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Articles

Injecting Competition in the Railroad Industry Through Access

Salvatore Massa*

I. INTRODUCTION

With the recent consolidation of several large track networks, the railroad industry has become highly concentrated. In spite of the increased profitability of the industry, the number of major networks has dwindled because the immense costs of creating new networks prohibits entry into the market. While the industry often competes with other

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* United States Department of Justice - Antitrust Division; J.D., University of Wisconsin, 1997. The views of the author do not necessarily reflect the views of the United States Department of Justice. The author thanks Peter Carstensen, Diana Cook, Mark Meitzen, Russell Pittman, Robert Rosenberg, and Neal Stevens for their assistance and comments.

1. These consolidations also allowed the newly merged firms to pare down parallel networks. As a result of such line sales, a growing number of independent carriers operate smaller, light density and labor intensive lines. Such lines provide the benefits of localized service at lower cost than many major railroad networks could provide. See Stephen R. Klein, Railroads' Second Golden Era May Be Dawning, STANDARD & POORS INDUS. SURV., Nov. 4, 1993, at R15. Many of these short or regional lines, however, have a limited role in competing against the larger networks that spawned them.

2. Currently, only one regional railroad has proposed an expansion which would "become the country's first major new railroad in more than a half-century." See Anna Wilde Mathews, Regional Railroad Plans Big Expansion, WALL ST. J., June 9, 1997, at A2. However, this new railroad would hardly be a national competitor, as it will only offer competition in the delivery of coal from the Powder River Basin in Wyoming to various electric utilities in the Midwest. See id; see also Steve Glishinski, DM&E Takes First Step Toward Powder River, TRAINS, June 1998, at 26-27. The Surface Transportation Board has given preliminary approval of the expansion—pending an environmental impact study. See Dakota, Minnesota & Eastern R.R. Corp. Constr. Powder River Basin, Fin. Docket No. 33407, 1998 WL 869567 (Surface Transp. Bd. Dec. 10, 1998).
modes of transportation to move freight, shippers who are relatively dependent on railroad transportation now have few competitive alternatives and face poorer service. Competitive access provides a remedy to constrain anticompetitive abuses in the industry and offers shippers more efficient transportation options. While various proposals exist, the core principle of competitive access is that potential entrants are permitted to use "facilities owned by one railroad for services provided by or in conjunction with another railroad."4

This Article explores the use of different regulatory regimes to encourage competition in the railroad industry. Section II of this Article explores railroad control of bottlenecks—portions of the network where only one railroad can provide service. This section relies on the economic theories concerning bottleneck control as well as anecdotal evidence of the impact of recent consolidations. Section III analyzes the current regulatory tools for encouraging competition: limited competitive access and rate regulation. This section also examines the administrative cases applying the competitive access and rate regulation provisions. Section IV surveys other approaches to enhance competition and discusses the burdens these approaches bring. Section V provides a brief summary and concluding remarks.

II. Problems at the Bottleneck: Railroad Anticompetitive Behavior

The railroad industry has undergone a steady process of consolidation that may soon result in two competing transcontinental systems.5 The remaining major networks overlap, with at least two firms competing


on each significant transportation corridor. However, these overlapping networks are not parallel on a regional level. While two networks may provide service between Los Angeles and Chicago, only one may provide a shipper with service to or from an intermediate point. As a result, many shippers have only one option for railroad service for a portion of the freight movement.

This concentration in itself, however, may not trigger abuse of market power. Other modes of transportation, such as trucking, pipelines and barges, provide competing services that some shippers may employ. These substitutes may place a ceiling on the price that a railroad firm exploiting its market power may charge. For many commodities, transportation costs may directly affect the supply of those goods. When transportation costs rise sufficiently in a regional market, product substitution and product source substitution may occur. For example, if Iowa corn farmers face higher transportation costs to move corn to a particular location, consumers, such as food processors, may use corn—or another substitutable grain—from another region to avoid paying the higher transportation cost for Iowa corn. In short, three options combat higher railroad transportation costs: (1) shippers may switch the mode of transportation; (2) consumers of the good may substitute the commodity with another good; and (3) consumers may obtain the commodity from another location where transportation costs are lower.

For some products in certain locations, railroad transportation may provide the only viable or most cost effective means of shipping a commodity. Anticompetitive behavior is possible under these circumstances when a railroad has exclusive control of either a destination or origin point in a movement. In this case, the price ceiling of other transportation substitutes may be very high, allowing a railroad to exploit its market power unless consumers can offset this market power with product substitution or product source substitution. When consumers are unable to offset this power, such a railroad becomes a bottleneck for the movement and may leverage its bottleneck onto other competitive portions of the

---

6. This would be especially true for products where the transportation service constitutes a substantial portion of the cost of the good.


8. See Wesley A. Wilson, Legislated Market Dominance in Railroads, in RESEARCH IN TRANSPORTATION ECONOMICS, 49, 54, 62 (B. Starr McMullen, ed. 1994).

9. For example, landlocked Montana grain farmers may rely only on railroad transportation to ship their crops to ports in the Pacific Northwest. See infra notes 120-22 and accompanying text. Electric utilities receiving coal shipments represent another example. See Coal's History of Dependence on Transportation, PUBLIC UTIL. FORTNIGHTLY, Apr. 1, 1997, at 42.
movement. Bottleneck control has a profound competitive impact on shippers because substantial barriers to entry exist which dissuade a new entrant from building a competing line to the shipper.

Illustration 1 exemplifies a typical bottleneck situation where one carrier provides service between two points and the other carrier must exchange traffic with its competitor at an intermediate point to provide service between the same two points:

<table>
<thead>
<tr>
<th>Illustration 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railroad X</td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>Railroad X</td>
</tr>
</tbody>
</table>

In this illustration, Railroad X can provide single-line service between points A and C for a shipment of freight. In contrast, Railroad Y must interchange with Railroad X at an intermediate point to provide service between A and C. Railroad X may even set the location of the interchange to extend the length of the bottleneck portion of the route or it may choose not to deal with Railroad Y altogether. When denied access

---


11. "A barrier to entry is any factor that permits firms already in the market to earn returns above the competitive level while deterring outsiders from entering." See PHILLIP E. AREEDA & HERBERT HOVENKAMP, 2A Antitrust Law § 420, at 55-56 (1996). Areeda and Hovenkamp note that a large initial investment could act as a barrier to entry. See id. at § 421b at 64. Barriers to entry are high in the railroad industry because of the significant costs associated with building a track network. No major entrant to the market has joined the railroad industry in over fifty years. See supra note 2.

12. The agency governing railroad mergers used a similar chart to illustrate this theory in Union Pacific Corp.—Control—Chicago & Northwestern Transportation Corp., Fin. Docket No. 32133 at 72 (I.C.C. Feb. 21, 1995) [hereinafter UP-CN]. The agency discussed the foreclosure of non-bottleneck carriers from providing interline service on bottleneck routes.
entirely, Railroad Y becomes subject to “vertical foreclosure.” If the costs of interchanging and using Railroad Y’s service were undesirable, Railroad X’s bottleneck power would be irrelevant in terms of selecting the more efficient routing because a shipper would always choose Railroad X’s service over the competitive portion of the movement.

However, if a superior network or another factor enabled Railroad Y to provide better service through that segment despite the costs of interchanging, then bottleneck control distorts the competitive options of a shipper. Railroad X could control the movement by subsidizing its less efficient segment through the monopoly segment. Table 1 provides a hypothetical example of the potential effects of this distortion:

<table>
<thead>
<tr>
<th>Monopoly Segment</th>
<th>Competitive Segment</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railroad X Only:</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>Railroads X and Y:</td>
<td>18</td>
<td>9</td>
</tr>
</tbody>
</table>

If a shipper uses Railroad Y’s service for the competitive portion of the movement (B to C), Railroad X will raise its rate for the bottleneck portion of the movement (A to B). Some of this price increase could be attributable to the cost of interchanging at an intermediate point with Railroad Y because interchange could require additional facilities and labor.

If market restraints exist on the pricing leverage of railroads, through limitations on information or industry custom, Railroad X may use its bottleneck control not to extract profits from Railroad Y’s lower


14. Under this scenario, the “efficient” routing would be selected. However, this does not escape the question of the bottleneck carrier’s leverage with respect to price. Recognizing the bottleneck carrier’s route as the most efficient, and one that the shipper would always prefer, grants the bottleneck provider an effective monopoly over the entire movement. See Areeda & Hovenkamp, supra note 11, ¶ 764b1, at 74 (discussing intrabrand competition).

15. See Grimm & Harris, supra note 10, at 50-51.


17. See Grimm, et al., supra note 13, at 299-300. The authors suggest that certain market constraints prevent bottleneck carriers from directly using pricing leverage. They argue that standard revenue division rules common in the industry govern such arrangements. In addition, they suggest that a bottleneck carrier may prefer to foreclose an interlining railroad over the competitive portion of the movement in order to maintain exclusivity with a customer who
cost network, but it could attempt to use its position to capture the competitive portion of the movement entirely and foreclose Railroad Y from competing for this movement.18

The three-unit increase in Railroad X's price over its bottleneck segment could represent only a one-unit increase in cost attributable to interchange, with the remainder representing market leverage. In this case, stripping Railroad X of this bottleneck leverage would reveal that interchange with Railroad Y is the more efficient option. The dual carrier service would be 25—16 on the bottleneck portion and 9 on the competitive portion—instead of the 26 that Railroad X offers for single-line service.

Manipulation of bottleneck pricing in order to control freight movements over competitive segments of the network has pernicious effects on two levels. First, the bottleneck carrier distorts the incentives of shippers to use a more inefficient network that provides poorer service or that simply has a higher cost structure.19 Like a classic tying arrangement, the bottleneck carrier uses its bottleneck service to divert traffic onto its own network for the competitive portion of the movement.20 Second, the shipper ultimately pays more for the service or receives lower service quality.21 Since the bottleneck carrier is able to raise the rate charged over the bottleneck segment, the shipper pays more than the efficient price by keeping traffic on the bottleneck network.

The Chicago leverage theory challenges this viewpoint, contending that a bottleneck carrier would have the incentive to route the traffic on the less costly network in order to obtain a higher return on its investment.22 According to this theory, vertical integration of firms is almost always harmless and often efficiency enhancing.23 Using the figures from

---

18. See Tye, supra note 10, at 215. As Tye has noted, railroad regulators have intervened in some merger proceedings to prevent this type of foreclosure by either creating conditions on the adversely affected firm or granting trackage rights to that firm, allowing it to operate over the bottleneck segment. Examples of such cases are noted in infra note 62.
19. See Grimm et al., supra note 13, at 298.
21. See Tye, supra note 13, at 54-55. Tye notes that transportation costs to shippers may be increased if there is an absence of intermodal competition, product or product source substitution, or regulatory intervention. See id. at 55.
22. See Grimm et al., supra note 13, at 298-99; Tye, supra note 13, at 42.
23. The Interstate Commerce Commission, the agency responsible for railroad merger oversight until recently, adopted this theory to permit many so-called end-to-end mergers which joined non-parallel track networks. See, e.g., Union Pac. R.R. Co.—Control—Missouri-Kan.-Tex. R.R. Co., 4 I.C.C.2d 409, 436 (1988) (noting that "parallel mergers generally present more serious competitive problems than end-to-end ones . . . ").
Table 1, Railroad X would rather pay Railroad Y to accrue the gains of using its bottleneck power without being hampered by a lower return on the less efficient portion of its network. Railroad X could effectively charge 17 for the bottleneck portion of the movement, making the shipper indifferent as to which routing to use. Railroad X's behavior illustrates an example of a price squeeze on Railroad Y because Railroad X appropriates a portion of its profits.24

Some economists have opined that the bottleneck carrier will then have an incentive to insure that the interchange carrier receives a return to sustain its operations over the line in order to perpetuate its monopoly profits:

A bottleneck railroad whose end-to-end price for rail service is effectively constrained by market forces or by regulation has every reason to encourage use of the facilities of a more efficient connecting carrier and to make certain that rates earned by that carrier are sufficient to permit it to survive and prosper in the long run. Assume for example, that segment A is the bottleneck and segment B can be served both by the owner of the bottleneck and one or more other railroads. If the market allows end-to-end rates of $100 and the long-run incremental cost to the bottleneck railroad of transportation along the non-bottleneck segment B is $40, then if the connecting carrier can carry it for $30 and offers service at a price of $39, the bottleneck carrier's profit will be increased by $1 . . . . Since a $1 . . . gain in profits is always better than zero, the bottleneck carrier always gains by perpetual continuation of service by the connecting carrier.25

Table 2 illustrates this concept by showing the profits Railroad X could accrue and the cost to the shipper under either scenario, assuming that Railroad X's cost to operate the bottleneck segment is 12 and the competitive segment is 10:

Some critics of the Chicago leverage theory have questioned the validity of its assumptions.26 For example, the theory assumes that a railroad is able to extract a price squeeze on its interlining rival, but certain industry customs—such as standard division rules that set mileage as a proxy for cost—may preclude or distort the use of a price squeeze.28 If rate divisions are set according to the distance freight travels, in many cases the bottleneck carrier will prefer to provide single-line service, even if it is less efficient.29 And, in order to exercise even a partially successful

24. Tye has defined a price squeeze as "a situation where a firm manipulates the input and output prices faced by a competitor to prevent that firm from competing effectively." See Tye, supra note 10, at 212 n.24.
26. See Grimm, et al., supra note 13, at 305-08; Tye, supra note 13, at 54-56.
27. See Grimm, et al., supra note 13, at 299-300.
28. See Grimm & Harris, supra note 10, at 52-53.
29. See id.
price squeeze, the bottleneck railroad would have to possess some knowledge of an interlining rival’s cost structure to enhance returns.

Indeed, a bottleneck railroad may prefer to foreclose an interlining competitor to prevent it from gaining knowledge about a customer. While the bottleneck railroad may earn the same or greater short-run profits by interlining in that particular market, the customer may need service in other markets where the bottleneck and the rival compete more directly.30 By withholding information from the interlining railroad, the bottleneck carrier may attempt to keep an exclusive relationship with the customer to prevent future competitive threats or customer leverage in other markets. Similarly, other strategic reasons, such as the desire to weaken the interlining competitor to gain additional market power in other markets, may also act as an incentive for foreclosure.

In addition, foreclosure may take subtler forms, in order to fly below the regulatory radar screen. Vertical foreclosure scenarios in the railroad industry commonly occur when the bottleneck carrier “threatens” the shipper with reduced service quality or reliability for interlined shipments.31 Other situations are more obvious. For example, prior to a merger, Southern Pacific and Wisconsin Central provided interlined competition against Union Pacific for the movement of taconite pellets from mines in Minnesota to a steel manufacturer in Utah.32 Because the railroads provided an innovative service by backhauling coal to the Midwest,

31. Grimm & Harris, supra note 10, at 53.
they were able to compete effectively with the single-line service of Union Pacific. After Southern Pacific merged with Union Pacific, this service was eliminated and the Union Pacific now provides single-line service. In another recent, and perhaps extreme example of such behavior, Union Pacific sought to divert its traffic onto ships to relieve network congestion rather than give the freight to a rival railroad.

Regardless of the validity of the Chicago leverage theory, captive shippers pay more for railroad transportation or receive poorer service because the bottleneck provider will use its position to maintain higher rates over the bottleneck portion of the movement like a monopolist. Clearly, a railroad that provides the exclusive rail service at both the origin and destination portion of a movement with a captive shipper could use its monopoly position to exploit the market price of the movement. This bottleneck leverage creates a wealth transfer from captive shippers to railroad firms and from interlining railroads to bottleneck railroads. In addition to these wealth transfers, monopoly leverage creates a deadweight loss to society through inefficiency. Furthermore, bottleneck control does not represent the only potential scenario for anticompetitive behavior. And, of course, other concerns exist regarding the wisdom of

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33. See Scanner, Trains, Aug. 1998, at 21 (reporting that “Wisconsin Central has come to terms with UP on moving Geneva . . . iron-ore trains . . . to an all UP routing from northern Minnesota, which took place in 1997, over a year before the contract expires.”).


35. For example, in the proposed merger of Santa Fe and Southern Pacific, the market of carriers for shipping many commodities would have been reduced to only the new merged entity. Analyzing other economic estimates, Pittman observed that the proposed merger would have increased freight rates from between 15 to 30% in selected commodities. See Russell W. Pittman, Railroads and Competition: The Santa Fe/Southern Pacific Merger Proposal, 39 J. Indus. Econ. 25, 32–39 (1990).

36. See Grimm et al., supra note 13, at 299; Tye, supra note 13, at 54.

37. See Tye, supra note 13, at 52-54.

38. See, e.g., Pittman, supra note 35, at 34-35; Timothy J. Brennan, Why Regulated Firms Should Be Kept Out of Unregulated Markets: Understanding the Divestiture in United States v. AT&T, 32 Antitrust Bull. 741, 747 (1987) (stating that “. . . monopoly is generally thought to lead to inefficient undersupply of goods.”).

39. In a classic antitrust law analysis, the competitive problems posed by industry concentration are two-fold. First, as indicated, firms may take unilateral action. Second, fewer competing firms create greater opportunities for collusion. Such behavior was a very common antitrust concern at the turn of the century. See United States v. Joint Traffic Ass’n, 171 U.S. 505 (1898); United States v. Trans-Missouri Freight Ass’n, 166 U.S. 290 (1897).

The United States Department of Justice has recognized competitive harm from both unilateral and collusive conduct. See United States Department of Justice & Federal Trade Commission, Horizontal Merger Guidelines 18-25 (1992, rev. Apr. 8, 1997). With respect to unilateral conduct, “[a] merger may diminish competition . . . because merging firms may find it profitable to alter their behavior unilaterally following the acquisition by elevating price and suppressing output.” See id. at 22.
a policy that has embraced nearly all railroad consolidations.  

Price and cost trends on freight movements provide an indicia of whether some form of market abuse has occurred in the railroad industry. While declines in price may indicate vigorous competition, this information, standing alone, can be misleading. Decreases in cost resulting from new technology or automation may outstrip falling prices, allowing firms to reap greater returns. A firm that is able to control price declines over time may be exercising market power like a firm that increases prices in spite of a stable cost structure. Since the implementation of railroad deregulation, the railroad industry has gone through a period of substantial price reductions in freight movements. From 1982 to 1996, rail rates have declined by 26% after adjusting for inflation. At the same time, the industry has dramatically reduced its cost structure.

Comparing the two trends, one trade magazine observed that “trends in rail rates have generally not tracked declines in the railroads’ costs of providing service.” This conclusion is further bolstered by the evidence that during the period immediately following deregulation, transportation prices for some commodities initially rose, probably be-

40. Several other considerations may mitigate against pursuing a policy of embracing all railroad mergers. First, a poorly crafted consolidation may lead to a weakening of the newly created firm. See Joseph R. Daughen & Peter Binzen, The Wreck of the Penn Central (1971). See also Brian O’Reilly, The Wreck of the Union Pacific, Fortune, Mar. 30, 1998, at 94. And, because of the reliance of other carriers on interlining shipments with each other, the woes of a newly merged railroad may spread to other railroads in the form of delays, inadequate interlining and diminution of traffic. See, e.g., Daniel Machalaba, Delays and Snafus Grip Nation’s Rail Freight, Wall St. J., May 29, 1998, at B1.

Second, the newly consolidated firms may grow too large to efficiently manage operations and provide adequate service to shippers. Ronald Coase, for example, has suggested that firm size is constrained by the cost of organizing a firm. Once the organization costs approach the cost of carrying out the transactions in the market, the efficiencies of the firm are lost. See Ronald H. Coase, The Firm, The Market, and the Law 7, 44-45 (1988). See also George Stigler, The Organization of Industry 67-70 (1968).

Third, the significant rationalization of railroad track in the nation has cut off communities to freight or potential passenger service, and the lack of “redundant” networks in regions imposes a risk on the free flow of commodities when one railroad’s network breaks down and no other firm can provide service on another competitive line. Since 1980, the Class I railroads have abandoned or sold nearly 20% of preexisting trackage. See Wesley A. Wilson, Cost Savings and Productivity in the Railroad Industry, 11 J. Reg. Econ. 21, 23 (1997).

Fourth, notable safety problems may arise as a result of mergers. The Union Pacific safety record provides an example of a safety breakdown during the early implementation of a merger. See Daniel Machalaba, Union Pacific Is Criticized for Safety Breakdown, Wall St. J., Sept. 10, 1997, at A4 (reporting that the Federal Railroad Administration criticized the Union Pacific for a “fundamental breakdown” in rail safety, hinting that safety should be a consideration in merger approvals).

41. See Klein, supra note 1, at 1.

42. See id. at 1-2, 3. See also Wilson, supra note 40, at 39. Wilson’s study has estimated that cost savings in the industry fell in the range of 41 to 44% over the period 1981-89.

43. See Coal’s History of Dependence on Transportation, supra note 9, at 42.
cause the short term cost savings from deregulation were still generally modest. Moreover, shippers claim that the savings from deregulation are not shared, with captive shippers paying 20 to 30% higher rates than shippers who can choose between railroad carriers or even another form of transportation, such as barges. In addition to these price effects, shippers have fewer railroad routing alternatives. As one commentator observed, "[f]ewer and larger railroads resulting from consolidation has resulted in fewer interlined shipments."

Service and reliability of freight movements, which represent indicators of the competitiveness of the market, have also declined. In the wake of recent mergers, the number of captive shippers who are building their own redundant railroad tracks to link up with competitors is growing. One study indicates that transit times for "general" freight have

44. See Wesley A. Wilson, Market-Specific Effects of Rail Deregulation, 42 J. Indus. Econ. 1, 20 (1994). This Wilson article reflects a study in rail rates for thirty-four commodity classifications for the period 1972-88. Wilson concludes that while commodity prices initially rose under deregulation, by 1988, "deregulation produced lower prices in most commodity classifications and did not increase prices in other classifications, suggesting that advances on productivity have dominated any adverse market power effects." See id. See also Ronald R. Braeutigam, Consequences of Regulatory Reform in the American Railroad Industry, 59 S. Econ. J. 468, 473-74 (1993).

45. See Bruce Ingersoll, Deregulation Aids Rails Too Much, Shippers Say, Wall St. J., Apr. 2, 1998, at A2 (comparing rates of West Virginia steel mills and coal mines that rely on one railroad for service and rates for the same class of shippers who have either more than one railroad option or a competing barge line to move freight).

46. See Wilson, supra note 40, at 23. Wilson's study, however, suggests that overall, the ICC and STB's policies supporting deregulation and permissive attitude toward mergers has improved consumer welfare. See id. at 39. Other economists have suggested, however, that most improvements in the industry are attributable to policies promoting deregulation, and not mergers. See Christopher A. Vellturo, et al., Deregulation, Mergers, and Cost Savings in Class I Railroads, 1974-1986, 1 J. Econ & Mgmt. Strategy 339, 367-68 (1992).


48. See Daniel Machalaba, Opening Lines: Tired of Costs, Delays of Railroads, Firms Lay Their Own Tracks, Wall St. J., Feb. 6, 1998, at A1. One financial analyst has stated: "Unquestionably, the construction of a track spur by a shipper points to a state of extreme displeasure with a carrier's rate/service package. Railroads that lose business in this way should undertake some deep soul-searching to determine how they lost touch with the customer." See Klein, supra note 1, at R17.
increased 25 to 30% in the past three decades with on-time performance of 60%, a far cry from the 95% timeliness the trucking industry offers.\textsuperscript{49} In one very recent merger proposal, the acquiring railroads have proposed to “slash” New York City to Chicago transit times for high priority freight to twenty-six hours, two hours slower than similar service offered thirty years ago.\textsuperscript{50} One railroad executive has likened the industry as “about where the automobile industry was 15 years ago.”\textsuperscript{51}

After the Union Pacific - Southern Pacific (UP-SP) merger, which promised improved service and cost savings, shippers have complained extensively about substantial service problems.\textsuperscript{52} In addition to suggesting that it would ship freight \textit{via} the Panama Canal, UP-SP had also discussed barring new shipments on its lines.\textsuperscript{53} These problems, at the very least, demonstrate some shippers' dependence on railroads and their inability to switch to other carriers when service problems arise. According to a study by Bernard Weinstein and Terry Clower for the Texas Railroad Commission, the UP-SP service disruptions have cost the national economy in excess of $2 billion as of February 1998.\textsuperscript{54} And, significantly, many affected shippers have avoided confronting UP-SP about these problems “for fear the railroad will punish them with higher rates in the future.”\textsuperscript{55} The service problems related to the UP-SP merger are not unique, as Union Pacific experienced similar difficulties during its 1995 acquisition of the Chicago & Northwestern, as did the parties in the re-


\textsuperscript{50.} See Bill Stephens, \textit{Will Eastern Intermodal Match the Hype?}, \textit{Trains}, Mar. 1998, at 24. Stephens discusses the proposed Norfolk Southern and CSX joint acquisition of Conrail. Conrail's intermodal schedule averaged thirty to thirty-two hours for this routing. The author asserts that transit times will improve partly because Conrail will be divided in two, and the railroads will have “two fast, high density . . . routes.” See \textit{id}. at 25. Apparently, when Conrail owned these two parallel routes itself, it failed to have the proper incentives to develop such transit speeds. See \textit{id}.

\textsuperscript{51.} See Machalaba, \textit{supra} note 49, at A1 (quoting Edward Burkhardt, chairman of Wisconsin Central Transportation Corp.).


\textsuperscript{53.} See Daniel Machalaba, \textit{Union Pacific May Bar New Shipments If Problems Aren’t Solved in 30 Days}, \textit{Wall St. J.}, Mar. 12, 1998, at A2; see also \textit{supra} note 34 and accompanying text.


\textsuperscript{55.} See O’Reilly, \textit{supra} note 40, at 102.
III. Current STB Policies Toward Competitive Access

In most industries, antitrust laws would attempt to prevent the development or entrenchment of market power, and possible subsequent abuse through the preclusion or substantial modification of mergers. Significantly, railroad consolidations are not subject to the antitrust laws, but instead are reviewed by the Surface Transportation Board (STB) under a "public interest" standard of review. Empirically, the STB and its predecessor, the Interstate Commerce Commission (ICC), have pursued a policy that favored consolidations. To remedy anticompetitive behavior, the ICC originally regulated freight pricing and other aspects of operations. However, reforms to deregulate the industry encouraged railroad firms to have independence in pricing and other service decisions. Two crucial elements of this independence which affect bottleneck shippers are the ability of a bottleneck carrier to set the interchange point and the ability to bid on a freight movement through either single-line service or in conjunction with another carrier.

At present, the STB has pursued a policy of granting mergers—even when they create bottlenecks—but imposing limited conditions on railroads as well as allowing shippers to petition for relief. The first two parts of this section discuss the tools the STB uses to regulate market abuse in bottleneck or monopoly situations. The third part of this section


57. See Milton Handler, et al., Trade Regulation 143-50 (1990).


59. The "public interest" standard, which has been adopted for quite some time, has been codified in 49 C.F.R. § 1180.1 (1996). Five factors guide whether this standard has been satisfied in a merger application. The factors are: (1) the merger's impact on the adequacy of public transportation; (2) the effect of including or excluding other railroads in the region from the transaction; (3) the fixed charges resulting from the transaction; (4) the interests of railroad employees; and (5) the adverse effect on railroad competition. See id.


61. See supra note 5.

62. See, e.g., UP-MP, 366 I.C.C. at 566-72, 580; BN-SF, supra note 10, at 76; UP-SP, supra note 47, at *87, *91. This form of remedy for potential anticompetitive effects from mergers has been in vogue since the early 1980s. See Paul S. Dempsey, Antitrust Law and Policy in Transportation: Monopoly Is the Name of the Game, 21 Ga. L. Rev. 505, 560 (1987).
analyzes two recent STB cases that address competitive abuse in the railroad industry.

A. Controls on the Interchange Point

Prior to deregulation, a shipper was entitled to select any particular routing it wished without regard to the economic costs imposed on the railroads to maintain interchange facilities and service. This "open routing" system was characterized as one that required railroads to maintain interchanges "on practically all combinations of railroad tracks between two points." The Staggers Act of 1980 and the Railroad Revitalization and Regulatory Reform Act of 1976 eliminated this absolute shipper right and ultimately replaced it with a limited right to petition the STB.

The ICC permitted shippers to petition the agency for three basic types of network access remedies that affect the routing of their freight. First, the agency could prescribe a "through route" between two or more railroads. The through route remedy establishes the interchange points at which the railroads switch traffic on their respective networks. To further allow access for shippers, the through route remedy can be supplemented with the prescription of a joint rate covering the movement as well as establishing the division of the rate.

Second, the agency has authority to order a competing railroad to operate over the terminal portion of the network to provide service to the shipper. The agency is empowered to require the railroad firm owning the network to provide access "including main-line tracks for a reasonable distance outside of a terminal [to] another rail carrier." The STB has characterized this remedy as "full access, for a fee, permitting the

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66. See 49 U.S.C. § 10705(a) (1994). This provision grants the STB the power to establish new routings for freight movements "when it considers it desirable in the public interest." See id. at § 10705(a)(1). The statute provides two possible scenarios for STB intervention: (1) the competition policies of the Staggers Act are defeated or other anticompetitive behavior has occurred; or (2) other statutory criteria in title 49 U.S.C. sections 10705 or 11103 are satisfied.
69. See id.
Injecting Competition in the Railroad Industry

non-bottleneck carrier to provide service over the lines of the bottleneck carrier and thereby complete its own single-line service." Like the through route remedy, the STB is empowered to establish the fee the tenant railroad pays to the owner of the bottleneck as well as the price that it charges the shipper.

The agency could exercise a third alternative—"reciprocal switching." Under this arrangement, "a bottleneck carrier, for a fee, transports the cars of the non-bottleneck carrier over its lines to [the] destination, thereby permitting the non-bottleneck carrier to establish single-line rates for customers to which it does not have direct access." Thus, the non-bottleneck carrier can independently set a single-line rate for the movement because the switching fee of the bottleneck portion is established. When disputes occur with respect to the cost of the switching portion of the move, the STB is empowered to prescribe the terms of such agreements.

The statutes allow broad discretion in applying these remedies because the STB may impose them when it is in "the public interest." While these remedies suggest significant regulatory leverage, the STB has interpreted the "public interest" standard more narrowly, deciding that the goal of allowing railroads to "rationalize their route structures making maximum use of efficient routings and eliminating others" was of greater importance. According to the STB, the access remedies were crafted to provide relief when a bottleneck carrier with market power provides inadequate service or forecloses more efficient service from a competing firm. Thus, a railroad firm's refusal to voluntarily establish a

72. See CP&L, supra note 5, at 7 n.13.
73. See 49 U.S.C. § 11102(a).
74. See id. § 11102(c)(1).
75. See CP&L, supra note 5, at 7 n.13.
76. See 49 U.S.C. § 11102(c)(1).
77. Each remedy has a similar "public interest" standard of application. The STB is permitted to impose through routes when "it considers it desirable in the public interest." See 49 U.S.C. § 10705(a)(1) (1994). It is permitted to impose actual direct access to the non-bottleneck carrier when it is "practicable and in the public interest without substantially impairing the ability of the rail carrier owning the facilities or entitled to use the facilities to handle its own business." See 49 U.S.C. § 11102(a). Similarly, the STB may impose reciprocal switching arrangements when "practicable and in the public interest." See id. at § 11102(c)(1).
78. See CP&L, supra note 5, at 6 (quoting Interchange Provisions at Jacksonville, Fla., 365 I.C.C. 905, 916 (1982)). However, in merger proceedings, the STB uses a more liberal "public interest" standard in granting competitive access relief to petitioning shippers. See UP-SP, supra note 47, at *140,*41.
79. In Central Power & Light Co., the STB repeatedly indicated the importance of this market abuse or inadequate service requirement in order to obtain relief. See CP&L, supra note 5, at 6-7 (observing that a shipper must demonstrate that the bottleneck carrier "... has used its market power to extract unreasonable terms on through movements, or, [] because of its mo-
through route is insufficient to establish a case for an access remedy.\textsuperscript{80}

The STB has recognized that a bottleneck carrier can maintain control of the bottleneck portion of the movement "unless it can be shown that the alternative routes sought are more efficient, or that the carrier[] ha[s] exploited [its] market power by providing inadequate service."\textsuperscript{81}

Under STB regulations, the agency considers "all relevant factors" in making such determinations.\textsuperscript{82} The STB claims that it is "attentive to the 'classical categories of competitive abuse' that could produce such a result, including foreclosure, refusal to deal, or other 'recognizable forms of monopolization or predation.'"\textsuperscript{83} In crafting a remedy, the STB also considers operational and service criteria, such as the comparative efficiency of routings.\textsuperscript{84} These factors further temper the application of competitive access remedies, even in light of clearly anticompetitive behavior by a bottleneck carrier.

Each remedy option provides a distinct level of intrusiveness on the bottleneck carrier's operations. This variation can be seen as a progression, from the through route remedy where the bottleneck carrier must accept another carrier's freight at a specified interchange point, to terminal trackage rights where the non-bottleneck carrier directly operates over the bottleneck carrier's network. The STB approach to considering all factors results in the assessment of the least intrusive remedy against a bottleneck carrier.\textsuperscript{85} Therefore the STB is more likely to prescribe a

\begin{quote}
 monopoly position, has shown a disregard for the shipper's needs by rendering inadequate service." (quoting Midtec Paper Corp. v. Chicago & N.W. Transp. Co., 3 I.C.C.2d 171, 181 (1986)).

In a fairly new development related to the UP-SP service crisis, the STB has also approved the use of these remedies "to provide temporary relief from serious, localized railroad service problems more quickly and effectively." See Expedited Relief for Service Inadequacies, Ex Parte No. 628, 1998 WL 887188, at *2 (Surface Transp. Bd. Dec. 21, 1998). The agency's decision to grant such relief is not premised on competitive considerations, but instead is based on a determination that "over an identified period of time, there has been a substantial, measurable deterioration or other demonstrated inadequacy in rail service provided by the incumbent carrier." See 49 C.F.R. §§ 1146.1(a) (1998); 63 Fed. Reg. 71,396, 71,401 (1998) (to be codified at 49 C.F.R. § 1147.1 (a)). Relief is available only when a shipper is able to obtain a commitment from another railroad to provide service and, once the incumbent can demonstrate that it can provide adequate service again, the relief ends. See id. at (b)(1)(C) & (d)(1), 1147.1(b)(1)(C) & (c)(1).

The effectiveness of these remedies to ameliorate the impact of a service breakdown remains untested.

80. See CP&L, supra note 5, at 7.
81. See id.
82. See CP&L, supra note 5, at 9 (quoting Midtec Paper Corp., 3 I.C.C.2d at 173-74).
83. See id.
84. See Vista Chem. Co. v. Atchison Topeka & Santa Fe Ry., 5 I.C.C.2d 331 (1989) (reciprocal switching); Shenango, Inc. v. Pittsburgh, C. & Y. Ry., 5 I.C.C.2d 995 (1989), aff'd sub. nom., Shenango, Inc. v. I.C.C., 904 F.2d 696 (3d Cir. 1990) (terminal trackage rights). When rejecting an argument that Congress intended reciprocal switching to be prescribed more frequently, the \textit{Midtec} court said, "If Congress intended any disparity in [the Board's] discretion to deny these
through route, rather than reciprocal switching or terminal trackage rights.

B. Price Ceilings

Price controls regulating maximum freight rates are closely tied to the three access remedies described above. During the 1970s, the ICC regulated freight pricing heavily, employing a policy of "rate equalization." Under rate equalization, the cost of shipping freight between two given points are the same on each competing network, regardless of the actual efficiency of each routing. In combination with the open routing practices described above, the ICC sought to "preserve the widest possible network of through routes in order to protect disadvantageously located shippers, and apparently viewed price competition on routes between the same two points as a form of improper 'discrimination.'"

This policy of rate equalization was abandoned after the reforms. Instead, "rate reasonableness" review was established which relied on the actual costs of the network. A shipper may petition the STB with respect to the rate reasonableness of a particular freight movement. Congress has fixed a universal benchmark for rate reasonableness claims in the United States Code. A railroad firm must show that the rate it charges "results in a revenue-variable cost percentage for such transportation that is less than 180 percent." The ICC interpreted this benchmark as a guideline that did not necessarily trigger a finding that a rate is unreasonable.

Subsequent adjudication has led the STB to determine whether rates are unreasonable by using constrained market pricing theory. Constrained market pricing theory examines the extent to which a firm may leverage prices on captive customers. The STB has recognized three pos-

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remedies, . . . it would almost certainly have been making reciprocal switching less rather than more available [than through routes]." See Midtec Paper Corp. v. United States, 857 F.2d 1487, 1501 (D.C. Cir. 1987) (later cited by CP&L, supra note 5, at 9 n.18).

87. See supra note 63 and accompanying text.
88. See Baltimore Gas, 817 F.2d at 110-11.
91. See id. Congress has also defined the components of "variable cost" in this calculation. This benchmark has remained relatively unchanged even though it was expected to be reduced as the health of the railroad industry improved. See Keeler, supra note 5, at 100.
sible approaches to apply constrained market pricing theory. In one approach, the stand-alone cost method, the shipper develops a hypothetical railroad and "calculate[s] the revenue requirements . . . to provide the rail service needed . . . free from costs associated with inefficiencies and free from cross-subsidies of other traffic." Using the data from this method, the STB then compares actual freight rates to determine whether they are excessive. Constrained market pricing theory may yield results that can justify a railroad's charges, even if they are substantially above the congressional benchmark.

Before examining the reasonableness of the rate, the STB must determine whether the railroad is "market dominant." Under the relevant statute, market dominance is defined as "an absence of effective competition from other rail carriers or modes of transportation." Until very recently, the STB had considered four factors that established market dominance: (1) lack of intramodal competition; (2) lack of intermodal competition; (3) lack of geographic competition; and (4) lack of product competition. Geographic and product competition are analogous to the source competition and product substitution concepts discussed in supra section II.

However, in late 1998, the STB has modified its position, considering only two factors: lack of intramodal and intermodal competition. Railroad firms are currently challenging the modified rules, petitioning to reopen the matter and threatening to appeal to the federal courts if the agency's position remains adverse. Regardless of which factors the STB will ultimately consider, they are an affirmative defense, and it is

94. The ICC recognized the following three approaches: (1) revenue adequacy; (2) management efficiency or pricing efficiency; and (3) stand-alone cost. See Coal Rate Guidelines, 1 I.C.C.2d 520, 537, 547 (1985), aff'd sub. nom., 812 F.2d 1444 (3d Cir. 1987).
95. See McCarty Farms III, supra note 93, at *3.
96. See, e.g., id.
97. See 49 U.S.C. § 10707(b) (1994). A showing that a rate exceeds a particular level does not necessarily establish market dominance. See id. at § 10707(d)(2).
98. See id. at § 10707(a).
100. See id. at 128. The ICC, in defining these two concepts, has stated: Geographic competition is a restraint on rail pricing stemming from a shipper's or receiver's ability to get the product to which the rate applies from another source, or ship it to another destination. Because the shippers and receivers can do this, the railroad must compete with the railroad serving the alternate source or destination. Product competition occurs when a receiver or shipper can use a substitute(s) for the product covered by the rail rate. In that case, the railroad must compete with the railroad or other mode who carries that other product, and again, must keep its rate competitive if it wants the traffic.
See id.
102. See Frank N. Wilner, Be Reasonable, TRAFFIC WORLD, Jan. 25, 1999, at 11.
incumbent on the responding railroad to present convincing evidence on any one of the four factors in order to avoid rate reasonableness review.103

The STB’s authority to review freight rates is limited to rates that the parties have not set by contracts.104 When a shipment is moved under a combination of a contractual agreement and a rate set by the STB, rate review extends only to the non-contractual portion of the movement.105 Outside of the limited exception for a combination of contract and non-contract movement of freight, a shipper can request review of only the entire rate charged.106 The STB has emphasized this point, quoting from an earlier United States Supreme Court case that said: “The shipper’s only interest is that the charge shall be reasonable as a whole.”107 In a recent ruling, the STB concluded that this approach “has continuing vitality.”108

C. APPLICATION OF THE COMPETITIVE ACCESS CASES

When these access remedies are construed narrowly and combined with a very onerous standard of federal appellate court review,109 it is unsurprising that many shippers have felt that the “deck is stacked against [them]” in obtaining regulatory relief.110 A review of the STB’s


104. Title 49 U.S.C. section 10709(c)(1) (1994) explicitly states that such contracts “may not be subsequently challenged before the Board or in any court on the grounds that such contract violates a provision [of the rate reasonableness statutes and regulations].”

105. See CP&L, supra note 5, at 13.

106. See id. at 12. The STB has emphasized this point with regard to the relevance of contracts in various disputes. The STB has explained that in “competitive access” cases, i.e., those cases involving a request by a shipper or railroad firm to obtain a through route, reciprocal switching or terminal access, “a contract may be used by a shipper to demonstrate that a connecting carrier should be required to provide competitive service.” See id. at 13 n.23. However, the STB notes, “In a rate case, review of the through rate would indeed subject the contract to regulation.” See id. Other older ICC decisions emphasize that rate relief is generally allowed only for the entire freight movement. See, e.g., BN-SF, supra note 10, at 76 (quoting UP-MP, 366 I.C.C. at 541).

107. See CP&L, supra note 5, at 12 (quoting Great Northern Ry. v. Sullivan, 294 U.S. 458, 463 (1935)).

108. See id. at 13 (citing Metropolitan Edison Co. v. Conrail, 5 I.C.C.2d 385 (1989)).

109. See, e.g., Western Resources, Inc. v. Surface Transp. Bd., 109 F.3d 782 (D.C. Cir. 1997) (examining “substantial evidence” standard of review for STB’s findings of no anticompetitive effects from merger); Midtec Paper Corp., 857 F.2d at 1496-97 (federal appellate court will overturn an agency’s interpretation of an ambiguous statute only if it is unreasonable).

110. See CP&L, supra note 5, at 9. See also Janusz Ordover & Russell Pittman, Restructuring the Railway for Competition, in WORLD BANK CONFERENCE ON COMPETITION AND REGULATION IN NETWORK INFRASTRUCTURE INDUSTRIES, 273, 275 (OECD 1995) (“Captive shippers regularly complain that such regulation does a poor job of protecting them from monopoly rail
application of these principles in two recent cases supports this perception.

The first, Central Power & Light Co. v. Southern Pacific Transportation Co. was a consolidated case that involved three different shippers and fact patterns. The first shipper, Central Power & Light (CP&L), opened a new generating facility in Coleto Creek, Texas, which could burn low sulfur coal mined from Wyoming's Powder River Basin. Southern Pacific (SP), whose railroad network did not extend to the Powder River Basin, provided exclusive service to CP&L. CP&L sought to obtain a rate on the SP network to the nearest interchange points with carriers who had direct access to the Powder River Basin coal mines and then sought to contract separately with those parties for that portion of the movement between the interchange point and the mine. SP refused to provide such a rate and CP&L petitioned the STB to prescribe a rate for the bottleneck portion of movement on the SP network.

The second shipper, Pennsylvania Power & Light (PP&L), owned four power stations served exclusively by Conrail. While PP&L originally received coal from mines in Pennsylvania, also served by Conrail, it sought to contract with mines that provided low sulfur coal in Kentucky and West Virginia served by other carriers. In earlier proceedings, the ICC prescribed a through route for access to the other mines. However, PP&L petitioned the STB to challenge the rate reasonableness of the bottleneck portion of the service at the established interchange points or, alternatively, to provide a local rate for the bottleneck portion of the movement.

The third shipper, MidAmerican, owned a power plant in Iowa that was served exclusively by Union Pacific (UP). UP provided single-line service to the shipper, delivering coal from mines in the Powder River Basin to MidAmerican under a contract set to expire in 1997. Anticipating the expiration of the contract, MidAmerican sought to obtain a local rate for coal movements to the plant from an interchange point with a competitor. MidAmerican then sought to bargain separately with the competitor for the competitive segment of the movement. UP denied MidAmerican's request and MidAmerican then petitioned the STB for prescription of a local rate.

The shippers argued that they could request a rate reasonableness review for bottleneck portions of a freight movement. The shippers tried to support their position by suggesting that their freight moved on "two journeys," one over a competitive segment and then a localized bottleneck.
neck movement. A shipper could then subject the bottleneck portion of the movement to separate review as a “local rate.” The shippers relied on two previous United States Supreme Court cases that suggested that such a division of rates was permissible in certain circumstances. However, the STB rejected each of the petitions and distinguished the facts of each case the shippers had brought forward. It concluded that CP&L failed to demonstrate that SP was providing inadequate service or that SP was exploiting its market power to trigger the competitive access remedies. The STB also rejected PP&L’s application to the extent that it could challenge the through route rate only over the entire portion of the movement and could not seek a local rate prescription for the bottleneck segment. The STB also denied MidAmerican’s petition on grounds substantially similar to the other shipper petitions. Finally, the STB bolstered its disposition of the MidAmerican petition on ripeness grounds since the contract with UP had not yet expired.

As the fact patterns of Central Power & Light indicate, the STB has avoided an approach that directly regulates the bottleneck portion of a freight movement for competitive access or rate reasonableness remedies. STB Commissioner Owen perceived the dispute in Central Power & Light as a tug-of-war “to transfer wealth from one great corporate entity to another [railroads to electric utilities] without a showing that the status quo is causing electricity rates to be higher than they otherwise would be and without a showing that there are inherent inefficiencies in the status quo.”

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112. See id. at 2.
113. A local rate is “a rate for transportation originating and terminating on the carrier’s line.” See id. at 2 n.3.
114. Great Northern Ry. v. Sullivan, 294 U.S. 458 (1935), arose out of a dispute involving a Canadian published tariff rate that was outside the ICC’s jurisdiction. Under these facts, a rate reasonableness analysis was applied only to the U.S. portion of the movement. The other case, Atchison, Topeka & Santa Fe Ry. v. United States, 279 U.S. 768 (1929), involved a dispute between railroads where one firm alleged that it was being foreclosed from using an established through route.
115. See CP&L, supra note 5, at 15.
116. See id. at 16-17. Interestingly, the Eighth Circuit, which reviewed CP&L, relied on the agency’s “considerable expertise in the economic underpinnings of the railroad industry” to affirm the decision. See MidAmerican Energy Co. v. Surface Transp. Bd., No. 97-1081, 1999 WL 60501, at *6 (8th Cir. Feb. 10, 1999).
117. The STB reasoned that ripeness was an issue because the contract with UP had not yet expired during adjudication. See CP&L, supra note 5, at 17.
118. See id. at 19 (Comm’r Owen, commenting). Commissioner Owen believed that “[t]he economic benefits of fewer railroads, coupled with deregulation have been enormous and largely shared with railroad customers.” See id. However, these shippers now “complain that they want even an even bigger share” of the savings even though they have considerable competitive options that place caps on market exploitation. See id. at 20. At the same time, Commissioner Owen apparently conceded that railroads were no longer revenue inadequate. See id. at 19.
The woeful state of shipper redress, however, is perhaps best illustrated by the litigation in *McCarty Farms v. Burlington Northern Railroad Co.*, which spanned approximately eighteen years. The petitioners in *McCarty Farms* were wheat producers in Montana that shipped much of their crop to ports in the Pacific Northwest. During the period in dispute, Burlington Northern (BN) was nearly the exclusive railroad transportation provider, serving 98% of all Montana grain elevators. BN controlled approximately 75 to 80% of the transportation market for transporting grain to these ports from Montana for the period 1981-84. Based on this evidence and other evidence showing a lack of geographic and product competition, the ICC concluded that BN was market dominant.

Despite the congressional benchmark setting the revenue-variable cost ratio at 180%, the ICC concluded that a reasonable benchmark in this case would be approximately 230% by obtaining data of comparable grain movements during the period in question. Nonetheless, using this elevated benchmark, the ICC found that rates in certain years were excessive. After a subsequent reversal and remand from a federal court, however, the STB used the stand alone cost method to determine the reasonableness of BN’s rates. The STB concluded that the McCarty Farms stand-alone cost hypothetical railroad had a “cumulative shortfall in revenues” and that BN’s rates were not unreasonable “[b]ecause the revenues that would be collected from the shipping group would not be sufficient for the [hypothetical] carrier.” Prior to this final STB decision, the *McCarty Farms* case was used as a model of an effective example of market dominance and unreasonable rates.

IV. ALTERNATIVE POLICIES TO INJECT COMPETITION

This section discusses three regulatory reforms that could better protect shippers from anticompetitive behavior stemming from bottleneck

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With respect to the electric industry, Commissioner Owen observed that 55% of the nation’s electricity is generated from coal and that somewhat over half of that coal was moved by railroad. Commissioner Owen also alluded to a new competitive option for electric utilities to “wheel” power on the wholesale market. Presumably, this option will allow utilities who have lower shipping rates to transmit power to other utilities facing steeper shipping costs. Wheeling power then acts as a form of intermodal competition. See *McCarty Farms III*, supra note 93; *McCarty Farms, Inc. v. Surface Transp. Bd.*, 158 F.3d 1294, 1296 (D.C. Cir. 1998).


121. See *id.* at 830.

122. See *id.* at 837-39.

123. See *McCarty Farms II*, 4 I.C.C.2d at 278.


125. See Wilson, *supra* note 8, at 58-62.
control: (1) divestiture; (2) enhanced price regulation and open routing reforms; and (3) various forms of mandated open access of the national railroad network. Before delving into these options, the burdens associated with escalating the level of regulation is examined.

A. THE ROLE OF REGULATION

Other regulations that enhance competition provide a means of offsetting the undesirable effects of deregulation. However, the cure may often prove worse than the disease, especially in situations where increased regulation imposes administrative costs for the regulatory agency and regulatory costs for the industry. Burdensome regulatory policies in the 1970s played a significant role in the financial decline of the railroad industry. Economists generally agree that extensive re-regulation would saddle the railroad industry's ability to compete with other modes of transportation. Therefore regulators need to carefully assess the regulatory tools available to them to minimize the burdens on the industry while encouraging the benefits of robust competition.

Regulators will invariably consider the effects of such policies on shippers and railroads. As one commentator has observed with respect to deregulating the gas industry and allowing some customers to "bypass" traditional service providers:

Changes in regulatory policies create winners and losers. In particular, competitive entry may improve the position of large industrial customers seeking to bypass the regulated utility while creating losses for captive customers who face higher prices after entry. Policymakers inevitably compare gains and losses, weighting them on the basis of various considerations, including the preferences of regulators, the political influence of the winners and losers and the ability of market participants to communicate with the regulators. If bypass leads to a price increase for captive customers and a price drop for switching customers, the regulator must evaluate the welfare effects in formulating regulatory policy toward entry.

This regulatory calculus is further complicated by rail labor—a third

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126. See, e.g., Keebler, supra note 5, at 96.
127. See, e.g., Ordover & Pittman, supra note 110, at 275 ("tighter regulation in the United States in the past ... brought many railroads to bankruptcy."); Tye, supra note 10, at 216 (a goal of railroad regulators should be to "minimize the scope of regulatory intervention"); see also Woodman & Starke, supra note 67, at 290.
interest group affected by competitive access reforms. Rail unions will most actively oppose regulatory reforms that are perceived as policies that adversely affect employment levels or working conditions. Access reforms are sufficiently amorphous in their impact on rail labor that they may provoke support or opposition. For example, divestiture and open access may be viewed positively because such reforms would create employment opportunities in the new firms that may enter the market to compete with incumbents. Rail labor may be less receptive if these reforms are perceived as worsening working conditions or displacing unionized workers of the incumbent railroads with a non-unionized workforce of the new entrants. Rail unions appear to have embraced the latter view. With respect to rail labor unions, regulators will face pressure to weigh the economic benefits of competition against labor impacts on unions.

Reforms encouraging competitive access will inevitably affect these parties differently and will require a careful consideration of these impacts. However, injecting competition into the industry eliminates the dead-weight loss to society associated with monopolies and creates greater efficiency in the industry. Pursuing a policy of efficiency should improve social welfare as shippers pass their cost savings to consumers. While using regulatory tools to guide the market toward efficiency may seem counterintuitive, successful policies to spur or preserve competition have often required government intervention. In their roles as antitrust regulators, for example, the U.S. Department of Justice and the Federal

129. While the rail workforce has decreased significantly, rail unions still remain well organized with the ability to reshape regulatory outcomes that would otherwise benefit railroads and shippers. See Rip Watson, Rail, Unions Unite To Deflect Shippers, J. COM., Feb. 1, 1999, at 1A. In the 1993-94 election cycle, rail unions contributed $1,929,507 to House and Senate campaigns throughout the country. Union contributions exceeded contributions from railroads. See David Barnes, Where the Money Flows, TRAFFIC WORLD, June 19, 1995, at 8.

In addition to rail labor, other interest groups, such as railroad industry suppliers or trade groups representing competing modes of transportation, may also seek to influence regulatory outcomes to their perceived benefit. For example, one trucking industry trade group has sought to have an impact on potential railroad competitive access reforms before Congress. See Frank N. Wilner, Truck-Rail War Looms, TRAFFIC WORLD, Feb. 22, 1999, at 12. However, such groups may play a less influential role than labor, shippers and railroads, because their interests are less directly affected by policy changes.

