competition between ports and made it more difficult for competitors to obtain data. Overall, however, the Shipping Act of 1984 has increased shipper choices and made intermodal shipment a more viable option.

A key responsibility of the FMC is keeping track of ocean carrier conferences.

Conferences were established to bring a measure of order and stability to ocean rates and competition. They allow carriers to join together without the threat of antitrust actions by a governing agency, to establish joint rates, and to provide common levels of service and schedules on a particular trade route.

The Shipping Act of 1984 allows conferences to establish different levels of rate making, including noncontract rates that are the basic rates charged to shippers who do not have sufficient volume or frequency of shipments to justify special rates (so-called "tier I" rates). Larger shippers can negotiate special rates with the conference ("tier II rates"). These shippers sign "exclusive patronage agreements" with the conference, in return for which they are charged rates that sometimes are 10 percent to 15 percent lower than noncontract rates. In exchange, conference shippers must use only member carriers of the conference.

The conference system, however, is not without problems. Carriers frequently withdraw from a particular conference. Thus a carrier may belong to a conference in one direction and not be a member for hauls in the opposite direction. Conferences are also being threatened by rate-cutting nonconference carriers serving the same trade route.

New carrier alliances have made conference membership confusing. Alliances act in some ways as a conference, but the terms and conditions of their agreements are more extensive, including vessel and container slot sharing using alliance member terminals and operations. If this trend continues, the conference system as it exists today will no longer be an effective force for either shippers or carriers.

In October 1998, the Ocean Shipping Reform Act was signed into law, and its provisions took effect on May 1, 1999. This act has been compared to previous bills that ushered in aviation and trucking deregulation. It allows individual carriers to negotiate confidential service contracts with shippers that keep their rates secret from other shippers. Rate-setting conferences will continue to exist and be given antitrust immunity. Conferences will be allowed to establish voluntary

guidelines that apply to the confidential contracts entered into by their members, thus opening the possibility that carriers could discuss the confidential contracts among themselves. Opinions vary widely on the effect that the new law will have on rates, different shipper groups, and specific segments of the ocean shipping industry. Intermodal operations could be particularly affected, as ocean shippers face new competitive challenges and opportunities within the ocean shipping market. As their focus turns to port-to-port operations, ocean shippers may draw back from earlier forays into double stack and other railroad businesses, both in the United States and internationally.

Motor Carrier Deregulation

During the late 1970s, as railroad regulation at the ICC was under fire, deregulation was also transforming the trucking industry. This effort resulted in the Motor Carrier Act of 1980, which relaxed requirements for entry into the trucking business. The number of new trucking applicants in the first year of deregulation more than quadrupled. Many restrictions on truck routes, types of traffic carried, and areas served by existing carriers were eliminated.

These deregulatory activities provided a substantial measure of rate freedom to both the trucking and rail modes. The changes gave shippers a wider range of price and service options and intermodal combinations of carriers.

These steps were bold, and many made dire predictions of how deregulation would affect different regions of the country, modal transport patterns, and the profitability of individual companies. Now, almost two decades later, motor carrier deregulation is widely acknowledged to have been one of the most effective policies ever applied to improve transport efficiency. No area in the United States is without service, although remote areas often pay higher rates. Nor have any reports of widespread rate gouging surfaced. Concerns center on the increasing concentration by the largest carriers in the less-than-truck-

load segment and possible safety problems in some marginal operations. Intermodal rail and truck competition has kept increases in rail rates below the general inflation level. Rail intermodal services have expanded the scope of competition by extending service well beyond a rail carrier's own lines.

Despite deregulation of interstate trucking since 1980, 41 states continued to regulate trucking within their borders during the 1980s. Six bills to deregulate this sector failed to win congressional approval between 1985 and 1993. Shippers together with large carriers, notably UPS and FedEx, pressed to deregulate this part of the industry.

Progress in this area came by attaching intrastate trucking deregulation provisions to airport legislation. A section of the Airport Improvement Program (AIP) Reauthorization Act of 1994 states that local governments or bistate agencies are prohibited from regulating "prices, routes, or services" of any motor carrier—common, contract, or private.

When the proposal was initially introduced, it covered only "intermodal all-cargo air carriers" or airfreight forwarders or carriers that used air cargo carriers 15,000 times a year. However, as it went through the legislative process, the act came to embrace almost all intrastate trucking. Section 601 does not cover household goods carriers, nor does it prevent states from regulating safety or insurance issues. In addition, it continues to allow states to set guidelines for uniform bills of lading, cargo liability, or credit rules and preserves antitrust immunity for joint rates or routes, classifications, and mileage guides.