130. For example, labor unions were active in challenging recent STB policies that curtailed certain benefits that employees enjoyed if their railroad employer was the target of a takeover. See Association of Am. Railroads v. Surface Transp. Bd., 162 F.3d 101 (D.C. Cir. 1998).

131. In the European Union, rail labor has become opposed to access reforms, fearing that unionized employees of state railways will lose their jobs to non-unionized workers. See Aviva Freundmann, Strikes in EU Protest Railroad Competition Plan, J. COM., Nov. 24, 1998, at 12A.

132. See Watson, supra note 129, at 1A.

133. Shippers who are competing against other firms in their respective industries have incentives to pass these costs off to consumers unless regulations or other factors preclude competition. See, e.g., RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 7-10 (1986).
Trade Commission have attempted to preserve competition in the marketplace. While some role in policing the market improves social welfare through enhanced efficiency, the appropriate extent of antitrust regulation and an optimal regulatory policy for the railroad industry that avoids over-regulation remain contentious issues.

B. DIVESTITURE

In retrospect, some mergers have increased bottleneck problems and failed to deliver better service or increased efficiency. A policy of selective divestiture of certain railroad lines to create competing networks offers one solution to alleviate competitive concerns. Such a policy recognizes that many railroad mergers may benefit consumers or fail to raise competitive concerns in many instances. And, such a policy may encourage mergers that enhance competition. For example, the recent Norfolk Southern and CSX acquisition and division of the Conrail network has created two competing railroad networks linking the Northeastern states with the Midwest, replacing a single firm.

However, logistical problems may plague the effective implementation of divestiture policies. As railroad networks have consolidated, they have shed substantial portions of their track network and deferred maintenance on other portions, especially in the case of mergers involving parallel lines. In many instances, effective divestiture would tax substantial resources in simply rebuilding abandoned lines or improving existing secondary lines that would provide competition. Existing railroads face similar capacity and logistical problems from shedding too

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134. See United States Department of Justice & Federal Trade Commission, supra note 39, at 1-3.
135. See Robert H. Bork, The Antitrust Paradox: A Policy at War with Itself 10-11, 20-21 (1978); Posner, supra note 133, at 265-96. Posner emphasizes that antitrust policy should primarily police inefficient behavior. However, antitrust enforcement may play other important roles, including reducing economic concentration and corporate influence over the political system. See, e.g., Harlan M. Blake, Conglomerate Mergers and the Antitrust Law, 73 Colum. L. Rev. 555, 575-78 (1973).
136. The implementation of the UP-SP merger illustrates this point. See supra notes 52-56 and accompanying text.
137. Some investors have questioned the wisdom of this merger because of the high acquisition price. The merger was the result of a bidding war, where Norfolk Southern and CSX Transportation agreed to split Conrail’s assets rather than allow either to acquire it entirely. See Daniel Machalaba, Conrail's Breakup Plan Is Released by Norfolk Southern, CSX Corp., Wall St. J., Apr. 9, 1997, at B4. See also Stephen R. Klein, Transportation: Commercial, Standard & Poors Indust. Surv., July 17, 1997, at 3. Interestingly, the proposal to divide Conrail has the effect of undoing another poorly crafted merger: the Penn Central merger which combined two significant competing networks in the 1960s. See Daughen & Binzen, supra note 40, at 67-68.
138. Dempsey has observed this trend since the early 1980s. See Dempsey, supra note 62, at 568. As a recent example, the current plans to split Conrail also involve the elimination of “redundant” tracks. See Klein, supra note 137, at 3.
much trackage. In divestiture situations, the issue of who should pay for the restoration of the network also exists.

In addition to the high costs involved with rebuilding a network, divestiture also raises the challenge of recreating corporate entities that were merged out of existence several years ago. The lack of institutional knowledge of operations for these newly independent lines would create logistical problems unless other more experienced railroad operators assumed control of the lines. Because of the significant number of railroad mergers, few major railroads remain that have experience in large-scale operations, and even fewer have the operating knowledge of the region where independent operations are to be restored. Moreover, for these new entities or operators to succeed, they must be able to be competitive relative to their larger rivals. This could require access to a track network larger than the bottleneck or monopoly segments.

Regulators would also have to monitor other circumstances surrounding the implementation of a divestiture scheme carefully. The timing of the sale could alter the competitive position of any newly divested firm. The choice of buyers for the new entities is also an important consideration. An incumbent firm may attempt to weaken its divested rival by selling the divestiture assets to a competitively weaker buyer or selling during an unattractive time. These basic monitoring issues have been problematic in previous divestitures of other industries.

As operating problems persisted on UP-SP, the STB considered limited divestiture to alleviate competitive and service problems in the Houston, Texas, area. However, the STB ultimately rejected all divestiture schemes because service levels began improving on UP-SP. The board also concluded that the merger had not spawned anticompetitive conduct that would justify divestiture. In spite of the STB inaction, UP-

139. For example, in 1989, Burlington Northern decided to abandon parallel trackage that linked the Tacoma and Seattle, Washington areas to the Cascade Mountains. This segment of trackage linked a route that reached the Midwest. When capacity problems plagued Burlington Northern's other track segment, it decided to reopen the trackage in 1996. The cost of rebuilding the 77.9 mile mountain crossing was estimated at $125 million. See Bruce Kelly, The Thunder Returns to Stampeded Pass, TRAINS, Nov. 1997, at 39, 49.

140. East of the Mississippi River, two major systems will remain after the Conrail consolidation: CSX Transportation and Norfolk Southern. West of the Mississippi, BN-SF and UP-SP remain. There are also a few regional railroads that are dwarfed by the major networks, such as Wisconsin Central and Kansas City Southern. See also supra note 5.

141. An internal study conducted by the Federal Trade Commission has raised these concerns in examining the effectiveness of previous divestitures. See George S. Cary & Marian R. Bruno, Merger Remedies, 49 ADMIN. L. REV. 875 (1997).


SP has voluntarily coordinated operations and has even allowed joint ownership of certain facilities to limit the impact of its recent service difficulties.\textsuperscript{144} In the short term, these changes will probably not alleviate the service problems UP-SP has encountered since its consolidation, although it might enhance competition in the long run.

The limited scope of the STB proceedings with respect to a UP-SP divestiture in portions of Texas perhaps reflects the practical considerations discouraging divestiture. In short, the difficulties in determining which areas are adversely affected by competition, in allocating costs for rebuilding abandoned or ill-maintained trackage, and in determining the scope of a divested firm's operations require significant regulatory intervention. Moreover, while divestiture may limit the competitive problems associated with bottleneck control, it is unlikely to eliminate every bottleneck situation.

C. Regulation of Rates and Choice of Interchange Point

Over the years, shippers have advanced proposals, such as creating easier access for reciprocal switching, terminal facilities, or joint rates to encourage greater competition.\textsuperscript{145} Shut out from the STB, shippers are again petitioning for relief from Congress.\textsuperscript{146} The latest incarnation of these reform efforts is the Railroad Competition and Service Improvement Act of 1999 pending before Congress that seeks to "ensure reasonable rail rates for captive shippers."\textsuperscript{147} Among other things, the proposed bill overturns \textit{Central Power & Light} in favor of shippers. It permits a shipper to request a rate for any two points of a movement "where traffic originates, terminates, or may reasonably be interchanged" without regard to "whether the rate established is for only part of a movement between an origin or destination" or "whether the shipper has made arrangements for transportation for any part of that movement."\textsuperscript{148}

The proposed bill extends STB rate review even if the parties have

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\item[145.] For example, Woodman and Starke analyzed a bill that was proposed in 1987. See Woodman & Starke, \textit{supra} note 67, at 282. See also \textit{The Railroad Shipper Protection Act}, S. 1429, 105th Cong., 1st Sess. § 5 (1997) (representing the most recent failed bill seeking shipper relief).
\item[146.] While many shippers seek reforms, they are not a monolithic group. Many shippers disagree on the appropriate approach and form of any remedial legislation. See Rip Watson, \textit{Rail Reform Uncertainty Remains as Sides Differ}, \textit{J. Com.}, Jan. 27, 1999, at 1A; Rip Watson, \textit{Rail Group Ponders Approaches To New Congress on Competition}, \textit{J. Com.}, Jan. 21, 1999, at 1A. One group, however, plans to use the failed bill as a model for the new one. See Rip Watson, \textit{Shippers Seek CURE for Rail Competition Ills}, \textit{J. Com.}, Feb. 10, 1999, at 1A.
\item[147.] See S. 621, 106th Cong., 1st Sess. § 2(3) (1999).
\item[148.] See id. at § 5(a).
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contracted for some form of service as long as the shipper is seeking a rate that does "not apply to transportation covered by such a contract."149 In addition, the proposed bill supports the STB’s most recent position and prohibits consideration of “evidence of product or geographic competition in making a market dominance determination.”150 The proposed bill also remedies many of the barriers agricultural shippers have faced in cases like McCarty Farms.151 However, it does not address the appropriate measure for establishing the reasonableness of rates, which currently appears to be the stand-alone cost method used in McCarty Farms.152

The adoption of such proposed reforms would effectively regulate all bottlenecks for rate reasonableness and allow greater routing freedom for shippers. The Association of American Railroads (AAR), a trade group that represents the major railroads in North America, submitted comments in Central Power & Light which suggested that bottleneck shippers constituted a substantial traffic base of the major railroads.153 Moreover, the AAR’s experts estimated that enforcing price ceilings on bottleneck movements, like the reforms envisioned in the failed legislation, would reduce annual industry-wide revenues by $1.5 to $2.4 billion.154

Reforms of this type will also impose administrative costs. In the short term, the reforms would increase the number of cases the STB would have to resolve. However, once a growing body of administrative decisions shapes the extent of shipper relief, these costs would probably decrease.155

Such reforms may also harm the railroad industry. The reforms return railroad policy closer to an “open routing” and “rate equalization” system.156 Critics of such regulations allege that they effectively limit the ability of railroads to differentially price commodities.157 One critic has

149. See id. at § 5(b).
150. See id. at § 8.
151. See id. at § 6. Section 6 shortens the length of proceedings, lowers the cost of filing an action, simplifies rate reasonableness review, and creates service obligations on railroads for captive grain shippers that ship fewer than 4,000 cars annually.
152. See supra notes 93-96 and accompanying text.
154. See id.; CP&L, supra note 5, at 12 n.21.
155. Posner’s general observations of the force of precedent in the adjudicative process is illustrative. See POSNER, supra note 133, at 509-15. As precedent builds in an area of law, it “reduces the costs of litigation by enabling the parties to a case, and the tribunal also, to use information that has been generated . . . in previous cases. See id. at 515.
156. See supra note 63 and 86-88 and accompanying text.
157. In Central Power & Light, the AAR asserted that the requested shipper relief prevents railroads from pricing services differentially. See CP&L, supra note 5, at 12 n.21. The AAR contends that differential pricing is essential to recoup joint and common costs associated with
argued:

Any mandated reduction in rates for a specific commodity would have a destructive effect on the rail carriers' ability to differentially price. Any such mandated reduction would require rail carriers to increase rates on other traffic. As a result, traffic subject to intermodal competition would shift to other transportation modes where it could move at lower rates, leaving the rail carriers with less market share and decreased sources of revenue to cover their costs. Any contribution made by those shippers to capital and operating costs would be lost, forcing carriers to make up that shortfall through rate increases on the remaining traffic to the extent competitive pressures permit. The ultimate effect would be a loss of the ability to differentially price rail service, resulting in rate increases, lost traffic, decline in revenues, lost jobs and deterioration in service . . . .158

However, a profit-seeking firm would not provide transportation for freight that does not generate additional profits, relying on other captive shippers to subsidize this traffic. Instead, a railroad would decline to offer or provide services that face excessive levels of competition.159 However, this critique does have force to the extent that railroads have returns to density.160 Intuitively, this conclusion seems reasonable since railroads require massive fixed costs to establish a functional right-of-way. Once these costs are paid, the railroad simply incurs the variable costs associated with moving freight up to the physical capacity of the


158. See Woodman & Starke, supra note 67, at 282. In criticizing the shipper petition for relief in Central Power & Light, the AAR also provided a grim forecast of the effect of such remedies. The AAR contended that railroads will substantially curtail capital expenditures and that the industry will begin to decline less profitable intermodal traffic, so that trailers and shipping containers "would be driven back onto the highway" rather than on trains. See Association of American Railroads, supra note 153, at 21-22.

159. See, e.g., Jim Giblin, Making Rail Intermodal Profitable, TRAINS, July 1998, at 64, 66 (describing Santa Fe's decision to abandon Chicago to Denver routing of intermodal traffic for cost reasons).

160. See Douglas W. Caves, et al., Network Effects and the Measurement of Returns to Scale and Density in the Railroad Industry, in ANALYTICAL STUDIES IN TRANSPORT ECONOMICS 97-120 (Andrew F. Daughety, ed., 1985) [hereinafter Caves et al., Network]; Douglas W. Caves, et al., Productivity Growth, Scale Economies, and Capacity in U.S. Railroads, 1954-74, 71 AM. ECON. REV. 994 (1981) [hereinafter Caves et al., Productivity]. Caves et al., have described returns to density as "the proportional increase in output made possible by a proportional increase in all inputs, with network and input prices held fixed." See Caves et al., Network, supra, at 100. Returns to density should not be confused with returns to scale, which they define as a "a proportional increase in both output made possible by a proportional increase in all inputs, with input prices fixed." See id. They conclude that the industry does have returns to density, but not returns to scale. See id. at 109-10, 112.
network. Thus, a railroad has incentives to price differentially to the extent it can obtain from captive shippers a greater share of fixed costs in order to pursue other traffic as long as it provides revenues in excess of variable cost and there are no capacity constraints in adding more freight. In this manner, the firm can acquire an optimal mix of traffic.

The validity of this critique rests on two important assumptions. First, it assumes that railroads are unable to price their services differentially. Railroads may still use differential pricing until reaching the price ceiling. Even if shippers have open routing and some form of rate equalization, railroads may raise their rates on competitive segments of the line to shippers of certain commodities that are traditionally considered "captive," like coal shipments, to recover a greater contribution of their fixed costs rather than at the bottleneck. This pricing strategy would equalize rates across commodity groupings, treating bottleneck and non-bottleneck shippers similarly. Second, this critique assumes that the price ceiling placed on the STB's rate reasonableness review is so low that it prevents any discriminatory pricing practices. The resolution of the McCarty Farms case demonstrates that the price ceiling on rate reasonableness is relatively high and underscores the need for limiting the upper bound of rates because of the limited competitive options many shippers face.

The Canadian experience also undermines criticism of such reforms. In the late 1980s, Canada adopted similar legislation to counteract other deregulatory measures. The regulations apply to shippers who have access to only a bottleneck carrier at either the origin or destination. The regulations permit shippers to request a "competitive line rate applicable to shippers of certain commodities that are traditionally considered "captive," like coal shipments, to recover a greater contribution of their fixed costs rather than at the bottleneck. This pricing strategy would equalize rates across commodity groupings, treating bottleneck and non-bottleneck shippers similarly. Second, this critique assumes that the price ceiling placed on the STB's rate reasonableness review is so low that it prevents any discriminatory pricing practices. The resolution of the McCarty Farms case demonstrates that the price ceiling on rate reasonableness is relatively high and underscores the need for limiting the upper bound of rates because of the limited competitive options many shippers face.

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In economic terms, variable cost is defined as a cost directly related to output, increasing as output increases. See Paul A. Samuelson, Economics 464-66 (9th ed. 1973).

162. Baumol and Willig described the need for differential pricing in Central Power & Light by noting that with vigorous competition in the non-bottleneck portion of an end-to-end railroad service, market forces can be relied upon to drive the prices of that portion of the rail service toward incremental cost. If the revenues attributable to the related bottleneck service are not allowed to cover more than the purported stand-alone costs of the bottleneck(s), it follows inexorably that there would be no source for which to recoup any of the very substantial fixed and common costs of an end-to-end movement.

See Baumol & Willig, supra note 16, at 12.

163. See supra notes 93-96 and accompanying text.


165. See Canada Transportation Act, ch. 10, 1996 S.C. § 129(1) (Can.).
to the movement of the traffic between the point of origin or destination, whichever is served exclusively by the local carrier, and the nearest interchange with a connecting carrier."\textsuperscript{166} Thus, a shipper may "designate the continuous route for the movement of the . . . traffic."\textsuperscript{167} This relief is subject to certain restrictions, including a cap on the length of the bottleneck portion and consent from the connecting carrier to provide service.\textsuperscript{168} Such relief is available to all shippers, except for intermodal shippers, unless their traffic originates or terminates in a port.\textsuperscript{169} The longevity of such reforms and the present strength of the Canadian railroad industry suggest that the dire consequences propounded by critics of such reforms may be exaggerated.\textsuperscript{170} However, the benefits of the regulations also remain unclear.

D. More Radical Regulatory Reform: Open Access

Railroad firms provide two distinct services: they maintain track networks and operate trains. By "unbundling" these services, firms could "rent" railroad trackage for their operations without owning a network, while other firms may simply own the right-of-way, renting it to operators, without moving any freight. Open access would foster the most direct form of competitive access. Just as truckers pay for their highway usage, tenants of the track network would operate over something akin to a system of private toll roads, paying according to their usage.\textsuperscript{171}

Conceptually, such an arrangement is not far removed from the pres-

\textsuperscript{166} See id. at § 130(1).
\textsuperscript{167} See id. at § 130(4).
\textsuperscript{168} See id. at § 131(1) and (4).
\textsuperscript{169} In the language of the statute, a competitive line rate cannot be established for "the movement of trailers on flat cars, containers on flat cars or less than carload traffic, unless they arrive at a port in Canada by water for movement by rail or by rail for movement by water." \textit{Id.} at § 131(3).
ent state of the industry. Joint use of facilities and equipment coordination are not uncommon in the industry and have deep historical origins. *United States v. Terminal Railroad Association* provides an excellent example of directly mandated joint use of facilities.172 The Terminal Railroad Association represented a collective of railroads that owned terminal trackage in St. Louis, Missouri. Twenty-four railroads converged on St. Louis, terminating in an equal proportion west and east of the Mississippi River, but none crossed the river. The association controlled the only two toll bridges that crossed the river and connected the carriers.173 Eventually, it also gained control of the terminal trackage of the only ferry line that offered rail transportation service across the river.174

The association was effectively a monopoly in control of all bridge traffic in St. Louis,175 charging non-member railroads higher rates and increasing rates on certain shippers.176 The association enforced the higher rates by limiting membership, which was allowed only on the unanimous consent of the existing members, and by foreclosing future rivals from entering the market through the membership agreement which obligated members to forever use the association’s facilities for their traffic.177 Recognizing that efficiencies and public policy considerations favored maintaining unified terminal lines rather than having “‘the city cut to pieces with the many lines of railroad intersecting it in every direction,’”178 the United States Supreme Court elected to require open access to the terminal facilities.179 The open access remedy allowed all railroads to join the association if they wished and required nondiscriminatory pricing for any party using the terminal service. The remedy also created the opportunity for other rivals to become terminal network providers by allowing anyone in the association to use other terminal facilities in the future.180

More contemporary examples of open access situations also exist. Trackage rights arrangements, which allow a tenant railroad to operate on a designated segment of the network paying on a use basis, represent

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172. See 224 U.S. 383 (1912). *Terminal Railroad* has also been recognized as the case that founded the “essential facilities” doctrine in antitrust law. See Areeda & Hovenkamp, supra note 11, ¶ 772b1, at 179.
173. See id. at 395.
174. See id. at 394.
175. Significantly, as a case decided during the early part of the twentieth century, intermodal competition was not an issue in this case because it predated trucking.
177. See id. at 399-400.
178. See id. at 403 (quoted source omitted).
179. See id. at 411-12.
180. See id. at 411.
another manifestation of joint use of a network. In the most recent wave of railroad consolidations, the STB and ICC imposed expansive trackage rights arrangements on merging parties and competing carriers to protect competition in regions adversely affected by the mergers. The STB has recently permitted open access on a national scale by allowing Amtrak, the nationalized passenger rail provider, to provide express service for freight on lines it rents from railroads who compete for the same traffic. In addition, voluntary agreements exist, although they typically involve the coordination of the movement of freight and do not permit the tenant operator to compete with the landlord for customers on the network. One clear explanation for the lack of such an arrangement is that the owners of the network are better able to fully exploit their bottleneck segments without access because it would be impractical for a new firm to build a competing network.

Generally, open access regulation requires network owners to allow any operators to use their network on a nondiscriminatory basis, with the landlord charging itself the same cost to use the network as any other competitor. The key to engendering effective competition under an open access system is to ensure that landlords receive an amount of rent that encourages them to maintain the network without exploiting their ownership of the network. A rental rate that is set too low would encourage tenants to exploit the low rate while creating competitive burdens.

181. See supra note 62 and accompanying text.
183. Numerous examples of such arrangements are provided in Massa, supra note 5, at 432 n. 104. See also, e.g., Hemphill, supra note 32, at 36-47. Amtrak is also working to permit access on its passenger-only track network in the Northeast to Norfolk Southern. See Daniel Machalaba, Norfolk Southern and Amtrak Discuss Running Freight on High-Speed Route, WALL ST. J., Jan. 19, 1999, at A3. Another form of a track sharing arrangement is provided in the National Detour Agreement, signed by several railroads, which allow “one railroad to use the tracks of another railroad to avoid temporary service disruptions caused by construction or other unforeseen events such as derailments or natural disasters.” Jahanshahi, supra note 171, at 29.
184. As Alfred Kahn has put it: “Mandatory interconnection becomes the logical way to ensure competition in the presence of concentrated control over nodes that cannot practicably be duplicated . . . it makes sense to require railroads to make their trackage available to competitors, where nobody is going to build a new major track for over 1,000 miles.” See Alfred E. Kahn, panelist, in Exclusionary Conduct, 57 ANTITRUST L.J. 723, 740 (1989). And, according to the AAR’s filings in Central Power & Light, railroads have approximately $1.5 to $2.4 billion in annual revenues at stake if bottleneck segments were opened to competition. See Association of American Railroads, supra note 153, at 20.
186. See id. at 97-101. Baumol and Sidak argue that the rent a tenant should pay on the network should include the economic costs associated with use, such as wear and tear on the track network, as well as the opportunity cost of allowing the operator to occupy the track when the landlord could be providing the service.
dents on the landlord. The assessment of the appropriate fee has been a contentious issue in the railroad industry where parties have often challenged the fees assessed by landlord railroads for trackage rights.187

The general principles of open access have been endorsed in other deregulation settings, most notably in the telecommunications field. After the AT&T antitrust settlement in the early 1980s, newly created regional telephone companies, carved from AT&T, were required to provide long distance telephone companies “equal access” to local telephone lines and switching facilities required to reach local customers.188 And more recently, Congress created an affirmative duty on local exchange carriers,189 who have historically controlled bottleneck networks—local telephone lines—to provide to “any requesting telecommunication carrier” interconnection onto the network at nondiscriminatory rates “at any technically feasible point within the . . . network.”190 The regulations also permit the local exchange carrier to charge a rate that is “based on the cost . . . of providing the interconnection or network element” and includes a “reasonable profit.”191

One observer explained the necessity of such regulations:

There is only one local exchange network today—that of the incumbent LEC [local exchange carrier]. At present, all LEC competitors are dependent on the ability to use that existing network—in part or in whole—in order to provide local exchange service comparable to the LEC. To meaningfully compete with the LEC competitors must have access to that network at the same price as the incumbent, i.e., the direct economic cost of such access.192

These regulations allow other firms to rent capacity on the local bottleneck to provide any range of services at their cost plus a reasonable return for the network owner. Because of the nondiscriminatory element of these regulations, one local exchange provider has actually unbundled network ownership and service over the network by separating its opera-

187. For example, in the UP-SP merger proceedings, the compensation for trackage rights agreements became a contentious issue. See UP-SP, supra note 47, at *119-21. See also Marshall & Cook, supra note 4, at 25-29 (arguing the costs associated with labor protection liability should be included in competitive access fees).


189. A local exchange carrier is “[a] provider of local transport and exchange service—the local telephone company.” See BAUMOL & SIDAK, supra note 185, at 147.


191. See id. at § 252(d)(1).

Injecting Competition in the Railroad Industry

However, the success of these recent open access measures remains uncertain, in part because of the novelty of the reforms and unresolved issues with respect to implementation, and also in part because of legal questions.

Other nations have implemented varying open access strategies in the railroad industry to achieve different goals. For example, in the United Kingdom, government efforts to privatize the industry and encourage competition led to the creation of a firm that owns the track network and rents it to train operators. This open access policy has attracted foreign investment, including one U.S. firm that manages a train operator in the United Kingdom. Three freight operators compete under this system, with one firm maintaining an 80% market share; others are considering entry into the market. At present, the freight operators seem to be enjoying economic success and greater investment in the railroad infrastructure is occurring, although some conflicts have arisen.


194. Using the Frontier example in supra note 193, as of mid-1997, the incumbent service provider appeared to maintain in excess of 95% of the business in spite of open access. See Duff & Phelps Cites Poor Results in Downgrading Frontier Ratings, Comm. Bus. & Fin., May 26, 1997, at 4. However, more vigorous competition is expected as new start-up firms emerge. See Mike Dickinson, Tiny Phone Firm Plans Local Service, Rochester Bus. J., Apr. 11, 1997, at 1.


196. For example, Sweden has "separated track services and train operation into two public agencies, with the train operator paying charges for track use." See Ordover & Pittman, supra note 110, at 276. Competing train operators have also used the network. However, the purpose of this reform was to facilitate equalization of rail and truck carriers, and not to engender competition. See id. In contrast, the United Kingdom's effort to create an open access system, which is described in the text, was intended to encourage competition and efficiency over the previous national railroad system. See id. In addition, reforms in the European Union are underway to transform the national railway systems into "freeways" open to other private operators. These reforms, however, are in their infancy. See supra note 171. In Germany, United Parcel Service is now considering running overnight trains over state owned tracks. See UPS Will Decide Soon If Overnight Rail Service in Germany Is Feasible, J. Com., Jan. 5, 1999, at 12A.

197. See Ordover & Pittman, supra note 110, at 276.

198. Wisconsin Central Transportation has acquired a 34% stake in the English Welsh & Scottish Railway, a train operator. Interestingly, Wisconsin Central has characterized its main competitive rival as the trucking industry. See Wisconsin Central Transportation Corp., Annual Report 10-13 (1997). See also Mel Holly & Nigel Harris, Britain's Freight Rail Revolution, Trains, July 1998, at 54.

199. See Holly & Harris, supra note 198, at 62-63.
arisen with the entity that owns the track network over infrastructure and the appropriate rental fee. Like the open access provisions in the domestic telecommunications industry, an accurate assessment of the British reforms is still too premature.

A system of open access injects actual competition onto every track segment through easier firm entry and exit. Train operators can utilize the network like a system of toll roads, competing for traffic without incurring the substantial capital costs associated with building a network infrastructure. However, direct access raises two regulatory issues: setting the appropriate rental rate for tenants and monitoring landlord behavior to prevent discriminatory practices that impair tenant operators.

With respect to the rental rate, it is the linchpin that is necessary to encourage competition while providing network owners with the incentive to invest in their right-of-way. Thus, careful monitoring of the rental rate is required. The U.S. railroad industry's opposition to such reforms echoes the fear that regulatory monitoring will be ineffective. One executive has argued that if the rental fee is set too low or does not permit a landlord to discriminate for the type of traffic hauled, the incentives for capital improvements will disappear:

[H]ow many railroad owners do you think are going to continue to pour billions of dollars into capital improvements in their franchises so that a competitor can come in and take the best traffic? . . . [I]t is not hard to imagine open access fostering the creation of a new breed of “independent carriers” who own no rail lines of their own, who would have no obligation to maintain and provide service over an extensive rail system, and who operate exclusively over the lines of other carriers. With minimal capital investment costs, such carriers would be free to skim the most profitable business, leaving the landlord railroad with only the least profitable business while it continues to bear the extensive burden of the common-carrier obligation.

And, from the standpoint of institutional choice between administrative regulation of rates and market forces, one railroad executive has said:

Tempting as it is for customers to push for access, I’d be worried about continued investment. Now, you might say “Well, the costs of access could be set high enough to encourage investment.” I’d reply, “Who’s going to decide? Do we really want to entrust our 21st Century to a new system of

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200. See id. at 58 and 63. In a very recent decision, the British courts have limited the permissible return the track owning entity can earn. The decision will likely lower access fees to operators. See Aviva Freundmann, British Rail Owner Reined In, J. COM., Dec. 11, 1998, at 13A.


Open access reforms may also affect a network owner's ability to price certain traffic differentially, creating the same problems outlined in section IV.C of this Article. The validity of such a claim will be resolved by the ceiling set for various rental rates. Two possible methods to avoid "cream-skimming" situations that have been proposed in the telecommunications industry are: (1) fully allocating network costs onto the user; or (2) creating a tax surcharge on entrants that will subsidize network costs. 204

With respect to discriminatory behavior, landlords maintain a position—through control of train dispatching and maintenance outlays—that may permit them to subtly discriminate against tenants, thus rendering a tenant's train service less reliable. In the telecommunications context, one commentator has suggested that a regulated firm "will have the strongest incentive to discriminate against suppliers of the new services that most reduce the demand for its own service." 205 Here, the landlord, who is regulated by open access rules, also provides unregulated train operating services in which it has an interest to maintain a dominant position on the network for train operations. Regulatory evasion will be most acute in circumstances where the tenant would offer a service distinct from the type or quality provided by the landlord's unregulated train operations, thus making it difficult for regulators to determine whether the landlords is providing the network service efficiently. 206

This problem becomes apparent by examining present trackage rights agreements where tenant railroads have lodged complaints about working with landlords. 207 For example, during UP-SP merger proceedings, one BN-SF executive characterized trackage rights as less desirable than exclusive ownership of the network. 208 Prior ICC and STB decisions have also emphasized the importance of "single-line" service to shippers, as opposed to joint operations, interchange or trackage rights to achieve

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203. See id. at 35 (quoting David R. Goode, CEO of Norfolk Southern).
205. See Brennan, supra note 38, at 755.
206. See id.
207. For example, Southern Pacific, before merging into UP-SP, complained about Union Pacific's management of lines that it operated via trackage rights, alleging inadequate capitalization of tracks and unequal treatment of trains. See UP-CN,W, supra note 12, at 20-21. BN-SF has also complained about the trackage rights the STB awarded it in UP-SP. It has alleged that UP-SP has handled BN-SF trains more slowly and given lower priority than UP-SP counterparts. See Union Pac. Corp.—Control—Southern Pac. Corp., Fin. Docket No. 32760, 1998 WL 887187, at *18 (Surface Transp. Bd. Dec. 21, 1998).
the same ends. In addressing this concern, regulators could simply bar network owners from maintaining train operations in order to avoid such discrimination.

However, these difficulties have not thwarted a clearly successful example of open access—the Terminal Railroad Association case discussed earlier, which imposed such a remedy at the turn of the century. Assessing the costs for capacity use on networks may be easier to measure because railroads have offered varying train services for a number of years. Furthermore, conceding the validity of these criticisms lends support for massive divestiture of track networks to recreate the parallel lines and represent a critique of present STB policies using trackage rights to preserve competition after mergers.

Alternative configurations of open access may alleviate some of the problems associated with a regulatory body deciding how to price network usage. Restructuring the national track network as a non-profit organization collectively owned by railroad operators may alleviate the need for governmental price regulation. Collective ownership of a non-profit organization may prevent anticompetitive behavior and encourage the incentives to maintain the appropriate investment in the network. Some economists have made similar observations with respect to agricultural cooperatives. Several major railroad firms have used a similar structure to cooperatively own and manage a freight equipment leasing concern.

Direct government ownership of the network, just like the U.S. inter-

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209. See, e.g., UP-CNW, supra note 12, at 63 (stating that "[t]o achieve . . . efficiency gains and improve service, applicants need . . . to develop and implement a coordination plan based on common management objectives."). See also Massa, supra note 5, at 430-32.
210. See Brennan, supra note 38, at 756.
211. See supra notes 172-80 and accompanying text.
212. See Williard F. Mueller, et al., The Sunkist Case: A Study in Economic Analysis 68-69, 201-02 (1987). A for-profit collective enterprise may create serious antitrust problems because incentives may exist to foreclose other entrants from using the network or charging monopoly rents for network access. However, non-profit arrangements must also be scrutinized carefully.
213. See Mueller, et al., supra note 212. The authors discuss the Federal Trade Commission's antitrust suit against the Sunkist growers cooperative and find that the cooperative posed no anticompetitive harms because of its organizational structure.
214. In 1955, the ICC permitted several railroads to create a collective entity to pool freight cars in spite of antitrust concerns, because it was viewed in the public interest. The company, currently known as TTX, continues to play a significant role in pooling intermodal and other freight equipment. See Trailer Train Company—Pooling of Car Service, 5 I.C.C.2d 552 (1989).
state system, may also alleviate the need for pricing regulations. Direct ownership, however, also transfers decisionmaking into the political realm, opening the door for interest group influence on network infrastructure, much like federal highway appropriations. These alternative modes of open access, however, involve the direct taking or restructuring of private property by the federal government. As such, they raise a special set of issues under the Takings Clause of the United States Constitution and likely require the government to compensate the current network owners.

V. Conclusion

After years of consolidations, the railroad industry has grown very concentrated, creating greater instances of bottleneck trackage. Service has also failed to improve significantly in the wake of the most recent railroad consolidations. While the true economic harm from these trends has not yet been quantified, they suggest that the railroad industry is standing at a crossroads. History has demonstrated that a laissez faire approach in markets does not necessarily lead to competition. Indeed, one writer has recently concluded that “Free markets, if left completely to their own devices, can wind up truly unfree. Competitive capitalism did not exist in a state of nature but had to be defined or restrained by law.”

The current regulatory regime provides little relief for shippers to counteract these industry trends and preserve competition. As one railroad analyst has described the situation: “Shippers perceive [the STB] to be a wholly owned subsidiary of the railroad industry.” While the STB


216. Depending on the extent of government control, such open access regulations could be viewed, for example, as physical occupations of private property. See Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419 (1982). See also supra note 195 on the Takings Clause issues relevant to telecommunications open access regulations.

217. For example, the author of a recent biography of John D. Rockefeller, Sr.—the man behind the creation of the Standard Oil trusts—concludes that Rockefeller was not interested in competing with his rivals, but in crushing them. Rockefeller sought to bring “cooperation” to the oil industry by controlling prices, production, profits, and employment levels. Indeed, he criticized “the chaotic condition in which virtuous academic Know-Nothings about business ... were doing what they construed to be God’s service in eating each other up.” See Alan Murray, Reading Rockefeller and Busting Up Trusts, WALL ST. J., May 18, 1998, at A1. See also RON CHERNOW, TITAN: THE LIFE OF JOHN D. ROCKEFELLER, SR. 297 (1998).

218. See CHERNOW, supra note 217, at 297.

219. See Ingersoll, supra note 45, at A2 (quoting Frank N. Wilner, a Washington-based railroad analyst). A recent government survey of shipper views of the STB’s remedies available to shippers in rate challenges reaffirms this view. Significantly, 69% of responding shippers indicated that they were disinclined to bring a complaint before the STB because the agency would
has implemented some reforms aimed at reducing discovery abuse and
delay in shipper proceedings, and implemented other reforms intended to
reduce shipper burdens in bringing forward competitive access claims,
other more sweeping reforms may better resolve the competitive
problems in the railroad industry. Three alternate forms of regulation
may be employed to protect competition: (1) massive divestiture; (2) ag­
gressive rate regulation and similar competitive access remedies for ship­
pers; and (3) open access.

All three offer unique advantages and burdens. While massive di­
vestiture requires a substantial initial reconfiguration of railroad net­
works, it holds the promise of returning the industry to the more intense
competition that existed prior to the more recent wave of mergers. More
vigorous use of rate ceilings and competitive access remedies increases
the long-term role of regulatory oversight, but promises a direct venue to
remedy anticompetitive behavior. Open access creates significant imple­
mentation and regulatory issues, but provides the most comprehensive
remedy to permanently inject competition on every bottleneck segment
on the national network. One or a combination of these reforms may be
necessary to unravel the competitive problems that have developed as a
result of the STB's and ICC's policy of granting virtually every merger
application. Ultimately, it is unfortunate that this state of affairs has
arisen as a result of the policies pursued by the ICC, which was originally
created in 1887 to “shield the public against the monopoly abuses of the
railroads.”220

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likely rule against them. See United States General Accounting Office, Railroad Reg­
ulation: Current Issues Associated with the Rate Relief Process 46-47 (1999). Fur­
thermore, many shippers responding to the survey sought greater reforms than the STB has
currently offered. See id. at 57-59.

220. See Dempsey, supra note 62, at 505.
The Spread of Tuberculosis in the Aircraft Cabin—
Issues of Air Carrier Liability

Ruwantissa I.R. Abeyratne*

I. INTRODUCTION

When there is incontrovertible evidence of a person contracting a disease, such as tuberculosis, as a result of being infected in an aircraft, liability issues pertaining to the airline arising from the incident may involve principles of private air carrier liability. The Warsaw Convention of 1929 provides that the carrier is liable for damage sustained in the event of death, wounding or any other bodily injury suffered by a passenger, if the accident causing the damage took place on board the aircraft or in the course of the operations of embarking or disembarking. Of course, on the face of the provision, the words “wounding” and “bodily injury” do not necessarily lend themselves to be associated with infection. A fortiori, according to the Warsaw Convention, the wounding or injury must be caused by “accident” which is not typically a synonym for “infection.” However, the recent decision in El Al Israel Airlines Limited v. Tseng introduced a new dimension to the word “accident” under the Warsaw Convention by giving it pervasive scope to include such acts as security.

* DCL (McGill) LL.M (Monash) LL.B (Colombo) FRAES, FCIT. The author, who is a senior official at the International Civil Aviation Organization (“ICAO”), has written this article in his personal capacity and its contents should not be attributed to his position at the ICAO Secretariat.

body searches performed by the airlines. In this context, the word "accident" loses its fortuity, and it becomes applicable to an expected or calculated act. Thus, if an airline knows, or ought to have known that an infected passenger was on board its flight, causing others on board to be infected, it may well mean that the act of the airline would be construed by the courts as an accident within the purview of the Warsaw Convention.

This article evaluates the principles of legal liability that may apply to air carriers with regard to passengers contracting tuberculosis while flying in their aircraft. This evaluation will be made both under the common law principles of tort law and the liability principles contained in the Warsaw Convention.

II. TUBERCULOSIS

*Mycobacterium tuberculosis* was identified in the 19th Century as causing tuberculosis ("TB"), which now ranks as the world's most deadly infectious disease. An estimated three million people die from TB annually, and scientists have yet to find a vaccine for the prevention of the disease. The World Health Organization ("WHO") has recorded that approximately one third of the world’s population is infected with the TB bacterium, and it is estimated that nearly eight million cases may have occurred worldwide in 1996.

The mycobacteria settle in and destroy a person’s lungs over time. The mycobacteria can also move to other organs such as the brain, liver, kidneys, and spine, triggering off a battle between the bacteria and the body's immune system. Mycobacteria are transmitted from an infected person in a sneeze or cough, carried through the air in what are known as "droplet nuclei" to be inhaled by others. Although the confined environment of an aircraft cabin is conducive for the transmission of airborne bacteria, there is no medical evidence concluding the transmission of bacteria can occur on short flights.

In 1996, three medical scientists investigated the likelihood of transmission of TB from a highly infectious passenger with pulmonary/laryngeal TB to others on board two short flights of approximately 1.25 hours in duration. The scientists followed up the event with questionnaires ad-

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4. *Id.*
6. *Id.* at 1097.
dressed to all 146 passengers on the flights. Their conclusion, based on the responses received, was that although the possibility of transmission cannot be excluded, there was a very low likelihood of the transmission of the disease during the flights in question.

One commentator records that the only time the air transport industry focused on the ramifications of the spread of TB in the aircraft cabin was in 1996, when a 32-year old woman succumbed to TB as a result of contracting the disease during a flight on a Boeing 747-100 aircraft from Chicago to Hawaii. On this flight, six passengers in the rear of the aircraft, thirteen rows away from the identified carrier of the disease, were infected. However, the air transport industry has not been lacking in its cooperation with health officials in handling the aftermath of infection. In the fall of 1998, an infected passenger on board an eight-hour flight from Paris to New York suffered from a particularly virulent form of TB, and the health authorities received every cooperation from the airline concerned in tracking down the thirteen passengers who were infected during the flight.

III. AIR CARRIER LIABILITY AT TORT LAW

Principles of liability of air carriers with respect to negligence from the spread of TB in their aircraft cabins are no different from liability principles pertaining to the spread of other diseases transmitted through food, such as salmonella poisoning, cholera, and staphylococcal food poisoning. In the case of the transmission of the TB mycobacterium in the aircraft cabin, like the other diseases mentioned, the air carrier has a two-phased prospect of facing a claim for damages: prevention and contingency planning.

A. PREVENTION

The environment affects any airborne disease such as TB, particularly if the environment is an enclosed one such as an aircraft. The ventilation system plays a critical part in this regard, therefore, it is crucial for

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7. Id.
8. Id.
10. Id.
an air carrier to determine how it will ventilate its aircraft. Early jet aircraft (until the last decade) offered 100% fresh air in the cabin. However, in the 1990's (ironically with more evolved technology) ventilation systems in aircraft were built in such a way as to recycle stale air, thus increasing the chances for survival of bacteria in the aircraft cabin. Even if such a practice were ineluctable, in that recycling is a universal practice that is calculated to conserve fuel, a prudent airline would take other measures, such as changing ventilation filters.

Air in the cabin is usually dry and lacking in humidity since the outside air at cruising altitudes has extremely low water content. The humidity level in the air of an aircraft cabin at cruising level has been recognized as being at about a 10% to 20% humidity level, approximately the same as desert air. The lack of humidity per se does not facilitate the transmission of bacteria, but it does make breathing difficult, particularly for persons suffering from respiratory diseases, such as asthma. When dry air becomes stale through recycling, the chance of removing droplets of air (which is usually accomplished by ventilating fresh air) becomes remote. A suggested solution for a prudent airline is to reintroduce 100% fresh air that is humidified.

B. CONTINGENCY PLANNING

The other limb under which an airline could face a liability claim lies in the area of contingency planning through effective communications. Although it is incontrovertible that an airline cannot know beforehand whether one of its passengers carries the TB mycobacterium, it can, once advised of the fact, take effective measures to ensure fullest cooperation with the health authorities involved.

Although, the health department is usually advised of an airline passenger who traveled while infected, there may be instances where a passenger, or his physician, might contact an airline first. In such instances, the airline is obligated to advise the health authorities immediately of all details, not only of the patient concerned, but also of all passengers who were on the flight with the infected person.

An essential prerequisite of airline contingency planning is the establishment of a link between the airline's medical center and its central booking or reservations system. When necessary, the reservations department of the airline can transmit full information to the medical center to follow up on instances of possible infections, particularly in the airline's home base. It is not sufficient for the airline to merely wash its

13. Tuberculosis and Air Travel, supra note 3, at 23. The humidity level of a home or office building is usually 40% to 60%. Id.
14. See Kahn, supra note 9, at 166.
hands of an infected flight by merely giving the passenger manifest to the health authorities. The airline’s reservation system should be sufficiently well-equipped to have all data relating to passengers’ addresses, telephone numbers, etc., which can be given to both the airline medical staff and the state health authorities.

A prudent airline would diligently follow up the list of infected passengers, to ensure that they receive proper medical care and provide documentation necessary for obtaining any assistance required. It is critical that the airline, at every moment, keep its own medical staff involved in instances where its passengers have been or may have been infected, in order for the proper clinical determination of quarantine times and isolation to be professionally followed.

In case of potential TB exposure to passengers, airlines should have a mechanism in place that would immediately advise the health authorities of the state concerned. Airlines should give special training to its crews in using first aid for precautionary purposes. All necessary medical equipment should be stored in the aircraft. In case of possible infection, airlines should vigorously maintain contact with those who may have been infected, offering them medical attention, in addition to that provided by state authorities. In stations other than their own home stations, airlines should maintain their own medical contacts to assist infected persons from a flight.

C. **Legal Issues**

Article 14 of the Convention on International Civil Aviation (Chicago Convention) contains the pre-eminent legal provision governing this issue.\(^\text{15}\) It states:

> Each contracting State agrees to take effective measures to prevent the spread by means of air navigation of cholera, typhus (epidemic), smallpox, yellow fever, plague, and such other communicable diseases as the contracting States shall from time to time decide to designate, and to that end contracting States will keep in close consultation with the agencies concerned with international regulations relating to sanitary measures applicable to aircraft. Such consultation shall be without prejudice to the application of any existing international convention on this subject to which the contracting States may be parties.\(^\text{16}\)

This provision explicitly devolves primary responsibility on states to take effective measures to prevent airborne diseases in aircraft, and implicitly requires states to issue guidelines for airlines, by working with the inter-


\(^{16}\) Id.
national agencies concerned. Non obstante, airlines have to face certain legal issues themselves in terms of their conduct. Primarily, airlines are expected to conform to applicable international health regulations and the laws of the countries where their aircraft land. Furthermore, the airline owes its passengers a duty of care to exercise all caution in protecting their rights, so that a blatant instance of a person who looks sickly and coughs incessantly at the check-in counter cannot be ignored. Common law principles of tort law vigorously distinguish between negligence, recklessness, and willful blindness. Of these elements of liability, willful blindness is particularly relevant, since it brings to bear the need for an airline to be vigilant in observing passenger profiles in potentially dangerous or threatening situations. The Canadian Supreme Court has stated:

Willful blindness is distinct from recklessness because, while recklessness involves knowledge of a danger or risk and persistence in a course of conduct which creates a risk that the prohibited result will occur, willful blindness arises where a person who has become aware of the need for some inquiry declines to make the inquiry because he does not wish to know the truth. He would prefer to remain ignorant. The culpability in recklessness is justified by consciousness of the risk and by proceeding in the face of it, while in willful blindness it is justified by the accused’s fault in deliberately failing to inquire when he knows there is reason for inquiry.

Civil wrongs that are exclusively breaches of trust or of some other equitable obligation fit in one of the four classes of wrongs. An imprudent and careless airline may be guilty in the case of the spread of disease in the aircraft cabin of the torts of misfeasance (deliberate wrong), and nonfeasance (failure to take action to perform an owed duty of care). Both of the torts are civil wrongs for which the remedy at common law is an action for unliquidated damages.

Therefore, in general terms, a tort arises from an act performed by the defendant whereby the defendant has, without just cause or excuse, caused some harm to the plaintiff. This rationale is grounded on the classical juridical maxim sic utere tuo ut alienum non laedes, which essentially means that no one can hurt another by word or deed. It follows naturally, therefore, that a person aggrieved because of the tort of another can claim pecuniary compensation in respect to damage suffered.

19. The other types of wrongs are: wrongs exclusively criminal; civil wrongs which create no right of action for unliquidated damages, but give rise to some other form of civil remedy exclusively; and civil wrongs which are exclusively breaches of contract.
20. This definition of a tort was cited with approval of Anglo-Saxon Petroleum Co. v. Damant [1947] K.B. 794, 796.
A person who contracts TB while travelling in an aircraft carrying an infected person can, under this principle, expect compensation from the airline concerned, if the airline is found to have breached its duty of care. This duty is breached by either positively contributing to the damage (by knowingly allowing the infected person to travel or by knowingly installing a ventilator system in the aircraft which is not effective in preventing the spread of airborne disease), or by willfully blinding itself to the potential danger of a sickly person entering the aircraft cabin without making further inquiry.

It is incontrovertible that proof of negligence of the airline, whether through willful neglect or through willful blindness would be extremely difficult to establish in the case of the spread of an airborne disease such as TB, as against such diseases as cholera. The former cannot be linked to unsanitary conditions in the cabin per se, whereas the latter can readily be determined through an ex post facto examination of the cabin. The only instance imaginable where an airline can be held responsible, and consequently liable, for pecuniary compensation is when: (1) an obviously sick passenger is checked in by the airline without making any inquiry; (2) when the airline knows beforehand that a particular passenger is positively infected with a disease; or (3) when the aircraft cabin is not properly equipped to prevent the spread of disease. Therefore, air carrier liability for this particular tort would invariably be addressed after the fact, i.e., after passengers have been infected with the disease, when action taken by the airline to assist both those infected and the health authorities concerned would become relevant.

In an instance where an airline is found liable, courts would be charged with quantifying the personal loss incurred by a person contracting the disease. In H. West & Son, Ltd. v. Shephard, Ltd., decided in the House of Lords in Britain, Lord Morris of Borth-y-Gest rejected the argument that courts should decide whether a person, who was so debilitated by disease, was in a position to enjoy monies awarded in compensation.22 His Lordship was of the view that the award of compensation was symbolic of reparation made, irrespective of its practical importance to the plaintiff:

I consider that it is sufficient to say that a money award is given by way of compensation and that it must take into account the actual consequences which have resulted from the tort. . . . If damages are awarded to a plaintiff on a correct basis it seems to me that it can be of no concern to the court to consider any question as to the use that will thereafter be made of the money awarded.23

23. Id. at 633.
Lord Morris of Borth-y-Gest made the distinction between money given in the form of compensation as above, in recognition of the damage caused, and compensation given to cover financial loss, such as payment for nursing and medical services and the cost of medicine, as two different elements of compensation. The overall point made by the Shephard decision is that compensation should be substantial and not merely a token, irrespective of whether the plaintiff was able to enjoy the money or not. In this sense, compensation is awarded for what the plaintiff suffers, not for the value of a thing lost. In the Australian case of Skelton v. Collins, Justice Taylor of the High Court of Australia observed that “compensation cannot be based on evaluation of a thing lost.” It surely must be based upon solace for a condition created, not upon payment for something taken away.” This reasoning was further developed by the House of Lords three years later in the case of Baker v. Willoughby, where Lord Reid said:

A man is not compensated for the physical injury; he is compensated for the loss which he suffers because of that injury. His loss is not in having a stiff leg; it is in his inability to lead a full life, his inability to enjoy those amenities which depend on freedom of movement and his inability to earn as much as he used to earn or could have earned.

The issue of quantum of damages for personal injury has been addressed by courts, on the basis that the damages awarded should be such that the ordinary rational man would not instinctively regard them as either mean or extravagant, but would consider them to be sensible and fair. Indeed, as Lord Denning observed in 1966, “the award of damages in personal injury cases is basically a conventional figure derived from experience and from awards in comparable cases.”

In addition to the compensation for damage caused, the plaintiff is also entitled to compensation for pretrial pecuniary loss, as a result of expenses actually and reasonably incurred on account of the injury. Compensation under this heading may cover clothing, medical expenses, and nursing expenses. As for future pecuniary loss, the usual consideration is towards loss of future income, although if the injured

24. Id.
26. Id. at 486. This view was endorsed at English common law. See Lim Poh Choo v. Camden & Islington Area Health Auth. [1980] A.C. 174.
person dies, there could also be a claim for lost dependency. Future pecuniary loss is usually calculated by the “multiplier” method. This method is based on a calculation of the plaintiff’s net annual loss multiplied by a figure chosen to produce an overall sum intended to provide, by withdrawals of both interest and capital, compensation for the lost income in the years ahead. The “multiplier” is not dependant upon the number of working years the plaintiff would have had ahead if not for the illness, since allowance is made in the calculation for contingencies—such as illness which might have struck the plaintiff. Therefore, in practice the multiplier rarely exceeds eighteen, even in very young plaintiffs.

Of course, in the case of TB, the court will also assess the period during which the incapacity will continue. Invariably, there will be consideration in this regard whether there will be total incapacity for a particular period, followed by partial incapacity for a further period. The following four considerations would be critical to a court’s assessment of future income loss:

1. the period when income would be lost;
2. the average loss of income for that period;
3. the appropriate multiple to give the value lost for the period; and
4. the deduction from the multiple for contingencies.

In the case of a young child not yet employed, and who is expected to be adversely affected by the disease contracted, the courts would have to determine whether the child could be permanently or temporarily disabled as a result of ill effects of the disease. In addition, courts would have to hazard a conjecture as to the child’s future had he not contracted the disease. In Taylor v. Bristol Omnibus Co., the court assumed that the child’s earning capacity would be similar to that of the father’s and assessed the loss at sixteen years’, then reduced it by 50% to give current value. In a later case a child of five years was expected to live only up to the age of twenty-seven years owing to a contracted disease. The court awarded the child a modest sum for the period concerned, but refused to recognize that compensation should be awarded for “lost years”—which the court found to be nebulous and therefore valued at nil. In Croke v. Wiseman, a child aged two with brain damage was ex-

32. See Esso Malaysia [1975] 1 Q.B. 198. In the case of loss of future income, courts may take into account the sums that may have been payable in the future by the plaintiff as income taxes, which would naturally be deducted from the compensation payment. See British Transp. Comm. v. Gourley [1956] A.C. 185.
35. Id.
pected to only live up to the age of forty, therefore, the court assumed that the child would earn the national average wage for twenty-two years.\textsuperscript{36} The court put a current money value on this amount, using actuarial tables, of nine times the average wage.\textsuperscript{37} It then reduced the multiple to five to arrive at the current value as the child might never become a wage earner.\textsuperscript{38}

Irrespective of the plaintiff's age, the rationale for determining future income loss was laid down in \textit{Moeliker v. A. Reyrolle & Co.}, where the court gave the correct criteria for determining compensation.\textsuperscript{39} According to the decision, what has to be quantified is the present value of the risk of future financial loss.\textsuperscript{40} If there is no actual loss of earnings, there should be no award.\textsuperscript{41} If, however, there is a significant risk of loss of earnings, the value depends on the magnitude of the risk.\textsuperscript{42} Using this premise, a young man with an arm injury was awarded substantial compensation, as he was likely to suffer from osteoarthritis later in life.\textsuperscript{43} The court awarded damages even though the risk of lost wages would not occur for many years.\textsuperscript{44}

Loss of career, in which a person injured or infected is already engaged, is another significant consideration. Of course, some occupations are more attractive than others, not necessarily in monetary terms, but rather in the job satisfaction they offer. When a person is already enjoying such a career—for instance, as an airline pilot or surgeon, two professions for which there are stringent health requirements—infection by a disease such as TB could be critical. In such instances, courts would be compelled to take into account the damage caused by total loss of that career.\textsuperscript{45}

As for loss of earning capacity that the plaintiff avers he would have had if not for the injury (and which the plaintiff did not have at the time of injury), the observation of Judge Diplock, in \textit{Browning v. War Office} is relevant.\textsuperscript{46} Diplock, stated, “A plaintiff is not entitled to damages for loss of capacity to earn money unless it is established that he would, but for

\begin{footnotesize}
37. \textit{Id.}
38. \textit{Id.}
40. \textit{Id.}
41. \textit{Id.}
42. \textit{Id.}
44. \textit{Id.}
\end{footnotesize}
his injuries, have exercised that capacity in order to earn money.\footnote{47}

In every claim for specific compensation for earning capacity, the plaintiff must clearly and convincingly show that there was actual loss of future income owing to the injury or illness caused.

IV. LIABILITY UNDER THE WARSAW CONVENTION

It is an incontrovertible principle of tort law that tortious liability exists primarily to compensate the victim by compelling the wrongdoer to pay for the damage he has done.\footnote{48} The Second International Conference on Private International Law ("Conference"),\footnote{49} which led to the introduction of the Warsaw Convention,\footnote{50} followed this basic principle. However, it deviated from the principle so as to align the provisions of the Warsaw Convention to existing exigencies of civil aviation. The Conference based its approach toward air carrier liability on the fault theory of tort that has its genesis in the Industrial Revolution. In fault theory the principle is that a wrongdoer or tortfeasor must be at fault in order to be compelled to compensate the injured. Fault theory was introduced as a solution to the problems caused by injury to persons by the proliferation of machinery during the industrial revolution. On this basis those responsible for introducing faulty machinery should pay those who are injured by them.

One fundamental deviation from the fault liability principle by the Warsaw Conference was that, instead of retaining the basic premise that a person who alleges injury must prove his injury was caused by the alleged wrongdoer, the Conference put the burden of proof on the carrier. This was done, seemingly, to obviate the inherent difficulties that are posed in situations of air carriage, where it would be difficult, if not impossible, to determine fault from evidence which is reduced to debris after an aircraft accident.

The Conference succinctly subsumed its views on liability through the words of its Reporter:

These rules sprang from the fault theory of the liability of the carrier toward passengers and goods, and from the obligation of the carrier to assume the burden of proof. The presumption of fault on the shoulders of the carrier was, however, limited by the nature itself of the carriage in question, carriage whose risks are known by the passenger and consignor. The conference had agreed that the carrier could be absolved from all liability when he had taken reasonable and ordinary measures to avoid the damage . . . . One

\footnote{47. \textit{Id.} at 754.}
\footnote{48. \textsc{John G. Fleming}, \textsc{The Law of Torts} 1 (6th ed. 1983).}
\footnote{49. Second International Conference on Private International Law, Oct. 4-12, 1929, Warsaw, Minutes, (Robert C. Horner and Didier Legrez trans., 1975) [hereinafter Conference].}
\footnote{50. Warsaw Convention, \textit{supra} note 1.}
restriction on this liability had been agreed upon. If for commercial transac-
tions one could concede the liability of the carrier, it did not seem logical to
maintain this liability for the navigational errors of his servants, if he proves
that he himself took proper measures to avoid damage.51

The Conference went on to suggest that if the damage arises from an
"intentional illicit act" for which the carrier was liable, it should not have
the right to avail itself to the Conventions provisions.52 The words “in-
tentional illicit act” were later changed to “wilful misconduct” by the
Conference, at the request of the British delegate Sir Alfred Dennis and
the Greek delegate Mr. Youpis.53

Deeming that it was not equitable to impose absolute liability upon
the carrier, the Conference admitted that the carrier’s responsibility
would be limited.54 Furthermore, the carrier would be freed of all liability
when it had taken reasonable and normal measures to avoid the
damage.55

The Conference, obviously, based the Warsaw Convention on tort
law principles of liability, where tort duties are primarily fixed by law—in
contrast to contractual obligations that can arise only from voluntary
agreement.56 Sixty-six years after the Warsaw Convention was intro-
duced, however, there has been a palpable shift towards introducing a
contractual element by the 1995 International Air Transportation Associ-
ation (“IATA”) Inter Carrier Agreement.57 Although the agreement
does not have the legal status of a convention, it remains an agreement
among air carriers which retains the Convention’s basic presumption of
air carrier liability, while rejecting the liability limitations of the Warsaw
Convention and its Protocols.58 It recognises that the compensatory
amount that a carrier should pay for personal injury or death may be
contractually agreed by the carrier and claimant, according to the law of
the domicile of the claimant.59

Admittedly, this is not what the Conference envisaged. However, it
must be borne in mind that the Conference recognised that the Warsaw
Convention applied only to the unification of “certain” rules as proposed
by the delegate of Czechoslovakia. Also, the underlying purpose of the
IATA initiative is to allow for greater flexibility for insurance underwrit-
ers on the one hand, and more leverage for airlines in their risk manage-

52. Id. at 58.
53. Id. at 59-66.
54. Id. at 251-52
55. Id.
56. FLEMING, supra note 48, at 2.
58. Id.
59. Id.
ment on the other—is fundamentally consistent with the views of the Conference. At the same time, the Convention does not preclude the right of a carrier to enter into an agreement with a claimant on the issue of compensation. The Conference itself recognised that:

[I]n reality, this Convention creates against the air carrier an exceptional system, because in the majority of the countries of the world, contracts of carriage are concluded under a system of free contract. The carrier is free to insert in the contract clauses that exclude or reduce his liability, as much as for goods as for travellers... 60

The Inter-Carrier Agreement, which was approved by IATA carriers at their annual general meeting in Kuala Lumpur in October 1995, claims to preserve the Warsaw Convention; but carriers agree to take action to waive the limitation of liability on recoverable compensatory damages in claims for death, wounding, or other bodily injury, so that recoverable compensatory damages may be determined and awarded by reference to the law of the domicile of the passenger. 61 In effect, this provision introduces a contractual element to an otherwise pure tortious liability regime. The agreement attacks the monetary limits of liability from the Convention and retains all other provisions of liability, which are essentially the presumption of liability of the carrier, and its defenses against such a presumption.

With the rejection of the liability limits, the provision relating to breaking such limits in instances where the carrier is guilty of wilful misconduct have also been rejected. Therefore, effectively, certain elements of tortious liability have been expunged from the Convention. In the final analysis the principles of fault that the architects of the Warsaw Convention created have been rejected by the IATA Agreement. Lee Kreindler observed:

The fault system is extremely important to the public. It is a public protection. It has improved aviation safety and security. While I don't profess to understand what the international airlines are now up to, it is clear to me that one of their purposes is to put an end to the tort system, in international airline transportation, at least as between the passenger and the airline, and that I oppose. 62

Kreindler points out the ambivalence of the IATA Agreement in designating the law of the domicile of the passenger as being applicable for the award of compensatory damages, while it retains the provision of the Warsaw Convention, which designates jurisdictions. 63 Sean Gates

60. Conference, supra note 49, at 47.
61. Kreindler, supra note 57, at 5.
62. Id.
63. Id. at 6.
looks at the issue of "domicile" and observes that the IATA Agreement refers to Article 28 of the Warsaw Convention, which it claims relates to "domicile," but in actual fact does not. In fact, Gates questions whether "domicile" would cover personal or corporate domicile, and holds that this is another area where the IATA Agreement has not shown clarity.64

A. The ICAO Draft Convention

Integral to the agenda of the Diplomatic Conference on Private Air Law of the International Civil Aviation Organization ("ICAO") of May 1999, is the Draft Convention for the Unification of Certain Rules for International Carriage by Air.65 The ICAO seeks to replace the existing Warsaw Convention of 1929 in its totality.66

Article 17 of the Warsaw Convention states that the carrier is liable for damage sustained in the event of death, wounding or any other bodily injury suffered by a passenger, if the accident that caused the damage sustained took place on board the aircraft or in the course of any of the operations of embarking or disembarking.67

From its inception, this provision has proved contentious in its application, as courts adjudicating a claim under Article 17 have been consistently constrained to interpret the words "bodily injury" either as pure physical injury or as mental suffering accompanied by physical injury, where the latter was a causative factor in bringing about the former. These rulings held that there could not be compensation under Article 17 for pure mental shock, psychic trauma, anxiety, or mental discomfort. In Eastern Airlines, Inc. v. Floyd, the United States Supreme Court concluded that there must be at least physical manifestation of injury, if not death or physical injury, in order for a claimant to successfully sue an air carrier under Article 17.68 The court, however, did not address the issue as to whether mental injury accompanied by physical injury was a compensable element.69 The Floyd decision is consistent with its precursor, Rosman v. Trans World Airlines, Inc.70 In Rosman, a hijacking case, the court held that there have to be palpable objective bodily injuries for recovery.71 However, the court allowed recovery for psychic trauma, re-

64. Sean Gates, IATA Inter Carrier Agreement—The Trojan Horse for a Fifth Jurisdiction?, XIV LLOYD’S AVIATION L. 1, 2 (1995).
66. Warsaw Convention, supra note 1.
67. See Warsaw Convention, supra note 1.
69. Id.
71. Id. at 856.
lated to the incident, that caused bodily injuries.\textsuperscript{72} Also, the court allowed recovery for mental anguish flowing from the bodily injuries and not from the trauma \textit{per se}.\textsuperscript{73} The \textit{Rosman} decision followed in the wake of a 1973 decision that held the same.\textsuperscript{74}

The inclination of the courts to insist on pure physical injury as an essential element of compensability is arguably due to the reason that courts took refuge in the original French terminology of the Convention which was \textit{"lésion corporelle,"} which means “physical wound”—as against \textit{“lésion mentale,”} which means “mental wound.”\textsuperscript{75}

The differences of courts over compensation for mental harm will be resolved as they start to apply the new ICAO Convention, which has gone through several drafts through the ICAO Legal Committee. In its first draft, the new Convention, under Article 16, provided as follows:

The carrier is liable for damage sustained in case of death or bodily injury or mental injury of a passenger upon condition only that the accident which caused the damage so sustained took place on board the aircraft or in the course of any of the operations of embarking or disembarking. However, the carrier is not liable if the death or injury resulted solely from the state of health of the passenger.\textsuperscript{76}

This draft, which was the result of the deliberations of the ICAO Study Group on the subject in 1995, underwent further “surgery” at a later stage of the Group’s deliberations, which introduced the element of “personal injury” into the provision to cover both physical and mental injury. However, the final draft submitted to the May 1999 Diplomatic Conference reads that the carrier is liable for damage sustained in case of death or bodily injury of a passenger, upon condition only that the accident that caused the damage took place on board the aircraft, or in the course of any of the operations of embarking or disembarking. However, the carrier is not liable to the extent that the death or injury resulted from the state of the passenger.\textsuperscript{77}

The re-introduction of the words “bodily injury” and the removal of “personal and mental injury” lead to two possible interpretations. Either the final draft intended to exclusively retain physical injury with no hint of mental injury, or mental injury is imputed to “bodily injury,” consider-

\textsuperscript{72} Id.
\textsuperscript{73} Id.
\textsuperscript{74} Burnett v. Trans World Airlines, Inc., 368 F. Supp. 1152, 1158 (1973).
\textsuperscript{75} For a detailed discussion on this subject see Caroline Desbiens, \textit{Air Carrier's Liability for Emotional Distress Under Article 17 of the Warsaw Convention: Can it Still be Invoked?}, XVII ANNALS AIR SPACE L. 153, 159-66 (1992).
\textsuperscript{77} Draft Convention, \textit{supra} note 65.
ing the emerging trend of balancing mental injury with a tangible bodily injury.

Although courts have been somewhat preoccupied with the term “bodily injury” as against “mental injury,” the crux of the matter essentially lies earlier in the provision that speaks of “damage” caused. In Zicherman v. Korean Air Lines, the court ruled that it was quite evident that the English word “damage” or “harm,” which was reflected in the official French text of the Convention as “dommage,” has a wide application and was, in fact, used by the Warsaw Convention drafters in its classical French law sense of “legally cognisable harm.”78 The Zicherman decision incontrovertibly brings to bear the compelling significance of legally cognisable harm as being a compensable element, and, therefore, admits of mental injury as “damage” under Article 17 (if the domestic law applicable to a case were to deem “mental injury” as such). Therefore, the operative issue remains as to whether “mental injury” is a legally cognisable harm.

The ICAO Draft Convention has been preoccupied, quite understandably, with the two most contentious and frequent issues within air carrier liability—physical and mental injury. However, if the Draft Convention retains the words “personal injury,” it would certainly be arguable that it may give courts wider scope to examine whether the infliction of a disease would be determinable as a personal injury.

B. GENERAL PRINCIPLES

Generally, in law, an accusation has to be proven by the person alleging it. Therefore, a presumption of innocence applies to an accused person until proven guilty. However, in the instance of carriage by air of passengers, the airline is presumed liable if a passenger alleges personal injury, or if his dependants allege his death as having been caused by the airline.79 Of course, the airline can show in its defence that it had taken all necessary measures to avoid the damage,80 or that there was contributory negligence,81 and obviate or vitiate its liability. This curious anomaly of the law—imposing on the airline a presumption of liability—is contained in the Warsaw Convention, Article 17, which states, “[t]he carrier shall be liable for damage sustained in the event of the death or wounding of a passenger, if the accident which caused the damage so sustained took place on board the aircraft or in the course of any of the operations of embarking or disembarking.”82

80. Id. at § 116.
81. Id. at § 117.
82. Warsaw Convention, supra note 1.
To control the floodgates of litigation and discourage spurious claimants, the Convention admits of certain defences the airline may invoke and, above all, limits the liability of the airline to passengers and dependents of deceased passengers in monetary terms. The Warsaw System, therefore, presents to the lawyer an interesting and different area of the law that is worthy of discussion.

Article 17 of the Warsaw Convention needs detailed analysis in order that the circumstances in which a claim may be sustained against an airline for passenger injury or death be clearly identified. Further, the defences available to the airline, and the monetary limits of liability, need to be discussed.

C. Accident Generally Defined

The Warsaw Convention stipulates that an “accident” should cause injury or death to a passenger for liability to be considered.\(^83\) As Halsbury states:

> The word accident (or its adjective accidental) is no doubt used with the intention of excluding the operation of natural causes such as old age, congenital or insidious disease, or the natural progression of some constitutional, physical or mental defect; but the ambit of what is included by the word is not entirely clear... what is postulated is the intervention of some cause... so as to be fairly describable as fortuitous... it covers any unlooked for mishap or an untoward event which is not expected or designed...\(^84\)

Perhaps the first known attempt to define “accident” was in a case reported in England in 1900, where a man in the course of lifting heavy machinery vomited blood due to abnormality of his internal organs.\(^85\) Smith, L.J., interpreting Section 1 (1) of the Workmen’s Compensation Act of 1897 under which the action was brought for compensation under a personal accident insurance policy, held that the death of the man was due to disease, and therefore did not accord with the true sense of the word accident.\(^86\) Collins, L.J., agreeing with the view expressed by Smith, L.J., decided that an accident should be fortuitous and unexpected, and in this case the event which led to the death of the worker was not fortuitous.\(^87\) In a case that followed, a workman had to balance a beam in such a way as to avoid falling and in the course of this precarious exercise he strained the muscles of his back.\(^88\) Collins, M.R. held that an accident, to

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83. \textit{ld.}
86. \textit{ld.} at 484.
87. \textit{ld.} at 485.
be compensated, should be fortuitous and unexpected (to which Matthew, L.J. added that the criterion should be to determine what would happen within the course of employment and what would not). 89

Both the cases cited seem to accord with Halsbury's inclination to treat an accident as a fortuitous event. By analogy, the approach of the judges to an accident caused to an airline passenger would seemingly have included the dual criteria of (1) there being an unexpected or fortuitous event not contributed to by the inherent ill health of the passenger, and (2) which should have occurred within the course of his carriage by air. Fenton v. Thorley later qualified the somewhat restrictive definition of the word "accident" adopted in the earlier cases. 90 Lord Macnaghten, while recognising that an accident should be an unlooked for mishap, or an untoward event which is not expected or designed, observed that the earlier definition could make even a stupid act performed by a person compensable, if the act was fortuitous. 91 In Fenton, an apparently healthy man, who ruptured himself by an act of over exertion during employment, was allowed compensation under the rubric of "accident." Perhaps the most significant statement on the applicant's position was by Lord Robertson, who said, "[n]o one out of a law court would ever hesitate to say that this man met with an accident . . . . The word 'accident' is not made inappropriate by the fact that the man hurt himself." 92

Lord Lindley, dealing with the term "accident" in the same case, held that "[t]he word 'accident' is not a technical legal term with a clearly defined meaning. Speaking generally, but with reference to legal liabilities, an accident means any unintended and unexpected occurrence which produces hurt or loss." 93 His Lordship went on to say:

Every injury must have a cause. The proximate cause may be an internal strain; but if, as in this case, the strain is occasioned by an effort to overcome an obstacle accidentally presented to a workman in the course of his employment, I am not prepared to say that the Act [the Workmen's Compensation Act of 1897] does not apply. 94

In a later case, Viscount Haldane, L.C., while agreeing with Lord Macnaghten's view in Fenton, qualified the decisions further by stating that Lord Macnaghten did not exclude intentional acts by third parties

89. Id. at 46.
91. Id. at 316.
92. Id. at 317.
93. Id.
94. Id. at 318; see also Trim Joint Dist. School Bd. of Mgmt. v. Kelly [1914] 30 T.L.R. 452, 453 (H.L.); see generally Anderson v. Balfour [1910] 2 I.R. 497; Nisbet v. Rayne [1910] 2 K.B. 689 (finding that potential robbery of a cashier is a risk incidental to employment and, therefore, accidental).
from the purview of the term “accident.”95 In Trim Joint, a schoolmaster was killed during the premeditated assault by two school boys, the assault was considered an accident, and compensation was allowed.96

In the more recent case of R. v. Morris, the term “accident” was interpreted to mean, in the broadest possible terms, “any unintended occurrence.”97 This was a case where two cars interlocked in pursuance of the driver of one vehicle pushing the other when it refused to start.98 Lord Widgery, C.J., in examining the word “accident,” has seemingly depended upon the quantum of damage more than on anything else to determine whether an accident had occurred.99 If this approach were to be followed, the English Law would show a decided inconsistency with the more laudable approach taken in Fenton.

A valid criticism, which may lie against the English common law, is that at no point has there been an attempt to define the term “accident” in concrete terms. The only positive step seems to have been that taken by Lord Lindley in Fenton, where he noted that, although there was no technical definition of the term itself, an occurrence may be considered “accidental” in the case of a workman, if an obstacle presents itself within the course of the activity which led to the occurrence.100 In assessing the term “accident,” American law is not as explicit as the English law (although it is noteworthy that American courts have excluded unforeseen and unexpected incidents from the purview of the word “accident”). In Kinavey v. Prudential Ins. Co., the deceased fell from a railway bridge after becoming intoxicated and placing himself in a position of grave risk.101 The court held that nothing unusual or unforeseen occurred, as the result was extremely likely under the circumstances.102 Accordingly, the insurance company that had covered the life of the deceased was not required to pay compensation.103

In a later case the principles applied by the court were substantially the same as in Kinavey, the operative criterion applied was that any act of the deceased or wounded, in which he voluntarily undertook a grave risk, would effectively preclude the dependents of the deceased from invoking the word “accident” in their claim.104 In this case, the deceased had lain

95. See Trim Joint [1914] 30 T.L.R. at 455.
96. Id. at 452, 455.
98. Id.
99. Id.
100. See Fenton, 89 L.T.R. at 314.
102. Id. at 288.
103. Id.
down on a busy highway and been killed by a vehicle. He was of sound mind and had been warned by his companions of the grave danger of his act. The court held that death was due to the voluntary assumption of risk by the deceased, and that the incident did not occur accidentally.

Voluntary assumption of risk appears to be the prominent factor that excludes compensation in the United States of America for claims relating to death or injury by accident. In a 1951 case, this principal was expressly laid down, when a court refused the award of compensation where the insured died as a result of participating in "Russian Roulette." Similarly, in an earlier case, a court held that, there is no accident "when a deliberate act is performed, unless [there is] some additional, unexpected independent, and unforeseen happening." It appears to be clear, therefore, that American law seems to run parallel to the English common law in insisting on unexpected events to be classified as accidental. The heavy reliance on voluntary assumptions of risk underscores this fact.

The common law of Canada has, in more than one instance, expressly recognised the principal enunciated by Lord Macnaghten in *Fenton*—that the word “accident” can be attributed to an unexpected incident, or one that is undesigned. In a 1940 decision, judge Crocket, spelt out the fact that an accident is an untoward event. In this case, a worker incurred internal injury in the course of her duties while operating a new hand-embossing machine. The decision is very clear, as in *Fenton*, that the claim was found to be compensable, notwithstanding the risk, since the employee had to take the risk involved to perform her duties. Courts in Canada have refused compensation in instances where consequential damage is caused by a person’s voluntary behaviour that leads to injury. In *Travellers’ Insurance Company v. Elder*, where a customer in a restaurant used abusive language and was assaulted as a result, the court held that the injuries were effected directly and independently of causes other than through accidental means.

A noteworthy feature in the *Travellers* case is that the court relied

105. *Id.* at 228.
106. *Id.*
107. *Id.* at 231.
111. *Id.*
112. *Id.*
113. See, e.g., *Travellers’ Insurance Company v. Elder* [1940] 2 D.L.R. 444, 450 (dismissing an insurance claim by a customer in a restaurant who used abusive language and was assaulted as a result; the court held that the injuries were effected directly and independently of causes other than through accidental means).
upon the fault of the claimant as a basis for rejecting his claim, and on the fact that the claimant had placed himself in a position that would objectively be considered to have brought about his assault. This approach was seen in another case, where a deer poacher shot at another poacher, who in turn retaliated and killed the deer poacher. The Nova Scotia Supreme Court held that death had not been caused accidentally, since the deceased, by his act of firing at the other, had invited the retaliatory shot. The rationale in the case appears to be that, if the injury caused is foreseeable by the injured, such injury would not be considered accidental.

The test of foreseeability was applied in Candler v. London & Lancashire Guarantee & Accident Co., where the court pronounced that an injury, which is the reasonable consequence of a voluntary act of the injured, could not be considered as having been caused by accidental means. In this case the deceased met with his death by falling off the twelfth floor of a hotel. The deceased’s insurance company denied compensation, on the grounds that the deceased had been in an advanced state of intoxication. Judge Grant stated:

The purpose of his (the deceased’s) action was to show his friend that he had sufficient nerve to take the risk of falling that was obviously associated with his actions, was so evident to Simmonds (the friend) that, to use his words, he was petrified at the display. His efforts to dissuade Candler from engaging in such act consisted partly in telling him that he need not so act . . . . His statement that he would show he still had nerve is the conclusive evidence that he appreciated the risk involved.

Judge Grant went on to say:

His acts on the night in question in assuming the dangerous position he did on the top of the coping could have no useful purpose whatever except the obvious opportunity to convince Simmonds that he possessed sufficient nerve to accept the challenge that was associated therewith. His conduct was foolhardy and attended with the most obvious danger . . . . I therefore hold that Candler’s death was not caused either by accidental means or by accident . . . .

The judge seems to have assiduously followed the objective test of foreseeability and attributed the cause of death to consequential injury arising from the initial act of intoxication of the deceased. This

114. Id. at 448-49.
116. Id. at 432.
118. Id. at 409.
119. Id. at 422.
120. Id. at 423.
interpretation has precluded the death of the deceased from being considered an accident.

There are two assumptions that emerge from the decision in Candler. One is that in determining the occurrence of an “accident,” Canada will consider the cause of the accident as a relevant fact. The other is the incontrovertible assumption that, if the incident arises out of the foreseeable consequences of an act of the deceased or injured person, the incident itself will not be considered for compensation.

It is very clear that the three jurisdictions of the United Kingdom, the United States and Canada recognise at common law certain basic facts in determining whether a given incident can be termed an “accident.” They are that the incident should constitute the following:

a) An unexpected, fortuitous or untoward happening;

b) It should not be a consequence of irrational conduct of the deceased or injured person; and

c) The incident should be one that is not reasonably foreseeable by the deceased or injured.

Perhaps the only exception is Fenton, where it was recognized that an injury might be compensable even if a person puts himself or herself at risk.\(^{121}\) However, the most critical problem in this area, is that the common law has not offered an acceptable definition of the word “accident.”

D. “ACCIDENT” IN AIR LAW

In commercial aviation, the word “accident” is sometimes given as broad a definition as those just considered. The Chicago Convention of 1944 defines accident as an “occurrence associated with the operation of an aircraft.”\(^{122}\) The Warsaw Convention in Article 17 speaks of the “the accident which caused the damage,” reducing the accident to the cause rather than to the death or injury.\(^{123}\) The United States Supreme Court has held \textit{in limine} that an accident must be unexpected and external to the passenger.\(^{124}\) It is not sufficient that the plaintiff suffers injury as a result of his own internal reaction to the usual, normal and expected operation of the aircraft.\(^{125}\) Incidents, such as hijackings, terrorist attacks and bomb threats, have been considered to be accidents, together with aircraft crashes.\(^{126}\) An accident could even involve such lesser incidents


\(^{122}\) Convention on International Civil Aviation, annex 13, 1944.

\(^{123}\) \textsc{Martin}, \textit{supra} note 79, div. VII, § 153.


\(^{125}\) \textit{Id.} at 406.

\(^{126}\) \textit{See generally} Husserl \textit{v.} Swiss Air Transp. Co., 485 F.2d. 1240 (2d Cir. 1975); Day \textit{v.}
as tire failure on take-off. 127

In 1982, a passenger travelling from New York to Manila suffered a massive coronary seizure in flight. 128 The allegation against the airline was that, because the airline's employees failed to render medical assistance, the patient suffered irreparable deterioration resulting in death. 129 Responsibility devolved upon the court to fit this incident to that of an "accident" within the meaning of the Warsaw Convention. The court readily did this by deeming that the word "accident", in air law in this instance, did not mean the heart attack itself, but the failure on the part of the airline to render in flight medical assistance. 130 The court said, "[t]his is somewhat analogous to the hijacking cases where the "accident" which caused the injury is not the act of the hijackers but the alleged failure of the carrier to provide adequate security." 131 The court, therefore, found the case was within the terms and conditions of the Warsaw Convention. 132

In a contemporaneous case, a passenger brought an action for a hernia sustained by the lifting of a heavy suitcase from an airport conveyor belt. 133 A baggage handler of the defendant airline had refused to carry the suitcase, and the plaintiff had solicited aid from her relatives, who were not allowed to enter the baggage area by a guard on duty. 134 The court dismissed the action against the airline, primarily on the grounds that the plaintiff did not suffer an unexpected injury, as she had previously undergone a gall-bladder operation and knew her condition was delicate. 135

In 1980, a medical practitioner suffering from a head cold and respiratory infection boarded an aircraft. 136 He disembarked completely deaf. 137 The plaintiff averred that he suffered discomfort in his ears at descent, probably due to sudden pressure changes. 138 He alleged that the airline knew, or ought to have known, that passengers suffering from

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129. Id.
130. Id.
131. Id.
132. Id. at 399.
134. Id.
135. See id. at 174.
137. Id.
138. Id.
head colds would risk losing their hearing. In addition, he alleged that the airline owed a duty to its passengers to warn them that it was dangerous to travel with a head cold. The airline denied the existence of such a duty. The court reasoned that it would be incongruous to impose a duty on an airline to envisage all possible human afflictions, assess their effect on air travel, and warn passengers accordingly. In any event, in this instance the airline was not aware that the passenger was suffering from a head cold. In its decision, the court clearly indicated that the presumption of liability, imposed by the Warsaw Convention on airlines, and the “highest-degree-of-care doctrine” applicable thereto, should not be taken advantage of by plaintiffs.

In April, 1984, an intermediate Appellate Court in New York was faced with the task of deciding whether an airline can be held liable for the death of a passenger who chokes to death owing to his own intoxication. The court held that the plaintiff had made out a cause of action for negligence. The airline serves its passengers with drink, and thus undertakes the responsibility not to serve in excess, and to exercise reasonable care for the safety of passengers. In addition, in the event of excessive intoxication of a passenger, the airline is under a legal duty to render such medical assistance as is necessary to revive the passenger, or, in any event, to keep him out of danger. In light of this principle, the airline has a further duty to protect others from a drunken passenger who gets out of control.

In Air France v. Saks, the court interpreted the word “accident” in the context of the Warsaw Convention to mean an occurrence whereby a passenger is injured owing to an unexpected or unusual event or happening external to the passenger. The court found that where injury results from the passengers own internal reaction to the normal exigencies of air travel such injury would not be construed as having resulted from an accident. In this case, the plaintiff was a passenger on an Air France flight from Paris to Los Angeles. During the descent the plaintiff suf-

139. Id.
140. Id.
141. Id.
142. Id. at 18.
143. Id.
146. Id. at 288.
147. Id.
148. Id.
150. Id.
151. Id. at 392.
fered severe pain in her left ear, which was aggravated thereafter. The plaintiff—who consulted a doctor after the plane landed—was informed that she was rendered completely deaf in her left ear. Air France argued that the plaintiff's allegation was not an "accident," a unusual and unexpected happening, under Article 17 of the Warsaw Convention. Further, the airline alleged that, at all times, the pressurization system of the aircraft had been normal. The District Court granted summary judgment to the plaintiff on the basis that "accident" in Article 17 was meant to be an unusual and unexpected happening. The Supreme Court rejected the rationale adopted by the lower court, on the ground that Article 17 refers to an accident that causes an injury, and, therefore, it is the cause and not the effect that is the determinant. Accordingly, the Supreme Court held that air carriers would be liable only if an accident caused the passenger injury. Thus an injury that was in itself an accident was insufficient to satisfy the requirements of Article 17 of the Warsaw Convention.

There will be no accident, if in a normal flight, free of turbulence, a passenger suffers discomfort from a condition he suffers from such as a hiatus hernia or thrombophlebitis. In Abramson v. Japan Airlines, an airline passenger suffered an aggravation of a pre-existing hiatal hernia shortly after take-off. The passenger, who was under medication for his condition for six years, had not informed the carrier prior to boarding. The passenger, however, claimed that, had he been given occupation of a few empty seats, he could have massaged his stomach to normalcy. The airline claimed there were no empty seats in flight, contrary to the passenger's claim that there were nine empty seats in flight in the first class section of the aircraft. The passenger claimed that his hernia attack constituted an "accident" within the provisions of Article 17

152. Id.
153. Id.
154. Id.
155. Id.
156. Id.
157. Id. at 406.
158. Id. at 406-07.
159. See Abramson v. Japan Airlines Co., 739 F.2d 130, 131, 135 (3d Cir. 1984).
161. See Abramson, 739 F.2d at 131.
162. Id.
163. Id.
of the Convention. As the court rejected this claim, holding that the plaintiff's difficulty was not in any way related to his transportation by air, and, accordingly, there was no accident under Article 17.

It would have been interesting if the Abramson court had applied the principle of Seguritan, where failure to render medical assistance by the airline was construed as falling within the purview of the word "accident." After all, the airline did not make any attempt to render assistance to the passenger in Abramson. The court's reasoning in the latter case contradicts the earlier decision and leads to a logical absurdity. The intention of the Convention was seemingly to provide a uniform system of compensation for passengers bringing claims against airlines operating international air services. To suggest that the failure of an airline to render required assistance is excusable under the Convention is completely at odds with earlier decisions, and also, arguably, with the intention and purpose of the Convention itself.

Insofar as the word "wounding" of a passenger in Article 17 is concerned, courts have initially held that claims are only actionable if there is "bodily injury" and consequently require palpably conspicuous physical injury. This excluded mental injury. However, a later decision held that the injuries enumerated in the Warsaw Convention should be construed expansively to encompass as many types of injury within the ambit of the enumerated injuries including mental and psychosomatic injuries. In the United States mental injury is now entrenched in most jurisdictions as an independently compensable injury. As Burnett, said in Medlin v. Allied Investment Co:

Memory and empathy tells us that "hurt" perceived through sensory media other than that of touch may be just as painful if not more than the hurt perceived by the tactile sense. Moreover, physicians tell us that the consequences of invasion of the person accomplished through the perceptive media of sight and sound may be also as damaging if not more damaging than invasions of the persons accomplished through the sense of touch.

Indeed, therefore, mental anguish or injury would now be recognized by most jurisdictions, as falling within the purview of "wounding" of a passenger under Article 17 of the Warsaw Convention.

164. Id.
165. Id. at 135.
167. See Abramson, 739 F.2d at 131.
It is apparent from the *cursus curiae* that a stringent standard of proof of the nature of the occurrence is insisted upon by the courts if liability of the carrier is to be established under Article 17 of the Warsaw Convention. In *Salce v. Aer Lingus Air Lines*, the court required the plaintiff to show that the landing of the aircraft in which the plaintiff travelled was anything other than a normal landing. The plaintiff averred that he had received personal injuries due to the hard landing of the aircraft. In the absence of clear evidence of a hard landing, the court would presume that the landing performed by the aircraft in this instance was not an unexpected or unusual event that would satisfy the requirements of an “accident” under the Warsaw Convention.

However, when facts clearly show an accident, as in *Salerno v. Pan American World Airways, Inc.*, courts will not hesitate to award damages to a plaintiff passenger. In this case, the court held that knowledge of a bomb threat, which subsequently caused a miscarriage to a passenger came within the meaning of the word “accident.” The plaintiff, together with her two children, were passengers aboard a Pan American Airways flight from Miami to Uruguay. The cockpit crew, after take off, instructed the cabin crew to look for a bomb that the former had been informed by air traffic control to be on board. The crew notified the passengers including the plaintiff. The Plaintiff suffered a miscarriage 24 hours after having been informed of the alleged bomb on board and having watched the cabin crew looking for the object. The court held that an “accident” within the meaning of the Warsaw Convention caused the plaintiff’s injuries because a bomb threat is “external to the passenger” and in an unexpected and unusual event outside the usual, normal and expected operation of the aircraft.

The above discussion surfaces the salutary principle that the word “accident” is considered far more liberally in modern air law than is done under other areas of common law. It also underscores the fact that courts are more inclined to treat acts of omission on the part of airlines as an “accident,” as was shown in *Seguritan*. The airline is presumed liable for an “accident” where a person is assaulted by a drunken passenger, or

173. *Id.*
174. *Id.*
176. *Id.* at 657.
177. *Id.*
178. *Id.*
179. *Id.*
180. *Id.*
where a passenger suffers a heart attack and is not given the necessary medical attention in flight as is possible, just to name two instances. Of course, the claimant has to adduce clear evidence of the event and the ensuing injury.

E. EMBARKING AND DISEMBARKING

Article 17 further provides that an accident that causes damage should take place on board the aircraft or in the course of any of the operations of embarking or disembarking. The first alternative, that of being on board, is self-explanatory and does not require discussion. The second alternative, involving embarking or disembarking, has been subject to sustained judicial discussion and analysis. Although ex facie, the words “on board the aircraft” are not problematical the phrase has been interpreted to include time spent by passengers in a hotel consequent to a hijacking. The argument in this case was that the passengers would have been on board, if not for the hijacking. This is an extreme interpretation that an airline is liable for all accidents within that period of time from the start of embarkation to the end of disembarkation.

Current law on the subject seems to favour the test known as the “Day-Evangelinos Test,” which was developed as a consequence of a series of terrorist acts on passengers in airport departure lounges. This is a test with three elements of consideration: (1) the location of the passenger; (2) the nature of his activity at the time of the accident; and (3) the degree of control exercised by the airline at the relevant time. A number of United States cases have accepted this test. This test clearly establishes the fact that unless the passenger is under the control or direction of the airline at the terminal there is no liability for injury or death caused to the passenger under the provisions of the Warsaw Convention.

The test obviates the need to painstakingly go through every possible exigency in light of the requirement that the accident occur during embarkation or disembarkation. Prior to the adoption of this test there was no uniformity in the judicial reasoning behind the definition of embarkation and disembarkation. It was left to each individual court to determine whether a given situation would fall within the scope of chronology of

184. Id.
these two extremities. Now, the tripartite test has made the task of the courts much easier.

F. LIABILITY LIMITS

The Warsaw Convention states in Article 22:

In the transportation of passengers the liability of the carrier for each passenger shall be limited to the sum of 125,000 francs. Where, in accordance with the law of the court to which the case is submitted, damages may be awarded in the form of periodical payments, the equivalent capital value of such payments shall not exceed 125,000 francs. Nevertheless by special contract, the carrier and the passenger may agree to a higher limit of liability.\textsuperscript{187}

The currency of denomination of the franc refers to the “French franc consisting of 65\(\frac{1}{2}\) milligrams of gold at the standard of fineness of nine hundred thousandths.”\textsuperscript{188} "These sums may be converted into any national currency in round figures."\textsuperscript{189} At the time the Convention was signed in 1929, twelve and a half French francs equalled one United States dollar, making the airline’s liability for passenger death or injury a maximum of US $20,000. The question today is what conversion rate applies to the French franc as stipulated in the Warsaw Convention. Admittedly, the currency fluctuations of today would not make the old conversion standards practicable. This has given rise to many debates, particularly in the United States.

The Supreme Court of Puerto Rico in 1982 held that the limits of liability of the Warsaw Convention should be converted from francs to dollars by reference to the last official price of gold in the United States, as set forth in the last Civil Aeronautics Board (“CAB”) order dealing with the dollar equivalents of the Warsaw Convention limits of liability.\textsuperscript{190} The most significant and recent development on this point is seen in \textit{Trans World Airlines, Inc. v. Franklin Mint Corp.} where the Court held that the limit of liability under the Warsaw Convention, is to be converted into United States currency by using the last official price of gold.\textsuperscript{191} The facts of the case were that Franklin Mint paid Trans World Airlines for the transportation of certain numismatic material from Philadelphia to London.\textsuperscript{192} The cargo was lost, and Franklin mint sought US $250,000 as damages from the defendant airline.\textsuperscript{193}

The court, somewhat unexpectedly, pronounced that Trans World

\textsuperscript{187} See \textit{Warsaw Convention}, \textit{supra} note 1, at 3019.
\textsuperscript{188} \textit{id.}
\textsuperscript{189} \textit{id.}
\textsuperscript{192} \textit{id.}
\textsuperscript{193} \textit{id.}
Airlines’ liability was limited under Article 22 of the Warsaw Convention, but the limits were unenforceable because of the inapplicability of the Convention and the impracticability of converting currency as envisaged by the Convention in 1929. The Supreme Court found the limits enforceable and cited with approval the decision of the CAB to use the last official price of gold as the basis for conversion within the authority of that agency and consistent with the Constitution.

*Franklin Mint* concerned the carriage of cargo, and the question arose whether the decision would apply to passenger liability in terms of the applicability of the provisions of the Warsaw Convention to cases of passenger liability. In 1984, this problem was solved when the court held that the principal of the *Franklin Mint* decision applied to personal injury and wrongful death claims. The *Franklin Mint* standards are, however, not absolute and static. In other words the United States Supreme Court considered that the use of a limit, based on gold, was designed to deal with the fluctuations of inflation; in an inflationary economic environment, a fixed limit in national currency might fail to meet the desired result envisaged by the Convention. To give effect to the objective of Article 22 and the envisaged economic uniformity, the Court recognized that it might be necessary for periodic adjustments of the limit as converted into dollars. The CAB was charged with making such adjustments to accord with values of other Western currencies and of changes in conversion rates of currencies of other Warsaw signatories. Since the Court considered the last valuation of the CAB in 1978 for its decision in *Franklin Mint*, such was taken to apply at the time the case was adjudicated in 1984.

It has also been suggested that a successful solution to the problem of matching the franc with the dollar would be to seek parity of the dollar with special drawing rights ("SDR"), a basket of currencies that adjust themselves with currency fluctuations. This, arguably, would also allow a ready conversion of the SDR to any currency of any jurisdiction hearing a case of passenger death or injury under the Warsaw Convention. There is no logically compelling argument for either the *Franklin Mint* principle or the SDR principle. In most jurisdictions courts may have to interpret the Convention on this point as best as they can, particularly in the absence of specific legislation.

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194. *Franklin Mint Corp. v. Trans World Airlines, Inc.*, 690 F.2d 303, 311 (2d Cir. 1982).
195. *Franklin Mint*, 466 U.S. at 254-60.
196. *In re Aircrash at Kimpo Int'l Airport, Korea, on Nov. 18 1980, 558 F.Supp. 72, 72 (C.D. Cal. 1983).*
G. Defences Available to the Airlines

The foregoing discussion involved two key factors governing the civil liability of airlines. These factors are: (1) the presumption of liability imposed upon the airline, and (2) the liability limits protecting the airline from unlimited liability and spurious claimants. However, two additional factors operate as adjuncts to the initial concepts: (1) the airline may show certain facts in its defense to rebut the presumption, and (2) if the airline is found guilty of wilful misconduct, it is precluded from invoking the liability limits under the Warsaw Convention. These concepts seem to be grouped into two sets of balancing measures. The end result is that, on one hand the airline is subject to stringent standards of liability, and on the other, two provisions limit its liability in monetary terms and allows a complete or partial defense in rebuttal of the presumption.

Article 20(1) of the Warsaw Convention provides that "the [airline] shall not be liable if [it] proves that [it] and [its] agents had taken all necessary measures to avoid the damage, or that it was impossible for [it] or them to take such measures." Shawcross and Beaumont are of the view that the phrase "all necessary measures" is an unhappy one, in that the death or injury of the passenger presupposes the fact that the airline or its agents had not taken all necessary measures to prevent the occurrence. Airlines usually take precautions such as making regular announcements to passengers on the status of a flight, and giving instructions on security and safety measures available in the aircraft. These measures are taken by the airline to conform to the Warsaw Convention requirements, that the airline take all necessary measures to prevent an accident, and rebut the presumption of liability. Thus, in a case decided in 1963, it was held that a passenger who left her seat when the aircraft went through turbulent atmosphere was barred from claiming damages for personal injury under the Warsaw Convention. The court held that an admonition of the airline that the passengers were to remain seated with their seat belts fastened during the time in question was proof of the airline having taken the necessary measures envisaged in the Warsaw Convention. This case also established the fact that "all necessary measures" was too wide in scope, and that a proper interpretation of the intention of the Warsaw Convention would require an airline to take all "reasonably necessary measures." In a more recent case judge Chapman, imputed objectivity to the phrase "reasonably necessary measures" by declaring that such measures should be considered necessary by "the rea-

197. See Warsaw Convention, supra note 1, at 3019.
200. See Chisholm, 1 LLOYDS REP. at 629.
The airline, which has the burden of proof, cannot seek refuge in showing that normal precautions were taken. For example, normal precautions in attending to the safety of the passengers prior to a flight are not sufficient. Therefore, if the airline cannot adduce a reasonable explanation as to why the accident occurred despite the reasonably necessary precautions being taken, it is unlikely to succeed in its defence. Insofar as the requirement of impossibility to take precautions is concerned, courts have required clear evidence of the difficulties faced by the airline in avoiding the disaster. In the case of a crash landing, a court said that it was an insufficient defence for the airline to merely show that the aircraft was in perfect condition and that the pilot took all steps to affect a good landing. The court required the airline show that weather conditions were so bad that the aircraft could not land at another airport. In Haddad v. Cie Air France, an airline had to allow suspicious passengers to board its plane. The passengers later hijacked the plane. The court held that as the airline could not deny boarding to the passengers it was impossible to take all necessary safety precautions and the airline's defence was sound under Article 20 (1). A similar approach was taken in the case of Barboni v. Cie Air-France, where the court held that when an airline receives a bomb threat while in flight and performs an emergency evacuation, a passenger injured by evacuation through the escape chute could not claim that the airline is liable, since it would have been impossible for the airline to take any other measure.

If the airline proves that the damage was caused by, or contributed to, the negligence of the injured person, the court may, in accordance

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206. Id.
207. Id.
209. Id.
with the provisions of its own law, exonerate the carrier wholly or partly from its liability.\textsuperscript{211} Contributory negligence under the Warsaw Convention has been treated subjectively when cases are adjudicated. The courts have not set an objective standard as in the earlier defense. For instance in \textit{Goldman v. Thai Airways International Ltd.}, a passenger was not guilty of contributory negligence even though he kept his seat belt unfastened throughout the flight because there was no sign given by the aircraft control panel to keep the seat belt fastened.\textsuperscript{212} However, courts have recognized that contributory negligence may be raised by airlines as a defense in some situations.\textsuperscript{213}

Article 25(1) of the Warsaw Convention states that an airline:

\begin{quote}
[S]hall not be entitled to avail [itself] of the provisions of [the Warsaw Convention] which exclude or limits its liability, if the damage is caused by [the] wilful misconduct or by such default on the part of the [airline] as, in accordance with the law of the court to which the case is submitted, is considered to be equivalent to wilful misconduct.\textsuperscript{214}
\end{quote}

Article 25 (1) extends this liability to acts of the agent of the airline acting within the scope of his employment and attributes such wilful misconduct to the airline.\textsuperscript{215} Such action as the failure of the technical crew of the aircraft to monitor weather conditions and the failure to execute a proper approach on adverse weather conditions are examples of wilful misconduct of the airline\textsuperscript{216}

Under Article 25 the plaintiff proving that the carrier was guilty of wilful misconduct in causing the injury could circumvent the liability limits of the carrier that the Warsaw Convention imposes.\textsuperscript{217} The original French text of the Warsaw Convention states that if the carrier causes the damage intentionally or wrongfully or by such fault as, in accordance with the court seized of the case, is equivalent thereto, it shall not be entitled to claim the limitation of liability.\textsuperscript{218} It has been maintained that the English translation inaccurately states that the liability limitations of a carrier will be obviated if the damage is caused by its \textit{wilful misconduct} or by such \textit{default}.\textsuperscript{219} The contentious issue in this question is what kind of misconduct is required. Drion is of the opinion that by approaching the issue in terms of conflicting concepts, the question whether \textit{faute lourde}

\begin{footnotes}
\footnote{211. Warsaw Convention, supra note 1, at 3019.}
\footnote{212. See Goldman v. Thai Airways International Ltd [1983] 1 W.L.R. 1186 (U.K.).}
\footnote{213. See Bradfield v. Trans World Airlines, Inc., 88 Cal. App.3d 681, 686 (1972).}
\footnote{214. Warsaw Convention, supra note 1, at 3020.}
\footnote{215. \textit{Id.}}
\footnote{216. Butler v. Aeromexico, 774 F.2d. 429 (11th Cir. 1985).}
\footnote{217. Warsaw Convention, supra note 1, at 3020.}
\footnote{218. Warsaw Convention, supra note 1, art. 25.}
\footnote{219. H. DRION, LIMITATION OF LIABILITIES IN INTERNATIONAL AIR LAW 195 (1954).}
\end{footnotes}
(as proposed originally in the French text, and for which there was an English equivalent of gross negligence) was in fact more appropriate than the word dol (which now occupies the document, and for which no accurate English translation exists) has emerged as to what standards may be used in extrapolating the words dol or wilful misconduct. Miller takes a similar view when she states that the evils of conceptualistic thinking that had pervaded the drafting of Article 25 which rendered it destitute of coherence, has now been rectified by the Hague Convention which has introduced the words “done with intent to cause damage or recklessly and with knowledge that the damage would probably result.”

This confusion was really the precursor to diverse interpretations and approaches to the concept of wilful misconduct under Article 25 of the Warsaw Convention. The French Government took steps by its Air Carrier Act of 1957 to rectify ambiguities in this area by interpreting dol in the Convention as faute inexcusable, or deliberate fault which implies knowledge of the probability of damage and its reckless acceptance without valid reason, making a strong analogy with the Hague Protocol’s contents. This interpretation, needless to say, brought out the question whether such reckless acceptance would be viewed subjectively or objectively.

The Belgian decision of Tondriau v. Air India, considered the issue of Article 25 of the Convention and The Hague interpretation. The facts of the case were usual, involving the death of a passenger and a consequent claim under the Convention by his dependents. The significance of the case lay, however, in the fact that the Belgian court followed the decision of Emery v. Sabena and held that, in the consideration of the pilot’s negligence under Article 25, an objective test would apply, and the normal behaviour of a good pilot would be the applicable criterion. The court held, “Whereas the plaintiffs need not prove, apart from the wrongful act, that the pilot of the aircraft personally had knowledge that damage would probably result from it; it is sufficient that they prove that a reasonably prudent pilot ought to have had this knowledge.” The

220. Id. at 200.
223. Miller, supra note 221, at 202.
227. Id.
court rationalised that a good pilot ought, in the circumstances, to have known the existence of a risk, and no pilot of an aircraft engaged in air transport ought to take any risk needlessly.\textsuperscript{228} The Brussels Court of Appeal, however, reversed this judgment and applied a subjective test, asserting that the Hague protocol called for "effective knowledge." Professor Bin Cheng seems to prefer the objective test in the interpretation of "wilful misconduct" under Article 25, on the grounds that a subjective test would defeat the spirit of the Convention and that judges would be "flying in the face of justice in search of absolute equity in individual cases."\textsuperscript{229}

Peter Martin, analysing the Court of Appeals decision in \textit{Goldman v. Thai Airways International Ltd.},\textsuperscript{230} agrees with Bin Cheng and criticizes the lower court decision (which awarded Mr. Goldman substantial damages for injuring his hip, as a result of being thrown around in his seat in turbulence, in an instance where the captain had not switched on the "fasten seat belt" sign).\textsuperscript{231} Martin maintains that Mr. Goldman failed to prove that the pilot knew that damage would probably result from his act, as envisaged in The Hague Protocol principle. Being an aviation insurance lawyer, Martin is concerned that, while the English courts have a proclivity towards deciding Article 25 issues subjectively, insurance underwriters could view the breach of the limits stringently. Both on the count of the need for objectivity and on the count of the adverse effects on insurance, it is difficult to disagree with Cheng and Martin.

The question of air carrier liability, and the approach taken in its context by the Warsaw Convention, has seen the emergence of the scholarly analysis of two issues—(1) should liability of the carrier be based on fault and, consequently, the principles of negligence and limited liability, or (2) should liability be based on strict liability? Drion, in his 1954 treatise on liability, inquires into the various rationales and scenarios that may come up in an intellectual extrapolation of the subject.\textsuperscript{232} He examines the fact that an insurance system for liability, which would inextricably be linked to a strict liability concept, would be desirable. Under this concept a plaintiff would be able to claim compensation from an impecunious defendant through the latter's insurer on the deep pocket theory.\textsuperscript{233} Consequently, insurance underwriters may, in their own interest, be im-

\textsuperscript{228} Id.
\textsuperscript{231} Peter Martin, \textit{Intentional or Reckless Misconduct: From London To Bangkok and Back Again}, VIII \textit{Annals of Air Space} L. 145, 149 (1983).
\textsuperscript{232} Drion, \textit{supra} note 219, at 7.
\textsuperscript{233} Id. at 8.
pelled to formulate aviation accident preventive schemes, strengthening the effects of accident prevention.\textsuperscript{234} Drion also puts forward eight rationales for the rebuttable limitation of liability presumption appearing in Article 17 and quantified by Article 22 of the Convention. These are: maritime principles carry a limitation policy; the protection of the financially weak aviation industry; the catastrophic risks should be borne by aviation alone; the existence of back-up insurance; the possibility of the claimants obtaining insurance; limitation of liability being imposed on a \textit{quid pro quo} basis on both the carrier and operator; the possibility of quick settlement under a liability limitation regime; and the ability to unify the law regarding damages.\textsuperscript{235}

These rationales, and whatever else forms considerations of policy in the assessment whether a liability system should be based on negligence or strict liability, should be addressed with the conscious awareness that, while the Convention imposes a rebuttable presumption of limited liability on the carrier, the contributory negligence of the plaintiff can exculpate the carrier and obviate or apportion compensation. More importantly, wilful misconduct of the carrier transcends liability limits and makes the liability of the carrier unlimited. Strict liability, on the other hand, as proposed in the Montreal Protocols 3 and 4, does not admit of breaking liability limits, sets a maximum limit of compensation that the carrier has to pay, making this limit unbreakable by such extraneous factors as the carrier’s wilful misconduct.