The North American Free Trade Agreement and Possible Transport Ramifications

With the exception of a large volume of goods flowing between the United States and Canada, geography, regional economic advantages, and trade patterns have resulted in a transport system in Canada, the United States, and Mexico that primarily runs east-west. This pattern is expected

to change in the next few decades as trading patterns acquire a greater north-south component.

In 1994, NAFTA opened trade and transport possibilities between Canada, the United States, and Mexico. In doing so, it created one of the world's largest free trade areas—an area that includes more than 360 million people and has a combined annual output of more than \$8.0 trillion. NAFTA established a timetable for removal of the barriers for international cargo and passengers. Free trade between the countries has the potential to change distribution strategies by allowing a company to relocate its distribution centers, which could shift the demand for trucking, rail, water, and intermodal transport. Many companies have started to look at North America as a single distribution region. This new perspective will alter how business is conducted as well as the transport systems necessary to serve it.

Under NAFTA, U.S. railroads and intermodal companies will continue to take advantage of gains they made through informal agreements with Mexico. These informal agreements affect the ability to market services; operate unit trains; construct, own, and operate terminals; and finance rail infrastructure. NAFTA also opens up full investment and operating rights to U.S. and Canadian companies in Mexico's port facilities.

Mexican trucks are now allowed to operate in commercial zones in the border states, but the administration still has not allowed their operation throughout the entire United States. By the year 2000, all restrictions on cross-border access are scheduled to be lifted. Trucks from each of the three countries will be able to travel within each other's borders to deliver or pick up international cargo. Meeting this timetable may prove difficult because of sharp differences in safety regulations and rules governing truck length and weight.

NAFTA promises to bring major changes to ocean transport as well. Tangled restrictions imposed to protect labor and other interests have reduced marine transport between Mexico and the United States and Canada. The development of ports in Mexico could create

shorter sea routes to the United States and Canada. To realize this potential, however, ports in Mexico will need to invest heavily in port infrastructure. The move toward privatization of these ports may attract the private investment needed to do this. In addition, Mexico could potentially develop land bridge services that compete with U.S. land bridge services and with vessels using the Panama Canal.

Priority for Intermodal Transport in Recent U.S. Legislation

The deregulation of transport that occurred in the United States in the last two decades is credited with reducing logistics costs, providing environmental benefits, and encouraging the growth of intermodal transport services. As the prospects of system coordination have become more evident throughout this period, intermodalism has increasingly become an end in itself. It has become a key strategy for rationalizing transport policy generally. Many earlier administrations and congresses have spoken of the need for an integrated, coordinated, national transport policy, but this goal has proven to be extraordinarily difficult to achieve. The immense U.S. transport system is owned and operated by a vast array of public and private organizations, and no one has the ability to coordinate them all to conform to some master plan. The creation of the U.S. DOT in 1967 was intended to help bring about better modal coordination, but it has had only limited success in achieving this. Centralized "command and control" multimodal planning might, in the abstract, appear to embrace the many elements of the system, but it does not fit at all with the rights, needs, or objectives of private carriers and shippers.

Intermodal transport offers a useful focal point for advancing total system coordination. It provides a market-based set of signals around which multimodal coordination can be realistically improved. It offers a strategic device for focusing public and private attention on key bottlenecks and gaps in the overall system. This strategy gained new priority in 1991 with

the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA). This bill aimed to "... develop a National Intermodal Transportation System that is economically efficient, 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."

These goals are encouraged through improved intermodal connectivity, reliability, and flexibility. This legislation provided \$155 billion over six years for highway, highway safety, public transportation, and other surface transportation programs.

The 1991 act also established the Office of Intermodalism to assist the U.S. DOT in developing policies and programs designed to encourage and support intermodal programs and projects. The funding and organizational attention given to intermodal transport signal a new recognition that the long-sought goal of a coordinated, multimodal, national transport system is most effectively addressed by focusing on key intermodal points in the system.

This intermodal strategy was further advanced in 1998 when Congress passed the Transportation Equity Act for the 21st Century. This law establishes eligibility for improvements to highway connections from the National Highway System to major intermodal terminals over the next six years. It authorizes some \$217 billion for surface transport projects, and part of this funding is available for intermodal projects.