Therefore, the ultimate question is whether one keeps the Warsaw-Hague concept of fault and limited liability, or does one embrace a system of strict liability which assures the aggrieved party of pecuniary or compensatory damages, while obviating the need for lengthy determinations of who was at fault after the fact. In other words, does one point a finger at the carrier in the first instance, then limit his liability and again break the limit if he is at fault? Alternatively, does one make the carrier pay a sum of money, the maximum limits of which have been set, with the assurance that such limits would not shoot up unconscionably if the carrier were negligent?

The Convention unified legal principles relating to air carrier liability, thus precluding the application of scores of differing domestic laws. It, however, did not succeed in presenting to the world unequivocally objective and quantified rules of liability. This precludes a plaintiff from knowing that he would be, as a rule, compensated if he is injured in an air accident, since the Convention admits of challenge on the grounds of the plaintiff’s conduct before, during or after the accident. The strict liability

\textsuperscript{234} \textit{Id.} at 10.  
\textsuperscript{235} \textit{Id.} at 12-13.
principle introduced by the Guatemala City Protocol and carried through by the Montreal protocols on the other hand has been applauded on the grounds that:

First, it gets money into the hands of the passengers much more quickly. Second, it saves transaction expenses, which include legal fees and other substantial litigation costs. Third, it provides compensation to passengers in those factual situations where no responsible party is at fault, such as an act of terrorism.236

Alexander Tobolewski validly points out that actual aviation practice in terms of aviation insurance by the airlines has nothing to do with limitation of liability and claims, since airlines insure their fleets and liabilities for colossal amounts in the insurance market.237 He suggests therefore, the harmonisation of the law and actual practice (presumably by infusing more specific quantum in damages) and simplification of the system of recovery inter alia, both of which strongly suggests a regime such as the one envisaged in the Montreal Protocols.238 Werner Guldimann concludes, "The most important and urgent matter in the present decade is the continuation of the efforts undertaken by ICAO to re-establish the former uniformity and universality of the Warsaw System by having the Montreal Protocols No. 3 and No. 4 rapidly ratified by the greatest possible number of Contracting States."239 Although Professor Bin Cheng holds the view that the Montreal Protocols are (1) heavily weighted towards the carrier, (2) the limits therein are inadequate, and (3) that the limit of the SDR value cannot be changed is undesirable;240 the view that strict liability should be embraced seems more sensible, in view of the inconceivable number of passengers carried every year by air, the possible eradication of legal contingency fees, and above all, giving teeth to the meaning and purpose of law—that it should be an instrument of solace, not an opportunity for debate.

In an evaluation of the Warsaw System in 1979,241 it has been said that during the first 25 years of the existence of the Warsaw Convention,

238. Id. at 266.
241. Convention 1961, the Guatemala City Protocol, 1971, and the Montreal Protocols 1, 2, 3, 4, of varying dates. It should also be noted that the Montreal Agreement of 1966—a private arrangement between air carriers—also purported to amend the Warsaw Convention. Hereinafter, joint references to all these instruments shall be referred to as the "Warsaw System."
it served the aviation community satisfactorily.242 Peter Martin bases this observation on the argument that when the Hague Protocol was being drafted in 1955, it was recorded that only 53 Warsaw cases had been adjudicated (a very small number of cases for an instrument of the stature of the Warsaw Convention).243 The unifying process of the liability of an air carrier, started by the Warsaw Convention, dealt with liability concepts, quantum of compensation, exceptions on liability, jurisdictional issues and prescription of action. It is sad, however, that with the original Warsaw Convention, there are now seven other international agreements, few of which have ever seen the light of day. This means that the unification process started by the Warsaw Convention had been criticised and found wanting at various stages of its chequered history. The original document has been excoriated many times, prompting Professor Cheng to call it a "disgraceful shambles"244 (although it remained, when these comments were made of it, the most widely implemented private international law convention).245

Ex facie, from a strictly practical standpoint, it would appear that many facets of unification of the Warsaw Convention have come under interpretation by different philosophies, presumably due to the lack of specificity of the principles of unification and, a fortiori, the language used. For instance, the delivery of the passenger ticket and the attendant carrier liability came under a series of confounding judicial thought processes, where in two cases246 the courts decided that the ticket had to be delivered in such a manner as to afford the passenger a reasonable opportunity to take measures to protect against liability insurance (only to decide in Chan v. Korean Airlines Ltd.247 that the only requirement of Article 3 of the Convention was that a ticket be delivered). Goldman v. Thai Airways International Ltd.,248 was another case where two confusing issues were decided. The first issue was whether the concept of "wilful misconduct," as reflected in Article 25 of the Convention, was to be interpreted objectively or subjectively. The second issue concerned compensatory limits, which were so confusing to both the courts and the parties

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243. Id.
245. Martin, supra note 242, at 239.
that an outside settlement was effected on a mutually acceptable basis. The issue regarding compensatory limits for death or personal injury has had a consistent evolution, starting from the Warsaw Convention at approximately 8300/US dollar, increased twofold by The Hague Protocol 1955, increased again by the Guatemala City Protocol to 100,000 SDR (about 130,000/US dollar) with the Montreal Protocols going even higher. The currency conversion to gold value has been another contention of many parties to litigation. Goldman v. Thai Airways International Ltd., left the situation in fiscal anarchy by deciding in the United States that the Poincare gold franc has to be converted to the last official price of gold before the United States left the gold market, and not the free market price of gold. This not only made the overall American attitude towards seeking enhanced compensation turn 360 degrees, but also awarded unrealistically low compensation to the plaintiff. Further, a case in Australia has given a new interpretation to the notion of carrier negligence in the carriage of cargo, and a New Zealand case has decided that any interested party can now claim compensation under a cargo claim.

The Montreal Agreement of 1966, a private agreement between carriers flying the United States, was also the result of failure by contracting States to reach an international solution to the problem of unifying principles of liability, particularly the quantum of damages. The Montreal Agreement amply demonstrates, as an ICAO document points out, that a private agreement between air carriers, sponsored by IATA, can unhinge and question the credibility of a multilateral international treaty between sovereign States. Mankiewicz attributes this chaotic state of disagreement to the stand taken by the United States when he states:

Indeed, there is real irony in the history of the Warsaw Convention. For more than 30 years the United States of America have steadily and successfully fought for, and obtained and signed, 6 Protocols to amend the Warsaw Convention as well as a ‘Convention Supplementary to the Warsaw Convention.’ But, they have ratified not one of these Warsaw instruments. In spite of the huge amount of time and money spent all these years by ICAO and its Member States, the US judiciary is still saddled with the awkward task of applying, construing constructively or destructively, misinterpreting and circumventing a Convention which is now 60 years old...

The only viable alternative towards rectifying this anomaly and preserv-
ing the unification efforts of the Warsaw Convention is ratifying the Montreal Protocols 3 and 4. As Professor Michael Milde states:

There is hardly any viable alternative to a determined effort to bring the Montreal Protocols Nos. 3 and 4 into force. If that aim is not accomplished in the very near future, we may witness a trend to denunciation of the Warsaw System by several States with the ensuing chaotic conflicts of laws, conflicts of jurisdiction, unpredictably high compensation claims, and skyrocketing increase in insurance premiums.\(^{254}\)

The civil liability of an airline for causing death or injury to passengers has been established by international treaty and entrenched in law by judicial interpretation. Courts have attempted to balance the interest of both airlines and passengers, as indeed has been the perceived intention of the Warsaw Convention. The predominant feature of this area of civil liability is that air transport, in terms of commercial transportation of passengers, is incontrovertibly the mode of transport involving the highest levels of technology. Therefore, courts may find difficulty in ascertaining negligence, wilful misconduct, and overall liability of an airline in the face of complex technical arguments and defence. However, this reason alone should not justify obviating the tortious element that has so carefully been entrenched in the Warsaw Convention by its founders and used by courts over the last 66 years. As the foregoing discussions reflect, liability issues under the Warsaw Convention has been consistently addressed by courts on the basis of their interpretation of negligence, wilful misconduct, and contributory negligence, all of which are exclusively issues involving principles of tort law.

V. ANALYSIS OF AIR CARRIER LIABILITY UNDER THE WARSAW CONVENTION

It is clear that the conventional interpretation of the term “accident” in tort liability has been extended in aviation cases under Article 17 of the Warsaw Convention where the Courts have imputed intention to the carrier in certain instances. To this extent, Seguritan\(^{255}\) (which addressed the issue of the carrier’s liability in not being able to give medical assistance when necessary) and O’Leary\(^{256}\) (more liquor than he could consume in flight) prove that courts have interpreted the Warsaw Convention to enforce liability of the carrier on the principles of intention. Therefore, wilful misconduct has played an important role in establishing, in certain


circumstances at least, that it would be justified in considering that the extent of the carrier's fault is a valid consideration in awarding damages.

Fault liability, as enforced by the Warsaw Convention, may also be adequately reflected in intentional negligence, where the carrier intentionally breaches the duty of care owed to a passenger. Determining a breach of duty or care, as a distinct evidentiary tool by courts, would act towards accident prevention in that instances of carrier liability which emerge from accident investigations could then be used as admissible evidence.

The new trend, in doing away with fault liability and introducing a system of liability that may apply irrespective of fault but aligned to monetary compensation based upon subjective assessments of jurisdictional liability, has its genesis in the decade between 1960 and 1970. During this period, civil law liability in tort entered a new phase, effectively superannuating the existing system of liability and replacing it with a system of liability insurance. Tortious liability was no longer considered cost-effective, and was no match for less expensive insurance. Jurists thought it more equitable and, above all, practical to embrace a legal system that espoused loss distribution, which acted as the national precursor to liability insurance. This system of liability was assisted along the way by three reasons which militated against fault liability and acted as catalysts towards the successful launch of liability insurance. First, a tort system based upon fault was expensive to administer when compared with any system of insurance; second, litigation was fraught with delay, which often a plaintiff could ill-afford; and third, the unpredictability of cases based upon fault liability often put plaintiffs under pressure to settle their claims for amounts less than they would receive if their claims went successfully to trial.

The question that now arises is whether the international aviation community should retain fault liability or embrace strict liability, which is designed to obviate adjudication for tortious liability and settle claims on a subjective basis.

Drion discussed rationales for the limitation of liability in private air law in 1954. The task that now has to be accomplished is to inquire whether private air law needs the concept of limited liability or whether another system could be recommended. The most compelling arguments for the limitation of liability in private air law are that it protects the financially weak aviation industry, unifies private air law against draconian domestic laws, and expedites the payment of compensation. It is interesting to analyze these concepts in today's aviation context. We live in a world where complex litigation issues emerge. These issues are care-

257. Drion, supra note 219, at 12.
fully thought out by contingency-fee lawyers who have an inexplicable capacity to produce a variety of defendants out of a hat. For instance, now, there is a conscious awareness that there are co-liable parties - manufacturers of component parts, air traffic controllers, and even government agencies such as airport authorities. Would it be fair to limit the liability of the carrier and expose these three categories of defendants to unlimited liability? There may also be the instance where the deceased or injured may have had enormous capacity to earn during his working life, which would be interrupted or terminated by an air accident. Does it mean that such a defendant settles for a limited sum of money as compensation and bears his losses? Professor Bin Cheng claims that the 100,000 SDR’s of the Montreal System is woefully inadequate and implies that a higher limit should be considered or the possibility of breakability of the limits should be endorsed in the lines of the Warsaw Convention.258

It is prudent to approach this question with due emphasis laid on the economic ramifications of this strictly legal consideration, since, at its core, the question addresses not principles of legal rectitude, nor issues of justice, but matters of financial interest to the parties concerned. It is inevitable, therefore, to consider the effect of limitation of liability as against unlimited liability and rationalise between the two, thus arriving at a synthesis of the concepts, or (if possible) a totally new concept. To determine this situation, it is necessary to assess the Warsaw Convention (principles of limitation of liability as coupled with unlimited liability in the event of gross negligence of the carrier), the Montreal Protocols (strict liability and higher limits of liability with no possibility to accommodate unlimited liability under any circumstances), and a pure instance of general liability with no inhibitions whatsoever. Of course, these three alternatives would be viewed from the standpoint of the plaintiff passenger or his dependant and the defendant airline. The operative theme of this inquiry would be money and not complex legal issues, since it is money in which both parties are ultimately interested.

It is incontrovertible that aviation insurers, when faced with increasing levels of claims and declining premium income, would naturally increase their policy deductibles and seek to incorporate exclusions of cover. The aviation insurance market increasingly feels that there is no closeness at all between the underwriters and brokers on the one hand and the insured (airline) on the other.259 One commentator recommends either a substantial increase in voluntary limits of liability or total abandonment of limiting air carrier liability, implying that either would benefit

both the plaintiff and the defendant. Peter Martin suggests that the best future for the Warsaw system is the abandonment of limitations. He states:

There are very good reasons for imposing on carriers at least a very high standard of care, and even strict liability. Strict liability without limitations already applies in many States to third party liability to persons other than passengers and that is generally believed to be right . . . . Why should a passenger, therefore, be in a worse position than a person or owners of property on the ground?

The insurance lawyers obviously need higher liability limits and specificity in this area. The steady disintegration of the Warsaw system (mainly attributable to its incompetence in providing for satisfactory compensatory limits) has been proved by figures, released by the Rand Corporation, that in a cross-section of cases studied, Warsaw-Montreal tickets obtained a per capita compensation of US$184,000, while non Warsaw-Montreal tickets had received double this amount. This amount has further increased over the years, demonstrating that the Warsaw limits are being left behind rapidly. Therefore, it is clear that one of the viable alternatives to the IATA Intercarrier Agreement's strict liability and private contract proposal is to consider the extension of the Warsaw Limits. The first step towards this goal is the States' ratification of the Montreal Protocols. If such a measure is accepted, it is also imperative that the scope of the Convention be extended to third parties (such as air traffic controllers and manufacturers of component parts of aircraft) to seek consistency and to give the insurance market a clear picture, and a more accurate assessment. By bringing these parties under the Warsaw umbrella, both the plaintiff and the defendant would be well served. The plaintiff would be assured of quick settlement, and the defendant would be comfortable with the thought that liability is limited. This could also preclude contingency-fee appearances by lawyers.

One must at the same time, not lose sight of the importance of the insurance aspect to liability under the Warsaw Convention. It must be noted that, when the subject of insurance was addressed at the Warsaw Conference, the President of the drafting committee Mr. Gianini observed:

I may remind you that, under present conditions of air navigation, we have arrived at the conclusion that the problem is not yet ripe. But, given the importance of the problem, given that no one is disposed to consider the

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260. Id. at 192.
261. Martin, supra note 242, at 248.
262. Id.
263. Guldimann, supra note 239, at 96.
work already done as an end, we have expressed, on my proposal, wishes by which we indicate that the study of the problem deserves to be pursued. That is to say that we leave the door open for later discussions. In order to advance the solution of this problem, we have also expressed a wish, signed by all governments, by which we ask the governments to bring insurance into practice as much as possible. It is only then that one will be able to envisage the possibility of setting up an international rule.264

These futuristic words of 67 years ago, which show vision and deep understanding of the future of civil aviation, should not be disregarded. It is time that the international aviation community looked hard at emerging trends relating to the Warsaw Convention and attempts a balanced and workable solution.

VI. EMERGING TRENDS IN WILFUL MISCONDUCT OF THE CARRIER

Of the two instances in which the Warsaw Convention provides that the carrier's liability is unlimited, one relates to the absence of documentation (absence of the passenger ticket and baggage check or air waybill) on the grounds that the document of carriage evidences the special regime of limited liability as prescribed in the Warsaw Convention. The other, which has turned out to be contentious, deals with instances where damage is caused by the carrier's wilful misconduct, or such default on his part as, in accordance with the law of the court which exercises jurisdiction in the case, is considered to be the equivalent of wilful misconduct. Article 25 of the Warsaw Convention provides:

The carrier shall not be entitled to avail himself of the provisions of this Convention or exclude or limit his liability, if the damage is caused by his wilful misconduct or by such default on his part as, in accordance with the law of the Court seised of the case, is considered to be equivalent to wilful misconduct.265

The provision further stipulates that the carrier shall not be entitled to avail himself of the above provisions, if the damage is caused as aforesaid by any agent of the carrier acting within the scope of his employment.266

The primary significance of Article 25 is that it addresses both wilful misconduct and the “equivalent” of wilful misconduct.267 The authentic and original text of the Warsaw Convention, which is in the French Language, uses the words “dol” and “faute...equivalente au dol.”268 There is a palpable inconsistency between English translation of the original text and the original text itself. The French word “dol” personifies the inten-

265. See Warsaw Convention, supra note 1, at 3020.
266. Id.
267. Id.
268. Id. at 3006.
tion to inflict an injury on a person, whereas the English words "wilful misconduct" requires the defendant carrier to be aware of both its conduct, and the reasonable and probable consequences of its conduct, in the nature of the damage that may ensue from the carriers act. Wilful misconduct, therefore, may not necessarily involve the intention of the carrier, its servants or agents, and remains wider in scope as a ground of liability.

Most civil law jurisdictions have equilibrated "dol" with "gross negligence." Drion dismisses the element of intention by citing examples such as the theft or pilferage of goods or baggage (which are more frequent in occurrence than aircraft accidents, and which may not necessarily always occur with the concurrence or knowledge of the carrier) and cites a list of possible instances where gross negligence would form more justification for the invocation of Article 25.269 Notable examples are assault or indecent behavior by personnel of the carrier; accidents caused by conduct of personnel; serving bad food; bumpy rides which cause passenger injury; and failure to instruct passengers of rough weather, etc.270 Drion also makes the valid point of citing delay in carriage as having many dimensions that may be accommodated within the purview of Article 25 without warranting the consideration of intention.271

Common law jurisdictions, on the other hand, have separated "wilful misconduct" from "negligence" and insisted that the conduct of the carrier has to be "wilful" or intentional for a successful case to be grounded on Article 25 of the Warsaw Convention. This approach is consistent with the original contention of the British delegate to the Warsaw Conference, who claimed that wilful misconduct should pertain to "acts committed deliberately or acts of carelessness without any regard for the consequences."272 In the 1952 British case of Horabin v. British Overseas Airways Corp., the Court held:

To be guilty of wilful misconduct the person concerned must appreciate that he is acting wrongfully, or is wrongfully omitting to act and yet persists in so acting or omitting to act regardless of the consequences, or acts or omits to act with reckless indifference as to what the result may be.273

In the same year, the New York Supreme Court Appellate Division held that wilful misconduct was:

[D]epend[ant] upon the facts of a particular case, but in order that an act may be characterized as wilful there must be on the part of the person or

269. Drion, supra note 219, at 212.
270. Id. at 213.
271. Id.
persons sought to be charged, a conscious intent to do or to omit doing the act from which harm results to another, or an intentional omission of a manifest duty. There must be a realization of the probability of injury from the conduct, and a disregard of the probable consequences of such conduct.\textsuperscript{274}

The above approach has been followed by subsequent American decisions, which have classified wilful misconduct as requiring "conscious intent to do or omit doing an act from which harm results to another"\textsuperscript{275} and "wilful performance of an act that is likely to result in damage or wilful action with a reckless disregard of the probable consequences."\textsuperscript{276}

As to the second limb of Article 25, which provides that the equivalent of wilful misconduct suffices to impose liability, the Convention leaves the scope of the provision wide open, including such topical issues as substance abuse at the work place and aircrew fatigue.\textsuperscript{277} A discussion of these issues follows.

\section*{VII. Recent Judicial Decisions on Wilful Misconduct}

Arguably the watershed decision on the notion of wilful misconduct in recent times was contained in the case \textit{In re Korean Airlines Disaster of September 1, 1983}, where the trial court considered wilful misconduct to be the "performance of an act with knowledge that the act will probably result in an injury or damage, or in some manner as to imply reckless disregard for the consequences of its performance."\textsuperscript{278} This pronouncement was used by the American Courts, in \textit{Pasinato v. American Airlines Inc.}, concluding that the act of the flight attendant in question did not constitute wilful misconduct within the purview of Article 25 of the Warsaw Convention.\textsuperscript{279} In \textit{Pasinato}, a passenger on an American Airlines flight was struck on the head when a heavy tote bag fell from an overhead bin in the cabin.\textsuperscript{280} The incident was the outcome of an initial request, immediately after take-off, by the passenger for a pillow.\textsuperscript{281} The flight attendant, in a bid to open the overhead bin above the passenger to retrieve the pillow, was unable to prevent a tote bag’s falling from the bin onto the passenger’s head.\textsuperscript{282} The passenger and her husband sued

\begin{itemize}
  \item \textsuperscript{275} Grey v American Airlines, Inc., 227 F.2d 282, 285 (2d Cir. 1955).
  \item \textsuperscript{277} Warsaw Convention, \textit{supra} note 1, at 3020.
  \item \textsuperscript{278} In \textit{re Korean Airlines Disaster of September 1, 1983}, 932 F.2d 1475, 1479 (D.C. Cir. 1991).
  \item \textsuperscript{279} Pasinato v. American Airlines, Inc., No. 93C1510, 1994 WL 171522, at *3 (N.D. Ill. May 2, 1994).
  \item \textsuperscript{280} \textit{id}.
  \item \textsuperscript{281} \textit{id}.
  \item \textsuperscript{282} \textit{id}.
\end{itemize}
American Airlines under Article 25 on the grounds of wilful misconduct. The trial court was of the view:

There is no dispute that [the flight attendant] opened the overhead bin to get a pillow for another passenger. [The flight attendant’s] deposition indicates that she opened the bin with one hand, in her customary manner, with the other placed defensively above her head near the bin to prevent an object from falling upon her or a passenger sitting below. Further, [the flight attendant] stated that she tried to catch the tote bag that fell from the bin (and may have touched it as it fell), but that it fell too quickly.

The court took cognizance of the contention of American Airlines that the technical and cabin crews give reported warnings to passengers of the dangers of opening overhead bins, both over the public address system of the aircraft and by personal messages. The evidence of the flight attendant, that incidents of objects falling from overhead bins were infrequent and generally harmless, based on her experience, was also considered relevant. The Court found difficulty in applying the criterion of Korean Airlines Disaster in that it was difficult, if not impossible, for the Court to envision how the flight attendant’s actions could amount to wilful misconduct. It was of the view that the pivotal criterion for determining the existence of wilful misconduct, knowledge that the act would probably result in an injury or damage, was absent. A fortiori, the Court observed that the other criterion established in Korean Airlines, that of an act which is performed in a manner indicating reckless disregard for the consequences, was also missing in Pasinato.

In Saba v. Compagnie Nationale Air France, (involving damage to cargo), a federal trial court in Washington found for the plaintiff awarding damages against the act of the defendant carrier for improperly packing and storing hand-woven Persian carpets (as a result of which some of the carpets were damaged owing to the seepage of rain water when the carpets were kept outside the carrier pending their loading onto the aircraft). The Court in this instance followed Pasinato by reiterating the criteria for the proof of wilful misconduct as established by the Korean Air litigation. A compelling piece of evidence, which enabled the

\begin{align*}
283. & \text{Id.} \\
284. & \text{Id.} \\
285. & \text{Id.} \\
286. & \text{Id.} \\
287. & \text{In re Korean Airlines, 932 F.2d at 1479.} \\
288. & \text{Pasinato, 1994 WL 171522, at *3.} \\
289. & \text{Id.} \\
290. & \text{Id.} \\
292. & \text{Id.}
\end{align*}
court to arrive at its conclusion in Saba, was the fact that the air carrier had disregarded its own cargo handling regulations in storing the carpets outdoors in the rain. In its findings the court held, “In short, through a series of acts, the performance of which were intentional, [the carrier] has demonstrated a reckless disregard of the consequences of its performance. This disregard is emphasized by the fact that no damage report was ever produced.” The court, while waiving the liability limits of the Warsaw Convention in Saba, noted that a combination of facts, taken together, may amount to wilful misconduct. In the courts view for an act to be intended it is sufficient, but not necessary, for the resulting injury or wrongfulness to reflect intention or knowledge. It was also significant that the Court further observed that a finding of wilful misconduct was appropriate when the act or omission constituted a violation of a rule or regulation of the defendant carrier itself.

Courts in the United States have been cautious to determine the parameters of “scope of employment” as envisaged in Article 25 of the Warsaw convention, which imputes liability to the carrier with regard to acts of its employees acting within the scope of their employment. In Uzochukwu v. Air Express International Ltd., where a New York federal trial court confronted issues of theft by two airline employees of two carriers. The court held that the fact that the employees used forged documents to perpetrate the offence of theft sufficient to conclude that the act was outside the scope of employment, and that the carrier could not be held liable under Article 25. It is arguable that the conclusion of the court was based on the fact that generally, in the United States, “wilful misconduct” is regarded as the intentional performance of an act with knowledge that the performance of that act would probably result in injury or damage, or that intentional performance of an act in such a manner as to imply reckless disregard of the probable consequences.

In Robinson v. Northwest Airlines, Inc., (decided in March 1996, involving circumstances similar to Pasinato), the court dismissed the appeal of the plaintiff who had lost in the trial court against the carrier. The trial court permitted the carriers motion asserting the plaintiff’s injury claims, stemming from her being injured by a piece of luggage falling from an overhead bin while the plane was taxiing and additional injuries

293. Id.
294. Id. at 594.
295. Id.
296. Id.
297. Id.
caused to her by a passenger striking her on the head with the latter's baggage, were valid at law.\footnote{300}

The Court of Appeals, in affirming the dismissal of the plaintiff's action, noted that while a common carrier (a carrier who opens itself to the world to conduct business in the carriage by air of passengers, baggage and goods) owes a high degree of care to its passengers, it cannot be considered an insurer of the passenger's safety.\footnote{301} The court found that the plaintiff failed to raise an issue of fact regarding the carrier's breach of duty towards her.\footnote{302} The court was of the view:

Short of physical constraint of each passenger until each is individually escorted off the plane, we fail to see what Northwest could have done to prevent this accident. At best, that is precisely what [the plaintiff] has established; the fact that an accident occurred. However, as noted above, common carriers are not absolute insurers of their passengers safety.\footnote{303}

Singh v. Pan American World Airways, Inc., offers a helpful insight into the rationale for determination of wilful misconduct.\footnote{304} In wrongful death and personal injury actions arising out of the 1995 hijacking of a Pan Am flight between Bombay and New York, the jury concluded that the carrier was guilty of wilful misconduct on the reasoning that the management of the carrier knew, or ought to have known, of serious lapses in its security program.\footnote{305} In fact, there had been representations made to the management by the carrier’s staff on several occasions prior to the hijacking.\footnote{306} Furthermore, the jury was influenced in its conclusion by the fact that the carrier was aware of terrorist activity at European, Middle Eastern, and Asian high risk airports, and that very little had been done by the carrier to provide enhanced security at these airports.\footnote{307}

In the case of the Crash of Thai Airways Flight TG-311 near Kathmandu, Nepal in July 1992, the question at issue was whether the aircrew had been guilty of wilful misconduct in flying into terrain.\footnote{308} The fatal crash occurred during approach to Kathmandu airport, an airport known to be one of the most difficult in the world at which to land.\footnote{309} Evidence revealed that the captain gave the bearings of the aircraft to the control

\footnotesize{300. \textit{Id.}}
\footnotesize{301. \textit{Id.}}
\footnotesize{302. \textit{Id.}}
\footnotesize{303. \textit{Id.}}
\footnotesize{305. \textit{Id.}}
\footnotesize{306. \textit{Id.}}
\footnotesize{307. \textit{Id.}}
stances of negligence pertaining to an airline accepting for travel a person seemingly caused an accident.\textsuperscript{315} The court was of the view that, since conduct hinges itself on knowledge of the perpetrator that damage would result or reckless disregard for consequences of an act on the part of the perpetrator. The question that then arises is whether such issues as substance abuse in the workplace and aircrew fatigue would subscribe to the notion of wilful misconduct, as it is presently perceived.

Thai Airways, therefore, marks an instance where the elements of wilful misconduct were imputed to the crew on the basis that, due to their expertise, they knew, or ought to have known, the reasonable and probable consequences of their act.

A further dimension to the notion of wilful misconduct was added in Northwest Airlines Air Crash of August 1996, where the court added that a finding of wilful misconduct may be based upon consideration of a series of actions or inactions.\textsuperscript{313} The court was of the view that, since many complex safety systems interact during an airplane flight, an air disaster would usually require multiple acts.\textsuperscript{314} In other words, the court held that it was permissible for a jury to consider an airline's individual errors, or a series of errors, and not restrict itself only to the act that seemingly caused an accident.\textsuperscript{315}

If one were to analyse the rationale of wilful misconduct in the light of the \textit{cursus curiae} so far discussed, one would conclude that wilful misconduct hinges itself on knowledge of the perpetrator that damage would result or reckless disregard for consequences of an act on the part of the perpetrator. The question that then arises is whether such issues as substance abuse in the workplace and aircrew fatigue would subscribe to the notion of wilful misconduct, as it is presently perceived.

\textbf{VIII. Conclusion}

Admittedly, it would be extremely difficult for an airline to determine latent illnesses, such as tuberculosis of its passengers. Therefore, instances of negligence pertaining to an airline accepting for travel a person

\begin{itemize}
  \item \textsuperscript{310} \textit{Id.}
  \item \textsuperscript{311} \textit{Id.}
  \item \textsuperscript{312} \textit{Id.} at 2-3.
  \item \textsuperscript{313} Polec v. Northwest Airlines, Inc., 86 F.3d 498 (6th Cir. 1996).
  \item \textsuperscript{314} \textit{Id.}
  \item \textsuperscript{315} \textit{Id.}
\end{itemize}
infected with tuberculosis may be rare. However, it would not be uncom-
mon to critically evaluate the conduct of an airline after the fact—i.e., by
an assessment of the quality of air in the cabin, and assistance offered to
those infected in flight. Airlines have to carefully follow the guidelines
issued by the World Health Organization and take initiatives on their
own (such as those discussed in the introduction of this article), in order
to convince a court they acted like a prudent and caring business enter-
prise in the face of a calamity.

It must be emphasized that an airline, in selling an airline ticket for
travel, offers a composite service, not only to carry a passenger from
point A to B, but also to ensure that transportation is accomplished in a
safe and sanitary manner. Therefore, the services offered by the airline in
the area of clean air in the cabin become extremely relevant and critical
to the issue.

As for issues of liability under the Warsaw Convention (although
Tseng316 widened the scope of the word “accident,” the case itself ad-
dressed a personal security check on a passenger), it remains to be seen
whether courts would interpret infection as an accident per se under the
Warsaw Convention. It certainly could be argued, in the light of the va-
ried interpretations emerging from the *cursus curiae*, that an accident
under the Convention, although not explicitly defined in any past in-
stance, could be considered to be “any incident unexpected and external
to the passenger which is avoidable by the airline and which causes death,
wounding or injury to a passenger.” Of course, the words “death, wound-
ing or injury” would become more clear once the future of the ICAO
Convention of 1999 is known.

Regulating Safety Culture in the Railroad Industry: The Time Has Come for Broader Horizons

James A. Squires*

I. INTRODUCTION

Railroads have registered some impressive safety gains in the last several decades. By almost all measures, the industry's safety performance has improved markedly. Collision, derailment and employee casualty rates are much lower than they were just twenty years ago.1 Railroads now rate favorably on safety with other transportation and comparable non-transportation industries.2

Progress on safety in the 1980s was made possible in large part by railroads' return to profitability following deregulation. The railroads consequent ability to invest in infrastructure had a direct impact on safety. For example, improvements in track structures tended to reduce derailments and collisions. As infrastructure-related accidents have declined, however, the percentage of on-the-job injuries caused by human factors has increased.3 According to the Federal Railroad Administra-

* General Attorney, Norfolk Southern Corporation. The views expressed in this article are the author's and are not intended to represent the views of Norfolk Southern Corporation.


3. Hearing Before the Subcomm. on Surface Transp. and Merchant Marine of the Senate
tion ("FRA"), the nation's rail safety watchdog, human factors were behind about one-third of rail accidents and incidents between 1991 and 1998.4

The rise in the percentage of human factors causing accidents and incidents has prompted FRA and all industry participants to focus on workplace attitudes and behaviors affecting safety. Regulators have taken to calling the collection of these attitudes and behaviors "safety culture," and the importance of "good" culture has become a theme in efforts to spur further safety improvements. As FRA's top executive said not long ago:

The work of safety is never done. However, I am pleased to report that we are making real progress that manifests itself in many ways, perhaps most fundamentally in a growing recognition by railroad managers that the culture of the railroad must change. If we are to accomplish rapid change and respond to service needs [sic] of the Nation while achieving a high level of safety, we must have a culture that affirms integrity, holds open lines of communication, encourages identification of safety hazards, and insists that what we say is what we will do every day, even when we are tempted to take the easy way out.5

The National Transportation Safety Board ("NTSB") also has begun looking at safety culture in the railroad and other transportation industries. NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in the other modes of transportation such as railroad, highway, marine and pipeline. NTSB also issues safety recommendations aimed at preventing future accidents. In several recent reports on railroad accidents, NTSB has examined safety culture factors.6

The purpose of this article is to examine FRA's and NTSB's initiatives in light of the growing body of thought on safety culture outside the rail industry. Much has been written on safety culture in recent years by regulators, consultants, academics, and others. This article argues that, in view of the burgeoning literature, rail regulators' model of safety culture is unnecessarily narrow. Rail regulators have devoted considerable attention to pinpointing "bad" safety attitudes and behaviors on the parts of individuals (principally managers), but they have made relatively little effort to probe social phenomena in the background of safety culture. Understanding these phenomena is essential to a complete account of safety culture.

4. Id.
5. Id.
An examination of the laws governing safety in the railroad workplace may be a salutary starting point. These laws are among the more important determinants of safety culture. To the extent they control (or even just strongly influence) managers' and employees' behaviors, merely targeting the behaviors will not yield cultural change; the laws must change as well. After assessing the strengths and limitations of this approach, the article takes a close look at one railroad workplace law with a pronounced impact on safety culture: the Federal Employers Liability Act, the industry's negligence-based injury compensation statute.

II. REGULATORY, BUSINESS, AND ACADEMIC ROOTS OF SAFETY CULTURE

After a rash of industrial catastrophes in the 1980s—including Chernobyl, Three Mile Island, Bhopal and the Space Shuttle Challenger—government policymakers began to ask whether traditional methods of evaluating accidents properly reflected the organizational context in which the accidents occurred. In the transportation area, John Lauber's dissent in a NTSB report on the 1991 crash of a Continental Express flight in Eagle Lake, Texas is frequently cited as a turning point. Departing from the usual mode of analyzing causation in aviation accidents, Lauber argued that the crash was brought on by a defective culture, one that failed to encourage and enforce adherence to maintenance and quality assurance procedures:

The multitude of lapses and failures committed by many employees of Continental Express discovered in this investigation is not consistent with the notion that the accident resulted from isolated, as opposed to systemic, factors. It is clear based on this record alone, that the series of failures which led directly to the accident were not the result of an aberration, but rather resulted from the normal, accepted way of doing business at Continental Express.

On the heels of Lauber's dissent, safety culture has become a theme in NTSB accident reports and has also been broadly endorsed by other transportation and non-transportation government agencies with jurisdiction over safety.

Just as safety regulators were casting about for a broader perspective on accident causation, one that would encompass organizational along with individual factors, business theorists introduced the idea that successful corporations were more than just their constituent parts; they were imbued with distinct cultures, to which they owed much of their

9. Id. at 53.
success. Two popular books, In Search of Excellence\textsuperscript{10} and Corporate Cultures,\textsuperscript{11} made the term “corporate culture” a permanent entry in America’s business lexicon. As Thomas Peters and Robert Waterman, authors of In Search of Excellence, observed: “[W]ithout exception, the dominance and coherence of culture proved to be an essential quality of the excellent companies.”\textsuperscript{12} In time, the concept of corporate culture migrated to the safety arena and, at the intersection of new approaches to accident causation and business management, “safety culture” was born.

In the background of safety regulators’ and management gurus’ efforts to improve safety performance through cultural change, the academic community has contributed a growing body of knowledge on organizations. The classical safety paradigm is not organizational in nature. On the contrary, it is based on the premise that most accidents are caused by individuals’ errors.\textsuperscript{13} This paradigm contains five essential elements. First, it is positivist and objectivist; techniques drawn from the natural sciences are used to model and predict safety.\textsuperscript{14} Second, safety is fundamentally behavioral and cognitive; accident prevention consists mainly of rooting out dysfunctional acts.\textsuperscript{15} Third, safety’s foundation is formal policies and instructions.\textsuperscript{16} As a corollary, “proceduralization,” which allows collection and reporting of incidents in a standardized format, dominates.\textsuperscript{17} Fourth, safety is a professional discipline, with an established niche in management hierarchies.\textsuperscript{18} Fifth, all of the above aspects of safety utilize corporate programs aimed at controlling and organizing safety.\textsuperscript{19}

In contrast to the classical paradigm, the cultural or organizational perspective on safety seeks to avoid “an exclusive focus on the design of the technical system or on individual factors.”\textsuperscript{20} Thus, recent qualitative evaluations of major industrial accidents have paid greater attention to

\begin{thebibliography}{9}
\bibitem{11} Terrence E. Deal & Allan A. Kennedy, \textit{Corporate Cultures: The Rites and Rituals of Corporate Life} (1982).
\bibitem{12} Peters & Waterman, \textit{supra} note 11, at 75.
\bibitem{13} Michel Llory, \textit{Human- and Work-Centered Safety: Keys to a New Conception of Management}, \textit{40 Ergonomics} 1148, 1150-51 (1997).
\bibitem{14} \textit{Id.} at 1150.
\bibitem{15} \textit{Id.}
\bibitem{16} \textit{Id.} at 1151.
\bibitem{17} \textit{Id.}
\bibitem{18} \textit{Id.}
\bibitem{19} \textit{Id.}
\end{thebibliography}
organizational factors as antecedents in the accident sequence. According to proponents of the organizational safety approach:

Whether accidents are triggered off by specific factors such as operator errors or sudden failure of technical systems, they only evolve and break through the sociotechnical defence systems as a whole if there is favourable grounds for 'pathogenetic' or 'accidentogenetic' factors, such as latent causes of technical failure, organizational failures, or mistaken decisions by the management.

All safety culture proponents seem to agree that the maintenance of open pathways of communication are critical to avoiding organizational failures. James Reason, a psychologist and leading safety culture advocate from the University of Manchester, England, has described the ideal accident-averse organization as capable of “creating a safety information system that collects, analyses and disseminates information from incidents and near misses, as well as from regular proactive checks on the system’s vital signs.” Organizations with this ability are said to possess an “informed culture,” that is, a culture “in which those who manage and operate the system have current knowledge about the human, technical, organizational and environmental factors that determine the safety of the system as a whole.” According to Reason, an informed culture, one in which safety-related information flows freely, is a safety culture.

A. Refining Rail Safety Regulators’ Approach: Culture or Climate?

In tracing the origins of the safety culture concept, it is helpful to lay out in greater detail the concept’s roots in organizational theory. This reveals what regulators call safety “culture,” but students of organizational theory are more apt to refer to it as “climate.” The distinction is not merely semantic; the culture and climate approaches bring different perspectives, assumptions, and goals.

Climate “portrays organizational environments as being rooted in the organization’s value system, but tends to present these social environments in relatively static terms . . .” Climate is bi-polar (labor on one side and management on the other), unidirectional (focused on manage-

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22. Llory, supra note 13, at 1152.
24. Id.
25. Id.
ment's initiatives), and confined to superficial aspects of the organization that participants can consciously perceive. The agents of the organizational system (the managers) create and sustain the environment within which the subjects of the system (the employees) work. Climate researchers use survey tools and statistical means to measure employees' perceptions of management and the impact of management's actions on employees. Changes wrought by social interaction and extrinsic forces are generally outside the scope of investigation.

Culture, on the other hand, resides deep within an organization, in the unconscious values, beliefs and assumptions of its members. Culture is neither fixed nor static, but "a process—essentially a political process—in which existing meanings are constantly being contested in a rough-and-tumble fashion, renegotiated, and redefined by the parties." From a cultural perspective, organizational control is contested, with various stakeholders vying for influence. Accidents (particularly those with catastrophic consequences) are seen as errors emanating from within an organization's structure. As Vaughan has explained in regard to the Space Shuttle Challenger disaster, a cultural approach to accident analysis seeks to explicate the "sociology of mistake." While climate research typically aims to enhance organizational performance, culture research focuses on unearthing the varied influences and interests, both internal and external, which collectively determine an organization's social constitution and proclivity to accidents.

What rail safety regulators call "culture" actually bears a closer resemblance to what organizational theorists call "climate." The following two examples illustrate this resemblance (1) FRA's proposed rules on merger-related safety integration plans and (2) NTSB's 1996 report on the collision of a Metrorail train with another commuter train in

27. Id.
28. Id.
29. Id.
30. Id.
31. Id.
The first example involves the draft regulations promulgated in December 1998, when FRA proposed to require railroads seeking authority to carry out mergers and similar transactions to prepare plans detailing how they will safely integrate train operations after the merger. The regulations call for a description of merger applicants' "corporate culture," which FRA defines as "the attitudes, commitments, directives, and practices of railroad management with respect to safe railroad operations." As FRA explained:

These elements ultimately provide the vision and direction for all levels of railroad employees and influence their training, health, morale, and safety practices and habits. The safety culture of U.S. railroad companies, especially the major Class I railroads, is established by the railroad's chief executive officer and permeates throughout the entire rank-and-file of employees. Management's attitudes, directives, planning, and resource allocations all reflect the mission and vision of a company, and influence the training, morale, and safety practices of carrier employees.

"Corporate culture" according to FRA, thus consisted of management's vision, something to be promulgated downward through a carrier's organization by means of directives, plans and resource allocations. In the draft rules, FRA did not acknowledge the role of employees in forging their own safety culture. In addition, there is not an express possibility that culture may be affected by the give and take of competing interests, or that circumstances extant in the rail industry or society at large may condition management's power to create good safety culture.

The second example of rail safety regulators' climate-based approach is NTSB's report on the 1996 collision of a Metrorail train with a standing...


35. 63 C.F.R. (proposed), supra note 34, at 72,239.

36. FRA's basis for instituting a rulemaking in connection with mergers and other transactions is the claim that recent "mega-mergers" have adversely affected combining carriers' safety performance. See id. at 72,227 (describing safety failures allegedly caused by the Union Pacific-Southern Pacific and Burlington Northern-Santa Fe combinations). While FRA's claim that mergers degrade safety performance may or may not be valid in a foreshortened transactional framework, the evidence suggests that, in the long run, rail mergers have been a boon to safety. See IAN SAVAGE, THE ECONOMICS OF RAILROAD SAFETY 160 (1998). This is due to the reduction of switching operations between combining rail carriers, in the course of which a disproportionate percentage of railroad occupational injuries occur. Id.

37. 63 C.F.R. (proposed), supra note 34, at 72,239.

38. Id. at 72,231.
commuter train in Gaithersburg, Maryland. NTSB determined that the probable causes of the accident were threefold. First, Metrorail’s management and board of directors failed fully to understand and address the design features and incompatibilities of the automatic train control system in use on the commuter system. Second, management and the board failed to permit operating department employees to use judgment to make decisions involving operations safety. Third, they effectively promulgated and enforced a prohibition against placing standby trains at terminal stations on the same track as incoming trains.

Reflecting later on the Metrorail accident’s causes, NTSB’s chairman noted:

It would be tempting to blame the conditions and circumstances of this accident on one person, the Deputy General Manager. But this would not have recognized corporate culture as a safety problem. Certainly he was part of the problem at Metrorail, but what about the seeming indifference and disregard by some employees for safety precautions, and the absence of informed opposition when flawed solutions to problems were being considered?

Among factors common to the Metrorail crash and similar accidents were “[t]he arrogance of management that believed in its inherent superiority to government regulations and sound operating practices” and “[t]he establishment of an organizations [sic] culture that discouraged communication, divergent opinion, and an appreciation for the importance of safety.” Resisting the temptation to attribute the accident’s causes to faulty technology (the automatic train control system) or to an individual’s missteps (the Deputy General Manager), NTSB tried to pinpoint systemic shortcomings. However, from an analytic standpoint, these supposedly system-wide defects, managerial indifference, disregard and arrogance are merely human errors up the chain of command within the Metrorail organization.

FRA’s and NTSB’s adherence to a human-factors paradigm of accident causation and closed-system view of organizational life are hallmarks of the safety climatological approach. Also, characteristic of the climate approach is the agencies’ near-exclusive emphasis on managerial factors; in FRA’s case, management’s attitudes, directives and re-

39. 63 C.F.R. (proposed), supra note 34, at 48-49.
40. Id. at v.
41. Id.
42. Id.
43. Jim Hall, Chmn., NTSB, remarks at the Symposium on Corporate Culture and Transportation Safety 9 (April 24, 1997).
44. Id. at 10.
45. 63 C.F.R. (proposed), supra note 34, at 48-49.
source decisions, and in NTSB’s case, management’s culpability. To suggest that rail regulatory authorities have adopted a managerial perspective is not to suggest, however, that the agencies’ interests are aligned with management’s. On the contrary, as Daniel Denison has pointed out, those investigating safety culture/climate from a perspective like the agencies’ are often “in the tacit position of playing both sides of the managerial issue. They seldom contest the managerial creation of organizational contexts, but they often represent the interests and perspectives of the nonmanagerial employees who operate within that context.”

B. STRENGTHS AND LIMITATIONS OF THE SAFETY CLIMATE APPROACH

While rail regulators may be perpetuating a misnomer when they call “safety climate” by the phrase “safety culture,” their reliance on the work of safety climatologists is not without a foundation. In fact, studies (including some in the rail industry) have validated the nexus between safety climate and safety performance. These studies (three of which are profiled below) are provocative not only for regulators, but also for managers and others whose goal is to enhance organizational safety performance. However, rail safety regulators would be well advised to weigh the climate perspective’s limitations before promulgating regulations in tacit reliance thereon.

In a study of locomotive engineers in England, Sharon Clarke found that organizational factors, particularly workers’ perceptions of managers’ safety attitudes, influenced the likelihood of hazardous incident reporting. Clarke surveyed engineers in three areas of the country, where earlier research had identified varying perceptions of management’s concern for safety. The results indicated that reasons relating to managers’ attitudes were most significant in predicting engineers’ intentions not to report hazardous conditions, including fairly serious locomotive and equipment failures.

In a study of ground workers at several Spanish airports, Rosa Isla Diaz and Dolores Diaz Cabrera found a nexus between organizational policies and practices and workers’ perceptions. They also found that organizational policies and practices, operating through safety climate, probably had an impact on workers’ safety behavior. One of the key dimensions of safety climate was company policy toward safety. This included an emphasis on compliance with safety standards, feedback on

46. Denison, supra note 26, at 50.
47. Sharon Clarke, Organizational Factors Affecting the Incident Reporting of Train Drivers, 12 WORK & STRESS 6, 8 (1998).
48. See id. at 14.
performance, assignment of funds and resources to safety areas, emphasis on safety training and management commitment to safety. A second important dimension of safety climate was employees' perception of the relative emphasis management placed on production versus safety. The researchers noted, however, that in some companies, a dichotomy did not exist and productivity and safety were considered compatible.50

Surveying utility line workers, David Hofmann and Adam Stetzer set out to probe whether safety climate would influence causal attributions about accidents. The research was designed to test the effects of safety climate on an acknowledged psychological phenomenon relating to causal attribution. This phenomenon, known as the “defensive attribution bias,” reflects the tendency of individuals who perceive themselves as personally similar to the victim of an accident to overattribute causation to external factors.51 Hofmann and Stetzer hypothesized that workers' tendency to use self-defensive, external attributions would be accentuated in negative safety climates and attenuated in positive safety climates. In particular, the quality of safety communication in the workplace would affect the extent to which workers were willing to place responsibility on other workers who were involved in an accident. Hofmann and Stetzer confirmed that safety-related communication “significantly moderated the relationship between informational cues and causal attributions” and concluded that “a context that encourages open, positive, and free-flowing communication about negative events” is an essential ingredient of effective accident investigations.52

Thus, rail safety regulators' focus on management's role in fostering an environment conducive to safety has a basis in organizational research. This research is thought provoking, not only for regulators, but also for managers and others striving to promote good organizational safety performance. Nevertheless, the climatological approach leaves many essential questions unanswered. What explains, for example, in Clarke's investigation of locomotive engineers in England, managers' varying attitudes, on which the engineers' willingness to report unsafe conditions so critically depended? Can it be ascertained, from Diaz' and Cabrera's survey of airport workers, why some companies underemphasized compliance with safety standards, feedback on performance, assignment of funds and safety training, with resulting negative impacts on safety per-

50. Id. at 648.
51. David A. Hofmann & Adam Stetzer, The Role of Safety Climate and Communication in Accident Interpretation: Implications for Learning from Negative Events, 41 ACAD. MGMT. J. 644 (1998). A countervailing bias which may lead those investigating accidents (typically supervisors) to overattribute responsibility to the workers involved in the accident is known as the "fundamental attribution error." Id.
52. Id. at 654-55.
formance? In Hofmann and Stetzer's study of safety-related communication, what were the reasons behind some work-teams' more open environment for communication?

More fundamentally, can we be confident that climate studies capture all the salient variables? What if, contrary to the core assumption of the climate approach, key determinants of safety were not within the closed loop of management's directives, planning and resource allocations, and employees' perceptions? Would a climate approach even suspect their existence? As Michel Llory has suggested, in regard to remodeling the classic accident paradigm, a more open-ended form of investigation may be necessary to avoid overlooking key elements:

[A]ccounting for work-related social and cultural processes means seeking out new data, and attaching importance or a relative meaningfulness to information that we had ignored or considered to be of secondary importance until then. It thus leads to modes of interpretation that are quite different from the incidents and accidents themselves, and hence to corrective or curative measures that are to a certain extent also different.

In other words, there is a radical change of perspective once we give primacy to social and cultural phenomena over individual behaviour.53

If regulators hope to understand what it is they are attempting to manipulate, and their goal is cultural transformation, then they should be willing to entertain a broad variety of factors contributing to safety culture. A full account of safety culture should extend beyond the confines of climatological studies and may even have to suspend (at least temporarily) an interventionist agenda.54 Again, as Llory has stated, "[t]o go beyond this initial phase of discussion we have to ask other questions about the normative quality of safety culture: Can we impose it? Can we decree it? Can we measure it with safety indicators? Above all what is safety culture made of?" 55

53. Llory, supra note 13, at 1152.
54. FRA's 1998 request for authority to investigate railroads' safety culture exemplifies the regulatory agencies' deeply normative, agenda-driven perspective. As FRA reported in the Federal Register, the probe was necessary "to expose cultural shortcomings in the railroad industry, including harassment and intimidation of subordinates, and frame a program to develop a corporate culture that advances and awards safety in the work environment." Agency Request for Emergency Processing of Collections of Information by the Office of Management and Budget, 63Fed. Reg. 17,478 (1998). Of course, regulators are not the only ones interested in promoting "good" safety culture. An interventionist orientation toward safety culture is, not surprisingly, also characteristic of the consultancies that have proliferated since the concept was invented in the early 1980's. Some academics as well have endorsed the view that safety culture is, fundamentally, something to be shaped and molded. See, e.g., REASON, supra note 23, at 192 (arguing that safety culture can be socially engineered by identifying and fabricating its essential components and then assembling them into a working whole).
55. Llory, supra note 13, at 1152.
C. EXPANDING THE HORIZONS OF SAFETY CULTURE

In broadening their perspective on safety culture in the rail industry, regulators might begin by looking at social and cultural phenomena prevalent in society at large. Safety attitudes and behaviors are not the by-product solely of work-related experiences; people import into the workplace ways of thinking and acting formed both before and outside of work. Similarly, safety norms are not limited to, or exclusively created at work. Many unwritten rules regarding safety preexist and, without intervention, may override workplace rules. Any safety initiative or description of safety culture that does not take into account background societal factors is likely to be less effective, on the one hand, and less illuminating, on the other.

Even without leaving work environs, however, regulators may discover social determinants of safety culture that are not strictly a function of management's initiatives, employees' perceptions, or the behaviors of individuals belonging to either group. In fact, regulators need look no further than the manifold laws regulating safety in the rail industry. These laws are among the more important background societal factors informing railroads' culture. They help explain industry participants' safety values, beliefs and assumptions; they are "what safety culture is made of." Moreover, from a practical standpoint, if the laws dictate (or even just strongly influence) safety behavior, and if modifying behavior is the objective, changing the law may be an essential first step.

FRA's own rail safety regulations are among the laws with a thoroughgoing impact on railroads' safety culture. These regulations specify design standards for many types of railroad equipment and infrastructure, including track, freight cars, rear-end marking devices, locomotives, power brakes and drawbars.56 Savage has described how these standards have unexpected effects relating to the development of safety-related knowledge, a critical component of safety culture:

While the government may have a legitimate interest in the engineering of certain critical components of railroad equipment and infrastructure, it is surely only interested in how the equipment or infrastructure performs and not how it is designed. There are two consequent problems. The first is that a government committee has to decide on what the design specifications are. The clear indication is that cost-benefit analysis is not one of the tools used by the FRA in making such a determination. The second problem is that there is clear evidence that once written into law, specification standards become so inflexible and so politicized that changes in technology and engineering knowledge are held back. This is particularly the case when engineering advances have repercussions on labor and work rules.57

57. Savage, supra note 36, at 163.
Thus, the rail safety laws’ rigid specification of equipment and infrastructure design, while intended to promote safety, may actually retard the development of technological and engineering knowledge.58 Once in place, these laws are subject to politicization because of their rigidity and issues unrelated to safety, such as employment levels, soon become intertwined. An unavoidable implication of safety’s politicization is that the government itself is not a mere observer of, or actor upon, safety culture. Regulators are participants in safety culture and, as Savage’s explication of the externalities associated with design specifications shows, their actions are presumptively neither neutral nor benign.59

Other workplace laws worth considering for their impact on safety culture include the railroad occupational disability laws.60 Arguably, however, no law is as fraught with consequences for safety culture in the railroad industry as the Federal Employers’ Liability Act (“FELA”).61 Applicable to about two hundred and seventy thousand railroad workers, including employees of freight railroads, the National Rail Passenger Corporation (Amtrak) and many commuter railroads, FELA stands in contradistinction to the no-fault workers compensation systems covering some ninety million American workers.62 FELA’s negligence-based regime erects barriers uncharacteristic of workers compensation programs to the free flow of safety-related information; something all observers emphasize is critical to good safety culture.63

58. The command-and-control characteristics of FRA’s design specification standards run counter to the trend in safety regulation. As Reason has described:

The past two or three decades have seen a marked change in the way safety legislation is framed in many industrialized countries. Putting it very simply, there has been a shift away from laws that specify the means by which safe working should be achieved to laws that focus on the attainment of certain safety goals. Instead of rules that prescribe the precise steps to be taken by individuals or organizations, leaving little or no discretion for deviation, the current trend is towards rules that emphasize the required outcomes of safety management, allowing considerable freedom on the part of the operators of hazardous technologies to identify the means by which these ends will be achieved.

Reason, supra note 23, at 175.

59. Id.

60. Higher disability benefits available to railroad workers may give rise to a moral hazard: “[A] number of studies have indicated that there may be strong incentives to make fraudulent claims and strong disincentives to return to work if the benefits provided approach or exceed full replacement of the worker’s wages.” Transp. Res. Bd., Nat’l Res. Council, Special Report 241, Compensating Injured Railroad Workers Under the Federal Employers’ Liability Act. (1994). In an effort to obtain higher benefits, workers may also be less than candid in describing the safety-related causes of their injuries. Id.


III. THE FEDERAL EMPLOYERS' LIABILITY ACT

Enacted by Congress in 1908, when railroads were the nation's largest employer and railroad work was unusually hazardous, FELA was a progressive measure aimed at compensating injured railroad workers when they likely would not have garnered compensation at common law. Through statutory repeal of the fellow-servant doctrine, restriction and later abolishment of assumption-of-risk, and substitution of comparative negligence for contributory negligence, Congress eliminated powerful common law defenses in personal injury suits brought by railroad workers. Building on FELA's remedial principles, the Supreme Court in a series of decisions eroded obstacles to recovery by lessening the standards for proving employer fault. As a consequence, under current law, to recover some quantum of damages a railroad worker need only establish a failure, however minimal, on the part of the employer to exercise due care. If an injury results from a violation of safety statutes or regulations, the railroad is subject to strict liability. Other worker-friendly provisions include the right to file suit in state or federal court and a prohibition on removal.

Not long after Congress enacted FELA, the states also began experimenting with alternatives to the common law approach. No-fault workers compensation programs are based on a fundamentally different premise than FELA or the common law, that both employers and employees should bear some of the costs of compensation for workplace injuries without regard to who caused the injury. Workers compensation incorporates a trade-off: employers give up the right to contest responsibility for injuries for which they are not at fault, but they are spared exposure to common law damages for injuries they do cause. At the same time, employees lose the right to seek full damages, but need not establish their employer's negligence (or counter allegations of their own) in order to recover. The logic in the trade-off is that, in the aggregate, workplace injuries are caused by both employer and employee negligence.

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64. 45 U.S.C. §§ 51-60.
66. See, e.g., id. at 58 (relaxed standard of proof applies in FELA cases; test is whether employer negligence played any part, even the slightest, in producing injury).
Rather than requiring that fault be proven in each case, workers compensation programs presuppose joint responsibility and assign liability at a macroscopic level.\textsuperscript{70}

Proposals to scrap FELA in favor of a federal no-fault system were floated in Congress within a few years of FELA’s passage.\textsuperscript{71} However, these proposals were defeated by railroad unions, which viewed, and continue to view, FELA as affording more generous benefits.\textsuperscript{72} FELA indeed is more generous. According to a 1994 study, the FELA “injury premium” averages two to four times workers compensation indemnity payments.\textsuperscript{73} From this premium, an injured worker typically pays twenty-five percent to an attorney, if he has retained one. The remaining differential over workers compensation comes from railroad workers’ higher salaries, indemnity for full wage losses without the caps found in most workers compensation programs, and payments for pain and suffering.\textsuperscript{74}

Understandably anxious to retain FELA’s higher benefits, rail labor also argued that FELA establishes superior incentives for railroads to operate safely.\textsuperscript{75} FELA in fact may offer the best incentives for railroads to exercise their current level of care:

On the face of it, FELA is likely to provide employers with strong incentives for investing in safety. Because workers may recover the full cost of their injuries, employers are likely to invest in precautions whose costs equal the costs of potential liabilities avoided. Because these costs include those that are normally shared by the employee in no-fault workers’ compensation systems, there may be an incentive to adopt more investments in safety than would be the case under workers’ compensation.\textsuperscript{76}

Furthermore, it is conceivable that replacing FELA with a workers compensation system would cause railroads to reduce their standard of care.\textsuperscript{77}


\textsuperscript{71} FELA when enacted was an attempt to sidestep constitutional questions surrounding workers’ compensation programs. See Reed v. Philadelphia, Bethlehem & New Eng. R.R. Co., 939 F.2d 128, 132 (3d Cir. 1991) (noting Congress’ understandable reluctance to provide a remedy for injured railroad workers that might not withstand constitutional scrutiny). As soon as that circumstance ceased to exist, there was an effort to replace FELA with a no-fault system. Id. According to some, if Congress were writing on a blank slate today, it undoubtedly would adopt a workers’ compensation program in lieu of FELA’s statutory vagaries. Id.

\textsuperscript{72} Savage, supra note 36, at 84.


\textsuperscript{74} Id. at 146-47

\textsuperscript{75} GAO/RCED-96-199, FELA 18 (1996).


\textsuperscript{77} Savage, supra note 36, at 90. On the other hand, the human and economic costs of accidents under any injury-compensation regime may provide ample motivation for an enterprise’s investment in and commitment to safety. Id.
However, FELA's positive features, more generous benefits and the exacting standard of care the statute fosters, carry a price. As noted, unlike workers compensation, FELA requires a case-by-case determination of negligence through a lawsuit or, more commonly, through internal resolution of a claim. Transaction costs associated with FELA's approach are high. Railroads must maintain a full-time staff to deal with injury-related investigations, settlement negotiations and rehabilitation. In addition, they must typically retain outside counsel to defend litigation. Injured employees are more likely to utilize an attorney and often must forego recovery while a settlement is negotiated. 78

Compounding FELA's high transaction costs, the statute creates an adversarial environment in which to resolve the facts surrounding workplace injuries. FELA's dictate that workers and management prove each other's negligence undercuts what researchers deem a key part of good safety culture: an organizational context for accident investigations that encourages open, positive, and free-flowing communication.

A. FELA'S IMPACT ON RAILROADS' SAFETY CULTURE

Investigations of railroad on-the-job injuries typically begin with the preparation of a personal injury report. Most rail carriers' operating rules and industry union contracts require that workers file such a report as soon as practicable after sustaining an injury. The employee or the railroad then initiates a claim, which at the outset the railroad's claims agents handle internally. From this point, the majority of personal injury claims are resolved without the involvement of attorneys or the filing of a lawsuit.

Even with claims destined for informal resolution, each side skews the focus of the investigation. This is due to the potential need to prove the other side's negligence, not just on the facts of an accident, but on how its circumstances are reported and how injuries are described. Anticipating the need for proof on such matters, one FELA plaintiff's law firm offers the following advice for completing personal injury reports:

> It may be helpful to look at the personal injury report as an "unsafe place to work report" because that is what the railroad should be interested in identifying and is really what you need to establish when you complete the form. The key is to remember that you are not simply reporting the INJURY, but also THE UNSAFE CONDITIONS THAT CAUSED THE ACCIDENT. 79

Another law firm advises that injured employees always ask themselves

before completing a personal injury report "what could the railroad have done to have prevented me from being injured? Could the work place have been safer? Were the tools furnished me sufficient to do the job? Did I have adequate help? Was I provided adequate training and supervision for the job I was required to do?". Because of the personal injury report's evidentiary significance, one railroad union advises its members not to make any statements or fill out any forms until fully advised by an attorney.

In fairness, injured employees' search for external attributions (to borrow Hoffman and Stetzer's phrase), care to avoid inculpatory admissions and comparatively frequent resort to legal representation may stem from the perception that railroads, also prompted by FELA, are themselves intent on deflecting liability in accident investigations. In fact, empirical research appears to confirm that employees view FELA as a key motivator in the investigative process. In a 1998 study, a consultant for FRA surveyed union employees and managers and conducted focus sessions and interviews on safety culture at four of the largest railroads in the United States. Among findings reported to FRA from the focus sessions:

Employees are particularly sensitive to the implications of the Federal Employee Liability Act and their perception of how it drives the nature and burden of railroad operating rules. As far as they are concerned, the whole basis of the investigative/disciplinary process is designed to place liability on the employee for all incidents and/or injuries. This is a dominant theme for all the railroads in this review.

Thus, railroad employees and managers alike may feel driven toward external, blame-shifting attributions for accidents. With FELA’s negligence standard determining compensation and liability, finger pointing is entirely rational. The problem with such a system from a safety culture standpoint is the disincentives to openness it creates. Conversely, a system that promotes candor in describing how and why an accident occurred is the key to identifying unsafe practices and improving safety performance. FELA establishes just the opposite incentives:

Because the employee’s right to be compensated for injuries is conditioned on showing the railroad was at fault, and because, conversely, the railroad can eliminate or reduce its liability by showing that the employee’s negli-

83. Id. at 27.
gence contributed to the injury, both parties have an economic incentive to place the blame for accidents on the other. This provides motivation to obscure the true causes of workplace accidents, and thus hinder their objective investigation. As a result, effective modifications of workplace procedures and equipment may be delayed or prevented. 84

FELA makes it more difficult to achieve the desideratum of good safety culture: a work environment that encourages open communication about accidents and incidents. In answer to the question implicitly left open by Hofmann and Stetzer's research on communication and safety climate, it may be a reason why some railroad safety climates are negative. If so, Hofmann and Stetzer's research makes clear, the result will be self-defensive, inaccurate causal attributions that do not provide the feedback from accidents essential to improving organizational safety performance.

In addition, because it is a fault-based regime, FELA frustrates attainment of Reason's ideal accident-averse culture, which must be capable of "creating a safety information system that collects, analyses and disseminates information from incidents and near misses, as well as from regular proactive checks on the system's vital signs." 85 Insofar as railroad employees and employers must prove each other's negligence in connection with workplace injuries, an "informed culture", meaning a safety culture "in which those who manage and operate the system have current knowledge about the human, technical, organizational and environmental factors that determine the safety of the system as a whole", will be more elusive. 86

IV. Conclusion

As long as railroads remain financially able to make robust, safety-
enhancing capital investments, occupational accidents attributable to defective rail infrastructure are likely to continue declining as a percentage of total work-related accidents. Human factors, conversely, may account for a growing percentage of on-the-job injuries. To the extent such factors are not readily identifiable with individuals’ errors, but can be said to derive from loosely defined organizational deficiencies, the concept of safety culture will retain a prominent place in rail regulators’ safety kitbag.87

To date, rail safety regulators have embraced an unnecessarily narrow model of safety culture, one that bears a closer likeness to what students of organizational life refer to as “safety climate.” Climate studies, including some in the rail industry, have borne out that managerial emphasis on safety can make a difference, not only with regard to workers’ attitudes, but for organizational safety performance as well. There are important limitations to these studies. The growing academic literature suggests that a true cultural analysis of safety should extend beyond the parameters of labor-management relations and consider a broad array of societal factors.

As a starting point, safety regulators need look no further for social determinants of safety culture than the laws affecting safety in the railroad workplace. Many of these have repercussions for safety culture. Perhaps none has a greater or more harmful impact than FELA, the railroads’ fault-based system for assessing responsibility for workplace injuries. The need to establish negligence in every FELA case, whether an injury ultimately is resolved by litigation or informally, as is the norm, creates a substantial impediment to safety communications between railroad workers and managers and frustrates the effective administration of safety programs. In regulators’ drive to promote cultural change in the rail industry, FELA’s effects, and the effects of other laws regulating safety in the railroad workplace, deserve every bit as much attention as employees’ perceptions and management’s attitudes. In the future, rail safety regulators should examine all determinants of railroads’ safety culture and not stop short of a true safety cultural perspective.

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87. The safety culture concept’s very imprecision and malleability may help explain its popularity. As one rail industry observer has noted:

Since its first usage, safety culture has been used as a catchall term for the human element within organizational systems, and to a certain extent used as an excuse for accidents. It has tended to be used to explain how organisations with well-developed safety management systems still have accidents. Hence the term has developed to cover the role of individuals in a system, and their effect upon the implementation of safety management systems, and the overall safety of the system.

Comment

Taxicab Licenses: In Search of a Fifth Amendment, Compensable Property Interest

Steve Oxenhandler

“There is nothing which so generally strikes the imagination, and engages the affections of mankind, as the right of property; or that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual...”1

I. INTRODUCTION

Thousands of years ago, according to legend, a massive tidal wave submerged the mystical City of Atlantis, inaugurating an ongoing search for the city; ancient mariners reconnoitered entire oceans in hopes of discovering Atlantis. Today, explorers continue the quest, once again hoping to uncover the lost civilization and corresponding putative right to its property. On July 9, 1998, the Miami-Dade County Board of County Commissioners (“Board”) passed Ordinance No. 98-105,2 setting in motion a similar search by Miami-Dade County’s (“County”) taxicab license

2. See Miami-Dade County, Fla., Ordinance No. 98-105, Amended Substitute Agenda Item No. 5(M) (July 7, 1998).
owners; this search, however, is in pursuance of a Fifth Amendment, compensable property interest in a taxicab license.

A. IMPETUS FOR THE SEARCH

Pursuant to the provisions of Ordinance No. 98-105, effective April 5, 1999, an owner of a County taxicab license may sell, either conditionally or outright, a taxicab license only to a County registered taxicab chauffeur. On October 1, 1981, the County assumed responsibility for taxicab regulation. From October 1, 1981 until April 5, 1999, the County, subject to Board approval, permitted taxicab license holders to sell, transfer, devise, give as a gift, or assign taxicab licenses to any qualified buyer, regardless of whether the purchaser operated the taxicab as a chauffeur.

Taxicabs are a familiar, if not ubiquitous, ingredient of the modern urban landscape. County strictly regulates the taxicab industry, including, but not limited to the following areas: (1) the issuance, renewal, and transfer of taxicab licenses; (2) the condition of vehicles used as taxicabs; (3) the chauffeurs operating taxicabs; and (4) the companies providing taxicab service. Likewise, the vast majority of major metropolitan areas in the United States, in addition to most smaller cities or counties, regulate, license, and inspect the taxicab industry operating in that particular jurisdiction. In all but a few communities, however, the number of taxicab licenses is capped; that is, open entry is the exception. This means that only a limited, fixed number of taxicabs operate at a particular time.

The licenses accrue an artificial value, because government agencies

3. See Miami-Dade County, Fla., Ordinance No. 98-105, at 31-82(r)(3) (this section, entitled, “Assignment, Sale (conditional or outright) and Transfer to Chauffeurs,” states, in pertinent part, “[u]nless otherwise provided, from the effective date of this ordinance for-hire taxicab licenses may only be assigned, sold (conditional or outright) or transferred to a Miami-Dade County registered taxicab chauffeur . . . .” Id.

4. On June 2, 1981, Miami-Dade County passed Agenda Item 4(l), which terminated dual county-municipal taxicab regulation and instituted a uniform plan of taxicab regulation applicable to the County as a whole. See Miami-Dade County, Fla., Mun. Code, Agenda Item No. 4(l) (June 2, 1981).

5. See Miami-Dade County, Fla., Code, ch. 31, art. II (1989).


issue taxicab licenses on a limited, infrequent basis. A low supply, combined with a high demand for the taxicab licenses, creates a speculative taxicab license market. This is especially appealing to investors who, instead of operating the taxicab, lease the privilege of using a taxicab license to a taxicab chauffeur.

When, therefore, the County mandated that all future sales of taxicab licenses be to taxicab chauffeurs only, the taxicab license owners feared losing the ability to charge exorbitant lease rates and sale prices. Furthermore, when the unlimited market of potential taxicab license purchasers is compared to the limited, known market of taxicab chauffeurs, taxicab license owners become highly motivated to protect the current, unlimited taxicab license sale system because they will probably lose anticipated or expected profits. In short, taxicab license owners are searching for a compensable property interest in a taxicab license. They claim that limiting sales of taxicab licenses, that is, limiting the market of potential purchasers to a specific group of people, is a taking of their property - the taxicab license - for public use without just compensation.

At the same time, taxicab drivers are also engaged in a search. Their search focuses on finding a way to implement an owner-driver taxicab system, where a taxicab license is a property right, enabling taxicab drivers to use it as collateral for a loan to purchase the license. Under the current taxicab licensing system, as the price of leasing a taxicab license rises, so does the outcry from taxicab drivers, who seek to end the practice of taxicab license leasing. Instead, they want a system where

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9. See Bruce Schaller & Gorman Gilbert, Fixing New York City Taxi Service, 50 Transp. Q. 85, 90 (1996) [hereinafter Fixing] (arguing that a fixed cap on taxi medallions enables medallion licenses to gain an enormous monetary value, which leads taxi owners to focus on protecting the values of their investment); see also Bruce Schaller & Gorman Gilbert, Villain or Bogeyman? New York's Taxi Medallion System, 50 Transp. Q. 91, 98-101 (1996) [hereinafter Villain] (contending that leasing damages a driver's position in a number of ways: (1) fleet drivers lose nearly all of their fringe benefits and work longer shifts to earn more income from each shift; (2) fewer drivers reap the financial benefits of owning their own medallions because mini fleets and owner-driver cabs are converted to being leased; (3) mini fleet lease drivers lose the opportunity to boost incomes; and (4) lease prices are subject to increase at the whim of the lessor, causing instability for taxicab drivers).

10. See U.S. Const. amend. V. "No person shall be held to answer for a capital . . . nor shall private property be taken for public use, without just compensation." Id.

11. Indeed, the drivers are underpaid, but not because there are too many cabs, or because the fares are too low. They are underpaid because they start out of the garage every day minus $100, the ridiculous daily rent or "gate" they must pay to the medallion owner for the right to drive the cab for one 10-hour shift. Letters to the Editor, Providing More Cab Service for San Francisco Riders, S.F. Examiner, July 31, 1998, at A22.

Drivers, though see it differently . . . you have to drive for so many hours to make enough money to take home and live, the system is designed to make money for the
taxicab license owner actually operates the taxicab, providing direct service to the consumer.\textsuperscript{12}

On July 9, 1998, the Board created a system of taxicab licenses operated by owner-drivers. It defined a taxicab license issued under a medallion system as intangible property and limited the future sale of the medallions only to chauffeurs. Taxicab chauffeur entrepreneurs who own the license and operate the taxicab free themselves from the whims of absentee taxicab license lessors, which leads to better service for consumers.\textsuperscript{13} The Board explicitly created a compensable property interest in a taxicab license after April 5, 1999 thereby resolving the taxicab chauffeur's search. However, the taxicab license owners' search for a Fifth Amendment, compensable property interest still existed. It centered on finding a compensable property interest in a taxicab license before the new ordinance of April 5, 1999 took effect.

\section*{B. The Search Begins}

On July 9, 1998, the Board faced a conundrum: Whether to perpetuate a system where taxicab license owners engage in a speculative taxicab license market, charging high lease rates to taxicab drivers, without operating a taxicab; or, to author a system where, over a gradual period of time, taxicab chauffeurs purchase and own the license, thereby providing direct service to the consumer. The taxicab license owners claim that the County, prior to April 5, 1999, implicitly created a compensable property right in a taxicab license. The County treated the license as compensable property for over seventeen years, permitting the owners to sell, devise, give as a gift, or assign the license to an unlimited, qualified purchaser market. By deciding to restrict the sale of existing and future taxicab licenses to taxicab chauffeurs, the Board, according to current taxicab license owners, diminished the "free alienability" and "right to exclude" strands in the taxicab license owners "bundle of property rights." This places in motion the search for a Fifth Amendment compensable prop-

\textsuperscript{12} See Schaller \& Gilbert, supra note 9, at 93 (endorsing a strategy to create more owner-driver cabs, which will be beneficial because of the following advantages: (1) "[P]lace more of the industry in the hands of owner-drivers . . . ." Id. (2) "[R]educe the role of management companies and absentee medallion [license] owners . . . ." Id. (3) "[E]ncourage more drivers to stay in the industry longer." Id.).

\textsuperscript{13} See Schaller \& Gilbert, supra note 9, at 87-88 (recognizing that fundamentally altering the relationships between taxi owners and drivers, and between the taxi industry and its customers, by restructuring taxi medallion ownership towards an owner-driver system will improve service quality to the consumer).
property interest in a taxicab license. Even though a taxicab license may have some attributes of traditional property, the County maintains that a taxicab license is not a compensable property interest. Instead, a taxicab license is a governmentally conferred benefit, a privilege that the County regulates.14

“Similar battles have been fought in many other areas of government activity.”15 Other beneficiaries of government action, including broadcast licensees, welfare recipients, and recipients of inexpensive government hydroelectric power, have “sought to transform the benefits received from a ‘privilege’ into a property ‘right.’”16 If a benefit is merely a privilege, then it can continue as long as the regulatory body determines that the industry “serves the public interest.”17 On the other hand, “when benefits become a ‘right,’” the benefit or privilege become “more certain and secure.”18

In this Comment, I will analyze the subject of when, how, or if a governmentally conferred benefit or privilege evolves into a compensable property interest, using a taxicab license as a model. I will argue two main points: (1) that if a government agency does not explicitly create a compensable property interest in a taxicab license, the license does not implicitly evolve into a Fifth Amendment, compensable property interest unless, upon license revocation, the license owner must divest himself of any interest in the license instead of surrendering the license to the governmental entity. A pure license, represents a government benefit and privilege, which can be granted or revoked by the governmental regulatory body without providing compensation, despite the preexisting ability of license holders to sell, transfer, or devise the license; and (2) even if a government agency explicitly defines a license as intangible property, as the County did by passing Ordinance No. 98-105, restricting the sale of licenses to a certain population does not eliminate the “alienability” or “right to exclude” strands in the “bundle of property rights.” At most, the restriction only shortens the strands, and therefore, does not amount to a taking of private property for public use without just compensation.

As previously stated, while this Comment focuses on taxicab licenses, it addresses the broader topic of when, how, or if governmentally created benefits or licenses evolve into compensable property rights.

14. See Robert H. Nelson, Private Rights to Government Actions: How Modern Property Rights Evolve, 2 U. ILL. L. REV. 361, 362 (1986) (emphasizing that contrary to accepted regulatory theories, when a government entity regulates a given industry, the regulation is designed and operated for the regulated industry's benefit, in effect, creating a new form of business property, designed, purchased, and managed by the regulated industry).
15. Id. at 364.
16. Id.
17. Id.
18. Id.
Part II provides a brief history of taxicab licenses and explains the regulatory environment in County concerning taxicabs, both before and after July 9, 1998. Part III will provide a summary of regulatory takings in general. In Part IV, the search for a Fifth Amendment, compensable property interest begins by surveying case law relating to taxicab licenses to aid in answering the question of whether a taxicab license amounts to a compensable property interest. Next, Part V explores traditional Supreme Court, federal, and state “takings” case law to determine whether restricting one strand of a property right related to a government license amounts to a taking of that property. Finally, Part VI analyzes developing legal tests that help answer the question of when, if ever, a governmentally conferred benefit evolves into a compensable property right. In this part, I propose a new test to evaluate when a governmentally conferred benefit or license evolves into a Fifth Amendment, compensable property interest. We begin by examining the historical roots of taxicab licenses.

II. HISTORICAL ORIGINS OF TAXICAB LICENSES

A taxicab license is the authority granted by a regulatory body to an owner, who could also be a driver, to operate a designated vehicle as a taxicab in a particular jurisdiction. In some jurisdictions, like New York and Chicago, the regulatory body issues the owner of a taxicab license a “medallion,” which is a plate representing physical evidence of a taxicab license, and is normally, although not required, affixed to the front grill or bumper of a taxicab.

A. EVOLUTION OF MODERN TAXICAB LICENSE

While most ancient forms of for-hire transportation probably involved human powered rickshaws or horse-drawn chariots, one can only guess whether the operator charged a fare while transporting a passenger. One must also engage in conjecture as to whether a governing body regulated the ancient forms of transportation.

Taxicab regulation began in earnest in Renaissance Europe with the advent of horse drawn carriages for hire, also known as “Hackneys.” These are the predecessors of today’s taxicabs, which the cities of London and Paris began regulating sometime between 1600 and 1620. Charles I instituted a licensing scheme in 1635 in order to curb the increasing

19. Memorandum from Nilifur Ozizmer, Law Clerk for Miami-Dade County’s Consumer Services Department, to Gerald K. Sanchez, Miami-Dade Assistant County Attorney (May 23, 1994) (on file with author).
20. See id.
21. Dempsey, supra note 7, at 76.
number of horse drawn carriages for-hire and, in 1654, the British Parliament adopted a licensing scheme which limited the number of hackneys.22

To pinpoint the beginning of taxicab license regulation in the United States, one need look no further than New York City, which fathered modern taxicab license regulation during the Great Depression.23 Entering the taxicab business did not require a large overhead, therefore, the number of unregulated taxicabs grew quickly to approximately 21,000 by 1931. Anyone who owned an automobile could provide taxicab service.24 As the number of taxicabs operating on the streets of the city increased, officials raised concerns about reckless driving, excessive competition for fares, traffic congestion, and run-down taxicabs. In response, the City Board of Alderman passed the Haas Act in 1937, which placed a moratorium on the issuance of additional taxicab licenses. With this moratorium in place, taxicab licenses became known as taxicab medallion-licenses.25

Despite economic growth after World War II, New York City failed to increase the number of taxicabs. As a consequence, the value of taxicab licenses increased and “developed a trading value in the open market.”26 In addition to regulating taxicab licenses, the city also permitted taxicab licenses to be sold, devised, given, or assigned from one party to another.27 Like New York City, virtually all municipalities currently regulate the taxicab industry pursuant to the jurisdiction’s police powers.

B. MIAMI-DADE COUNTY’S TAXICAB LICENSE REGULATORY ENVIRONMENT

Before 1981, countywide taxi regulation did not exist; instead, each of Miami-Dade County’s various municipalities issued and regulated taxicab licenses separately. As a result, a patchwork of duplicative regulation caused taxicabs to “dead head,” i.e., they return to their trip origin, usually the municipality governing the operation of the taxicab, without pas-

22. Id.
23. Villain, supra note 9, at 93.
24. See id.
25. Id. In 1937, the number of taxicab licenses fell to 11,787 and remained at this number for over 50 years. Id. The Haas Act not only capped the number of taxicab licenses, it instituted the following provisions: (1) provided for automatic renewal of vehicle licenses; (2) allowed, subsequent to City approval, the transfer of licenses to qualified purchasers; and (3) mandated that the City issue 60% of the medallions to fleets that could rent the licenses to drivers, and the remaining 40% be issued to owner-drivers, a move intended to guarantee the survival of owner-drivers. See id.
26. Id.; see also, Bob Minzesheimer, To be a NYC Cabbie, Fare’s Not Cheap, USA TODAY, May 20, 1996, at 2A (explaining that for the first time since 1937, when medallions sold for $10.00 a piece, New York City auctioned 260 taxicab medallion licenses which sold from $175,000 to over $220,000).
27. See Ozizmer, supra note 19.
sengers. When taxicabs "dead head" they lose money and provide inefficient transportation to consumers. In addition, if a taxicab operator desired to operate in more than one municipality, he needed to obtain a separate taxicab license from each jurisdiction, including Miami-Dade County if the taxicab operated in any unincorporated area. Each jurisdiction, therefore, had separate, sometimes conflicting standards. Furthermore, each taxicab could charge different rates, creating confusion among consumers. Also each jurisdiction imposed varying taxicab operating and safety standards, including vehicle age, signage, and taxicab management company responsibilities.

On July 21, 1981, the Board found dual taxicab regulation against public interest and approved Ordinance No. 81-85. This amended Chapter 31 of the Miami-Dade County Code ("Code") and eliminated the existing system of dual county-municipal taxicab regulation. Ordinance No. 81-85 placed sole responsibility for taxicab regulation under the supervision and jurisdiction of the County. Ordinance No. 81-85 became effective on October 1, 1981, and contained the following provisions: (1) a person desiring to operate a taxicab in the County must first obtain a County for-hire license; (2) only the County Commission determines the need for additional taxicab for-hire licenses; (3) a taxicab for-hire license owner must renew the license by October 1 of each year; and failure to renew results in the license expiring and reverting back to the County; (4) a taxicab for-hire license holder may assign, sell (either outright or under a conditional sales contract), or transfer the license to another for-hire license owner or other qualified person after approval by the Board; (5) the Office of Transportation Administration enforces the provisions of the Code; (6) uniform taximeter rates throughout the County; (7) for-hire taxicab license suspension and revocation proceedings; and (8) caps on the number of taxicab licenses in the County at

29. See id. at 3(2)(A). Section B and C required, among other things, that each application contain information concerning the class or classes of transportation service the applicant desires to furnish; the names and addresses of at least three residents of the County as references; a factual statement indicating the public need for the proposed service; a record of all crimes of which the applicant has been convicted within the five years preceding the date of the application; and two credit references, including at least one bank, where the applicant maintains an active account. Id. at 3(2)(C).
30. See id. at II(E).
31. See id. at II(H & I).
32. See id. at II(J).
33. See id. at IV(A).
34. See id. at VII.
35. See id. at XI. The County, upon proper notice and hearing, could recommend suspending or revoking for-hire taxicab license under the following conditions: (1) a court convicted the license owner of a felony or any criminal offense involving moral turpitude; (2) the license
one taxicab per 1,000 residents.\textsuperscript{36}

The County granted each taxicab license owner, who had operated a taxicab in one of the municipalities before the ordinance passed, a County for-hire taxicab license.\textsuperscript{37} Because the County limited the number of taxicab licenses, the licenses began accruing value.\textsuperscript{38} The taxicab license regulatory system, initiated pursuant to Ordinance No. 81-85, remained substantially the same though experiencing some modifications, from October 1, 1981 until July 9, 1998.

The first mention of taxicab medallions in the County occurred in mid-1989. Industry members, including taxicab license owners and drivers, began exploring the feasibility of converting the taxicab license system to a taxicab medallion system. Some members of the taxicab industry, including both chauffeurs and license owners, wanted to encourage more taxicab owner-drivers. A medallion represented a property interest, thereby creating a mechanism for drivers to borrow money from a financial institution to purchase a taxicab license.\textsuperscript{39} In addition, taxicab license owners believed that a medallion system would permit the owners to finance new vehicles to sell to chauffeurs who, in turn, would use the vehicles as taxicabs.\textsuperscript{40} The Board, however, did not amend the existing taxicab license regulatory system. Instead, between 1990 and 1994, County staff, along with taxicab industry representatives, convened over 72 workshops, in a forum known as the Ground Transportation Advisory Committee, to formulate changes and enhancements to the existing taxicab regulatory system.\textsuperscript{41} Moreover, between 1994 and 1998, the County conducted numerous meetings with the taxicab industry, including meeting once per month to discuss the current and future state of the taxicab industry. Finally, on July 9, 1998, after two days of consecutive

\begin{itemize}
  \item owner lied on an initial or renewal application;
  \item the license holder permitted the taxicab to be operated in violation of any law;
  \item the license holder failed to comply with or willfully violated a provision of the Code; or
  \item the public interest will best be served; however, the County must demonstrate good cause. \textit{Id.}
\end{itemize}

\textsuperscript{36} See id. at XIII(C). The County granted a for-hire license to each taxicab operating in the County before Ordinance 81-85 passed; however, the cap of 1:1000 remained in effect. \textit{Id.}

\textsuperscript{37} The County issued 1,504 taxicab for-hire licenses shortly after Ordinance 81-85 passed; between the inception of Countywide regulation and 1988, the County did not issue additional licenses. In 1988, however, the Board authorized the issuance of 323 additional taxicab licenses, distributed pursuant to a lottery, which brought the total number of authorized taxicab licenses to 1,827. See Memorandum from Merrett Stierheim, Miami-Dade County Manager, to the Board of County Commissioners (July 7, 1998) (on file with author).

\textsuperscript{38} See id. Data concerning the sales prices of taxicab licenses is available since 1992: In 1992, the average taxicab license sold for $26,521; by 1997, the average taxicab license sold for $51,658, with one license selling for over $80,000. \textit{Id.}

\textsuperscript{39} See id.

\textsuperscript{40} See id.

\textsuperscript{41} See Metro-Dade County, Draft Ground Transportation Regulation Recommendations Report submitted to the Community Affairs Committee (August 14, 1991) (on file with author).
public hearings, the Board culminated over eight years of workshops and committee meetings by approving Ordinance No. 98-105, significantly altering the County's taxicab regulatory landscape.

The new taxicab regulatory environment differed from the County's original system in a number of ways. First, the Board distributed existing taxicab licenses pursuant to a "medallion system," which is defined as "the system which deems a taxicab for-hire license to be intangible property."42 Second, the County will issue each taxicab for-hire license owner a "medallion," defined as "a plate or decal issued . . . as the physical evidence of a taxicab license, affixed to the outside or inside of such taxicab."43 Finally, a taxicab for-hire license is defined as "an annual, renewable license . . . which may expire, be suspended, or revoked." If the license, however, expires, is revoked, or suspended, the license does not return back to the County; that is, the County will no longer have final control over the use of the taxicab license. Instead, only the license owner's ability to operate the license is adversely affected, but the license itself remains in the public market for purchase by a Board qualified third party.44

Besides remaining in the public market place upon revocation, a taxicab license issued under a medallion system is significantly different from a taxicab license issued pursuant to a pure licensing scheme. A medallion system permits liens to be placed on taxicab licenses, making them subject, like private property, to involuntary transfer through foreclosure.45 Even though a taxicab license under a medallion system is intangible property, the Board still retains the power to change licensing criteria or regulations pertaining to subsequent transfers of taxicab licenses; however, the Board's authority to make such changes could affect a lender's willingness to lend money for the taxicab licenses.46 A medallion system, therefore, may have a chilling effect on the Board's willingness to change the Code in the future. Conversely, under a taxicab permit system, most lending institutions did not loan money and use the taxicab license as collateral because the County treated the license as a pure privilege. The County was free to adjust the operating abilities of license holders, including revoking the license and reissuing or disposing of the license. On the other hand, under the medallion system, revocation of a license by the County does not extinguish the operating rights of the license, i.e.

42. See Miami-Dade County, Fla., Ordinance No. 98-105 at 31-81(aa). Intangible property is defined as property which cannot be touched because it has no physical existence such as claims, interests, and rights. See Black's Law Dictionary 846 (6th ed. 1991).
43. See Miami-Dade County, Fla., Ordinance No. 98-105, at 31-81(z).
44. See Miami-Dade County, Fla., Code ch. 31, art. II, at 31-81(r) (1998).
45. See Stierheim, supra note 37.
46. See id.
while the owner may be forced to divest himself of any interest in the taxicab license, the lien holder or transferee will continue to operate the license.47

While the majority of Ordinance No. 98-105 enhanced existing regulatory provisions, such as insurance requirements, taxicab company responsibilities, vehicle age requirements, and enforcement mechanisms, the amended Code limited the sale or transfer of a taxicab license only to qualified chauffeur-drivers.48 Even though the license owner may sell the license only to a chauffeur, the amended Code permits the 1,824 existing taxicab license owners to continue to lease the license to a chauffeur for an owner's lifetime. The owner can also devise or give the license as a gift to an immediate family member. The owner thereby retains the taxicab license in his family in perpetuity.49 Before discussing whether a taxicab license is a compensable property interest, a review of regulatory takings is warranted in order to establish the appropriate framework to analyze the two major arguments of this Comment.

III. Regulatory Takings in General

The Takings Clause of the Fifth Amendment protects private property from appropriation by the government without just compensation.50 The Supreme Court has long held that the Takings Clause applies to the states through the Fourteenth Amendment.51 Case law recognizes two distinct categories of takings: physical and regulatory.52 A physical taking occurs when the government actually seizes or performs the equivalent of actually seizing the property. A pure physical taking is rare because our government or its agents infrequently seize or occupy private property. The typical physical takings cases involve government appropriation of the private property to use for a public purpose. In United States v. Causby, the government used a citizen's airspace for its planes.53 Similarly, in Loretto v. Teleprompter Manhattan CATV Corp. the government used a small area of the citizen's building.54

47. See id.
48. See Miami-Dade County, Fla., Ordinance No. 98-105, at 31-82(r)(5)-(6).
49. See id.
50. U.S. Const. amends. V, XIV.
53. Causby, 328 U.S. at 264 (recognizing that a physical invasion of airspace over a landowner's property by intermittent entry of government planes amounted to a taking).
54. Loretto, 458 U.S. at 441 (finding that a New York law requiring landlords to permit the permanent installation of cable TV apparatus gave rise to a physical taking).
States the government used the citizen's land for its test wells.55

By contrast, the regulatory taking category relates mainly to economic losses and involves the imposition upon private property of some required government restriction, generally limiting or prohibiting any beneficial use by the private owner. In 1978, the Supreme Court decided Penn Central Transportation Co. v. City of New York, identifying three factors to consider in analyzing whether governmental action amounts to a regulatory taking: (1) the character of the government action; (2) the economic impact of the regulation; and (3) the extent to which the regulation interferes with the property owner's reasonable investment-backed expectations.56 The Court added that these factors should be evaluated by "focusing on the uses the regulations permit,"57 and rejected the "contention that a 'taking' must be found to have occurred whenever the land-use restriction may be characterized as imposing a 'servitude' on the claimant's parcel."58 If a landowner is left with some property value, the takings analysis requires the balancing of the three Penn Central factors.59

In 1980, in Agins v. City of Tiburon, the Court further clarified the issue of "regulatory takings" by holding that to establish a just compensation claim, a landowner must show that the challenged regulation (1) does not substantially advance legitimate state interests; or (2) denies him economically viable use of his land.60 To help evaluate the second prong of the Agins test, courts will use the three factors of the Penn Central test.

Although the Court in Penn Central did not elevate the importance of any one factor above another, the Court later carved out two circumstances, one for a physical taking and one for a regulatory taking, under which a single factor alone might determine the outcome of a takings case. The Court announced the first "per se rule" in Loretto, explaining that because a government regulation that authorizes a permanent physical occupation of property so closely resembles an exercise of eminent domain, a taking should be found regardless of the other Penn Central factors.61

55. Hendler v. United States, 952 F.2d 1364, 1376 (Fed. Cir.1991) (ruling that a physical taking occurred when the EPA issued an order giving itself and the State of California authority to enter plaintiff's land to test for ground water pollution and to return as often as they pleased to continue the monitoring).


58. Id. at 130 n. 27.


The Court, in *Lucas v. South Carolina Coastal Council*, announced the second per se rule, which involved an economic taking analysis finding that a regulation which deprives real property of all economic value is a taking, without considering the other *Penn Central* factors, unless the regulation prevents an activity that would have been considered a nuisance under historical state common law.62

The Court qualified the *Lucas* rule, however, by holding that a total loss of value would not trigger a taking if "the owner's estate shows that the proscribed use interests were not a part of his title to begin with."63 In cases where all economic use is deprived, the Court will most likely grant the remedy of compensation.64 On the other hand, if less than permanent deprivation of all use takes place, both federal and state courts have held that no taking occurs.65 Again, if the *Lucas* per se rule does not apply, a court will engage in balancing the *Penn Central* factors.

If a takings claim does not fall within either the *Loretto* or the *Lucas* per se rules, a plaintiff can claim he had reasonable investment-backed expectations in the property, thereby invoking the balancing of *Penn Central* factors. This limits recovery to property owners who can demonstrate that they made an investment in reliance upon the nonexistence of the challenged regulatory regime, i.e., one who invests in property with the knowledge of a restraint, or strict regulatory climate, assumes the risk of economic loss.66 In *Ruckelshaus v. Monsanto Co.*, the Court resolved a regulatory takings claim solely under the reasonable-investment backed expectation factor of the *Penn Central* test.67 Monsanto argued that various amendments to federal law, providing for the disclosure of trade secrets, submitted in government pesticide registration constituted a taking of those secrets.68 The Court, however, relying on the highly regulated nature of the pesticide industry, rejected Monsanto's taking claim and held that Monsanto did not have a reasonable investment-backed

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63. See *Lucas*, 505 U.S. at 1027.
64. See *First English Evangelical Lutheran Church v. County of Los Angeles*, 482 U.S. 304 (1987).
65. See generally *Citizen's Ass'n v. Int'l Raceways, Inc.*, 833 F.2d 760, 762 (9th Cir. 1987) (holding that a mere reduction in property's value is not sufficient to constitute a taking); *see also Haas & Co. v. City of San Francisco*, 605 F.2d 1117, 1120-21 (9th Cir. 1979) (finding that a 95 percent reduction in value does not amount to a taking).
68. *ld.* at 1008. The federal law in effect at the time Monsanto submitted the trade information did not address the issue of disclosure of trade secrets.
This section will address the following questions: (1) where a government entity has not expressly created a compensable property interest in a license or permit, under what circumstances does regulatory action, or inaction, by the government entity create a compensable property interest?; and (2) where a compensable property interest exists in a government license or benefit, under what circumstances may a government entity be obligated to compensate as a consequence of regulatory action?; i.e., does shortening the “alienability” or “right to exclude” strands in the “bundle of property rights” amount to a taking?

Property interests are not created by the Constitution; rather, they are “created and their dimensions are defined by existing rules or understandings that stem from an independent source such as state law.” As stated earlier, taxicabs are a ubiquitous ingredient in most cities across the United States. As a result, an interesting body of case law developed, which outlines the circumstances by which a government entity’s regulatory action or inaction may create a compensable property interest in a taxicab license among the various states.

69. Id. at 1013.
71. Id. (quoting FHA v. Darlington, Inc., 358 U.S. 84, 91 (1958)).
72. Connolly, 475 U.S. at 224 (eschewing “the development of any set formula for identifying a ‘taking’ forbidden by the Fifth Amendment,” and relying instead “on ad-hoc, factual inquiries into the circumstances of each particular case.”).
A. SURVEY OF CASE LAW RELATING TO TAXICAB LICENSES

1. Taxicab Licenses are Privileges, Not Compensable Property Interests

One line of cases focuses on a common theme in many jurisdictions: Taxicab permits, issued as incident to a city's regulation of the use of its streets, like a franchise do not constitute a compensable property right. Taxicab licenses are mere privileges granted for the purpose of regulation. In some instances, even an exclusive concession to provide taxicab service is not considered a compensable property right. Primarily, this is due to the fact that terminating the franchise or exclusive concession does not adversely affect the taxicab company's ability to continue operating on the public streets. Moreover, commercial businesses cannot acquire a vested property right to use the public streets in pursuit of private, commercial gain; therefore, when a governmental entity passes legislation adversely affecting existing taxicab owner's licenses, a challenge based on infringing upon a substantive property right will not be countenanced.

73. See Luxor Cab Co. v. Cahill, 98 Cal. Rptr. 576 (Cal.App.1 1971) (acknowledging that the use of the streets by taxicabs is a privilege that may be granted or withheld without violating due process or equal protection); Ex Parte Sterling, 53 S.W.2d 294, 297 (Tex. 1932) (holding that the long-standing law in Texas is "that the use of public highways by common carriers . . . is an extraordinary use enjoyed as a mere privilege or license, revocable at the will of the Legislature"); Bellew v. City of Houston, 456 S.W.2d 185 (Tex. App.-Houston [1st Dist.] 1970, writ denied); White Top Cab Co. v. City of Houston, 440 S.W.2d 732, 735 (Tex. App.- Houston [14th Dist.] 1969, writ denied) (holding that plaintiff's existing permits to operate taxicabs do not constitute a compensable property right when regulatory agency granted additional taxicab permits to competitors); Dallas Taxicab Co. v. City of Dallas, 68 S.W.2d 359, 362 (Tex. App.-Dallas 1934, no writ) (holding that the "right to solicit passengers and convey them for hire from one point to another in a city . . . is a privilege . . . granted by the city."); Kizee v. Conway, 35 S.E.2d 99, 101 (Va. 1945) (holding that a new taxicab ordinance, which fixed the number of taxicab licenses, thereby precluding some existing license holders from operating, is not unconstitutional because "[t]he right to use the streets of a city as a common carrier for hire is a privilege and not an inherent right, and may be granted or refused by the city, in the exercise of its police power, at its pleasure.");

74. See, e.g., Rocky Mountain Motor Co. v. Airport Transit Co., 235 P.2d 580 (Colo. 1951) (rejecting the claim that the original taxicab company had a property right to continue its taxicab business at the airport because of its general license to operate upon the streets of the City and County of Denver); Independent Taxicab Assoc. v. Columbus Green Cabs, Inc., 616 N.E.2d 1144, 1150 (Ohio Ct. App. 1992) (holding that even though appellants had most of airport business before the city contracted with appellee, no property right exists in guaranteeing independent taxicab drivers a certain amount of airport business).

75. See White Top Cab Co., 440 S.W.2d at 735; Bellew, 456 S.W.2d at 185; see also Yellow Taxicab Serv. v. City of Twin Falls, 190 P.2d 681, 682 (Idaho 1948) (recognizing that no one has a vested right to use the streets for or in the prosecution of a business for private gain, including the right to taxi stands, which the city has the power to revoke or replace, even though the taxicab stand existed in the same location for 16 years); State ex rel. Fohl v. Karel, 180 So. 3 (Fla. 1938) (recognizing as valid a statute requiring transportation companies engaged in for-hire operations to obtain certificates of public convenience and necessity because the right to use the public highways and streets for profit may be wholly denied or permitted to some and denied to others in order to promote the safety, welfare, health and morals of the people).
2. **Taxicab Licenses Do Not Create Vested Rights**

Related to the concept of a taxicab license being considered a governmentally conferred "privilege" is a jurisdiction's police power to validly enact new legislation governing the operation of taxicabs. This occurs either where no regulation previously existed, or when enacting changes to existing ordinances. One example, is where government entities had no rules controlling the operation of taxicabs, but later enacted such laws adversely affecting existing taxicab companies. Courts have upheld this type of legislation because no commercial entity has an inherent right to use the public streets for private gain. In *Allen v. City of Kosciusko*, taxicab owners challenged the city's revocation of all existing taxicab licenses and refused to reapply for brand-new licenses under a new regulatory scheme. The court held that "[a] permit to operate taxicabs... is a mere personal privilege, revocable for due cause and is not a vested, or property right in a constitutional sense." In *Seattle Taxi, Inc. v. King County*, a taxicab company challenged the validity of legislation setting uniform taxicab rates. The court used a two-part test established in *State v. Conifer Enterprises, Inc.*, to hold the legislation valid.

The *Conifer* two-part test required the following: (1) that King County's new legislation promote the health, safety, morals, good order, and welfare of the people; and (2) the legislation bear a reasonable and substantial relation to accomplish the purpose established in step one. 

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76. See Caulkins v. Wilkes, 58 N.W.2d 391, 393 (Iowa 1953) (acknowledging as a valid exercise of police power the City of Knoxville's regulation of taxicabs and subsequent limiting the number of licensed taxicabs to five, despite the objections of current taxicab license owners who did not receive one of the five permits "[because] no person has the inherent right to use the streets and highways for the operation of vehicles for hire."); Yellow Cab & Baggage Co. v. Publix Cars, 253 N.W. 80, 84 (Neb. 1934) (emphasizing that regulation requiring taxicab owners to apply for and obtain an operating permit not arbitrary, nor did it deprive existing taxicab owners of their property or property rights when regulations are enacted to protect the "public interest"); Bryan v. Olson, 282 N.W. 405, 406 (N.D. 1938) (upholding the authority of the City of Bismarck to enact taxicab regulations requiring an applicant to meet certain eligibility requirements before being able to operate a taxicab, even though the taxicab owner operated before the passing of the new legislation). The taxicab owners attempted to attack the ordinance as class legislation; however the court stated, "[i]t does not confer a class privilege or deprive any person or class of persons of a personal or property right." *Id.* at 406 (quoting Yick Wo v. Hopkins, 118 U.S. 356 (1886)).

77. *Allen v. City of Kosciusko*, 42 S.2d 388 (Miss. 1949)

78. *See id.* at 389.


80. *State v. Conifer Enterprises, Inc.*, 508 P.2d 149 (Wash. 1973). The two-part test is as follows: (1) does the new legislation tend to promote the health, peace, morals, education, good order, and welfare of the people; and (2) whether the particular statute bears a reasonable and substantial relation to accomplish the purpose established in step one. *Id.*

81. *Seattle Taxi, Inc.*, 744 P.2d at 1084 (holding that setting uniform taxicab rates, where none existed before, a valid exercise of the county's police power because it meets the requirements of the test laid out in *Conifer*).
3. Is a Taxicab License Property for Due Process Purposes?

Still another line of cases relates to whether a jurisdiction must guarantee due process, under the Fourteenth Amendment, to taxicab owners before changing or affecting their ability to operate taxicabs. In some jurisdictions, a taxicab license is a constitutionally protected property interest, and courts have held that the rights embodied in a taxicab license cannot be abrogated without due process of law. In *Cooper v. City of Chicago*, a taxicab driver claimed the City deprived him of his property interest in earning a living while he attended a hearing on a citation he received for not abiding by the City's taxicab rules. The court, however, held that the driver failed to state a due process claim because attending a hearing is not a deprivation of a protectable property right in earning a living. In addition, before a person can make a denial of due process claim, he must have a property interest in whatever is being denied or taken away. Even if he has a security interest in a taxicab medallion, if the debtor company received proper notice of a hearing to revoke the medallion, a creditor entity having a security interest need not receive notice of the hearing and, therefore, cannot claim a denial of due process.

On the other hand, in *Flower Cab Co. v. Petitte*, the court upheld a Fourteenth Amendment denial of due process claim when the Commissioner of the City of Chicago's Department of Consumer Services Department retroactively prohibited the sale, transfer, or assignment of taxicabs. The court reasoned that only the legislative body, not an administrative appendage, could amend existing ordinances or place a moratorium on sales, transfers, or assignments of government largess.