Possible Steps Toward Better European-U.S. Intermodal Transport

To further enhance the health of intermodal freight transport between Europe and North America, we need to reduce regulatory barriers, promote fuller competition, and allow new competitors to enter the market. Each carrier, shipper, terminal, and region can identify different opportunities to enhance competition,

but there is little consensus on the specifics. The underlying issues are complex and often controversial. One of the aims of the November 1998 forum on Intermodal Freight Transport in Europe and the United States is to move the discussion closer to resolution by identifying possible opportunities for increased competition in international intermodal freight transport. Four issues on the U.S. side that might be considered at that forum are listed below:

- Ocean shipping reform
- Non-U.S. companies providing transport service in domestic markets (including aviation, the Jones Act, and other cabotage laws)
- New entrants in third-party logistics
- Crossmodal ownership barriers

This list, or any such list, is not likely to find unanimous acceptance. Rather, the intent is to offer a few examples, stimulate discussion, and begin a process that focuses on issues of common concern.

Ocean Shipping Reform

Some believe that the regulations governing ocean shipping are cumbersome, restrictive, and confusing. Advocates for change have sought the right to negotiate private, confidential service contracts between carriers and shippers that would not need to be filed under present regulations. They also wanted increased availability of global contracts covering multilink movements, which would help preserve the confidentiality of rates on certain important routes within the overall contract. Before the passage of the Ocean Shipping Reform Act of 1998, tariffs had to be filed with the FMC, and carriers could monitor each other's deals.

Under the new provisions, confidential contracts are possible, and carriers will not always know what their competitors were offering. This situation could create competitive pressures to bid lower. The advantages of being a carrier cartel are largely eroded. Carrier conferences are likely to lose members and rate-making power.

Those who pressed for this change believe that if cargoes such as bulk cargo, forest products, recycled metal scrap,

waste paper, and paper are exempt from FMC's filing requirements, other cargoes should be exempt as well. They wanted ocean carriers and shippers to be able to negotiate with each other the same way truckers and railroads negotiate with their customers.

The provisions of the new law are now being translated into administrative regulations by the FMC. These regulations will open a new chapter in ocean shipping in international intermodal freight transport. By some accounts, these regulations may give ocean carriers more leverage in rate and service negotiations by allowing the carriers to join together in negotiations with railroads. Such leverage could lead to improved rail service. The new law may also alter the balance in negotiations between truckers and ocean carriers. The regulations that are drafted and phased in to implement the new law will govern the competitive structure of ocean shipping for a number of years. International intermodal freight interests have a stake in how these new regulations are drafted.

Non-U.S. Companies Providing Transport in Domestic Markets

International air and water carriers serving U.S. airports and ports are restricted in their ability to carry goods between points in the U.S. The Jones Act of 1920 is one such restriction. To protect U.S.-flag shipping, the Jones Act requires that all domestic waterborne freight move on U.S.-built ships crewed with American citizens. This form of cabotage has been in existence for centuries, especially by nations that were particularly vulnerable to foreign-flag competition in their own waters.

There are approximately 35 "Jones Act" containerships operating in domestic trade lanes between the continental United States and Puerto Rico, Hawaii, Guam, and Alaska. In recent years, however, the act has been under attack by shippers, such as the Jones Act Reform Coalition, who argue that they are forced to pay higher rates for their cargoes because of the lack of competition. Others

contend that the act, like some of the restrictions connected with FMC-affected vessel operations, affects the spirit and intent of deregulation, causing the maritime industry to lag far behind the other modes.

Meanwhile, American carriers and shipyards are waiting to see what the future holds before they invest in building and operating U.S.-flag vessels. In addition, the strict requirements of the Oil Pollution Act of 1990 are forcing many older vessels to be removed from domestic services.

Similar cabotage restrictions apply to air-freight carriers. Critics of such restrictions argue that this is more than a "zero-sum" game in which profits are redistributed between companies or countries. Instead, they contend, these barriers introduce inefficiencies in international intermodal transport that impede economic trade and economic growth.

The arguments surrounding the Jones Act and similar protections have gone on for decades, and few anticipate that Congress will make any major changes here soon. Growing global commerce, and the rise of international intermodal services, could potentially increase the chances of change. The issue might receive some attention as reciprocal cabotage arrangements are considered in connection with the Passenger Vessel Act.

New Entrants in Third-Party Logistics

Third-party logistics has grown rapidly in the United States in the 1990s. This sector has shown that the specialization and flexibility inherent in placing the logistics function outside both carrier and shipper can improve service and reduce costs. More than 1,000 firms now provide third-party logistics services in the United States, accounting for gross revenues of some \$34 billion. About \$9 billion of this total goes to companies with international operations.

Facilitating entry into this sector is key to the growth of intermodal services, since third-party logistics firms operate

free of any need to protect fixed investment in facilities or equipment. Such firms function best in a flexible regulatory environment where the full range of modal and intermodal options is available. Free entry into this segment will reward companies that effectively exploit communications, transport technology, market knowledge, and systems management. The ability of new entrants to thrive in this sector reflects the pace of intermodal transport overall. Steps that enhance the ability of third-party logistics to function in international movement are key to progress in the area.

The opportunities to enhance third-party logistics are different in Europe and the United States. The issue may get further attention as provisions of the Ocean Shipping Reform Act of 1998 are implemented. Under the new law, freight forwarders and NVOCCs can continue to provide third-party ocean transport through contracts with carriers. Unlike ocean carriers, NVOCCs currently cannot deal directly with individual shippers, but can negotiate only within shipping associations. Some have argued that this restriction on third parties places them at an unnecessary disadvantage and that fuller competition would be achieved by allowing them to negotiate separately with shippers. While NVOCCs did not get the powers they sought from the recent bill, this issue promises to remain in the public spotlight as ocean shipping reform moves forward.

Crossmodal Ownership Barriers

While economic deregulation has greatly expanded the ability of carriers in one mode, such as railroads, to own carriers in another mode, like trucking, the potential

synergy of such arrangements has been difficult to realize. With their fixed routes, railroads have a different sense of customer relations than do truckers. With their massive capital investment, the culture of competition in railroads also differs from that of motor carriers. The advantages that attach to vertical integration cannot be realized without favorable geographic conditions. The scale of multimodal companies may be too large to achieve in-house synergy. Labor agreements involving a company may be transferred to its acquisitions. For all these reasons, it has proven difficult for carriers to be successful in crossmodal acquisitions.

Regulatory barriers per se are probably not responsible for the apparent difficulty in crossmodal and multimodal ownership. However, the apparent synergy promised by such arrangements continues to be elusive, and the economic consequences of the full set of rules and regulations attached to each of the modes may be part of the difficulty.

Conclusion

The opportunities sketched here are intended to stimulate discussion. This list is not complete, nor do these issues represent priorities that are shared by all parties. Rather, these opportunities are presented as a point of departure for discussions among participants at the November 1998 Forum in Munich. The carriers, shippers, government officials, and analysts present will each be aware of many other specific opportunities for advancing intermodal service. The objective is to consider all such possibilities and to identify areas of common interest where participants from both regions may be able to return and work for compatible progress.

Acronyms and Abbreviations

ANSI	American National Standards Institute
APL	American President Lines
ATCS	automated train control systems
ATS	automatic train supervision
AVI	automatic vehicle identification
CAB	Civil Aeronautics Board
CMR	1956 Convention for Carriage of Goods by Road
COFC	container-on-flatcar
COST	Cooperation in the field of Scientific and Technical research
CPC	cellular pallet-wide containers
CVO	commercial vehicle operations
DISK	Dispositioning and Information System for Intermodal Transport
DOT	U.S. Department of Transportation
EDI	electronic data interchange
EDIFACT	electronic data interchange for administration, commerce, and transport
FBL	FIATA bill of lading
FedEx	Federal Express
FIATA	International Federation of Freight Forwarders Association
FMC	Federal Maritime Commission
GNP	gross national product
IATA	International Air Transport Association
ICC	Interstate Commerce Commission
ICCTA	Interstate Commerce Commission Termination Act of 1995
ILDm	Institute for Logistics and Distribution Management
ILUs	intermodal load units
ISO	International Standards Organization
ISTEA	Intermodal Surface Transportation Efficiency Act
ITO	intermodal transport operator
ITS	intelligent transportation system
ITV	in-transit visibility
NAFTA	North American Free Trade Agreement
NVOCCs	nonvehicle owning common carriers
PL	Public law
RO/RO	roll-on/roll-off
SDO	standards-developing organization
SDR	special drawing right
STB	Surface Transportation Board
TABD	transatlantic business dialogue
TACS	Transatlantic Advisory Committee on Standards, Certification, and Regulatory

TEA-21	Transportation Equity Act for the 21 st Century
TEU	twenty-foot equivalent unit
TIRRA	Trucking Industry Regulatory Reform Act of 1994
TOFC	trailer-on-flatcar
U.S. COGSA	U.S. Carriage of Goods by Sea Act
U.S.C.	U.S. Code
UIC	Union Internationale de Chemins de fers
UNCTAD	United Nations Conference on Trade and Development
UPS	United Parcel Service
WISDOM	Waterborne Information System, Distributed to Other Modes