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82. *Id.*
83. "No shall any State deprive any person of life, liberty, or property, without due process of law." U.S. *Const.* amend. XIV, § 1.
86. See *id.* at *2.
87. See *Strickland v. Daley*, No. 91C0194, 1991 WL 14085 (N.D.Ill. Feb. 2, 1991) (holding that a person who expressed only a desire to obtain a City of Chicago taxicab medallion does not have a sufficient property interest to state a due process claim); see also *Board of Regents v. Roth*, 408 U.S. 564, 577 (1972) (stating, "[t]o have a property interest in a benefit, a person clearly must have more than an abstract need or desire for it . . . . He must indeed, have a legitimate claim of entitlement to it.").
90. See *id.* at 1175. The court spoke of a due process property interest only, not Fifth Amendment property interests, invoking a functional view of property for due process purposes.
4. **Is a Taxicab License Property for Purposes of a Fifth Amendment “Taking”?**

Perhaps the strongest case for acknowledging a compensable property interest in a taxicab license occurred in *Boonstra v. City of Chicago*, especially because the City of Chicago did not explicitly define a taxicab medallion as a compensable property interest.\(^91\) During the pendency of *Flower Cab Co.* in the Seventh Circuit, the City of Chicago ("City") passed an ordinance amendment that retroactively banned the assignment of taxicab licenses.\(^92\) Almost one and one-half years earlier, however, Mr. Joseph Zawistowski purchased, by assignment, a taxicab license issued by the City: a taxicab license he operated as an owner-driver.\(^93\) Although Mr. Zawistowski paid the annual renewal fees for the years preceding the ordinance amendment, the City, in 1984, and only two days after Mr. Zawistowski’s death, went to his home and confiscated the taxicab license based on the theory that the sale violated the ordinance amendment.\(^94\) Almost six years later, the City repealed the ordinance and once again allowed taxicab licenses to be freely transferred to qualified persons under the provisions of their licensing scheme; the City, however, failed to return Mr. Zawistowski’s taxicab license to his estate.\(^95\)

The court rebuffed the City’s contention that a taxicab license is not a protectable property interest on the following grounds: (1) the City limited the number of taxicab licenses; (2) the City permitted the assignment or sale of the licenses; and (3) the City never rejected a proposed assignment of a taxicab license.\(^96\) According to the court, "[t]he hallmark of a

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which focuses on whether the taxicab license constituted "secure and durable" property. *Id.* To the court, "secure and durable" meant that the taxicab license holder is the exclusive owner, can assign it with few qualifications, and is entitled to renew the license absent revocation or suspension. *Id.*

91. See *Chicago, Ill., Mun. Code* ch. 9-112-010(l) (1996) (defining a "medallion" as "a metal plate . . . for display on the outside hood of a taxicab, of such size and shape . . . as shall be required by this ordinance and by the commissioner.").


93. See *id.* at 690. Mr. Zawistowski later died, and his estate represented his interests in this case. *Id.* at 693.

94. See *id.* at 692.

95. See *id.* at 692-93. The decedent’s estate, therefore, brought this action claiming, among other things, that the City unconstitutionally took his property without due process or just compensation. *Id.* at 693. The City contended, however, that a taxicab license is not property for purposes of the Fourteenth Amendment and, as long as it acts through the legislative process, "may re秩序 the property rights of its citizens as it chooses even depriving citizens of property." *Id.*

96. See *id.* at 694. In effect, the court held that because the City fostered and created a public marketplace for the assignment of taxicab licenses, a taxicab license constituted more than a personal permit. *Id.* Moreover, relying on the functional definition of property, the court ruled the City parented a system where taxicab licenses constituted "secure and durable" property. *Id.* But see *O’Connor v. City of San Francisco*, 153 Cal. Rptr. 306, 310 (Cal. Ct. App. 1979)
constitutionally protected property interest is an individual entitlement which cannot be removed except for cause or with just compensation."97 In other words, despite the lack of an explicit recognition that a taxicab license constituted a compensable property interest, the court reasoned that because the City treated the taxicab license as a traditional form of property, the City implicitly created a compensable property right in a taxicab license.

Alternatively, see in O’Connor v. City of San Francisco, when the City San Francisco, pursuant to an ordinance known as Proposition K, compelled all existing 700 taxicab permittees to surrender their existing taxicab permits in exchange for new permits, and prohibited the future transfer or assignment of the new permits. The court held that motor vehicle for-hire permits were privileges granted pursuant to the city’s police power, and did not convey any vested property rights.98 In addition, the court relied heavily on the rationale, adopted by a vast majority of other jurisdictions, that the “use of the streets by taxicabs is a privilege that can be granted or denied without violating either due process or equal protection.”99

In Boonstra, the court held that while a legislative body may reorder property rights as it chooses, once a right is conferred, it may not authorize the deprivation without due process or just compensation. To do so, the court held, is a taking of property without due process or just compensation.100 Conversely, in O’Connor, the court rejected the plaintiff’s contention that revoking existing taxicab permits unconstitutionally deprived them of property without just compensation.101 Instead, the court reasoned that because existing taxicab owners did not have vested rights to begin with, the statute did not unconstitutionally infringe on any compensable property right.102

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97. See O’Connor, 153 Cal. Rptr. at 308. Proposition K also mandated that a new permit will be automatically revoked in the event of the death of the permit holder or when 10 percent or more of the stock or assets of the license changes during a sale or transfer of the license. Id.

98. See O’Connor, 153 Cal. Rptr. at 308. Proposition K also mandated that a new permit could be held only by natural persons, except in the case of legal entities currently holding permits. Id.

99. See id. at 309-10 (quoting Luxor Cab Co. v. Cahill, 98 Cal. Rptr. 576 (Cal. Ct. App. 1971)).

100. See Boonstra, 574 N.E.2d at 695.

101. See O’Connor, 153 Cal. Rptr. at 310. The court stated, “[h]e fact that an enactment alters legal relationships and disappoints business expectations is not fatal.” Id.

102. See id.
Although Boonstra supports the argument that a taxicab license is a Fifth Amendment, compensable property interest, when juxtaposed with the O'Connor decision, it loses its luster. First, Boonstra, incorrectly extends to government largess compensable property right protection and abrogates the ability of legislative bodies to implement new legislation pursuant to the government entity's police power. Second, Boonstra creates a slippery slope where all forms of government largess are susceptible to becoming compensable property interests once a government entity issues licenses or benefits, limits the number of licenses, and permits the licenses to be transferred. The court in Boonstra appears to imply that if government largess has some indices of traditional property, than the governmental entity is precluded from implementing new legislation to enhance existing laws because the largess evolved into a compensable property interest, and any change in the law has Fifth Amendment implications.

5. Taxicab Case Law: Comparing Miami-Dade County & Chicago's Regulatory System

As the case law relating to taxicab licenses reveals, the vast majority of states do not consider a taxicab license a Fifth Amendment, compensable property interest. In Illinois, however, even though Chicago did not explicitly define a taxicab medallion as a compensable property interest, a taxicab license apparently evolved into an implicit, compensable property interest because Chicago limited the number of licenses and always permitted the sale, transfer, and assignment of a taxicab license. If both the County and Chicago permit similar activities relating to a taxicab license, what distinguishes a taxicab medallion in Chicago considered a compensable property interest, from a taxicab license in the County recognized as a mere privilege?

Two distinguishing differences exist between a taxicab medallion in Chicago and a taxicab license in the County. First, Chicago does not define the authority to operate a taxicab as a license; rather, it is, and always has been, defined as a "medallion." Lending institutions in Chicago use the medallion as collateral for loans, where the medallion holder grants the lending institution a security interest in the medallion in order to secure payment of the loan. Conversely, the County, from October 1, 1981, until April 5, 1999, defined the authority to operate a taxicab as a "license," and lending institutions have never been willing to use a license as collateral for a loan because licenses are considered privileges, not property interests. Second, if Chicago revokes a medallion owner's ability to operate the medallion, it permits a secured party to foreclose on a taxicab
license and then sell the medallion to a qualified buyer.103 Chicago, therefore, does not retain final control over the medallion in cases involving foreclosure or revocation of the medallion. The County, on the other hand, always retains final control over the issuance, reissuance, or disposal of a taxicab license and, if the County revoked a license owner’s ability to operate the taxicab, the County then assumes control over the license for reissuance or disposal.

The County’s regulatory actions concerning existing taxicab license owners is consistent with the facts and decision in O’Connor, and indicate a strong desire not to recognize a taxicab license as a compensable property interest. First, unlike Boonstra, the County never physically appropriated a properly assigned taxicab license between 1981 and 1998.104 Furthermore, the County, under the regulatory scheme before the ordinance amendment passed, never placed a moratorium on the assignment, sale, or transfer of a taxicab license. Second, the County’s current taxicab license holders continuously operated the taxicabs pursuant to a license system, regarded as a privilege, not as a compensable property right.

Also, the County continually notified the taxicab license holders of the possibility of a change in the current ordinance.105 Where parties are on notice that their property interests may change or when regulatory action adversely affects property acquired while the regulatory system is in effect, a plaintiff will probably not be able to successfully assert an unconstitutional taking claim.106

Finally, the Boonstra court’s broad, functional “secure and durable” property test constrains the government and is more appropriate in the due process atmosphere, rather than in an unconstitutional taking environment. Boonstra is consistent with Supreme Court precedent relating

104. The County, however, did revoke four taxicab licenses either because the owner did not meet the criteria or operated in violation of the Code; the County did not reissue the four licenses.
105. See M & Z Cab Corp., 18 F.Supp.2d at 947 (finding that the City, by not permitting the assignment of a taxicab license until a revocation hearing, did not violate plaintiff’s due process rights because of the temporary nature of the prohibition and the holds on sale served an important government interest: whether the licensee has any rights to transfer the license). The court went on to hold that property which is acquired, generated, and developed within a preexisting regulatory scheme which subjects the property to the deprivation complained of cannot constitute a taking provided the regulations are rationally related to a legitimate government interest). Id. at 953.
106. See Ruckelshaus v. Monsanto Co., 467 U.S. 986, 1007 (1984) (recognizing that no taking occurs where a party was on notice of the conditions under which the property interest may be affected); see also NL Indus., Inc. v. United States, 12 Cl. Ct. 391, 400 (1987) (finding no taking when regulatory action affects property that is acquired while the regulatory system is in effect).
to government largess, such as driver's licenses,\textsuperscript{107} disability benefits,\textsuperscript{108} and welfare benefits,\textsuperscript{109} which all focus on due process protections only.

The body of case law which considers a taxicab license to be a privilege instead of a property right is consistent with, and supports, the County's position that the ability to operate a taxicab is a privilege, and not a compensable property right.

\section*{B. Taxicab License Case Law in Florida}

In Florida, a taxicab license is not considered a compensable property interest; instead, similar to the vast majority of states, the license represents a privilege, not an inherent right.\textsuperscript{110} In \textit{Hamid v. Metro Limo, Inc.}, the court found that a common carrier does not have an inherent right to operate a taxicab, but only a mere privilege, a privilege which can only be acquired by a license or a permit issued from the government entity.\textsuperscript{111}

\section*{C. Taxicab Licenses Compared to Liquor Licenses}

When discussing whether a license is considered a privilege or a Fifth Amendment property interest a taxicab license is often compared to a liquor license. Great diversity exists among the states as to whether a liquor license should be considered property; however, in Florida, a liquor license is not considered a property interest.\textsuperscript{112} In \textit{Leafer v. State}, the court stated, "a [liquor] license is not property in a constitutional sense, ... since it confers no right or estate or vested interest."\textsuperscript{113} Like taxicab licenses, liquor licenses have many attributes of property: the right to obtain, the right to alienate, the right to renew, and the state's

\footnotesize
\begin{itemize}
\item \textsuperscript{107} See Bell v. Burson, 402 U.S. 535 (1971).
\item \textsuperscript{108} See Mathews v. Eldridge, 424 U.S. 319 (1976).
\item \textsuperscript{110} See Yellow Cab Co. v. Ingalls, 104 So.2d 844, 847 (Fla. Dist. Ct. App. 1958) (holding that a license or permit to operate motor vehicles on public streets for the conduct of a private business is mere privilege, not an inherent right).
\item \textsuperscript{111} See \textit{Hamid v. Metro Limo Inc.}, 619 So.2d 321, 322 (Fla. Dist. Ct. App. 1993).
\item \textsuperscript{112} See \textit{Leafer v. State}, 104 So.2d 350, 351 (Fla. 1958) (holding that a liquor license was not a property right; and subsequently enacted statute which prevented the renewal of the license by anyone, other than the owner of the licensed premises, to distribute the liquor did not deprive the purchaser of the liquor license of due process of law).
\item \textsuperscript{113} See \textit{id.} at 351. The plaintiff, who purchased the license from the license owner pursuant to state guidelines, challenged new legislation which prohibited anyone other than the owner of the liquor establishment from renewing the license. The purchaser did not own the motel where the license granted authority to engage in selling intoxicating liquors. \textit{Id.} The court rejected the plaintiff's argument that a "property right" vested in the license upon purchase and wrote, "[w]hen a person enters the business of selling liquor he does so well-knowing that the legislature has the power not only to regulate but to prohibit."). \textit{Id.}
\end{itemize}
right to revoke.114 While not recognizing a property interest in the liquor license, however, courts do countenance property right protection in a legitimate liquor business.115 Interestingly, language such as "not a vested interest" or "confers no right" appears when courts reject the proposition that taxicab or liquor licenses amount to a compensable property interest.

As previously mentioned, the great majority of case law does not establish a Fifth Amendment property interest in a taxicab license; that is, absent explicit language defining a taxicab license as a form of intangible property, a taxicab license does not normally evolve into a compensable property interest. Rather, taxicab licenses are viewed as mere privileges, not as a vested, compensable property right.

The next question this Comment poses is the following: Where a government entity explicitly creates a compensable property interest in a government license or benefit, under what circumstances may a government entity be obligated to compensate as a consequence of regulatory action?: i.e., does shortening the "alienability" or "right to exclude" strands in the "bundle of property rights" amount to a taking?

V. THE Alleged REGULATORY TAKING

If a taxicab license is considered a compensable property interest, a takings challenge can be raised whenever a regulatory action detrimentally impacts a licensee's interests. The analysis of a personal property taking is similar to the analysis of a taking of real property. Thus, the Agins test must be applied to any regulatory action affecting intangible, personal property such as a taxicab license. The first element of the Agins test is met because restricting the sale of medallions to chauffeurs only will advance a legitimate County interest in improving the quality of taxicab service and eliminating the practice of charging high lease rates to taxicab drivers. The second element of the Agins test, however, requires an examination of the nature of the challenged regulatory action, and it is here where courts use the three Penn Central elements to determine if the property owner is deprived of all beneficial use of the property.

In 1922, Justice Holmes set an agenda for generations of lawyers with his famous epigram, "while property may be regulated to a certain

114. See Yarbrough v. Villeneuve, 160 So.2d 747, 748 ( Fla. Dist. Ct. App. 1964) (noting that because the number and location of liquor establishments are limited, a liquor license has come to have some quality of property, "with an actual pecuniary value far in excess of the license fees exacted by the state.").

115. See Davidson v. City of Coral Gables, 119 So.2d 704,709 ( Fla. Dist. Ct. App. 1960) (finding that "while a liquor business is a legitimate business protected by law as are other businesses, such a license is not a vested right, and it can be subject to further regulation or even revocation, at the pleasure of the legislature.").
extent, if regulation goes 'too far' it will be recognized as a taking."\textsuperscript{116} In cases where a physical occupation does not occur, determining how far is "too far" plagued the Court for over six decades,\textsuperscript{117} and the attempt to differentiate "regulation" from "taking" is a difficult jurisprudential problem.\textsuperscript{118} To help settle whether the County went "too far" when it shortened one of the strands in the traditional "bundle of property rights" by restricting the sale of medallion licenses to chauffeurs only, we first look at \textit{Lucas} for guidance, and then to \textit{Penn Central} for clarification.

\section*{A. Permanent Takings Claim}

Is it possible for taxicab license owners to assert a successful permanent takings claim? The County's restrictions on alienability did not constitute a physical invasion of property. However, when an owner's property is affected by government regulation, the owner may argue that the government's actions have gone "too far," resulting in a compensable taking of the property, under one of two tests. First, the property owner may show that the government has effected a "categorical taking" by demonstrating that the regulation denies the property owner of "all economically beneficial or productive use of the property."\textsuperscript{119} As the court explained in \textit{Florida Rock Industries, Inc. v. United States}, "[i]f a regulation categorically prohibits all economically beneficial use of [property], destroying its economic value . . . the regulation has an effective equivalent to permanent physical occupation. There is, without more, a compensable taking."\textsuperscript{120}

The rule outlined in \textit{Lucas} and \textit{Florida Rock} does not apply to the County because restricting the sale of taxicab medallions only to chauffeurs does not deprive license owners of all economically beneficial or productive use of the property; license owners may still lease the license to a chauffeur, sell the license to a qualified chauffeur, keep the license and operate the taxi themselves, or give the license to an immediate family member.

\section*{B. Partial Regulatory Taking}

Applying the second part of the \textit{Agins} test demonstrates that even if

\begin{itemize}
\item \textsuperscript{116} See \textit{Pennsylvania Coal Co. v. Mahon}, 260 U.S. 393, 415 (1922).
\item \textsuperscript{117} See \textit{United States v. Riverside Bayview Homes, Inc.}, 474 U.S. 121, 126 (1985) (emphasizing that the court has never precisely determined those circumstances where land-use regulations amount to a taking); \textit{Penn Cent. Transp. Co. v. City of New York}, 438 U.S. 104, 105 (1978) (taking analysis involves essentially ad-hoc, factual inquiries).
\item \textsuperscript{120} \textit{Florida Rock Indus. Inc. v. United States}, 18 F.3d 1560, 1564-65 (Fed. Cir. 1994).
\end{itemize}
a taxicab owner is unable to prove that the County effected a categorical taking pursuant to the *Lucas* rule, he may nevertheless be able to prove that the government has effected a compensable "partial taking."^{121} In cases where the property owner alleges a partial taking of property, the court must conduct an ad-hoc factual inquiry into the circumstances of each scenario. The Court balances the following three factors: "(1) 'the economic impact of the regulation on the property owner'; (2) 'the extent to which the regulation interferes with distinct investment backed expectations;' and (3) 'the character of the government action.'"^{122} The critical factor, however, in determining whether the government has effected a taking of property under the ad-hoc test is the relationship between the value of the property interest allegedly taken and the value of the property owner's interest in the "parcel as a whole."^{123} A successful just compensation claim hinges on the remaining economically viable uses of property rather than on the ability to take advantage of a particular right relative to the property.^{124}

C. **The Economic Impact Factor**

From the perspective of the taxicab license owners, the economic im-

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121. *See id.* at 1570.
122. *See Connolly v. Pension Benefit Guaranty Corp.*, 475 U.S. 211, 225 (1986) (quoting *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 124 (1978)). *See also Graham v. Estuary Properties, Inc.*, 399 So.2d 1374, 1380-81 (Fla. 1981) (establishing the framework in Florida for a takings analysis by holding that the following factors, or some combination thereof, are important: (1) whether there is a physical invasion of the property; (2) the degree to which there is a diminution in value of the property, i.e., whether the regulation precludes all economically reasonable use of the property; (3) whether the regulation confers a public benefit or prevents a public harm; (4) whether the regulation promotes the health, safety, welfare, or morals of the public; (5) whether the regulation is arbitrary and capriciously applied; and (6) the extent to which the regulation curtails investment-backed expectations).
123. *See Penn Cent. Transp. Co.*, 438 U.S. at 130 (stating "'taking' jurisprudence does not divide a single parcel into discrete segments and attempt to determine whether rights in a particular segment have been entirely abrogated."); *see also Villas of Lake Jackson, Ltd. v. Leon County*, 121 F.3d 610, 614 (11th Cir. 1997) (emphasizing that a rezoning of property which eliminated the landowner's ability to construct high-density apartment complexes is not considered a taking because "[a]ny constitutional claim . . . challenging the regulatory deprivation of a single use of real property alleged to be vested under state law must be considered in light of the remaining use of the property as a whole."); *Florida Game & Fresh Water Fish Comm'n v. Flotilla, Inc.*, 636 So.2d 761 (Fla. Dist. Ct. App. 1994) (holding that restricting development of 48 acres near a bald eagle nesting site not to be a taking because the property as a whole retained economic life and, therefore, did not deprive the developer of most or all of its interests in the property); *Marshall v. Board of County Comm'r's for Johnson City*, 912 F.Supp 1456, 1472 (D.Wyo. 1996) (agreeing that the proper inquiry is to examine the entire bundle of property rights rather than analyzing each strand separately).
124. *See Corn v. City of Lauderdale Lakes*, 95 F.3d 1066, 1074 (11th Cir. 1996). In *Corn*, the City denied a landowner the ability to build a shopping center and mini-warehouses after the City rezoned the property for residential use. *Id.* at 1068.
pact of the County's new regulation destroyed their ability to freely sell taxicab licenses. This could result in reducing the value of the license in the future. Determining value is difficult because it is a nebulous concept; however, a few points are clear. First, before the County created the medallion system and subsequent restraint on alienability, taxicab licenses sold between $60,000 - $80,000; during this time period, many chauffeurs purchased taxicab licenses under conditional sales contracts, paying as much or higher than non-chauffeurs. Even though chauffeurs purchased taxicab licenses in the past, the license owners feared that restricting the purchaser's market to chauffeurs would drastically reduce the sales price of taxicab licenses to $40,000 or less. Potential economic losses, however, even though substantial, do not amount to a taking.125

Second, taxicab license owners retain the ability to lease the licenses to chauffeurs and currently earn between $7,800 to $10,400 per year. A taxicab license owner who leases the license to a chauffeur, for example, retains the ability to recover the cost of a license he purchased for $60,000 in less than six years. A reduction in value, even to the extent where government regulations prevent the most profitable use of a claimant's property, is not necessarily equated with a taking.126

The facts in Andrus v. Allard are strikingly similar to the circumstances of taxicab license owners. Pursuant to the Eagle Protection and Migratory Bird Treaty Acts, both designed to prevent the destruction of

125. See United Nuclear Corp. v. United States, 17 Cl. Ct. 768 (Fed. Cir. 1989) (holding that a severe economic impact alone, which in this scenario reached upwards of $5 million in exploration costs, did not amount to a taking); Naegele Outdoor Adver., Inc. v. City of Durham, 803 F.Supp 1068 (M.D.N.C. 1992) (finding that a Durham ordinance requiring removal of certain outdoor advertising signs did not amount to a taking, even though the claimant lost use of over 54% of its signs, reducing Naegele's revenue by 29.75% because the City provided a generous amortization period to realize a reasonable return on its remaining signs); see also Flotilla, 636 So.2d at 765 (noting that "[t]he loss of future profits ... provides a slender reed upon which to rest a takings claim.") (quoting Andrus v. Allard, 444 U.S. 51 (1979); Gardens Country Club, Inc. v. Palm Beach County, 712 So.2d 398, 402 (Fla. Dist. Ct. App. 1998) (holding that a regulation which reduced the value of the owner's land from $8,000 per acre to $3,000 per acre not to be a taking because the remaining value constituted more than a negligible amount)).

126. See Andrus v. Allard, 444 U.S. 51, 66 (1979) (holding that even though the federal statute denied the claimant's the most profitable use of his property, a reduction in value does not equal a taking); see also Corn, 95 F.3d at 1072 (noting that the correct standard by which to test for deprivation of all economically viable use of property "is not whether the [owner] has been denied those uses to which he wants to put his [property]; it is whether the landowner has been denied all or substantially all economically viable use of his land."); PVM Redwood Co., Inc. v. United States, 686 F.2d 1327 (9th Cir. 1981) (ruling that passage of the Redwood Park Expansion Act, which reduced the supply of wood to the plaintiff by 98%, requiring the company to deal with inferior grade lumber, did not amount to a taking because it had not ownership interest in its source of supply and the company could still operate its sawmill); Rubano v. Department of Transp., 656 So.2d 1254, 1257 (Fla. 1995) (noting that a loss of access to an interstate highway does not constitute a taking when considered in light of the remaining accesses to the property) (quoting Palm Beach County v. Tessler, 538 So.2d 846, 849 (Fla. 1989)).
The Court held that denying the sellers most profitable use of his property did not amount to a taking. Similarly, the County's new law affects the future sale of preexisting taxicab licenses; however, the County is not banning the sale of licenses, only limiting the potential market to chauffeurs.

In Burns Harbor Fish Co., Inc. v. Ralston, the court held that a prospective ban on gill net fishing did not amount to a taking of the fisherman's fishing licenses, even though the law significantly reduced the company's profitability. While the fisherman had a property interest in the gill nets themselves, the state did not preclude the fisherman from selling the nets or fishing with them outside of Indiana waters. Instead, the court found no compensable property interest in a fishing license and noted, "[w]hen an individual or corporate entity purchases personal property . . . to engage in a commercial venture, the purchaser is taking a risk that government regulation will diminish the value of that property."130

Assuming, in a light most favorable to the taxicab owners, that the County's new laws may have a slight negative economic impact on taxicab owners' ability to sell the licenses, the controlling question now becomes whether the taxicab license owners could reasonably expect that they would be permitted to freely sell their licenses in the most profitable manner.

D. INTERFERENCE WITH INVESTMENT-BACKED EXPECTATIONS

The taxicab owners argue that the County's new regulatory scheme disturbed the owner's reasonable investment-backed expectations to use a taxicab license in the most profitable manner. In analyzing the reasonable investment-backed expectation part of the Penn Central test, courts limit recovery to property owners who can demonstrate that they purchased property relying upon the nonexistence of the challenged regulatory scheme.131 Investing or purchasing government largess with the

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127. See Andrus, 444 U.S. at 53.
128. See id. at 66.
130. See id. at 726. In addition, the court states, "[b]y reason of the State's traditionally high degree of control over commercial dealings, [such a purchaser] ought to be aware of the possibility that new regulation might even render his property economically worthless." Id. (quoting Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992)).
131. See Good v. United States, 39 Fed. Cl. 81, 109 (1997); see also Marine One, Inc. v. Manatee County, 898 F.2d 1490, 1492-93 (11th Cir. 1990) (finding that a mere license or permit to use land did not rise to a protected, compensable property interest where the state granted the license subject to the public trust doctrine). Also, the court wrote, "[b]oth federal and . . . state cases stand for the proposition that permits to perform activities on public land, whether the
knowledge of a possible future restraint is similar to the tort doctrine of assumption of risk. Under that doctrine a plaintiff, who voluntarily assumes a known risk, will probably be held comparatively negligent, thereby reducing or eliminating the liability of a tortfeasor. When determining whether the property owner knowingly purchased property subject to future limitations, courts examine not only the specific regulatory restrictions at issue, but also the regulatory climate of the industry, and whether the owner’s investment is objectively reasonable in light of that climate.132

Taxicab license owners may argue that they justifiably relied upon the existence of the County’s previous regulatory scheme, which allowed unrestricted alienability of taxicab licenses. Therefore, the County is now estopped from denying free alienability. The owner’s argument, however, is flawed. Since 1981, the County stringently regulated the taxicab industry, enacting numerous ordinance amendments relating to the operation of the taxicab licenses. Furthermore, beginning in 1990, the County held over 72 separate Ground Transportation Review Committee meetings over the next four years, focusing on taxicab industry reform. After 1994, the County held many workshops with the taxicab industry, again concentrating on changing the nature of taxicab licenses. The taxicab license owners, therefore, conducted business in a climate of regulatory flux, seriously diminishing their expectations in the status quo, and undermining any reasonable investment-backed expectations.

Moreover, when determining whether the County exercised a regulatory taking of the taxicab owner’s property, investment-backed expectations must be more than a unilateral expectation or abstract need; instead the expectation must be reasonable in light of all the circumstances surrounding the regulated field.133 Also, depriving a claimant of expected

132. See id. at 109.
133. See Forest Properties, Inc. v. United States, 39 Fed. Cl. 56, 76 (1997) (holding that the claimant did not have a reasonable investment-backed expectation to develop a lake bottom because it purchased the land knowing the highly regulated nature of the field); Shrader v. United States, 38 Fed. Cl. 788, 796-97 (1997) (finding that more than a “mere expectancy” is needed for a pilot to be able to renew a pilot’s license given the Air Force’s wide discretion in establishing eligibility standards); Herndon v. United States, 36 Fed. Cl. 198 (1996) (ruling that more than a “mere expectancy” is required for Oregon to convey title to land); Store Safe Redlands Assoc. v. United States, 35 Fed. Cl. 726, 734 (1996) (maintaining that the plaintiff did not have a compensable expectancy in grazing permits because the “plaintiff bought its interests subject to all existing statutes, regulations, . . . and had very specific notice prior to purchase that forage would be reduced.”); 767 Third Ave. Assoc. v. United States, 48 F.3d 1575, 1581 (Fed. Cir. 1995) (finding that no taking occurred because the claimant knew, as a member of the public, that the U.S. government could close a foreign government’s offices and freeze its assets and, therefore, had no reasonable investment-backed expectations regarding its rights under lease
markets, and corresponding loss or gain of anticipated revenues or profits is not a reasonable, compensable property interest. A property owner need not even foresee changes in the regulatory scheme for a court to hold no taking occurred. In short, "[i]nterests that are not sufficiently bound up with reasonable expectations of the claimant are not 'sticks' in the claimant's 'bundle of rights' and thus do not constitute property for Fifth Amendment purposes.

E. Character of Government Action

The third part of the Penn Central analysis focuses on the character of the government action; looking at whether the government regulatory action is a physical invasion or a type of program, which is rationally related to a legitimate state interest. "A 'taking' may more readily be found when the interference with property can be characterized as a physical invasion by the government . . . than when interference arises from some public program adjusting the benefits and burdens of economic life to promote the common good." The County's ordinance is not a physical invasion of the taxicab license owner's property; rather, it is a legitimate exercise of the County's police power, regulatory in nature, framed to advance the County's legitimate interest in providing better quality taxicab service to the County's tourists, residents, and visitors.

Taxicab licenses are a form of government largess, issued in the public interest and subject to limitations that may reasonably be imposed upon them to further the public interest. Not all government adjustments to largess will be acceptable to all concerned parties because government action is a physical invasion or a type of program, which is rationally related to a legitimate state interest. "A 'taking' may more readily be found when the interference with property can be characterized as a physical invasion by the government . . . than when interference arises from some public program adjusting the benefits and burdens of economic life to promote the common good."

134. See NL Indus., Inc. v. United States, 12 Cl. Ct. 391, 405 (1997) (holding that "market expectations" are not automatic or foregone conclusions). In addition, anticipated profits and revenues do not qualify as property with the Fifth Amendment. Id. at 405.

135. See Allied-General Nuclear Serv's. v. United States, 12 Cl. Ct. 372, 381 (1987) (finding that "[j]ust as private ventures reap the rewards of success, so must it bear the burden of loss.").


138. See Air Lines Pilots Assoc., Int'l v. Quesada, 276 F.2d 892, 896 (2d Cir. 1960); see also Clajon Prod. Corp. v. Petera, 70 F.3d 1566, 1579 (10th Cir. 1995) (stating, "[w]hile a property owner does not and should not expect to be forced to dedicate land . . . it is well established that a property owner necessarily expects the uses of his property to be restricted, from time to time, by various measures newly enacted by the State in legitimate exercise of its police powers.") (quoting Lucas, 505 U.S. at 1027).
ernment regulation necessarily involves adjusting rights for the public good. In Andrus, the Court stated, "[t]o require compensation in all such circumstances would effectively compel the government to regulate by purchase."140

The taxicab license owners simultaneously offer two contradicting propositions. First, the license owners applaud the ordinance for limiting the number of medallions permitted to operate in the County, thereby maintaining the licenses value. Simultaneously, however, the license owners decry regulation which may decrease the future marketability of the licenses. Government largess does not exist solely for the benefit of the regulated industry; rather, the public interest should supersede private gain. The County, therefore, by limiting the sale of taxicab licenses to chauffeurs only, legitimately advanced its interests in improving the quality of taxicab service, and should not be held hostage to a regulated industry solely interested in protecting its private, economic profits.

After performing the previous takings analysis, an argument can be made that even though the County explicitly created a compensable property interest in a taxicab license after April 5, 1999, shortening the "alienability" or "right to exclude" strands in the "bundle of property rights" does not amount to a "regulatory taking."

VI. DEVELOPING LEGAL THEORIES CONCERNING THE CREATION OF A COMPENSABLE PROPERTY INTEREST

The discussion thus far on whether a taxicab license is a compensable property interest, followed by the takings analysis, leads to the final question of this Comment: Absent explicit language creating a compensable property interest, does a legal theory or test exist which answers the question of when, how or if, a governmentally conferred benefit or privilege evolves into compensable property interest? Any legal theory concerning this question must take into account the problematic nature of property and the burgeoning amount of governmentally conferred benefits and licenses.

A. THE PROBLEMATIC NATURE OF PROPERTY

What does it mean to have rights or interests in private property which are subject to the Takings Clause? Most people have various and quite different visions of property. The traditional "dominion" conception of property rights refers to ownership of corporeal things such as

140. See id. The Court went on to note, "[g]overnment hardly could go on if to some extent values incident to property could not be diminished without paying for every such change in the general law." Id. (quoting Pennsylvania Coal Co. v. Mahon, 260 U.S. 393, 413 (1922)).
land and chattels and certain intangibles including bills, notes, stocks, and bonds. While physical occupation or confiscation of real property or chattels is easily grasped, the same cannot be said for more nebulous, intangible forms of property interests, such as those involving permits and licenses.

Clearly delineating a property interest meriting protection becomes difficult because property can be tangible or intangible. Property interests are not created by the Constitution; rather, property dimensions generally stem from state law. As a result, while the Just Compensation Clause appears to represent a substantial check on government power, a federal, state, or local government agency might simply respond: “You can’t complain of any injury at all because you never had what you claim we took away. From the very beginning, your property was subject to the condition that, if and when we thought it wise to do so, we could restrict it as we have or transfer it as we have.” No longer, therefore, are property rights the “sole and despotic dominion which one man claims over the external things of the world.” Instead, a state or local government can realign state-created property rights to serve legitimate state or local interests. Determining whether the government has “taken” property necessarily involves a resolution of exactly what rights the individual has in a particular property. This is especially true when a governmental entity creates “new property” to serve the public interest; taxicab licenses or medallions are forms of this “new property.”

B. NEW PROPERTY RIGHTS

Professor Reich, in his groundbreaking article “The New Property,” described “new property” as a person’s interest in government largess: “While Government acts as a gigantic siphon, drawing in revenue and power, it also pours forth wealth in the form of benefits, services, contracts, franchises, subsidies, and licenses.” Property, therefore, increasingly took the form of rights rather than tangible goods such as real or personal property. For example, a person’s employment interest can be more valuable than a house, car, or bank account. Likewise, a government license to operate a radio station, liquor license, grazing permit, etc.
or taxicab license is an extremely valuable commodity. The owner of such a license considers this wealth his "own," often seeking legal protection against interference from his enjoyment.\textsuperscript{147}

The "new property" conception includes entitlements to government benefits or economic rights which had previously been considered "privileges." Reich contends that once a government creates and distributes benefits or other economic rights, subsequent government action regarding a particular benefit or other economic right may give rise to a "taking."\textsuperscript{148} Controversies over largess may arise from a variety of government actions: (1) denial of the right to apply; (2) denial of an application; (3) attaching conditions to a benefit; (4) modification of a benefit already made; or (5) suspension or revocation of a benefit.\textsuperscript{149} Courts tend to provide the greatest protections in cases of suspension or revocation of largess. However, those protections are mainly procedural, that is, a government benefit that supposedly vests cannot be taken away without providing the beneficiary due process.\textsuperscript{150} A new applicant for a license, however, is offered less protection, and substantive safeguards to possess and use the largess remain very limited because largess remains revocable.\textsuperscript{151} In addition, because most forms of largess are subject to limitations on their use, such as transferring a benefit only with government approval, or limiting the use to a specific purpose, the largess does not usually vest in the recipient.\textsuperscript{152} While Reich concentrated on the "new property's" Fifth Amendment, due process interests, he did not fully explore the area of when, how, or if largess evolves into a Fifth Amendment, compensable property interest; consequently, an examination of a variety of additional theories.

\section*{C. Four Theories of how Fifth Amendment, Compensable Property Rights Are Created}

\textbf{1. The Nelson Model}

Robert H. Nelson's theory states that property rights are created pursuant to a four step process: (1) when demands for the use of a given resource, tangible or intangible, grow large enough to create a congestion

\begin{itemize}
\item \textit{Property Rights, 37 U. Kan. L. Rev. 529, 549 (1989) (arguing that “new property” rights arise from the expectation of the individual and should not be treated exactly like “old property”).}
\item \textit{See Reich, supra note 144, at 738-39.}
\item \textit{See id. at 744.}
\item \textit{Id.}
\item \textit{Id.}
\item \textit{See id. at 744-45 (Reich stresses that because largess is doled out in the “public interest,” when largess, such as television licenses, are revoked in the public interest, the largess holder usually receives nothing).}
\item \textit{Id. at n. 62 (citing Osborn v. United States, 145 F.2d 892, 896 (9th Cir. 1944) (holding that a grazing permit on public lands may be revoked without payment of just compensation)).}
\end{itemize}
problems, i.e., when excessive use deteriorates the quality of the resource, spawning a desire for social control; (2) when a government unit establishes a permit system, pursuant to its respective police powers, to manage the congestion and improve the quality of the resource; (3) when the government unit allows the resource to be traded and sold, sometimes encouraging the sale, but restricting the types of purchasers or imposing conditions that a transfer serve a “public purpose”; and (4) when the government regulatory entity terminates its regulatory activities, shifting total use rights to the private user.153

Nelson contends that when a government institutes a regulatory program which creates the condition of scarcity, limiting the ability of potential users to enter the regulated industry, “the best government policy will normally be to eliminate actions that cause the scarcity.”154 In this way, the government could deregulate an industry, thereby eliminating the new property rights it hatched in the first place.155 However, eliminating the regulation is politically difficult once an industry acquires regulation that equals a “de facto” protectionist economic environment in favor of the regulated industry.156 Nelson then contends that if the government cannot eliminate the scarcity of the resource, formally recognizing the property is an option that encourages the greatest efficiency of property use.157

On the other hand, when the government creates “new property,” such as taxicab licenses, by artificially limiting the scarce resource through regulation, the “new property” rights are considerably less secure because the government may eliminate the scarcity, thereby undercutting the value of the right.158 When the government faces a regulated industry claiming “new property rights,” Nelson affords four options: (1) eliminate, through legislation, the scarcity of resources by not capping the entry of the resource, thereby eliminating the value and subsequent claim to a property right; (2) accept the existence of private rights but adopt or strictly enforce laws that prohibit the sale and transfer of the resource; (3) recognize the private rights, encouraging the sale, but leave open the possibility of later rescinding the rights of users; or (4) provide the legal protections that ordinary private property owners enjoy.159

If we apply Nelson’s four step test to the County’s regulatory history

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154. See id. at 381.
155. See id.
156. See id.
157. See id.
158. See id. at 380. Nelson states, “[t]axi medallions similarly have a high selling price in some cities that regulate the total number of taxis.” Id.
159. See id.
and system, a number of important factors become more pellucid. First, in 1981, the County began regulating and permitting taxicabs for the following reasons: (1) to curtail the congestion of taxicabs; (2) to reduce deadheading; (3) to improve the quality of service to users; and (4) to enhance the caliber of taxicab owners, chauffeurs, and vehicles used to provide taxicab service. The County’s regulatory system, which artificially limited the number of taxicabs under a highly regulated permit system, therefore, meets the first and second prongs of Nelson’s test.

Second, the County allowed the artificially scarce taxicab licenses to be transferred, assigned, and sold. However, the County imposed stringent transfer and sale qualifications and reserved the right to deny a transfer if an applicant did not meet the requirements of the Code, or if the transaction would not serve the “public interest.” By sanctioning the sale and transfer of taxicab licenses, albeit according to strict transfer standards, taxicab licenses meet the third stage of Nelson’s property right development test.

Finally, the County never shifted total use rights to taxicab license holders by terminating its regulatory activities. Rather, when faced with taxicab license owners claiming Fifth Amendment, compensable property right protections, the County persisted in stringently regulating the sale, assignment, and transfer of taxicab licenses. Thus, reserving the right to liquidate the scarcity of licenses by instituting a regulated, unlimited license entry system. According to the Nelson Model, the County, while constantly providing due process protections, never implicitly recognized a Fifth Amendment, compensable property interest in a taxicab license. In addition, a government’s reservation to amend a created “new property” right for Fifth Amendment purposes does not need to be express. Instead, the reservation may be implied, based on prior actions of the government authority that created the “new property” right in the

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160. See Perry v. Sindermann, 408 U.S. 593, 602-03 (1972) (holding that procedural safeguards must accompany the revocation of governmental benefits, permits, or licenses).

161. See Democratic Cent. Comm. v. Washington Metro. Area Transit Comm’n, 38 F.3d 603 (D.C. Cir. 1994) (holding that where the court reserves the power to amend attorney fee provisions of a compromise agreement on an ad-hoc basis, the interests that attorneys may have had in being paid additional fees from a common fund never achieved the status of “private property” under the ambit of the takings clause of the 5th Amendment). In addition, the court stated, “[g]enerally, when a government entity acts to create property rights yet retains the power to alter those rights, the property right is not considered ‘private property,’ and the exercise of the retained power is not considered a ‘taking’ for Fifth Amendment purposes.” Id. at 606. See also Ruckelshaus v. Monsanto Co., 467 U.S. 1011 (1984) (emphasizing that when a government unit intends to reserve the power to modify a government created right in response to changing conditions, it indicates an unwillingness by the government entity to relinquish control of the property to such an extent that it acquires the status of “private property”).
2. The Rasmussen Model

In *G.S. Rasmussen & Associates v. Kalitta Flying Service, Inc.*, the court outlined three criteria which must be met before the law will recognize a property right: (1) the interest must be capable of precise definition; (2) the interest must be capable of exclusive possession; and (3) the putative owner must have established a legitimate claim to exclusivity of the property interest.163

This case involved an attempt to protect intellectual property developed pursuant to a government privilege. Rasmussen, an aeronautical engineer, developed an aircraft modification allowing certain types of airplanes to carry significantly more cargo than permitted under the airplane's original type-certificate issued by the Federal Aviation Administration ("FAA").164 The FAA approved the design modification, and issued a Supplemental Type Certificate ("STC"), certifying a major alteration to the planes already type-certified.165

Although the court in *Rasmussen* declared the "[p]roperty interest is of a most interesting and peculiar sort . . .", it further explained that the "[i]nterest has value only because it helps secure a government privilege to do something that would otherwise be forbidden."166 The court, ad-
heded to a very broad definition of compensable property. It held that Rasmussen had a protectable, Fifth Amendment compensable property interest in the design because the interest met the three-prong property interest test outlined by the court. First, an STC is capable of precise definition, enabling an airplane owner the ability to obtain an airworthiness certificate for a particular airplane design modification. Second, Rasmussen, the designer, could exclusively possess or transfer control of the design to a third party. Third, because Rasmussen spent considerable time, effort, and money to develop the design, the STC Kalitta relied on would not exist but for Rasmussen’s efforts, thereby legitimizing his claim to exclusivity.

When applying the Rasmussen property interest test to taxicab licenses, it is important to note that the test may be appropriate for property interests developed as intellectual creations, even when tied to securing a government privilege. However, where the claimed property right is based solely on the privilege of operating a license, issued by the government entity, to serve the public interest, and not involving independent innovative scientific or technological advances, the test falls dismally short for a number of reasons.

First, taxicab license owners, like most recipients of largess, do not bring independent innovations or creations to the taxicab permit table. Most taxicab license owners do not even own the vehicle used to provide taxicab service but, instead, lease the taxicab license to a chauffeur, who supplies the vehicle, taxicab meter, signage, top light, and color markings. Furthermore, existing taxicab license owners desiring to sell the privilege of operating a taxicab under the County’s regulatory system are not the exclusive decision makers as to the pool of potential applicants who can

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167. The court uses the broad definition enumerated by the California Supreme Court, “although a . . . license is merely a privilege so far as the relations between the licensee and the state are concerned, it is property in any relationship between the licensee and third persons, because the license has value and may be sold.” Id. at 902 (citing Roehm v. County of Orange, 196 P.2d 550 (Cal. 1948)).


169. Id.

170. Id.

171. Id.

172. See J. Miles Hanisee, An Economic View of Innovation and Property Right Protection in the Expanded Regulatory State, 21 PEPP. L. REV. 127, 161 (1993). The author proposes a two-pronged analysis to be used when determining whether an interest using regulatory privileges, in conjunction with products of intellectual creation, rise to the level of a compensable property interest: “First, property right protection should be provided only upon showing measurable scientific or technological or scientific advances resulting directly from the design or innovation. Second, the standard measuring such an advance should ask whether society now has the capacity to do something that it could not have done prior to the innovation.” Id.
purchase the license. The County still reserves the right to deny an applicant if he does not meet the criteria of the Code.

Second, a taxicab license is not under the exclusive control of the taxicab owner. The County mandates strict control over the operation of the taxicab by outlining requirements related to lost and found procedures, taxicab rates, complaint procedures, and adherence to minimal insurance standards.

Third, if a taxicab owner violates the Code, the County retains the right to revoke the taxicab license and not reissue the licenses to new operators. Property right protections of government privileges must be juxtaposed with the innovation, if present, and "[t]he property rights retained are not the rights to receive such a privilege from the government, but rather to protect such a privilege from conversion after the receipt."

The Rasmussen Model provides too broad a definition of a "property interest" to be useful in most forms of largess. A driver's license, for example, is capable of precise definition: exclusive possession by the licensee. The licensee does have a legitimate claim to the license because he must successfully complete a written test before obtaining the driver's license. Few would argue, however, that a license is a Fifth Amendment, compensable property right; to hold otherwise would mean affording compensable property rights to largess solely intended as a mere privilege.

3. The Salvatore Model

A third theory of property right evolution focuses not on the property right of the beneficiary or recipient of largess, but on the property right of the government entity distributing the wealth through permits, licenses, or other types of government benefits. In United States v. Salvatore, the court held that video poker licenses constituted property of the State of Louisiana to support a mail fraud conviction. The court, in affirming the conviction of the defendant for fraudulently obtaining a video poker license through the mail, rebuked the defendant's argument that video poker licenses do not constitute "money or property"

173. See supra text accompanying note 103.
174. See supra note 172, at 162.
175. United States v. Salvatore, 110 F.3d 1131, 1132 (5th Cir. 1997). After 1991, any manufacturer, distributor, or owner of a video poker machine in Louisiana needed to be licensed by the state pursuant to the "Video Draw Poker Devices Control Law." Id. at 1135.
176. To obtain a video poker license, Louisiana required that each applicant satisfy certain "suitability" requirements, precluding person's from obtaining a license convicted of certain criminal offenses; and the defendant acted as a front man for applicants involved in organized crime. See id. at 1135.
under the mail fraud statute.\textsuperscript{177}

In affirming the mail fraud conviction, the court relied on \textit{McNally v. United States},\textsuperscript{178} and \textit{Carpenter v. United States},\textsuperscript{179} to shape its rationale. First, the Court in \textit{McNally} determined that although the mail fraud statute “does not refer to the intangible right of the citizenry to good government;”\textsuperscript{180} the Court concluded that “any benefit which the Government derives from the [mail fraud] statute must be limited to the Government’s interest as property holder.”\textsuperscript{181} Second, in \textit{Carpenter}, the Court extended the mail fraud statute’s protections to intangible property, resolving that confidential business information is property.\textsuperscript{182} The court in \textit{Salvatore}, therefore, needed to determine whether Louisiana not only had a regulatory interest, but also a property interest in the video poker licenses.

In \textit{Salvatore}, the court grounded its decision that video poker licenses are a form of state property from a blend of two important ingredients. First, property must be viewed not only in terms of state law but also traditional property law where property is regarded as a “bundle of rights.” In this case, the state zealously sought to control one of the most important sticks in the bundle: the issuance and use of such licenses.\textsuperscript{183} Furthermore, the state mingles in Professor Reich’s ingredient of government largess, noting that a license is a form of government largess “[which] is originally a form of public property, comes from the state, and may be withheld completely.”\textsuperscript{184}

Second, the court looked to the character of the license itself to aid in deciding whether Louisiana has a property interest in the video poker licenses.\textsuperscript{185} Because Louisiana acted in a proprietary as well as regulatory manner, by defining the licensee’s participation in an enterprise from which the state derives significant revenues,\textsuperscript{186} the court distinguished a number of cases which stood for the proposition that a government entity has only a regulatory interest in largess.\textsuperscript{187} In \textit{Toulabi v. United States}, for

\begin{itemize}
  \item \textsuperscript{177} See \textit{id.} at 1138.
  \item \textsuperscript{178} McNally \textit{v. United States}, 483 U.S. 350 (1987).
  \item \textsuperscript{179} Carpenter \textit{v. United States}, 484 U.S. 19 (1987).
  \item \textsuperscript{180} See \textit{McNally}, 483 U.S. at 356.
  \item \textsuperscript{181} See \textit{id.} at 358 n. 9.
  \item \textsuperscript{182} See \textit{Carpenter}, 484 U.S. at 25. In \textit{Carpenter}, the Court affirmed the conviction of a defendant who schemed to defraud the Wall Street Journal of confidential business information by obtaining, through the mail, pre-publication release of the confidential information. See \textit{id.} at 22-24.
  \item \textsuperscript{183} See \textit{United States v. Salvatore}, 110 F.3d 1131, 1140 (5th Cir. 1997).
  \item \textsuperscript{184} \textit{Id.} (quoting Reich, \textit{supra} note 144, at 778).
  \item \textsuperscript{185} See \textit{id.}
  \item \textsuperscript{186} See \textit{id.}
  \item \textsuperscript{187} See, e.g., \textit{Toulabi v. United States}, 875 F.2d 122, 125 (7th Cir. 1989) (holding that the City of Chicago had no property interest in a fraudulently obtained taxicab driver’s license because the license, at most, represented a promise not to interfere rather than a sliver of prop-
\end{itemize}
example, the court stressed that a chauffeur’s license to drive a taxicab is different than a taxicab medallion because Chicago does not cap the number of driver’s licenses, and the driver’s license does not accrue a value. Chicago does cap the number of medallions, however, thus creating a value to the medallions which the city participates in distributing to potential applicants.188

The Salvatore Model stands for the proposition that when a government entity acts in a proprietary fashion, (1) deriving significant revenues from the regulated industry; (2) controlling who receives and uses the license; and (3) limiting the number of licenses to be issued; it creates value to the license. The court held, however, that for the purposes of the mail fraud statute, the government, not the licensee, had a protectable property right.189

Applying the Salvatore Model to the County’s regulatory system concerning taxicab licenses, one observes that the County closely mirrors Louisiana’s regulation of video poker licenses. The County controls the issuance and use of taxicab licenses, caps the number of licenses available, thereby creating a value to the licenses, and derives regulatory fees, which totally fund the regulating agency. Also, taxicab licenses represent public property distributed as largess to entities which are supposed to act in the “public interest.” Furthermore, if the County revokes a taxicab owner’s privilege of operating a taxicab license because of violating certain provisions of the Code, the County takes back the license and either reissues the license pursuant to a lottery or retains the license without reissuing it to a new operator.

Because the Salvatore Model stresses that largess is the property of the issuing government entity, the model is deceptively appealing. However, most government entities do not issue largess in a proprietary fashion. Rather, largess is more often distributed in a pure regulatory environment, where the only revenue generated is used to partially or totally fund the governmental entity responsible for oversight of the regul-

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188. See Toulabi, 875 F.2d at 125.
189. See United States v. Turoff, 701 F.Supp 981, 985 (E.D.N.Y. 1988) (holding that a scheme to defraud the City of New York of unissued taxicab medallions deprived the City of property for purposes of the mail fraud statute). The court further accented that the medallions are a valuable, marketable commodity and that the City maintained them under lock and key, had title to the medallions, and would maintain an action for conversion if stolen. See id. at 986; see also United States v. Sacco, 923 F.2d 970, 976 (2nd Cir. 1991) (holding that a scheme aimed at obtaining “something of value” from the State by deceptive means deprives the State of a property interest).
lated industry. The Salvatore Model could apply when a government entity derived a certain percentage of revenue from the sale, auction, or issuance of largess, above typical regulatory fees designed to fund the entity responsible for regulatory oversight. Then the government entity, not the regulated industry, may be able to claim a property right in the largess. The Salvatore Model, however, does not address the issue of when largess evolves into a compensable property interest in a pure regulatory environment.

4. A Proposed Model

I propose an alternative method of evaluating when, how, or if largess evolves into a Fifth Amendment, compensable property interest. First, determine if the government entity explicitly created a property interest in largess. If the government entity does explicitly create a property interest then clearly the analysis ends and a compensable property interest exists. An example is when the County, on July 9, 1998, defined a taxicab license issued pursuant to a medallion system as intangible property. If, on the other hand, no explicit recognition of a compensable property right exists, the next question becomes whether the government entity, through regulatory action or inaction, implicitly created the compensable property interest.

The dividing line between regulatory action and inaction is often gray and difficult to discern. Regulatory actions which may imply a compensable property interest in largess, for example, include a government entity limiting the number of licenses available for issuance, thereby adding value to the largess. Another example is a government entity explicitly permitting largess to be transferred, sold, assigned, or devised, which creates the inference that largess embodies some important “transfer strands” of traditional property’s “bundle of rights.” Alternatively, an example of government inaction which may create an implied compensable property right is a government entity ignoring the language of a “Bill of Sale,” submitted as part of a transfer of a taxicab license that contains words such as, “this taxicab license constitutes the property of the seller.” By ignoring the reference to a taxicab license being property, the government entity could be viewed as implicitly recognizing the license as property. Conversely, in response to a taxicab license owner referring to a taxicab license as property, the government entity could have required the license owner to remove any reference to the word “property.” Over time, the regulated industry could assemble other examples of a government entity’s actions or inactions into a cohesive body which stands for the proposition that the governmental entity implicitly created a compensable property interest in the largess.

The two factors to consider and balance in determining when, how,
or if the governmental entity, through action or inaction, implicitly created a compensable property interest in largess are the following: (1) the nature of the regulatory system; and (2) the reasonable expectations of the regulated industry.

A. NATURE OF THE REGULATORY SYSTEM

The nature of the government entity's regulatory system can be determined by analyzing and balancing the following aspects of the regulatory system: (1) the regulatory requirements for issuance of a license; (2) the regulatory requirements for operation or use of a license; and (3) the regulatory requirements and consequences where a licensee involuntarily ceases to operate the license.

1. The Regulatory Requirements for Issuance of a License

The regulatory requirements for issuance of a license element of the Proposed Model considers the following additional items: (1) whether the government entity limits or caps the number of licenses available for use by the regulated industry; and (2) the type of criteria the government entity uses to determine who is eligible to receive the license. If, for example, the government entity does not limit the numbers of licenses available for issuance, then the licenses do not accrue an artificial value. Even if entry is highly regulated, licensees will not need to transfer, assign, sell, or devise the largess because an unlimited supply of licenses are available and any qualified applicant can obtain the largess. A driver's license, for example, is largess issued in unlimited numbers to qualified applicants which has no value and is not transferable by gift or sale, assignable, or devisable. Conversely, if the government entity limits or caps the number of licenses available for issuance, the licenses will accrue an artificial value and license holders will most likely desire to start trading, selling, transferring, assigning, or devising the license because of the license's artificial value. In most jurisdictions taxicab licenses are an example of largess which is limited in quantity. New York City, Chicago, and the County, where taxicab licenses sell for $250,000, $80,000, and $60,000 respectively, are excellent indicators of how limiting the available license creates value in the largess.

Determining whether a government entity numerically limits the issuance of largess functions as a "railroad switch" for the remainder of the analysis; that is, if the government entity limits the number of largess available, the analysis moves to the next factor of the Model. On the other hand, if the largess is not numerically limited, an argument can be made that no compensable property interest will evolve because an unlimited number of licenses, available to all qualified applicants, means...
that the largess will not accrue value. If the largess is limited, then the
next item to analyze is the degree to which the government entity re-
stricts applicant entry into the regulated industry.

Entry into the regulated industry relates to how strictly the govern-
ment entity governs the criteria used to determine who is eligible obtain
the largess. Where a government entity establishes applicant standards
related to character, which may include criminal history and driver’s li-
cense standards, financial ability, and personal credit references, the en-
tity is further restricting the ability of applicants to obtain the largess. If,
for example, the government entity imposed a standard which prohibited
the issuance of largess to an applicant convicted of certain types of felo-
nies, the largess becomes even more scarce, and, therefore, more valu-
able. From the point of view of the government entity, however, strict
applicant standards do not create more value to the largess; instead, more
rigid regulation means that the largess is less like traditional property be-
cause it is not freely available to all potential users. If the government
entity strictly regulates who can obtain the largess, the next element to
discuss concerns whether the government entity places restrictions on
how the largess can be used.

2. The Regulatory Requirements for Operation and Use of the License

The regulatory requirements for operation and use of a license factor
of the Proposed Model considers whether the government entity estab-
lishes guidelines on how or when the license can be operated and used.
When a government entity adopts standards which establish the hours of
operation, location of use, or user requirements after initial issuance, it is
implicitly saying to the regulated industry that the license is not like tradi-
tional property because a license holder cannot exclude governmental
regulation, even if the license has value. For example, when a govern-
ment entity requires a taxicab license holder to charge a fixed rate, train
chauffeurs who operate the taxicab, implement a management plan which
contains a complaint handling and lost and found element, submit taxicab
accident reports to the regulatory entity, comply with minimum insurance
standards, and maintain minimum taxicab vehicle safety standards, the
government entity is ensuring that the largess is operated in the “public
interest,” not in the interest of the license owner only. On the other
hand, if little or no restrictions are placed on the use of the largess, the
license holder retains more control over the use and scope of the largess,
similar to the control a person exercises over private, personal property.
When, therefore, a government entity establishes use and operation re-
quirements which touch and restrict almost every aspect of the largess,
the government entity is implying that the largess is not like traditional
property. Rather, the largess constitutes more of a privilege which the government entity strictly monitors and controls.

3. The Regulatory Requirements and Consequences of Involuntary License Transfer

While each element of the Proposed Model is important, the following element has greater weight than the others during the factual, balancing inquiry: Whether the government entity retains control and discretion over the ultimate fate of the largess upon involuntary cessation of the license holder’s operation of the license. Assuming that all elements of the Proposed Model are met in favor of the regulated industry’s claim of a compensable property interest, if the government entity revokes the licensee’s ability to use or operate the largess and retains control and discretion over whether to reissue or dispose of the license, then no compensable property interest exists for the licensee under the theory that the government did not implicitly intend the recipient to have ultimate control over the continued operation of the largess. Any form of government largess which, upon revocation, returns to the government entity to either reissue or dispose is not compensable property; that is, upon revocation, the license holder is left with nothing, regardless of the license holder’s investment in the largess. Before April 5, 1999, if Miami-Dade County revoked a taxicab license holder’s ability to operate the license, the license returned to the County to reissue or dispose; the license never remained in the public market for purchase by a qualified third party.

On the other hand, if, upon license revocation, the governmental entity does not retain final control and discretion over the license, and instead the largess remains in the public market for purchase by a qualified third party, the government entity implicitly intended the largess to remain private property, similar to real or personal property. A taxicab

190. See Gluck v. City of Syracuse, 665 N.Y.S.2d 135, 136 (N.Y. App. Div. 1997) (holding that airport medallions did not create a vested property right because the City issued the medallion for a vehicle, not a person and, upon transfer or destruction of the vehicle, had to be surrendered back to the City). In addition, the court explained that because the “Chief of Police had full discretion to determine the number of medallions . . . the medallions lacked an essential quality of 'investment-backed expectations' that must be compensated if taken by the City.” Id. at 136.

191. In New York City, where a taxicab medallion is intangible property, when the City revokes a taxicab license, the owner must divest himself of any interest in the license; however, the City never regains possession of the license. See King Victor Taxi Corp. v. New York City Taxi & Limousine Comm’n, 654 N.Y.S.2d 358, 359 (N.Y. App. Div. 1997) (holding that divestiture requirement is not so disproportionate as to shock one’s sense of fairness); Boiadjian v. New York City Taxi & Limousine Comm’n, 663 N.Y.S.2d 176, 177 (N.Y. App. Div. 1997) (ruling that taxicab owners who fraudulently removed vehicle identification numbers from taxicabs must divest themselves of any interest in the taxicab license); Mystic Cab Corp. v. New York City Taxi
medallion in Chicago and New York always remains in the public market, even if the license is revoked.

B. REASONABLE EXPECTATIONS OF THE REGULATED INDUSTRY

The second prong of the Proposed Model relates to the regulated industry's reasonable expectations: Could the regulated industry and those industries connected with the regulated industry, e.g., lending institutions, reasonably expect that the largess is a compensable property interest. To claim "reasonable expectations," the regulated industry must be able to demonstrate some action or inaction by a government entity which caused the regulated industry to rely upon the existence of a compensable property right in the largess. The elements necessary to evaluate the reasonableness of the industry's expectations include the following factors: (a) statements or actions, either written or verbal, indicating that the government entity considers the largess a compensable property interest; and (b) conduct on the part of industries closely connected to the regulated industry, such as lending institutions, which indicate they consider the largess to be collateral to secure repayment of a loan. The regulated industry's expectation that the largess in a compensable property interest must be reasonable in light of all the circumstances surrounding the regulated field.

1. Governmental Conduct Which May Lead to Reasonable Expectations

Governmental action or inaction which may lead a regulated industry to reasonably expect that largess is a compensable property interest concerns the relationship between conduct and reliance. For example, the regulated industry may view the ability to transfer, sell, devise, or assign largess as affirmative conduct on the part of the government entity which is sufficient to foster reliance by the regulated industry that the largess is a compensable property right. On the other hand, a government entity may deny the regulated industry's "reliance interests" on specific conduct because participants in a highly regulated field should know that relying on a regulatory system in constant flux is not reasonable.

The "reasonable expectations" prong is crucial, because unless a qualified, commercial lending institution considers the largess to be a form of intangible property, the likelihood of the lending institution loaning money for the purchase of the largess is slight. If the holder of largess knows that a lending institution will not loan money for the purchase of the largess and use the license as collateral to secure repayment of a loan,

the license holder may reasonably expect that the largess is not a sufficiently definite property interest to assert a takings claim.

C. APPLICATION OF THE PROPOSED MODEL

If we apply the Proposed Model to the County's taxicab regulatory system before April 5, 1999, one finds that the County did not explicitly create a compensable property interest in a taxicab license. The next step, therefore, is to examine each element of the "nature of the regulatory system" and "reasonable expectations" prongs of the Proposed Model. Because the County limited the number of licenses, creating an artificial value and permitted the license holders to sell, give, or devise the licenses, the taxicab license holders can argue that these government actions implicitly created a compensable property interest in a taxicab license. On the other hand, because the County strictly regulated entry into the field and established operating standards for taxicabs, the County can argue that a taxicab license is a stringently controlled privilege. The key ingredient, therefore, relates to who retains control and discretion over the operation taxicab license when the license is revoked. Since the County maintained strict control and discretion over the final use of the license upon revocation, which also negatively influences the parties' "reasonable expectations" that the license is similar to traditional property, the County can tip the balance in its favor.

Conversely, when applying the Proposed Model to the Chicago's taxicab regulatory system, one finds that Chicago's regulatory system meets all elements of the test favoring a compensable property interest, including the element relating to Chicago relinquishing control and discretion over taxicab medallion upon revocation of the license. According to the Proposed Model, therefore, a Chicago taxicab license implicitly evolved into a compensable property interest.

The Proposed Model can be applied to other forms of largess, including driver's licenses, welfare benefits, hunting licenses, liquor licenses, and pilot licenses. Assume, for example, that a government entity issues hunting or fishing licenses in limited numbers, permits the licensee to transfer the license, and restricts market entry and use of the license. If the government entity revokes either license, the license is void and cannot be used by any other licensee. In effect, the government entity retained final control and discretion over the operation of the hunting license, never implicitly intending to grant a compensable property interest because the government entity has the discretion to simply reissue or dispose of the license.
VII. CONCLUSION

A taxicab license, like other largess, is a valuable asset to the license holder, whether it is considered a privilege or a property interest. As this Comment illustrates, in the arena of taxicab licenses, the vast majority of jurisdictions deem a taxicab license not to be a compensable property interest.

Determining when, how, or if a governmentally conferred benefit, permit, or license implicitly evolves into a Fifth Amendment, compensable property interest is important in today's environment of increasing governmental regulation of activities relating to the public's health, safety, and welfare. Recognizing compensable property interests in largess may create a substantial limitation on subsequent government regulation, effectively binding the hands of a government entity to enact future legislation designed to serve the "public interest."

When regulatory authorities do not explicitly define largess as a compensable property interest, the licensee is likely to expect some constitutional protection, especially if the government entity implicitly treats the largess as property. By using the Proposed Model's factual, balancing inquiry, which considers a number of important elements, the extent of such constitutional protection will depend on the "nature of the government entity's regulatory system" and the "regulated industry's reasonable expectations" that the largess is a compensable property interest.
I. INTRODUCTION

Controlled Flight Into Terrain ("CFIT") or, in simple terms, when crews unwillingly fly their aeroplanes into the ground, remains still the single most contributor to and causative factor of aircraft accidents.\(^1\) In 1998, 24 CFIT driven accidents occurred, resulting in at least 17 total hull losses and 385 fatalities.\(^2\) The previous year's records reflect that 50 CFIT related accidents occurred, resulting in 31 hull losses and 770 fatalities. Going back further, it is recorded that during the 1978-1996 period, there were an average of 42 accidents per year resulting in 29 hull losses and 510 fatalities.\(^3\)

Despite these demoralising figures, the International Civil Aviation
Organisation ("ICAO") has been carrying out a sustained program and prevention campaign, particularly in the last decade. Two noteworthy achievements of the ICAO in this field have been the numerous recommendations incorporated into Annex 6 to the Chicago Convention as a result of work carried out by a CFIT task force led by ICAO and the Flight Safety Foundation, culminating in 1995, and the ICAO Accident Investigation and Prevention ("AIG") Divisional meeting held in Montreal, September 14 – 24, 1999. At this meeting, some 151 world aviation experts agreed on a series of recommendations designed to strengthen aircraft accident prevention through enhanced reporting systems and more efficient sharing of safety related information.

Opening the meeting, the President of the ICAO Council, Dr. Assad Kotaite succinctly drew attention to the pervasive and all encompassing factors prevailing upon modern aviation as being significant in the prevention and investigation of CFIT accidents. Dr. Kotaite observed:

Fundamental to prevention in aviation safety is the thoroughness of accident and incident investigations, and the timely reporting of the findings . . . . Our investigation policies, procedures and techniques must keep pace with developments in aviation technology, world-wide expansion of air services, increased competition among airlines, liberalisation of access to markets and the continuing trend of partnerships among airlines and manufacturers.

Dr. Kotaite makes the very relevant point of there being a compelling need for work on accident prevention and investigation in order to keep pace with the prolific advancements of commercial aviation and aviation technology. In the spirit of this observation by Dr. Kotaite, the September 1999 meeting proposed a new chapter in Annex 13 to the Chicago Convention. The chapter contained requirements inter alia for states to establish mandatory incident reporting systems to facilitate the collection of information on actual or potential safety deficiencies; and establish voluntary incident reporting systems to complement the information captured by mandatory reporting systems.

Also among ICAO'S contributions towards the prevention of CFIT related accidents is the requirement for the installation of Ground Proximity Warning Systems ("GPWS") worldwide in large jet aircraft. It is

6. Id.
7. See Chicago Convention, Annex 13, Aircraft Accident and Incident Investigation, July 1994, 8th ed.
reported that GPWS reduces CFIT risk by 95 per cent.\(^8\) Of course, prevention of aircraft accidents, be it CFIT related or otherwise, does not depend entirely on technology. The human factor is equally important, as emphasised by Earl F. Weener, Chief Engineer for Aircraft Reliability at the Boeing Commercial Airplane Group.\(^9\) This view is supported by the Flight Safety Foundation ("FSF") which emphasises that as soon as a GPWS warning occurs in an aircraft in flight, pilots should, immediately and without hesitating, evaluate the warning, execute the pull up action recommended in the company procedure manual. If such a manual is not available, the FSF recommends that pilots should immediately initiate a maximum performance full power climb until the GPWS warning signal stops. The only exception to this procedure is when clear meteorological conditions prevail enabling one hundred percent visibility, which would entitle the pilots to determine whether a warning signal is false. The final step in the procedure is for the pilots to notify air traffic control, as soon as possible, when a pull up is executed consequent to a GPWS warning signal.

It is incontrovertible that CFIT involves a delicate balance between the involvement of technology and human professional conduct in the cockpit. In this context, the CFIT checklist developed by the FSF in 1994 and endorsed by ICAO is all encompassing and effective. The checklist is capable of being used both to evaluate specific flight operations and also to enhance pilot awareness of the CFIT risk. The Checklist’s most salient and positive attribute is that it enables the pilot, through a system of positive and negative scoring, to evaluate the risk to the greatest precision possible. It has as the last line of defence the GPWS Signal, before which, if a pilot follows the three-part document faithfully, a ground proximity warning could be obviated. From a legal perspective, the availability of such a document imputes good airmanship to the pilot as a matter of course and the GPWS and the global requirement of its instalment in aircraft places a responsibility on the carrier.

This article will address regulatory and legal issues involving CFIT accidents and the liabilities of the parties responsible for the avoidance of such accidents.

II. Regulatory Issues

The seminal pronouncement on aviation safety is contained in the Preamble to the Convention on International Civil Aviation ("Chicago Convention") wherein states’ agree on certain principles and arrangements of the Convention in order that international civil aviation may be

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developed in a safe and orderly manner.\textsuperscript{10}

The Chicago Convention also established the ICAO whose aims and objectives are \textit{inter alia}, to insure the safe and orderly growth of international civil aviation throughout the world;\textsuperscript{11} meet the needs of the people of the world for safe, regular, efficient and economical air transport;\textsuperscript{12} and promote safety of flight in international air navigation.\textsuperscript{13} In pursuance of these aims and objectives, ICAO, at its 29th Assembly, held from September 22 to October 8, 1992, adopted Assembly Resolution A29-13 on the improvement of safety oversight which reaffirms a state's responsibility for safety oversight and calls member states to reconfirm their safety oversight obligations, \textit{inter alia}.\textsuperscript{14}

The 31st Assembly, held in Montreal in 1995, adopted Resolution A31-9 on the Implementation of the ICAO Program for the Prevention of Controlled Flight into Terrain. The Resolution makes reference to the updating of ICAO Standards relating to GPWS and the objective of the CFIT Task Force of a fifty percent reduction in the global CFIT accident rate by 1998 and directs the ICAO Council to continue to develop the ICAO Program for the reduction of CFIT accident rate as a matter of priority. It also urges states to implement ICAO's CFIT prevention program, particularly in terms of the installation and carriage of GPWS in aircraft and take all necessary measures towards achieving the fifty-percent reduction rate on CFIT accidents.\textsuperscript{15}

At its 32nd Assembly, held in 1998, ICAO saw the adoption of Resolution A32-15 on the ICAO Global Aviation Safety Plan ("GASP"), which \textit{inter alia} noted with concern that CFIT continues to be a very significant cause of accidents in airline operations and stressed the need for a reduction in the rate of fatal accidents in airline operations. The Resolution reiterates the need for full implementation of the ICAO Program for the prevailing CFIT as outlined in Resolution 31-9.\textsuperscript{16}

As guidance material for states on the prevention of CFIT accidents, the latest edition of Annex 6 to the Chicago Convention, which is on the subject of operations of aircraft, requires \textit{in limine} under the subject of international general aviation that aeroplanes when operated across land areas which have been designated by the state concerned as areas in which search and rescue would be especially difficult, shall be equipped

\begin{thebibliography}{13}
\item\textsuperscript{11} See Convention on International Civil Aviation, Dec. 7 1944, art. 44 (a).
\item\textsuperscript{12} See id. at art. 44 (d).
\item\textsuperscript{13} See id. at art. 44 (h).
\item\textsuperscript{14} See Assembly Resolutions in Force, ICAO Doc. 9730, Oct. 2, 1998, at 1-47.
\item\textsuperscript{15} See id. at 1-49.
\item\textsuperscript{16} See id. at 1-50.
\end{thebibliography}
with such signalling devices and life saving equipment (including means of sustaining life) as may be appropriate to the area overflown.\(^{17}\) The Annex also makes the recommendation that all turbine-engined aeroplanes of a maximum certified take off mass in excess of 15,000 kg, or authorised to carry more than 30 passengers should be equipped with a ground proximity warning system.\(^{18}\)

There are other provisions in the Annex which require the installation of a GPWS in other types of aircraft.\(^{19}\) The Annex also emphasises the need, from January 1, 1999, for a GPWS to provide warnings of an excessive descent rate, excessive terrain closure rate, excessive altitude loss after take off or go around, unsafe terrain clearance while not in landing configuration when the gear is not locked down or flaps are not in a landing position, and excessive descent below the instrument glide path.\(^{20}\)

For international commercial air transport, the Annex stipulates that an aeroplane engaging in commercial air transportation should be equipped with instruments which will enable the flight crew to control the flight path of the aeroplane, carry out any required procedural manoeuvres and observe the operating limitations of the aeroplane in the expected operating conditions.\(^{21}\) Commercial aircraft are also required to be equipped with GPWS and from January 1, 1999, the same criteria for warning requirements,\(^{22}\) as are contained in the Annex for general aviation would apply.\(^{23}\)

### III. ICAO's Safety Oversight Program

#### The ICAO Dilemma

There are three provisions in the Chicago Convention, which impact the subject of safety. Primarily, Article 12 requires each contracting state to maintain uniform aviation regulations in conformity, to the greatest possible extent, with those established under the Convention. Article 31 stipulates that every aircraft engaged in international aviation shall be provided with a certificate of airworthiness issued or rendered valid by the state in which it is registered. The following provision - Article 32 requires the pilot of every aircraft and the other members of the operat-


\(^{18}\) See id. at Recommendation 6.9.1.

\(^{19}\) See id. at Recommendations 6.9.2 & 6.9.5.

\(^{20}\) See id. at Recommendation 6.9.4.


\(^{22}\) See id. at Standard 6.15.

\(^{23}\) See id. at Standard 6.2.1.
ing crew of every aircraft engaged in international navigation to be provided with certificates of competency. More importantly, Article 32 b) empowers states to refuse to recognize, for the purposes of flight above their own territories, certificates of competency and licenses granted to any of its nationals by another contracting state.

All these provisions really mean one thing maintain uniform standards in certification so that safety of civil aviation can be ensured. The question is whether such uniformity is ensured in the scenario of an airline which prolifically uses leased aircraft or a "virtual" airline where most services are outsourced and largely unsupervised by the airline itself. There is also the question whether some airlines may be tempted to accept the lowest cost in terms of contracted out engineering and maintenance services. The answer, of course, lies in one thesis ensure that regulation in the area of safety is uniformly carried out.

Incontrovertibly, such a responsibility should fall on the entire world civil aviation community. The methodology for this proposition is already in place, in the nature of ICAO Standards and Recommended Practices ("SARPs"). The solution, however, is elusive, purely because ICAO SARPs do not have absolute powers of enforceability under international law.

Basically, ICAO promulgates its SARPs through its 18 Annexes to the Chicago Convention. Article 54(1) of the Chicago Convention prescribes the adoption of international Standards and Recommended Practices and their designation in Annexes to the Convention, while notifying all contracting states of the action taken. The fundamental question which has to be addressed in limine, in the consideration of the effectiveness of ICAO's SARPs, is whether SARPs are legislative in character. If the answer is in the affirmative, then at least theoretically, one can insist upon adherence to SARPs by states.

The adoption of SARPS was considered a priority by the ICAO Council in its Second Session (September 2 – December 12, 1947) which attempted to obviate any delays to the adoption of SARPs on air navigation as required by the First Assembly of ICAO. SARPs inevitably take two forms: a negative form e.g. that states shall not impose more than certain maximum requirements; and a positive form e.g. that states shall take certain steps as prescribed by the ICAO Annexes.

Article 37 of the Convention obtains the undertaking of each contracting state to collaborate in securing the highest practical degree of

25. ICAO Resolutions A-13 and A-33, which resolved that SARPS relating to the efficient and safe regulation of international air navigation be adopted.
uniformity in regulations, standards, procedures and organization in relation to international civil aviation in all matters in which such uniformity will facilitate and improve air navigation. Article 38 obligates all contracting states to the Convention to inform ICAO immediately if they are unable to comply with any such international standard or procedure and notify differences between their own practices and those prescribed by ICAO. In the case of amendments to international Standards, any state which does not make the appropriate amendment to its own regulations or practices shall give notice to the Council of ICAO within 60 days of the adoption of the said amendment to the international Standard or indicate the action which it proposes to take.

There is no doubt that the Annexes to the Convention or parts thereof lay down rules of conduct both directly and analogically. In fact, although there is a conception based on a foundation of practicality that ICAO’s international Standards that are identified by the words “contracting states shall” have a mandatory flavor (imputed by the word “shall”), while Recommended Practices identified by the words “contracting states may” have only an advisory and recommendatory connotation (imputed by the word “may”), it is interesting that at least one ICAO document requires states under Article 38 of the Convention, to notify ICAO of all significant differences from both Standards and Recommended Practices, thus making all SARPs regulatory in nature.\textsuperscript{27}

Another strong factor that reflects the overall ability and power of the Council to prescribe civil rules of conduct (and therefore legislate) on a strict interpretation of the word is that in Article 22 of the Convention each contracting state agrees to adopt all practical measures, through the issuance of special regulations or otherwise, to facilitate and expedite air navigation. It is clear that this provision can be regarded as an incontrovertible rule of conduct that responds to the requirement in Article 54(1) of the Convention. Furthermore, the mandatory nature of Article 90 of the Convention - that an Annex or amendment thereto shall become effective within three months after it is submitted by the ICAO Council (“Council”) to contracting states is yet another pronouncement on the power of the Council to prescribe rules of state conduct in matters of international civil aviation. \textit{A fortiori}, it is arguable that the ICAO Council is seen not only to possess the attribute of the term “jurisfaction” (the

\textsuperscript{27. Aeronautical Information Services Manual, ICAO Doc. 8126-0 AN/872/3. ICAO Resolution A 1-31 defines a Standard as “any specification for physical characteristics . . . the uniform application of which is recognised as necessary . . . and one that States will conform to. The same resolution describes a Recommended Practice as any specification for physical characteristics . . . which is recognised as desirable . . . and one that member States will endeavour to conform to . . . .” T. Buergenthal, \textit{Law Making in the International Civil Aviation Organisation}, 1969, at 10 (citing the definitions given in ICAO’s Annex 9 of SARPS).}
power to make rules of conduct) but also the term "jurisdiction" (the power to enforce its own rules of conduct). The latter attribute can be seen where the Convention obtains the undertaking of contracting states not to allow airlines to operate through their air space if the Council decides that the airline concerned is not conforming to a final decision rendered by the Council on a matter that concerns the operation of an international airline. This is particularly applicable when such airline is found not to conform to the provisions of Annex 2 to the Convention that derives its validity from Article 12 of the Convention relating to rules of the air. In fact, it is very relevant that Annex 2, the responsibility for the promulgation of which devolves upon the Council by virtue of Article 54(1), sets mandatory rules of the air, making the existence of the legislative powers of the Council an unequivocal and irrefutable fact.

Academic and professional opinion also favors the view that in a practical sense, the ICAO Council does have legislative powers. Milde says:

The Chicago Convention, as any other legal instrument, provides only a general legal framework that is given true life only in the practical implementation of its provisions. Thus, for example, Article 37 of the Convention relating to the adoption of international standards and recommended procedures would be a very hollow and meaningless provision without active involvement of all contracting states, Panels, Regional and Divisional Meetings, deliberations in the Air Navigation Commission and final adoption of the standards by the Council. Similarly, provisions of Article 12 relating to the rules of the air applicable over the high seas, Articles 17 to 20 on the nationality of aircraft, Article 22 on facilitation, Article 26 on the investigation of accidents, etc., would be meaningless without appropriate implementation in the respective Annexes. On the same level is the provision of the last sentence of Article 77 relating to the determination by the Council in what manner the provisions of the Convention relating to nationality of aircraft shall apply to aircraft operated by international operating agencies.

Milde concludes that ICAO has regulatory and quasi-legislative functions in the technical field and plays a consultative and advisory role in the economic sphere. T. Buergenthal had earlier expressed a similar view:

[T]he manner in which the International Civil Aviation organization has ex-

29. Article 12 stipulates that over the high seas, the rules in force shall be those established under the Convention, and each contracting state undertakes to insure the prosecution of all persons violating the applicable regulations. See Chicago Convention, art. 12 (1999).
31. See Milde, supra. note 30, at 122.
ercised its regulatory functions in matters relating to the safety of international air navigation and the facilitation of international air transport provides a fascinating example of international law making... the Organization has consequently not had to contend with any of the post war ideological differences that have impeded international law making on politically sensitive issues.\textsuperscript{32}

Paul Stephen Dempsey endorses in a somewhat conservative manner, the view that ICAO has the ability to make regulations when he states:

In addition to the comprehensive, but largely dormant adjudicative enforcement held by ICAO under Articles 84-88 of the Chicago Convention, the Agency also has a solid foundation for enhanced participation in economic regulatory aspects of international aviation in Article 44, as well as the Convention's Preamble.\textsuperscript{33}

One of the issues that is being addressed by ICAO is the need for a formulation by the Organization of a comprehensive response of ICAO to Resolution A29-3, taking into account the related tasks planned or already in hand by the subsidiary bodies. Therefore, one of the main goals of ICAO at present is to find ways to create a greater interest and participation in the formulation of SARPs by states and to strengthen the Organization's capability of monitoring the actual status of differences from or compliance with Standards on the basis of its own findings. The latter element is especially important, as differences filed by states do not always appear to be representative of the reality.

ICAO believes that there are a number of reasons that prevent states from indicating their compliance, or otherwise, with ICAO SARPs. These may include:

1. Insufficient communication between ICAO and recipient states; loss of documentation by recipients and delays in delivering the documentation to the responsible party beyond the target date for replies; organizational structures of civil aviation authorities which render difficulties in identification of, and routing to, the responsible party;
2. Insufficient resources within states to consider expeditiously and process ICAO documentation and to implement the relevant Standards into their national legislation;
3. Difficulty in comprehending and interpreting Annex material as well as subject matter which is beyond the level of expertise of the recipient administration; and


\textsuperscript{33} Paul Stephen Dempsey, \textit{Law and Foreign Policy in International Aviation} 302 (1987).
4. Possible lack of understanding about the role of states in the consultation phase of the development of ICAO Standards.  

More fundamentally, it is always a possibility that states may have insufficient resources either to implement Standards or to advise ICAO of non-compliance with the relevant Standards. It should be noted in this context, that recent initiatives by states, in an effort to address the concerns raised by the 29th Session of the Assembly and to assure the safety of their citizens, have raised fundamental questions about the effectiveness of the multilateral safety assurance afforded by the Chicago Convention.

ICAO feels that the need to remind contracting states on an ongoing basis of their obligation to notify the Organization of any differences to the Standards in the Annexes to the Convention remains a critical factor in its advances towards more state participation in its regulatory process. Furthermore, the level of implementation of those Standards by states into their national legislation and procedures has to be improved. These two elements complement each other; if too many states simply notify ICAO of their non-implementation of the safety Standards, states could no longer assume a mutual level of minimum safety Standards and would have to resort to a bilateral or regional approach in order to ensure an acceptable safety oversight between themselves.

Some catalysts for the global implementation of Standards and the harmonization of national rules have been identified as the bilateral and multilateral cooperation of states. As was discussed earlier, organizations such as the European Civil Aviation Conference, the African and Latin American Civil Aviation Commissions have already taken initiatives in this region. Other organizations, such as the Conference of Directors General of Civil Aviation of the Asia and Pacific Regions, the Commonwealth of Independent states, and other groups, including trading blocs may be considered as effective vehicles for the promulgation and adoption of agreements and understandings in this regard.

Another significant issue is that there is an increasing need for cooperation in the regulatory field for states in a particular geographic setting and with certain common regulatory needs that are dictated by technical, operational and environmental needs and motives. Recent years have witnessed the growing significance of regional organizations that are addressing traditional ICAO activities such as technical harmonization, standardization and regulatory matters. These activities are likely to intensify in the near future and may well affect the role of ICAO as the

34. Id. at 5.
principal intergovernmental organization responsible for the regulation and coordination of international civil aviation.

ICAO's strategy for the development and implementation of ICAO Standards and Recommended Practices purports to make use of available modern technological tools but at the same time aim at more basic issues, for example to:

1. Ascertain and document the actual status of implementation of ICAO SARPs and the extent of differences to Standards, improving communication channels amongst headquarters, regional offices and states to facilitate this objective;
2. Improve the awareness on the part of states of the vital role they play in the multilateral safety assurance provided for in the Chicago Convention, which is founded upon the effective implementation of ICAO SARPs;
3. Similarly, create or improve the awareness on the part of states of their role in the development of ICAO SARPs, with a view of encouraging more states to be actively involved in the formulation process;
4. Pursue systematic analysis of the reasons for any non-implementation of SARPs and differences to Standards;
5. Develop realistic programs, including the ICAO Technical Co-operation programs, and their funding, to assist states in implementing SARPs, where necessary; and
6. Establish adequate co-ordination and co-operation with states in a regional context in the field of rule harmonization and the implementation of standards.

ICAO is a United Nations' agency and the United Nations was created, in more senses than one, during World War II. Although originally, there were questions asked by the international community whether this war-time union of states could satisfactorily and appropriately be converted into a peacetime organization for international cooperation, these questions were solved by the creation within the Economic and Social Council ("ECOSOC") of the United Nations of various specialized agencies—ICAO being one—which were brought into relationship with the United Nations\(^{35}\). The ECOSOC may enter into agreements with any of these specialized agencies; coordinate activities of the agencies through consultation; and define terms on which the agency concerned would be brought into relationship with the United Nations\(^{36}\).

Therefore, ICAO conceptually shares the same international status

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35. See U. N. CHARTER art. 57.
36. See id. at art. 63 (1) & (2).
as the United Nations, while members of the ICAO Secretariat are international civil servants. The establishment of ICAO as the specialized agency of the United Nations which is responsible for regulation of international civil aviation brings to bear the need to inquire as to why such specialized agencies are created instead of conferring functions which are to be performed by them upon the United Nations itself. One of the reasons that have been adduced is that the general organization of the United Nations and its personnel could not take on all specialized activities that are handled by the various specialized agencies. Another is that a single organization with greatly increasing administrative personnel would have been too cumbersome a bureaucracy.

Be that as it may, the question as to what status ICAO holds in the international community, which in turn would shed some light as to the status of its regulations, would largely lie in the definition of the word “agency”. On the term “Specialized Agency” one commentator has observed:

[T]hey are Specialized as to subject matter, of course, but the implications of the second term may not be so clear. These Agencies are in fact, examples of international administrative agencies . . . whose chief function is the administrative one, although the conference or representative organs associated with them (or with which they are associated), and the legislative or policy determining activities of the latter, are not to be disregarded. . . .

The relationships to be developed between Specialized Agencies and the UN constitutes a major problem of international statesmanship. As in the case of regional organizations, whatever the value of the special institutions of the situation would be difficult and dangerous unless adequate measures for coordination of the various elements could be worked out. This is a problem for searching analysis in principle and for careful application in practice. If the Specialized Agencies are created by the UN suitable co-ordination should be possible, but if it be a question of coordinating with the UN an Agency created independently the task is more difficult.37

The above comment supports the view that a certain coordination exists between specialized agencies and the United Nations on the basis of their relationship ipso facto. Hence, this may infer argument that the regulations promulgated by a specialized agency should have similar status and leverage as any created by the parent United Nations.

Over the years, ICAO has played a seminal and alert role in moni-

37. PITMAN B. POTIER, AN INTRODUCTION TO THE STUDY OF INTERNATIONAL ORGANISA-
toring safety in civil aviation and has diligently endeavored to enhance ICAO SARPs and obtain state compliance of these provisions.

At the 31st Session of the ICAO Assembly, held in Montreal from 19 September to 4 October 1995, ICAO contracting states adopted Resolution A31-2\(^{38}\) on increasing the effectiveness of ICAO. The Resolution \textit{inter alia} recognizes the new and rapidly evolving technological, social, economic and legal challenges in the field of civil aviation and directs the ICAO Council and Secretary General, within their respective competencies, to intensify efforts to develop a Strategic Action Plan for the Organization. The Plan is required to be implemented by a systematic planning process that draws the financial progress and utilization of the Organization. It also directs the Council \textit{inter alia}, to ensure the effectiveness of the ICAO safety oversight mechanism.

On 22 May 1997, ICAO officially launched its Strategic Action Plan in accordance with the directives of the Assembly in Resolution A31-2. At the launch, the President of the ICAO Council, Dr. Kotaite, renewed calls for increasing powers which would enable ICAO to oversee the implementation of aviation safety and security standards worldwide.\(^{39}\) Dr. Kotaite identified ICAO’s role in the present context succinctly when he said:

Never has there been a greater need for a strong and active ICAO. ... In civil aviation, globalization, commercialization of government service providers, liberalization of economic regulation, increasing environmental controls and the emergence of new technologies all have significant implications for safety and security. Addressing these issues effectively requires an unprecedented level of co-operation among countries and a corresponding level of global co-ordination that extends beyond borders.\(^{40}\)

The President of the Council concluded by suggesting that ICAO’s goal should be to become the recognized worldwide auditor of safety and security standards for international civil aviation.

The message of the ICAO Council’s President echoes the fundamental truth that nothing in international civil aviation is parochial and disconnected.

**Recent ICAO and Regional Initiatives**

In order to address the issue of aviation safety, the ICAO convened in Montreal, from 10 to 12 November 1997, an international conference


\(^{40}\) Id.
for Directors General of Civil Aviation to review the ICAO Safety Oversight Program and to consider its expansion. Almost simultaneously with this event, ICAO released its preliminary 1996 accident and security statistics, showing that scheduled air carriers from the 185 ICAO contracting-states reported twenty-three fatal aircraft accidents, compared with twenty six the previous year. Although the incident rate declined in 1996, the number of passenger deaths reported rose to 1,135, compared to 710 in 1995.

The Conference concluded, *inter alia*, that ICAO should continue making the safety-oversight program more assertive and effective; that there should be a harmonized approach in conducting safety audits; and that the ICAO should expand the safety-oversight program initially including air traffic services, aerodromes, support facilities and services to other technical fields at the appropriate time.

Although the CFIT statistics portend a certain perceived gloom, the silver lining comes with the awareness of the enormity of the problem and the identification of factors contributing to the aircraft accident rate. These factors include underdeveloped aviation infrastructure; poor airline operating practices; inadequate national aviation oversight at varying degrees; poor air traffic control capability; lack of navigational aids and radar coverage; and substandard airport equipment. Unsatisfactory meteorological facilities also possibly cause aircraft accidents.

For its part, ICAO, through its Air Navigation Commission, completed the development of a framework that encapsulates the seminal ICAO activities in pursuit of aviation safety within the period 1995 to 1998. The Commission created a comprehensive document that encompassed a GASP that gives ICAO leadership a commitment from states and the industry to enhance aviation safety worldwide.

Safety is the primary concern of the world aviation community at the present time. This concern is not only because the fundamental postulates of the Chicago Convention of 1944 call for the safe and orderly development of international civil aviation and mandate ICAO to insure the safe and orderly growth of international civil aviation throughout the world, but also because the aviation world faces a critical era where, in the words of Dr. Kotaite:

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41. See ICAO Doc. P10 1697 at 1.
42. See ITA Press 284, Apr. 1-5, 1997 at 10.
45. See *id.* at Preamble.
46. See *id.* at art. 44 (a).
[The international aviation community cannot afford to relax its vigilance... ICAO would continue to take timely action to ensure safety and security standards are in effect, and that deficiencies are properly and efficiently addressed.]

The ICAO Council adopted ICAO's Strategic Action Plan on February 7, 1997, formally recognizing the compelling need for higher standards in aviation safety. The basic strategic objective of the Plan is to further the safety, security and efficiency of international civil aviation. ICAO plans to accomplish this task by assisting states to identify deficiencies in the implementation of Annexes to the Chicago Convention, in particular provisions that ensure safety in aviation.

One of the core elements of ICAO activity on safety, according to its Strategic Action Plan, is to have teams of experts assess the capacity of participating states to control effectively the level of safety for which they have responsibility. ICAO's safety-oversight program, which would implement this activity, extends to personnel licensing, operation of aircraft, and aircraft airworthiness. ICAO may, in the foreseeable future, extend ICAO's safety-oversight program to areas such as air traffic control and the operation of airports.

Taking a cue from ICAO, several regional aviation organizations have formally incorporated safety provisions in their documentation. The African Civil Aviation Commission ("AFCAC"), at its Thirteenth Plenary Session (Abuja, May 11-18, 1995) discussed the matter of safety oversight in Africa. This discussion led to the Commission's adopting Decision S13-3 on safety oversight, recognizing that states must ensure compliance with international safety standards contained in the relevant Annexes to the Chicago Convention, and that most African States may not have the necessary infrastructure to fully implement such standards. The Commission refers to the ICAO safety-oversight program in Decision S13-3, instructing the AFCAC Bureau to improve safety-oversight in AFCAC activities and to promote cooperation among African States in the field of safety-oversight. Through the decision, AFCAC also requested ICAO's assistance for African States, so they could effectively introduce the safety-oversight program in Africa.

The Fifteenth Plenary Session of AFCAC, held in Abuja on April 20-24, 1998, followed earlier safety action of AFCAC by adopting Resolution S15-5, which recognized the increasing numbers of private airlines licensed and operating in Africa following the liberalization policies adopted by some African countries. In this context, the Assembly recog-
nized that aviation safety in Africa is of paramount importance to African civil aviation. To this end, the African States and airlines need to enhance safety awareness amongst themselves. Resolution SI5-5, therefore, urges all African member states to enhance safety awareness within their respective organizations through increased training of flight crews and technicians and strict adherence to safety regulation and operations within the prescribed safety standards. The Resolution further calls upon each African member state to reaffirm its commitment to safety-oversight.49

The European Civil Aviation Conference ("ECAC"), at its 100th Meeting of Directors General of Civil Aviation (Paris, May 14 – 15, 1997) discussed an ECAC Recommendation on Safety of Foreign Aircraft,50 which calls for increased ramp checks on aircraft, and rigid bilateral adherence by states to the provisions in the Chicago Convention on licensing of personnel and certification of aircraft.51

The ECAC bilateral safety clause calls, in limine, for consultations at any stage where such consultations relate to safety standards of aircrew, aircraft or the operation of aircraft. The provision allows for the revocation of the clause, if one party to the agreement finds that the other party does not maintain minimum ICAO Standards. The clause also admits the need to conduct random ramp checks for one party to determine whether aircraft conform to Article 33 of the Chicago Convention, relating to certification of airworthiness.

At the same meeting, ECAC discussed a recommendation52 on the safety of leased aircraft, calling for standards as prescribed in Annex 6 to the Chicago Convention (Operation of Aircraft,) and minimum conditions to ensure that owners maintain leased aircraft in accordance with ICAO Standards of Safety.

Notably, safety regulations of the European Community are generally stringent on product liability,53 stipulating that the community considers any person who imports a product for leasing is the manufacturer of that product for purposes of product liability.

At the 103rd Meeting of the Directors General of Civil Aviation in
Paris on July 1 - 2, 1998, ECAC considered further safety issues of the European region, and discussed issues related to ICAO's safety-oversight program and follow up of oversight assessments of the European region.54

More recently, at the 108th Meeting of Directors General of Civil Aviation in Paris in December 1999, the ECAC DGCAs endorsed having an annual discussion of the ECAC Program for Safety Assessment of Foreign Aircraft ("SAFA"), and agreed to publish the SAFA Annual Report in early 2000.55 A 1996 to 1998 SAFA Report records some of the common deficiencies observed by ECAC pertaining to flight decks of foreign aircraft as being the non availability of flight crew licenses, the absence of a noise certificate and required manuals on board, or such manuals being out of date, and deficiencies in the calculation of load distributions.56

Another regional civil aviation organization that recognized the compelling need for the implementation of safety oversight in its region is the Latin American Civil Aviation Commission ("LACAC"). At LACAC's Eleventh Assembly in Manaus from November 7 – 10, 1994, some LACAC member states adopted the "Manaus Declaration," which expressed support of the role of the ICAO Council to establish a safety-oversight program, and requested ICAO to implement the program as quickly as possible.57

At the 12th LACAC Assembly, held in Panama from November 5 to 8, 1996, the Assembly adopted Resolution A12-4, which referred to the Manaus Declaration as the basis of aviation-safety policy in the region, and resolved to support ICAO efforts at safety-oversight. The Resolution also urged all member states to take necessary measures to achieve the highest possible technical perfection in implementing aviation safety-measures in their territories.58

Both ICAO and the regional aviation organizations have focused their attention on the air navigational aspects of safety oversight. Understandably so, since civil aviation safety depends primarily on safe air navigation. However, civil aviation safety does not stop at air navigation. Other extraneous factors, such as human conduct in the aircraft and air traffic controller liability, might impact aviation safety.

At the 32nd ICAO Session Assembly, held in Montreal from Sep-

58. See Commission Latinoamericana de Aviacion Civil, XII Asamblea Ordinaria, CLACI 12, Nov. 5 – 8, 1996, at 14.
tember 22 to October 2, 1998, the Assembly endorsed a universal safety oversight program, comprised of regular, mandatory, systematic, and harmonized safety audits. Commencing on January 1, 1999, ICAO conducts these audits in all 185 contracting states, with their consent and at their request, under a Memorandum of Understanding signed by and between the state concerned and ICAO.

The ICAO Safety Audit aims at determining whether individual states have the capacity to provide safe air navigation services to aircraft which traverse their airspace. It comes at a critical time in aviation history, with an expected doubling of air traffic in both the upper and lower airspace in the first fifteen years of the new millenium.

Also during the 32nd Session, the ICAO Assembly recognized that the ICAO safety-oversight program has reached a saturation point in terms of policy, and sought to address policy in developing further the oversight program. ICAO recognized regional deficiencies and shortcomings in the field of air navigation and directed contracting states to correct such problems.

In its deliberations, the Assembly found useful the developments of the United States safety program Safer Skies, developed in April 1998 the Federal Aviation Administration (FAA). Through Safer Skies the FAA intends to address, inter alia, the CFIT issue; matters pertaining to engine failures; and weather and loss of control hoping to achieve a five-fold reduction in fatal accidents.

Taking the above into consideration in the context of its own Global Aviation Safety Plan, the ICAO Assembly adopted Resolution A32-15, which recognized that the primary objective of the Organization is to continue promoting the safety of international civil aviation. ICAO noted, inter alia, that the expected increase in the volume of international civil aviation would result in an increasing number of aircraft accidents unless the accident rate were reduced. The Assembly also adopted Resolution A32-1 on increasing the effectiveness of ICAO. While Resolution A32-15 endorses the ICAO Plan urging, inter alia, contracting states to examine and revise their laws, if necessary to achieve a proper balance among the various elements of accident prevention efforts and to encourage increased voluntary reporting of events that could affect aviation safety Resolution A32-1 endorses, inter alia, continuing work by the ICAO Council along the lines of Resolution A31-2, referred to earlier.

IV. LEGAL ISSUES

With all the exhortations of the ICAO Resolutions and ICAO's work in establishing standards, recommended practices and guidelines, the concerned states are primarily responsible for recognizing that in CFIT acci-
idents the flight crew is but the final link in a chain of events caused by systemic factors.

States should, in order to significantly reduce CFIT accidents, ensure that aviation systems are improved. State responsibility in preventing CFIT accidents should be two pronged. First, to ensure that crews of airlines over which a particular state has control receive adequate training. Since few operators have instituted training on CFIT accidents, states have the responsibility of taking cognisance of the fact that (although ICAO has distributed more than 3,000 copies of its *CFIT Education and Training Aid*, both in paper and in CD-ROM format, and more than 6,000 copies of a video on the subject) states have not yet comprehensively trained all personnel concerned in CFIT accidents. States should ensure training of all concerned personnel. Such training should include standard operating procedures; conducting route and familiarisation checks of terrain; training on available ATC radar services; training on departure and approach procedures and charts; and ensuring third party audits of training procedures used by airlines. States must also make operators aware of the enormity of the CFIT problem and establish an effective risk management program concerning the prevention of CFIT related accidents.

One of the biggest responsibilities of states is the commitment to updating communication facilities, such as radio communication, radar in civilian air traffic control and regulatory agencies, including governmental authorities. If states are decision-makers and creators of policy for airlines, they should also ensure total compliance of the CFIT Checklist.

Airline management has a pre- eminent role in ensuring safety of their flights. Management-level decision-makers of the airlines have an inherent duty to fully endorse recommended regulations on CFIT prevention and concentrate on risk management of the human error factor. Airline management must create and sustain the safety culture of the organisation concerned. A fundamental measure in this regard is the proper allocation of crew duties. Since most of CFIT related accidents occur at night, airline management has a responsibility to ensure proper management of flight crew duties during night. Proper monitoring of approaches and landing at night, monitoring of the effective use of autopilot during approaches and follow up of AIC clearance by air crew are also implicit in the airlines’ list of responsibilities in the field of safety.

Another important strategy for a prudent airline to follow lies in communication, where the concerned airlines should establish clear and


60. See *Management has a Responsibility to Ensure a Viable CFIT Accident Prevention Program is in Place*, ICAO J., Mar. 1997, at 10-11.
functional links between management, policy makers and flight crew. The liability of an airline consequent upon a CFIT accident significantly lies on the absence of teamwork and the absence of effective and proper communication systems.

The airline must primarily determine and appreciate that CFIT accidents might occur due to both human and environmental factors. The latter may involve inadequate air traffic control services and radar malfunction; proximity of landing facility (airports) to mountainous terrain; and poor runway lighting. Airlines must ensure flight crew awareness of these risk factors and educate the crew on preventive techniques through comprehensive training programs run by the organisations’ flight operations departments.

Boeing’s Chief Engineer of Aircraft Reliability, Earl F. Weener, made one of the most constructive recommendations on flight crew training with regard to the prevention of CFIT accidents: “Flight crew training must emphasize approach planning and the criteria for acceptable approach stabilisation. Moreover, there must be a clear management philosophy that does not penalise crews for making missed approaches.”61

At the aircrew level, pilots (particularly the command pilot) have an extremely heavy responsibility to ensure taking all measures of CFIT prevention on the flight. The CFIT Checklist identifies some of these:

   a) Fly the way you train. Do not deviate from Standard Operating Procedures rehearsed during practice flights;
   b) Conduct route and familiarisation checks for new pilots - especially on international flights. Use visual training aids such as videotapes of instrument approaches into unfamiliar airports;
   c) Use ATC radar services to the maximum extent possible and know when they are limited or not available;
   d) Furnish all cockpit crew with departure and approach charts, including adequate chart-holders and proper illumination;
   e) Use supplemental instrument charts that have colours or shaded contours depicting topographical features (similar to British Airways’s Aerad or Lufthansa’s Atlas charts);
   f) Thoroughly review the entire instrument departure or approach prior to commencing the procedure;
   g) Complete the approach checklist prior to starting the instrument approach procedure;
   h) Make the cockpit a distraction-free, “sterile” environment during the instrument departure or approach procedure;

   61. More Moves on CFIT, supra note 9, at 35.
i) Have the second-in-command crewmember fly the departure or approach procedure during night or IMC and use the pilot-in-command to monitor the procedure;

j) Have the PNF (pilot-not-flying) crosscheck all critical altitudes, including the initial approach fix, glideslope intercept altitude, step-down fixes on non-precision approaches and the final approach fix;

k) Have the PNF provide a 500-foot altitude callout and other altitude cues during the final stages of the approach; and

l) Whenever possible, have a qualified observer occupy the jump seat to help monitor terrain avoidance during instrument approaches in IMC or at night.

The captain bears ultimate responsibility for the safety of passengers and others on board, and such responsibility extends towards declaring and exercising emergency authority, exerting managerial authority and control over the rest of the crew, directing crewmember actions, and assigning duties and responsibilities. The captain is also in charge of “conflict resolving” communications between flight crew in instances where the captain and co-pilot differ in opinion on a particular move in coping with an emergency situation such as CFIT.

The captain’s overall responsibility for a flight does not in any way derogate the accountability at law of a co-pilot or any other technical crewmember responsible for the operation of a flight. In the cockpit a certain mutual responsibility exists among crewmembers due to the varying amount of experience they might have. For example, inasmuch as a senior pilot must guide and instruct his less-experienced colleagues in flight, an experienced first officer might have a duty to assist a newly appointed captain.

V. Conclusion

At the root of the issue of aviation safety in general, and the prevention of CFIT accidents in particular, is the fundamental question as to whether ICAO Assembly Resolutions and other declarations bind states. Conceptually, neither the United Nations nor its specialised agencies are legislative bodies. Rather, both the United Nations Charter and the Chicago Convention contemplate as their objectives the coordination or harmonising of states’ activities through recommendations and guidelines, however termed. However, this does not in any way preclude the United Nations, or a specialised United Nations’ agency such as ICAO, from acting like legislatures through the traditional processes of treaty law making and declarations of law. The various resolutions, standards and recommendations adopted through the ICAO mechanism result from
the exercise of the collective will of governments and, therefore, incontrovertibly become law *ipsa facto*. The United Nations law-making process involves a certain "democratisation" of law making, on the basis that, as against traditional law making, the United Nations system operates on the principle that all Member states have an equal right to participate in the "adoption of law" process, where a single or two thirds majority or consensus basis makes decisions.

ICAO Assembly Resolutions, provisions of the various Annexes to the Chicago Convention, and other declarations are certainly reflective of binding international law. The basic postulate is that they are authentic interpretations of the Chicago Convention as agreed by all ICAO contracting states. They are also affirmations by states of recognised autonomy law, and are expressions of general principles of law accepted by states. Therefore there is no doubt that the criteria set by Article 38 of the Statute of the International Court of Justice ("ICJ") for a given rule, recognised as public international law, are met by ICAO "law." Recognition of the ICJ of the legal force of several United Nations Resolutions and other declarations within the scope of the courts' advisory opinions further supports this philosophy.62

State responsibility towards adherence of ICAO declarations becomes, in view of the above discussion, non-negotiable. *A fortiori*, in the case of aviation safety, even non contracting states must follow the ICAO legislative process, in the same lines as the applicability of the United Nations Convention on the Law of the Sea of 1982 and the various United Nations Covenants on human rights which affect all states. Periodic reports from states on the status of adherence; facilitation by ICAO of the adherence by states (for example, by the conduct of safety-over-sight audits and checks); and even more drastic measures that may seriously jeopardise the membership of a non-compliant state ensure adherence by states. This includes the availability of the measure of adjudication and judicial enforcement through such an organ as the ICJ.

State responsibility percolates to all instrumentalities operating air services, whether or not they belong to the concerned state, to the extent that states have overall responsibility and accountability to ensure that airline management and flight operation departments take all necessary measures in the compliance of international regulations on safety.

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An Owner’s Guide to Avoiding the Pitfalls of Disputes Review Boards on Transportation Related Projects

Daniel D. McMillan*

I. INTRODUCTION

Over the past twenty years, billions of dollars of public money has been committed and spent on the construction of major transportation projects, including subway systems, above-ground commuter rail projects, highways, freeways, and airports. As with any large construction project, substantial disputes frequently arise during the construction of transportation projects. These disputes can be quite complex and technical in nature with enormous amounts of money in controversy. The resolution of substantial construction disputes can be costly and may result in years of litigation. Dissatisfaction with the traditional litigation model of dispute resolution long ago triggered efforts to develop specialized forms of alternative disputes resolution (“ADR”) for heavy construction projects.

A unique form of ADR known as disputes review boards (“DRBs”) has gained increased acceptance on major transportation projects. While the DRB concept was initially promoted for underground projects, public

* Mr. McMillan is a litigation partner in the Los Angeles office of the international law firm of Jones, Day, Reavis & Pogue. He is the Co-Chairperson of the firm’s national Construction Industry Litigation Practice, a member of the firm’s multi-disciplinary Construction Practice Team, and represents public owners and contractors. This article is adapted from a paper presented at the 14th Annual Construction Superconference held in San Francisco, California, on December 9-10, 1999.
owners have used DRBs on a wide variety of transportation projects ranging from construction at airports to the building of subways.1 DRBs continue to be used on an ever increasing number of multi-billion dollar transportation projects. Industry publications report that DRBs demonstrate remarkable success in helping owners and contractors avoid costly litigation.2 In the context of these encouraging results, however, owners (and contractors) need to be cognizant of lessons learned from the industry’s now substantial experience with DRBs. Applying such lessons will ensure that DRBs remain an effective means of avoiding litigation on transportation and other construction projects.

At this juncture in the development and use of DRBs, certain pitfalls with the DRB process can be identified and addressed by owners. A recent California Court of Appeal decision concerning DRBs – the first published court decision in the country to address the operation of DRBs – demonstrates that the pitfalls associated with DRBs are not hypothetical and, in many instances, can be avoided with advance planning and careful drafting of the contract documents governing the DRB process.3 This article identifies a number of potential pitfalls associated with DRBs and other issues that should be considered when drafting DRB related contract documents. All of these issues are discussed in the context of the attributes that distinguish DRBs from other forms of ADR and mediation. Better that owners embrace DRBs with “eyes wide open” than with “eyes wide shut.”

II. THE UNIQUE NATURE, FUNCTION AND PURPOSE OF DISPUTES REVIEW BOARDS

Before discussing the various features of the DRB process, it should be noted that at least three sources of model DRB contractual provisions exist.4 These model DRB contractual provisions include: model three

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4. See DRB Manual, supra note 1, at 122-40; 1991 ASCE Guide, supra note 1, at 45-60;
party agreements between the owner, contractor, and the DRB (i.e., its three members); and model DRB specifications to be incorporated into the prime contract between the owner and the contractor. These model contractual provisions should be consulted by the owner, the contractor, and their attorneys. Each of these sources contains commentary on DRBs and explanation of the DRB process. These sources also describe the conventional wisdom concerning DRBs.

In assessing the potential pitfalls of DRBs and the options available to avoid these problems, it is important to understand the nature, function, and primary purpose of DRBs. By specifying the features credited with the reported success of DRBs, the available options to avoid these pitfalls can be critically evaluated and the impact on the effectiveness of DRBs better assessed. Different commentators may attribute the success of DRBs more to one characteristic than another and may have varying opinions about the primary purpose of DRBs. Despite any divergence in viewpoints, an appreciation of these competing views of the nature, function and primary purpose of DRBs provides owners an analytical framework in which to make decisions about how to structure DRBs to avoid potential pitfalls.

A. THE DRB CONCEPT

A traditional DRB is a three person board of industry experts that assists the owner and contractor in resolving disputes. The DRB conducts hearings on disputes and issues non-binding recommendations that are intended to help the parties reach a resolution without resort to litigation. The DRB concept, while relatively simple and straightforward, has a number of significant features.

Composition Of A DRB. Typical DRB agreements provide that the owner and the contractor each appoint one member of the DRB and that the first two members nominate the third member, who ordinarily serves as the chairperson. The party appointed members must be approved by the non-appointing party and both parties must approve the chairperson. The conventional DRB wisdom is that this ensures that both the owner and contractor have confidence in the DRB as initially constituted.

Model DRB agreements specify that DRB members must have technical qualifications.\textsuperscript{10} Each DRB member is to be experienced with the type of construction involved in the project.\textsuperscript{11} Again, conventional DRB wisdom is that the parties will give greater weight to the recommendations of respected industry experts than to the views of those who lack such experience and stature.

While the owner and contractor each appoint one DRB member (with the approval of the other party), all DRB members are to be neutral and impartial.\textsuperscript{12} The DRB members, regardless of which party appointed them, are \textit{not} to act as advocates for either the owner or the contractor.\textsuperscript{13} Conventional DRB wisdom holds that the impartiality (and the perception of impartiality) of each DRB member and the DRB as a whole is critical to the success of a DRB. This makes intuitive sense because the owner and contractor are less likely to give serious weight to the non-binding recommendations of a DRB when the impartiality of the DRB and its members is subject to doubt. Further, conventional DRB wisdom holds that the mere existence of a DRB reduces the number of disputes because owners and contractors will be much more judicious in pursuing claims knowing that a panel of respected experts will be reviewing disputes that are not resolved at the project level.

The three party agreement governing the DRB ordinarily specifies each party's contractual right to remove or terminate a DRB member.\textsuperscript{14} The original industry model three party agreement promulgated in 1989 provided that DRB "members may be terminated for cause only by their original appointer; the OWNER may only terminate the OWNER-appointed member, the CONTRACTOR may only terminate the CONTRACTOR-appointed member, and the first two members must agree to terminate the third member."\textsuperscript{15} The 1991 model agreement abandoned the cause standard for exercising the contractually specified right to remove a party-appointed DRB member in favor of an essentially "at will" standard: "BOARD members may be terminated for or without cause only by their original appointer; the OWNER may only terminate the OWNER-appointed member, the CONTRACTOR may only terminate the CONTRACTOR-appointed member, and the first two members must agree to terminate the third member."\textsuperscript{16} The more recent model three party agreement retains the "for or without cause" standard for party

\textsuperscript{15} 1989 ASCE \textit{Guide}, supra note 4, at B19 (Three Party Agreement art. IX).
\textsuperscript{16} 1991 ASCE \textit{Guide}, supra note 1, at 59 (Three Party Agreement art. IX).
appointees and provides that the two party appointed DRB members "or the Owner and Contractor must agree to terminate the third member."17

Notably absent from each of the three model agreements is an express contractual right on behalf of the owner or contractor to remove or terminate the other party's appointee. This creates a potential source of tension in the event one party loses confidence in the DRB and seeks to replace the DRB members. This aspect of the model agreements and the advisability of a modification permitting either party to remove any DRB member "for or without" cause is discussed below.

Familiarity With The Project Through Site Visits And Periodic Meetings. DRBs are meant to be constituted as soon after the execution of the contract and as early in the construction process as practical. The creation of a DRB is not intended to be deferred until disputes actually arise. Instead, the DRB is to be composed at the outset of the project. On many projects, however, there is some delay in constituting the DRB.

In addition to conducting hearings as particular disputes arise, DRBs (i) participate in periodic site visits and progress update meetings, and (ii) receive copies of project documents, including the contract documents, project schedules, and various progress reports. During the site visits, the DRB members tour the project with owner and contractor representatives and observe the progress of the construction. Usually on the same day as the site visits, the DRB conducts a progress update meeting in which the owner and contractor discuss the status of the project. In this way, the DRB members develop a familiarity with the project. Conventional wisdom is that the DRB's familiarity and firsthand knowledge of the project adds to the credibility of the DRB and the weight the parties will assign to recommendations issued by the DRB.

DRB Hearings And The Admissibility Of The DRB's Non-Binding Recommendations: If a dispute cannot be resolved at the project level, the parties may submit the matter to the DRB.18 The DRB is to conduct a fair and impartial hearing.19 Each party is to be given a reasonable time to prepare for the hearing in light of, among other things, the nature and complexity of the dispute.20 Each party may make written submissions to the DRB and is to be afforded a full opportunity to present its position at the hearing.21 However, the model DRB provisions do not provide either party with any formal right to engage in discovery in advance of

17. DRB Manual, supra note 1, at 138 (Three Party Agreement art. IX).
the hearing. By addressing issues as they arise and promoting early resolution of disputes, the conventional wisdom is that DRBs thereby reduce the friction and difficulties that might otherwise arise when issues are left unresolved and the owner and contractor become embroiled in litigation during the construction of a project.

After a hearing, the DRB prepares and provides to both parties written recommendations concerning the resolution of the dispute. The recommendations of the DRB are not binding on the parties. The parties ordinarily have fourteen days from receipt of the recommendations to respond by either accepting or rejecting the recommendations and the failure to respond in a timely fashion is deemed an acceptance. Conventional DRB wisdom provides that, although the DRB recommendations are non-binding, the parties will nonetheless seriously consider the DRB recommendations whether favorable or unfavorable because: (i) the parties have faith and confidence in the neutrality and impartiality of the DRB members; (ii) the DRB members are themselves experienced in the type of construction involved on the project; (iii) the DRB members are familiar with the project; and (iv) the recommendations should themselves have some persuasive or logical force.

While DRB recommendations are not binding, the model DRB agreements provide that the DRB recommendations are admissible as evidence "to the extent permitted by law" in the event of subsequent litigation. Conventional DRB wisdom is that, if the above enumerated factors are themselves insufficient to encourage a party to utilize the DRB's recommendations to resolve the dispute, the admissibility of the recommendations provides added incentive. The assumption is that an owner or contractor would be reluctant to proceed with litigation knowing that unfavorable recommendations of neutral and respected experts in the industry may be admissible and presented to the judge and/or jury.

B. IMPORTANT ATTRIBUTES OF A DRB

Based on the above discussion, a number of important characteristics of the DRB process can be identified that contribute to the success of DRBs in assisting owners and contractors in avoiding litigation.

22. 1991 ASCE GUIDE, supra note 1, at 50; 1989 ASCE GUIDE, supra note 4, at B12.
24. See, e.g., DRB MANUAL, supra note 1, at 132 (DRB Specifications §1.04 (I)).
25. The most recent model DRB specification states:
   If the Board’s recommendation does not resolve the dispute, the written recommendation, including any minority report, will be admissible as evidence to the extent permitted by law in any subsequent dispute resolution proceeding or forum to establish (a) that a Dispute Review Board considered the Dispute, (b) the qualifications of the Board members, and (c) the Board’s recommendation that resulted from the process. DRB MANUAL, supra note 1, at 132 (Model Specifications § K1).
• **Confidence In The Neutrality And Impartiality Of The DRB And Its Members:** As a practical matter, a prerequisite to the success of the DRB process is that both the owner and the contractor have continuing confidence and faith in the neutrality and impartiality of the DRB and its members. Absent this, the chances of a successful DRB process are marginal at best. DRB recommendations are non-binding.\(^{26}\) The reality is that, if the owner or contractor has lost confidence in the neutrality and impartiality of the DRB or its members, the disillusioned party cannot be expected to view the DRB’s recommendations as a constructive tool to resolve the dispute.

• **Admissibility Of Recommendations:** The admissibility of DRB recommendations is intended to provide additional impetus to accept even unfavorable recommendations or to at least compel the parties to seriously consider the recommendations before initiating litigation. Of paramount importance, however, is that the owner and the contractor have confidence in the neutrality and impartiality of the DRB and its members. While there might be hypothetical circumstances where the admissibility of the recommendation might induce a disappointed party to accept the DRB recommendations, a loss of confidence in the neutrality and impartiality of the DRB and the process that produced the recommendations undermines the effective functioning of the DRB.

• **Qualifications Of DRB Members:** The expertise of DRB members and their familiarity with the type of construction involved in the project is quite important. The expertise of the DRB members and their technical background allows for disputes to be handled more expeditiously and without the need to educate a judge or jury who is unfamiliar with construction and engineering concepts. The unbiased assessment of a dispute by a group of respected experts undoubtedly would be given serious consideration by any responsible owner or contractor. The qualifications and stature of the DRB members is intended to reinforce the owner’s and the contractor’s confidence in the DRB and the weight accorded its recommendations.

• **Familiarity With The Project:** One of the intriguing aspects of a DRB is that its members develop familiarity with the project as the construction progresses. Familiarity with the project permits more efficient consideration of disputes. Of course, familiarity may breed contempt or a perception by either the owner or contractor that the other party has somehow ingratiated itself to one

or more of the DRB members. DRB rules, however, are designed to minimize this risk by (i) ensuring that representatives of both the owner and contractor are present at site visits, project update meetings, and DRB hearings, and ii) prohibiting DRB members from providing advice or expressing opinions on the merits of disputes except in their written recommendations.27

- Removal Of DRB Members: All of the model agreements provide express contractual rights to remove a party’s appointee to the DRB.28 Although the standard for removal varies from “cause” to “for or without cause,”29 removal of a DRB member may be necessary, for example, to restore the confidence of a party in the neutrality and impartiality of the DRB or a DRB member. The removal of one or more DRB members results in a loss of that member’s (or the entire DRB’s) familiarity and historical knowledge of the project. However, the right to remove a DRB member is not conditioned on the member’s degree of familiarity with the project. The standard for removal does not become more difficult to satisfy as the DRB member’s historical knowledge of the project increases.

- Timely Resolution Of Disputes: Another important attribute of DRBs is that they are intended to address disputes as they arise or as the parties fail to resolve the disputes at the project level. DRB conventional wisdom holds that this “real time” feature helps avoid the hardening of positions and the damage to the relationship between owner and contractor that may occur if an issue is allowed to fester.30 Similarly, this feature is viewed as an advantage over litigation and other forms of traditional ADR like arbitration where disputes frequently are not addressed until several years after the occurrence of the relevant events by judges or arbitrators with no firsthand familiarity with the project.

27. One of the industry DRB practice guides expressly admonishes against ex parte communications between DRB members and owner or contractor representatives:

In order to avoid any suggestion of partiality, there should be no individual communication between Board members and employees of the contractor or owner during the life of the Board. Board communications with the owner or contractor, outside DRB meetings or hearings, should be handled only by the board chairman.

1991 ASCE GUIDE, supra note 1, at 8.

At the initial DRB kickoff meeting, the DRB and the owner and contractor ordinarily discuss procedural rules to be followed with respect to the DRB process. Most DRBs adopt a rule requiring that each party designate a DRB contact person and that the DRB chairperson coordinate administrative matters (e.g., scheduling of meetings, site visits, and hearings).


Mindful of these key attributes of DRBs, owners can assess how modifying the DRB process to avoid potential pitfalls may compromise (or enhance) the effectiveness of a DRB in helping the parties avoid litigation.

C. THE PRIMARY PURPOSE OF THE DRB: ASSISTING THE PARTIES IN AVOIDING DISPUTES AND LITIGATION

There should be no doubt as to the primary and essential purpose of a DRB - i.e., to help the parties avoid and resolve disputes without litigation. In short, the central purpose of the DRB process is to avoid litigation.

Unfortunately, either the owner or the contractor may develop a distorted view of the DRB process. For example, a contractor who believes the DRB is sympathetic to the contractor’s plight and suspicious of the owner may consider the DRB as a means to generate recommendations for use in litigation and not as a means to resolve disputes and avoid litigation. This, of course, turns the purpose of the DRB on its head. The purpose of the DRB is not to generate evidence for use in litigation, but to avoid litigation. The admissibility of recommendations is simply one feature of the DRB process designed to encourage parties to accept DRB recommendations and to discourage parties from litigating marginal claims.

III. OWNER BEWARE: DRB PITFALLS AND OTHER ISSUES

A. ISSUES CONCERNING DRB MEMBERSHIP AND REMOVAL OF DRB MEMBERS

The first three issues and potential pitfalls of the DRB process involve the qualifications, appointment, and retention of DRB members. These issues should be of significant concern to owners and contractors because the effectiveness of a DRB is inextricably linked to the parties’ mutual confidence in the neutrality and impartiality of the DRB and its members.

1. The preferred standard for removal of DRB members: A lesson from the MTA v. SKK case

A recent California Court of Appeal decision, MTA v. SKK,31 addressed the standard for removing a party’s appointee to the DRB.32 That case contains a number of lessons and illustrates several potential pitfalls in the DRB process. Most notably, a DRB can be structured in a way to reduce the risk of owners and contractors becoming embroiled in

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32. Id. at 681.
connection with a ORB hearing concerning the owner's removal of the contractor's general su-

justified the termination of its appointee. 39 The necessity of proving

addressed while the contractor and the other DRB members defended

cased cause required that difficult and uncomfortable issues of misconduct be

constituted cause for removal. 40 . This decision was affirmed by the court

ded standards governing his conduct as a DRB member and that such conduct

MTA's appointee and MTA's appointee refused to honor the notice of

termination (or to resign under protest), the matter proceeded to trial. 38

As a result, MTA was required to develop and present all of the facts that

premature advice on incipient disputes during site visits and quarterly meetings.

Because the contractor contested the existence of cause to terminate

MTA's appointee and MTA's appointee refused to honor the notice of termination (or to resign under protest), the matter proceeded to trial. 38

As a result, MTA was required to develop and present all of the facts that justified the termination of its appointee. 39 The necessity of proving cause required that difficult and uncomfortable issues of misconduct be addressed while the contractor and the other DRB members defended the conduct of MTA's appointee. In the end, the trial court found that MTA's appointee had violated contractual provisions and industry standards governing his conduct as a DRB member and that such conduct constituted cause for removal. 40 . This decision was affirmed by the court

33. Id. at 683, 683 n.3.
34. Id. at 679.
35. 1989 ASCE GUIDE, supra note 4, at B19 (Three Party Agreement § IX).
37. Id. at 681.
38. Id. at 678.
39. Id. at 685, 687.
40. Id. at 685. The trial court found six types of violations, each of which independently satisfied the cause requirements, including: (i) improper prejudgment of issues concerning the MTA's termination of the contractor; (ii) improper prejudgment and ex parte communication in connection with a DRB hearing concerning the owner's removal of the contractor's general superintendent; (iii) statements at an industry function demonstrating bias against the MTA; (iv) improper ex parte communication with the contractor after the DRB member received notice of his termination; (v) failure to exhibit an appropriate temperament; and (vi) providing premature advice on incipient disputes during site visits and quarterly meetings. Id.; see also MTA v. SKK, No. BC 136559, slip op. at 6-10 (Cal. Super. Ct. Dec. 6, 1996) [hereinafter Statement of Decision].
of appeal.\textsuperscript{41}

The contractor had alleged that MTA’s decision to terminate its appointee was made in bad faith and was strategically motivated to disrupt the functioning of the DRB.\textsuperscript{42} The contractor’s argument centered on the fact that MTA’s termination of its appointee occurred \textit{after} the following events: (i) the contractor had itself been terminated for cause; (ii) the DRB had conducted a hearing concerning the termination of the contractor over the objection and in the absence of MTA; and (iii) the contractor thereafter sought to schedule additional DRB hearings on other pre-termination claims.\textsuperscript{43} Contrary to the contractor’s contention, the trial court specifically found that the owner had acted in good faith and this finding was again affirmed by the court of appeal.\textsuperscript{44} The trial court, however, did not expressly address whether the contractor’s conduct was itself strategically motivated to block the owner’s efforts to replace its appointee and restore mutual confidence in the DRB. Regardless of the contractor’s motivation, it is quite clear that the DRB process cannot function effectively where both parties do not share confidence in the DRB’s neutrality and impartiality.

In light of the experience of \textit{MTA v. SKK}, DRB agreements should allow for termination of a party’s appointee “for or without cause.” This will avoid disputes over a party’s right to remove its appointee and collateral litigation over the exercise of that right. The “for cause” standard may require that reasons for removal be articulated. The very process of having to specify the misconduct constituting cause exacerbates the situation. An industry expert accused of misconduct (and the other DRB members) often may take issue with accusations of misconduct. The owner or contractor may be strategically motivated to defend the conduct of the DRB member accused of misconduct. This dynamic can only raise suspicions and further compromise the ability of the DRB to resume a useful function. A standard that allows removal “for or without cause” minimizes the opportunity and incentive for this type of strategic behavior. This “at will” type of standard also permits an amicable separation without the accusations and recriminations that accompany proof of “cause.”

In this way, the “for or without cause” standard maximizes the potential success of the DRB. True, the replacement of DRB members sacrifices their project familiarity and historical knowledge. While there may be no way to replace firsthand knowledge, knowledge and familiarity

\begin{itemize}
\item \textsuperscript{41} MTA v. SKK, 59 Cal. App. 4th at 687.
\item \textsuperscript{42} \textit{Id.} at 683 n.3; Statement of Decision, \textit{supra} note 40, at 10.
\item \textsuperscript{43} Carl F. Ingwalson, Jr., \textit{Court Upholds Removal of DRB Panelist}, 21 Const. Dispute & Avoidance & Resolution Punch List, May 1998, at 3.
\item \textsuperscript{44} MTA v. SKK, 59 Cal. App. 4th at 686-87; Statement of Decision, \textit{supra} note 40, at 10.
\end{itemize}
with the project can be learned by an appropriate replacement DRB member. A loss of trust and confidence, however, may irrevocably compromise the ability of a DRB to function unless and until restored by replacing DRB members or by other means. For this reason, the DRB process should allow removal of a party’s appointee "for or without cause."

Recent industry publications recognize that mutual confidence in the neutrality and impartiality of DRB members is of paramount importance.\(^45\) Consistent with this recognition, the model three party agreements in both the 1991 ASCE Guide and the more recent 1996 DRB Manual provide for removal of party’s appointee “for or without cause.”\(^46\) Indeed, the 1991 ASCE Guide advises that DRB members should voluntarily resign when a party has expressed a loss of confidence: “If, at any time, the Board believes that the process might work better with other Board members, it should offer to step aside. This necessity would arise if the Board senses that either the owner or the contractor has lost trust in their impartiality or judgment.”\(^47\) Similar advice is echoed in the 1996 DRB Manual: “If, at any time, it becomes apparent that either party has lost faith in a member of the board, that member should step aside. Regardless of the merits of the occasion, the credibility of the DRB concept should never be sacrificed to individual feelings.”\(^48\)

This advice – namely, that a DRB member should resign in the event a party loses confidence in that member – is not fully reflected in the 1991 and 1996 model DRB agreements. While those agreements do permit removal of a party’s appointee “for or without cause,” the agreements do not confer an express contractual right to remove the other party’s appointee and provide that the owner and the contractor or the first two members must agree to terminate the third member.\(^49\) In other words, there is no express contractual right to remove the other two members “for or without cause.”

Due to the critical nature of mutual trust and confidence in the DRB and its members, owners should consider revising the language of the model agreements to permit the owner or the contractor to replace any of the DRB members “for or without cause.” This will allow either party to more freely take the steps it deems necessary to restore mutual confidence in the DRB. The counter-argument is that permitting removal of

\(^{45}\) Ingwalson, \textit{supra} note 42, at 4.  
\(^{46}\) DRB \textit{Manual}, \textit{supra} note 1, at 138 (Three Party Agreement art. IX); 1991 ASCE \textit{Guide}, \textit{supra} note 1 at 59 (Three Party Agreement art. IX).  
\(^{48}\) DRB \textit{Manual}, \textit{supra} note 1, at 41.  
\(^{49}\) DRB \textit{Manual}, \textit{supra} note 1, at 138 (Three Party Agreement, art. IX); 1991 ASCE \textit{Guide}, \textit{supra} note 1, at 59 (Three Party Agreement art. IX).
any DRB member "for or without cause" may have a revolving door effect on DRB membership and does nothing to deter strategic removal of DRB members. But this ignores the central tenant of the DRB process – mutual trust in each of the DRB members is essential to the effectiveness of a DRB. Accordingly, owners should consider permitting either party to remove any of the DRB members "for or without cause" and, at a minimum, this standard should be adopted for removal of a party's appointee.

2. Qualifications: Retired judge as chairperson

As the case of MTA v. SKK illustrates, a DRB's failure to maintain a sense of procedural fairness and regularity may seriously compromise the owner's or contractor's confidence in the DRB and its members.50 Seemingly innocent statements or well intentioned efforts to expedite consideration of an issue may violate contractual provisions and suggest prejudgment of issues or bias in favor of one side. One of the lessons of MTA v. SKK is that process matters and adherence to the standards of conduct specified in DRB agreements is critical.51

Owners concerned about reducing the likelihood of procedural issues compromising the integrity of the DRB process should consider specifying that a retired judge or attorney with experience with construction litigation serve as the chairperson of the DRB. Certain of the issues that arose in MTA v. SKK involved issues of temperament and procedure.52 Judges and attorneys receive specialized training in procedure and due process. An effective DRB depends on the preservation of the parties initial perception of the DRB's impartiality – a delicate task considering the generally informal nature of the DRB process and the sometimes heated tenor of DRB hearings. The best judges develop a judicial temperament well suited for adversarial settings and an attentiveness to procedural propriety that may help preserve the perception of the DRB's impartiality. Attorneys who are trained and experienced as arbitrators will display many of the same characteristics. The inclusion of a well qualified retired judge (or attorney) on the DRB panel may provide a valuable complement to engineers and other technically qualified DRB members.

This suggestion will undoubtedly face much criticism and resistance for a variety of reasons.53 In viewing the critical attributes of a DRB,

51. Ingwalson, supra note 43, at 3 ("What the case does is highlight the need for DRB members to have strong ethical and process training. DRB panelists must adhere to the contract documents, maintain their integrity and avoid any appearance of bias.").
52. MTA v. SKK, 59 Cal. App. 4th at 685-86.
53. If the absence of a third DRB member with technical expertise is a real concern, a
however, the inclusion of a retired judge should not compromise the effectiveness of a DRB or cause the parties to unnecessarily “lawyer up” their submissions and presentations to the DRB. To the contrary, appointment of a well respected judge who understands and appreciates the difference between a court of law and the DRB process should enhance and help maintain the impartiality of the DRB. This change in the composition of the typical DRB therefore may increase the likelihood of acceptance of DRB recommendations and the avoidance of litigation.

3. Careful evaluation of DRB nominees is a must

One of the frequent pitfalls of the DRB process is that owners do not conduct due diligence or sufficient due diligence when considering a DRB nominee. Similarly, the owner’s staff is frequently reluctant to reject a contractor’s nominee.

An essential element of the DRB process is that the parties be satisfied with the appointees to the DRB. For that reason, both the owner and the contractor must approve each of the three DRB members. 54

Owners must not be shy about rejecting a contractor’s nominee. Frequently, an owner’s project manager feels ambivalent and conflicted about the prospect of rejecting a contractor’s nominee. The owner may believe that the contractor will misinterpret such a rejection as a sign of obstruction or lack of cooperation. The owner’s staff may not want a conflict with the contractor over the DRB’s composition to be the first conflict on the project or may fear that rejecting the contractor’s nominee will precipitate a retaliatory rejection of the owner’s nominee. In a completely different vein, the owner’s staff may have prior experience with the nominee and may not want to reject the nomination for fear of insulting the DRB candidate.

Owners should feel no qualms about rejecting a DRB nominee. A rejection is not meant as an insult to the nominee and should not be misinterpreted by the contractor. Owners must recognize that accepting a nominee when questions exist as to the suitability of that member only heightens the likelihood of greater problems down the road. Owners should take heed of the following admonition:

If a party is not comfortable with a nomination, it has the right to disapprove, and the appointing party should honor this right. Each party should make clear that it will not take offense if the other party rejects a nomination and will honor that commitment should the situation arise. 55

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55. DRB Manual, supra note 1, at 43-44.
In terms of due diligence, owners should not hesitate to conduct a systematic assessment of a DRB nominee. Some owners interview the contractor's nominee and review the submitted disclosure statement and resume. Even more importantly, the owner's staff should inquire of individuals involved on other projects where the nominee served as a DRB member. Inquiry should be made of the role and demeanor of the nominee (e.g., did the nominee serve as the chairperson, did the nominee ask a lot of questions during DRB meetings and hearings, etc.), the confidence of both the owner and contractor in the neutrality and impartiality of the nominee, and how successful the DRB was in assisting the parties in avoiding litigation.

Another crucial piece of information ignored by most owners is prior DRB recommendations. Owners should request from DRB nominees copies of all prior DRB recommendations for prior DRBs on which they served. The recommendations themselves will provide significant insight into the effectiveness of the DRB member. For example, a review of prior recommendations will indicate whether the nominee has participated on DRBs that generate effective recommendations that will be useful in resolving disputes versus recommendations that are too bare bones or inflammatory.

Appropriate due diligence provides a basis for owners to evaluate whether to approve or reject a DRB nominee and thereby increases the likelihood of creating an effective DRB. Thus, an owner interested in a successful DRB should do its homework and be prepared to reject nominees as appropriate.

B. LIMITING THE JURISDICTION OF THE DRB: AVOIDING THE PITFALL OF THE UNRESTRAINED DRB

1. Termination of the contractor and other issues that should be carved out of the DRB’s jurisdiction

Owners need to consider whether the contract documents should provide unlimited DRB jurisdiction over disputes or whether there should be limitations on the type of disputes that may heard by a DRB. At least one issue should always be carved out of the DRB’s jurisdiction – termination of the contractor.

Conventional DRB wisdom counsels against imposing limitations on the type of disputes a DRB may consider:

In several instances, the scope of DRB activities has been limited to specific types of issues or minimum or maximum claim values. There should be no limitation on the issues which can be referred to the board. To impose such limits invites controversy over those subjects and calls into question the com-
2. Termination of the contractor and survival of the DRB

Owners should consider whether it is desirable for a DRB to survive after (i) completion of the project (whether defined as final payment, final completion, or some other point), or (ii) termination of either the contract or contractor. 58

56. DRB MANUAL, supra note 1, at 121.


58. The question of whether a DRB survives termination is a slightly different issue than whether the DRB should have jurisdiction over termination related disputes. The contractual provisions may carve out disputes over termination from the DRB’s jurisdiction but the DRB may still have continuing jurisdiction over non-termination or pre-termination disputes. The survival issue addresses whether the DRB continues to function after the contractor’s termination.
The most recent model three party agreement provides that the DRB "shall be active throughout the duration of the Contract" and "shall terminate its activities on completion of the Construction Contract after final payment has been made." \(^5^9\) The corresponding model DRB specifications state: "The Board will be dissolved as of the date of final payment to the Contractor unless earlier terminated or dissolved by mutual agreement of the Owner and Contractor." \(^6^0\)

A more restricted duration on the life of the DRB may be advisable. Good arguments can be made for structuring the DRB so that it does not survive termination of either the contract or the contractor and that all DRB activities conclude at that time. Under this approach, once the contract or contractor is terminated, the DRB would cease to function even as to pre-termination disputes. \(^6^1\) When a contractor is terminated for cause, other pre-termination disputes take a back seat to the termination. Ordinarily, pre-termination disputes must be resolved as part of the resolution of the termination issue - whether through litigation or as part of a global settlement. In these circumstances, the utility of a DRB is questionable.

Additionally, some of the primary justifications for a DRB no longer exist after a contractor has been terminated. A DRB is intended to permit prompt resolution of disputes so that (i) the positions of parties do not become fixed in stone, (ii) good relations between owner and contractor are maintained during the course of construction, and (iii) construction of the project is not disrupted by the commencement of litigation. If a contractor has been terminated for cause, a DRB can do little to achieve these goals. Accordingly, it may make little sense to continue to use a DRB after the contractor has been terminated.

One option owners might consider is having the DRB terminate automatically upon the earlier of (i) final payment and (ii) termination of the contract or the contractor, unless both parties elect to reaffirm the DRB process and agree that the DRB should hear any unresolved disputes. If the DRB is to be effective after termination, both the owner and contractor need to remain committed to the DRB process. If they are unwilling to reaffirm the value of the DRB, then it is quite likely that one or the other party will seek to use the DRB to posture for litigation.

\(^{59}\) DRB Manual, supra note 1, at 136 (Three Party Agreement art. VII (A)).

\(^{60}\) Id. at 124 (DRB Specifications § 1.01 (F)(2)).

\(^{61}\) Some might criticize suggestions of curtailing the life of a DRB in the event of termination of the contractor because this might provide the owner with an incentive to engage in strategic conduct - i.e., terminating the contractor to bring the DRB to a standstill. Of course, if an owner were willing to take such an extreme step, there is little to no hope that the DRB could accomplish its purpose even if it were to survive.
C. ISSUES AND PITFALLS ASSOCIATED WITH DRB HEARINGS

1. Non-Admissibility of DRB recommendations as the preferred approach

Competing views exist as to whether DRB recommendations should be admissible in subsequent litigation. The committee responsible for preparing the 1991 model DRB provisions stated that it “strongly believes that the effectiveness of the DRB will be maximized, and the parties given greatest incentive to adopt the Board’s recommendations, if they know in advance that the Board’s decision and rationale will be received in evidence in the event the dispute is not resolved amicably.”62 Some maintain that DRB recommendations should be admissible because the DRB’s “findings are likely to be accurate” to the extent they are “based on first hand observations.”63

A number of arguments have been made against the admissibility of DRB recommendations.64 Certain of those arguments focus on whether a court would even permit DRB recommendations to be admissible to the extent they are hearsay or the result of an ADR or settlement process.65 If the (potential) admissibility of DRB recommendations is a true deterrent to litigation, then parties may treat the DRB proceeding itself as a trial and thereby undermine the efficiency and flexibility of the DRB process.66

Unfortunately, the empirical data has not been assembled and analyzed to determine whether DRBs experience greater success when the recommendations are admissible versus inadmissible. Owners on a number of projects have opted to drop the provisions in the model agreements providing for the admissibility of DRB recommendations. If the industry literature reporting the overwhelming and unqualified success of DRBs is to be credited and that literature does not distinguish between DRBs whose recommendations are admissible and those whose recommendations are inadmissible, a question certainly exists as to whether the admissibility provision is crucial to the successful operation of DRBs.

In the absence of any study on comparative success, ad hoc experience can be considered. The author has been involved in cases where: (i) contractors have initiated litigation despite unfavorable DRB recommendations, and (ii) owners have refused to accept unfavorable DRB recom-

63. DRB MANUAL, supra note 1, at 38 (stating that the DRB recommendations can be no more reliable than the process that generated the recommendations — a process that does not allow for discovery).
64. Id. at 38-39.
65. Id. at 39.
66. Id.
The party who is in receipt of the unfavorable DRB recommendations is more likely to adopt an attitude of “I’ll take my chances in court because I can’t fair any worse.” In addition, the author has observed what appears to be strategic use of DRBs by certain contractors to obtain what the contractor hopes will be admissible DRB recommendations for use in litigation rather than utilizing the DRB process to avoid litigation.

In view of the foregoing, owners that use DRBs should consider deleting the model DRB specification language concerning the admissibility of DRB recommendations. This will minimize the incentive to engage in strategic use of the DRB to “set up” litigation. Rather, the parties will remain focused on the primary purpose of the DRB, which is to help avoid and resolve disputes without litigation.

2. Conducting hearings in the absence of a party: A failed DRB process

Another problematic issue that has arisen is whether DRB’s can or should conduct hearings if the owner or the contractor refuses to attend. As with the other DRB pitfalls, there is no one right solution to this problem. However, if an owner decides that a DRB should not be able to conduct a hearing in the absence of a party, language should be inserted into the DRB provisions to expressly limit the DRB’s jurisdiction and eliminate any ambiguity. Otherwise, whether a DRB may conduct a hearing in the absence of a party who has been provided with notice of the hearing will turn on an interpretation of the language of the contracts at issue and the vagaries of the applicable state or federal law.

A number of arguments can be made in favor of self-executing DRBs – that is DRBs that can conduct duly scheduled hearings in the absence of a party who refuses to attend without the need to first secure a court order authorizing the hearing or compelling attendance. Some argue that the party who has requested the hearing loses the benefit of his bargain if the DRB does not conduct a hearing when requested to do so. Of course, if the agreement expressly provides that the DRB may

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68. Id. at 6.
not conduct a hearing in the absence of a party or unless a court order is obtained, the party seeking the hearing has not been denied the benefit of the bargain.

Similarly, the argument has been made that the benefit of the bargain includes a party’s right to secure DRB recommendations that may be admissible in subsequent litigation. Again, neither party is denied “the benefit of the bargain” if the governing contracts specify that (i) a hearing may not be conducted in the absence of a party unless a prior court order has been secured, or (ii) the DRB recommendations are not admissible. Thus, a premium is placed on owners deciding how to structure the DRB at the time the agreements are being drafted and before the contract is awarded.

The arguments against DRB hearings in the absence of a party are similarly compelling. Every commentator recognizes that the DRB process is not functioning properly when one party refuses to attend a hearing. If the DRB conducts a hearing in the absence of a party, the DRB process is almost assured of failure. The DRB process is fundamentally a mediativ process. The effectiveness of the DRB in helping parties avoid litigation hinges upon the voluntary participation of the parties and the mutual confidence placed in the DRB by the owner and the contractor. A party typically cannot be expected to accept unfavorable DRB recommendations that are a product of a hearing conducted in that party’s absence. A DRB that conducts a hearing over the objection of, and in the absence of, a party invariably compromises its appearance of neutrality in its eyes of the objecting party. The only real solution is for the DRB to request that the party seeking the hearing obtain a court order compelling the hearing. This helps preserve the DRB’s appearance of impartiality because it insulates the DRB from the appearance of choosing sides.

This is a thorny problem with no perfect solution. However, nothing meaningful is normally gained by proceeding with a DRB hearing in the absence of one of the parties. For this reason, it is recommended that DRB agreements specify that a hearing not be conducted in the absence of a party. At most, the agreement should provide that a DRB hearing may proceed in the absence of a party only if a prior court order compelling the hearing has been obtained.

3. The information vacuum: How to minimize this pitfall by exercising an owners’s audit rights

The information vacuum is another potential pitfall of the DRB process that can be minimized with some advance planning. The model

69. Id.
70. Id.
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DRB provisions do not expressly allow for discovery by the owner or the contractor in advance of a DRB hearing. The model DRB provisions do not specify that the “Board members and the parties may ask questions, request clarification, or ask for additional data.” However, this provision does not provide a formal mechanism to gain discovery and does not directly address securing documents from third parties.

Owners frequently are at a significant information disadvantage with respect to many types of differing site condition claims and certain other claims that might be heard by a DRB. To effectively present its position (i.e., defend itself), the owner often needs to review documents from the contractor's file and the files of third parties. In many instances, such information is not voluntarily provided by contractors in advance of DRB hearings. If a contractor submits to the DRB selective pages from project diaries in support of a claim but does not make available the balance of such diaries, the owner (and the DRB) may never know whether the diaries contain information inconsistent with the contractor's position.

One simple solution for owners is to exercise their audit rights under the contract in advance of the hearing. The owner can request pertinent documents such as shifter and walker diaries, diaries of the project superintendent, scheduling and pricing information, the contractor's bid documents, and other documents typically unavailable prior to the hearing.

When drafting contract documents, owners therefore should make sure that the audit language is sufficiently broad to enable the owner to secure project documents in advance of DRB hearings. In addition, owners should make sure that their audit rights apply to subcontractors and suppliers. This will enable owners to secure pertinent information from these sources prior to DRB hearings. Any changes to clarify otherwise standard audit language should be made by the owner in consultation with its counsel. Effective use of audit rights will enable owners to be better prepared for significant DRB hearings and to avoid the pitfall of the information vacuum.

4. The danger of unintended acceptance of DRB recommendations

The model DRB specifications provide time restrictions for the owner and contractor to accept or reject the DRB’s recommendations. If an owner or contractor does not accept or reject the DRB recommendations within two weeks of their receipt, the failure to respond is deemed to be an acceptance.

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71. DRB Manual, supra note 1, at 131 (DRB Specifications § 1.04 (F)).
72. Id.
73. See, e.g., DRB Manual, supra note 1, at 132 (DRB Specifications § 1.04(I)) (noting that the legal effect of a “deemed acceptance” on public entities may be subject to some debate
The time restrictions contained in the model DRB provisions may be impractical for many state and local agencies. Many local public entities must secure approval of a board before DRB recommendations can be accepted. Often times a public entity’s board cannot be convened within fourteen days of receiving the recommendations. Consequently, the owner must somehow secure an extension to respond to the DRB recommendations or simply reject the DRB recommendations until the necessary board action can be taken.

Neither of these two options is entirely satisfactory. If the owner is late securing an extension, the contractor may argue an acceptance already has occurred by virtue of the owner’s failure to timely respond. Further, the contractor may interpret requests for extensions as gamesmanship. Likewise, if the owner is put in the position of automatically having to reject the DRB recommendations because insufficient time exists for internal review of the recommendations, this too may be perceived as gamesmanship and strain the relationship between the contractor and owner.

To avoid such problems, the owner should realistically assess how much time will be required to act upon DRB recommendations. Model DRB provisions should be modified in the contract drafting process to allow sufficient time to make decisions to accept or reject DRB recommendations. Of course, owners should be mindful that one of the goals of the DRB process is to resolve disputes sooner rather than later. Public owners therefore should try to develop a streamlined process of review that enables a decision to accept or reject DRB recommendations to be made on an expedited basis.

In all events, an owner needs to make sure that its contract administrators and construction management personnel understand the applicable time limitations for accepting or rejecting the DRB’s recommendations. The owner’s staff needs to be aware that, even though the DRB recommendations are “non-binding,” time limits exist to respond to the DRB recommendations. The unwary owner runs the risk of a “deemed acceptance.”

IV. Conclusion

The DRB process continues to be incorporated into the bid documents on many major transportation projects. While the DRB process has garnered much praise for its effectiveness in helping parties avoid litigation, a number of potential pitfalls exist. The industry has developed and revised model agreements addressing some (but not all) of these is-
sues. Owners interested in employing DRBs on large construction projects need to be cognizant of the associated pitfalls and the various modifications that can be made to model industry forms to mitigate these problems. With this information in hand and with "eyes wide open," owners can structure the contractual provisions governing the DRB process to avoid traps for the unwary and to enhance the success of both the DRB and the project as a whole.
A Carrier's Liability for Commercial Default
and Default in Navigation or
Management of the Vessel

I. INTRODUCTION

Intractable problems in applying the Hague Rules arise from conflicts between two seemingly independent provisions: (1) immunity under the Hague Rules for negligence "in the navigation or in the management of the ship," and (2) responsibility under Hague Rules to "carefully ... keep, care for, and discharge" the goods. Both negligent care of cargo (hereinafter "Commercial Default") and defective navigation or management of the vessel (hereinafter "Vessel Management Default") help determine whether a carrier has responsibility. If a ship owner is found responsible for Commercial Default he is generally liable to the cargo owner but if his negligence is due to Vessel Management Default, he may be immune to a suit by the cargo owner. Often there is a compromise between carrier interests and cargo interests, as shown by exception clauses in contracts of affreightment that help create a legal distinction.

* Professor of International Law and Practices, Pusan National University, Pusan, Korea; Ph.D. in Economics; Advisor, Pusan International Law Offices, Pusan, Korea.

** Researcher, Korea, Institute of Economic Policy Inc., Pusan, Korea; Ph.D. in Economics.

between the two defaults. However, it is often difficult to separate the two defaults, since the same careless conduct often involves both "care for" cargo and navigation or management of the ship. Therefore, the compromise in the contract of affreightment is not sufficient to solve legal problems related to a carrier's responsibility for cargo damages.

Today, many scholars disagree with existing opinions and present their own theories to test Commercial Default and Vessel Management Default. Since Korea has a shorter history of commercial laws than other developed countries, few cases related to standards of distinction between Commercial Default and Vessel Management Default exist. As such, analogizing Korean cases does not allow for the construction of organizational principles or standards. Still, it is proper to use internationally accepted interpretations of cases of Commercial Default and Vessel Management Default. Thus, Korea's acceptance of the Hague-Visby Rules and the distinction between the two defaults has served to legalize the Korean Commercial Code.

2. See Stephen Zamora, Carrier Liability For Damage or Loss to Cargo In International Transport, 23 AM. J. COMP. L. 391, 406 (1975); Joseph C. Sweeney, Happy Birthday Harter: A Reappraisal of the Harter Act on its 100th Anniversary, 24 J. MAR. L. COM. 32 (1993); R. Glenn Bauer, Conflicting Liability Regimes: Hague-Visby v. Hamburg Rule-A Case by Case Analysis, 24 J. MAR. L. COM. 55 (1993) (stating that "[t]he compromise consists in that the carrier is unable to exonerate himself from liability for negligence other than in the navigation or management of the vessel, while he had exercised due diligence to make the vessel seaworthy.").


In foreign trade, for example, where the port of loading or discharge is located in a foreign state, or the bill of lading is issued in a foreign state, the contracting parties may designate the applicable law pursuant to Art. 9 of the Korean Private International Law. Where the contracting parties to the carriage by sea designate the Hague Rules, the Visby Rules or the Hamburg, those Rules are applicable. In domestic trade, however, Korean law applies. See William Tetley, Marine Cargo Claims 1056 (1988).

4. Korean commercial laws are mainly incorporated in the Commercial Code, Law No.1000 (1962), amended by Law No. 5591 (1998) and its various supplementary laws and provisions. The Korean Commercial Code supplemented by the Civil Code, Article 1, corresponds to the United States (hereinafter "U.S.") Uniform Commercial Code (hereinafter "UCC"). The Korean Commercial Code, which is based on the merchant status of the participants and not on the nature of the transaction, Rudolf B. Schlesinger, et al. Comparative Law 542 n.2 (5th ed. 1988), is not as complete and sophisticated in dealing with complicated or strategic commercial issues, nor is it as flexible and responsive to the perceived needs of the commercial and legal communities, when compared with the U.S. UCC. See Jae Yeol Kwon, An Isolation in Systems of Law; Differences Between The Commercial Code of U.S. and Korea, 29 Loy. L.A. L. REV. 1095, 1100 (1996). The Korean Commercial Code includes provisions about commercial transactions (Book II), corporations (Book III), insurance (Book IV) and maritime commerce (Book
This paper attempts to define a distinguishing standard for Commercial Default and Vessel Management Default by analyzing the theories and the precedents of the United States\(^5\) and the United Kingdom,\(^6\) both of which have adopted the Hague Rules or Hague-Visby Rules. Considering the many reasons for damage or loss to cargo, it is worthwhile to analyze the relationships of various facts to clarify a standard of Commercial Default and Vessel Management Default. Although the two defaults appear independent, intractable problems arise in separating the defaults in actual cases, primarily because the two-default concept is general, abstract and ambiguous. Often the same careless conduct involves both "care for" cargo and "management of the vessel." As a result, it is difficult to apply the concept in a standard manner. The facts of a case may produce divergent interpretations and conclusions in different countries. These differences lead to complex and unpredictable problems of conflict of laws and more grounds for forum shopping. Furthermore, when the two defaults concurrently cause damage or loss, the Hague Rules and Hague-Visby Rules have no direct provisions, resulting in difficulty constructing a clear standard regarding the two defaults.\(^7\) Thus, the Hague Rules and Hague-Visby Rules cause uncertainty and confusion as to exactly where to draw the line between what does and does not constitute error in the navigation or management of the vessel within the meaning of the exception. As such, this article proposes a standard based on the concept of the "purpose of an act" as it relates to cargo or navigation and management of the vessel. Establishing a standard to distinguish the two defaults is desirable both for risk management of the shipping companies, as well and clarifying whether the carrier or the cargo insurer has liability.

\(^5\) In 1936, the United States enacted its Carriage of Goods by Sea Act ("COGSA"), which is substantially the same as the international convention. The United States ratified the Hague Rules in 1937.

\(^6\) The British government enacted domestic legislation putting the Hague Rules in force even before the conclusion of the diplomatic conference, a clear precedent for what the United States would do in 1936 to formulate the treaty language in its own image. The Hague-Visby Rules were adopted by the UK legislature through the enactment of the Carriage of Goods by Sea Act of 1971, replacing the Hague Rules, which had been adopted by the 1924 Act of the same name.

\(^7\) The Hague Rules were not a comprehensive code and were silent on some matters.
II. LEGITIMACY OF EXEMPTION CLAUSES IN BILL OF LADING

Early maritime law usually placed strict liability upon common carriers, making the carrier liable for loss or damage to the cargo, even when the carrier was not negligent. The result is that apart from the express contract and with certain exceptions, the carrier is absolutely responsible for the safety of the goods entrusted to the carrier. Exceptions include loss or damage to goods caused by acts of God, the King's enemies, the inherent vice of the goods themselves, or their having been properly made the subject of a general average sacrifice. At common law, all ship owners who contract to carry goods undertake absolutely, in the absence of express provisions negating such undertaking, that their ship is seaworthy at the beginning of the voyage, and that they will proceed on the voyage with reasonable dispatch and without unnecessary deviation.

Although carriers have strict liability for the safe arrival of cargo under common law in England, they have protected themselves by using exemption clauses, available under the principle of freedom of contract since the seventeenth century. However, concerning the carriage

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8. It is agreed that ship owners incur this absolute liability when they are a common carrier. While the exact meaning of 'common carrier' is not entirely clear, a ship owner is probably a common carrier when his ship operates as a general ship, but not when it is under charter. In the latter situation, the basic liability of the ship owner is the subject of controversy. This controversy that has yet to be finally resolved because the carriage is usually governed by the charter-party and thus by the general law of contract rather than by the common law with its seat in bailment. See Malcolm A. Clarke, Aspects of the Hague Rules 113-14 (1976).


10. See Nugent v. Smith, 33 L.T.R. 731, 736 (C.P. 1876); Liver Alkali Co. v. Johnson, 9 L.R.-Ex. 336, 338 (1874); Pandorf v. Hamilton, 17 Q.B.D. 670, 685 (1886). This liability is not removed by a practice of the ship owner to insure at the cost of the goods owner and by his direction. See Hill v. Scott, 2 Q.B. 371, 375 (1895). The liability is not assumed by a warehouseman who undertakes to have goods brought by barge from the ship to his warehouse and carries out that arrangement by sub-contract with a lighterman. See Thomas Scrutton, Charterparties and Bill of Lading 103 n.4 (1984) (citing Consolidated Tea Co. v. Oliver's Wharf, 2 K.B. 395, 399 (1910)).

11. See Carver, supra note 9, 19-20; E.R. Ivamy, Payne & Ivamy's Carriage of Goods by Sea, 178-80 (1989); Gilmore & Black, supra note 9, 139-40; Schoenbaum, supra note 9, at 293; Scrutton, supra note 10, at 201-05; Sturley, supra note 9, at § 11 (1992); Tetley, supra note 4, at 531.


13. This rule responded to practical considerations: Usually only the carrier had detailed knowledge of what happened to the shipment; consequently, the shipper found it difficult or impossible to prove that the carrier or its agents were negligent. See John O. Honnold, Ocean Carriers and Cargo; Clarity and Fairness-Hague or Hamburg, 24 J. MAR. L. COM, 76 (1993).

of goods at sea, exemption clauses simply stated, "dangers of the sea only excepted...the act of God excepted, or the King's enemies and dangers of the sea excepted." The decision of *Smith v. Shephard* in 1795,15 which strictly interpreted the exemption clause "the dangers of the sea excepted," began to give way to more diverse and complex opinions.16 In the nineteenth century many sea carriers included all-embracing exclusion clauses in bills of lading. This was particularly true of English carriers, who had a virtual monopoly on much of the world's shipping. The hostility of cargo-owning countries led to the passage of legislation attempting to defeat unfair exclusion clauses. The most famous example of this is the United States' "Harter Act" of 1890. However, the exclusion clause was further extended, until, as has been said, "there seems to be no other obligation on a ship owner than to receive the freight."17 The carriers' bargaining power prevailed until the end of the nineteenth century, when a shortage of shipping space developed. Then, the Hague Rules of 1924 changed the situation.18

Under the Hague Rules - based on the general principles of the Harter Act,19 the carrier's defaults were classified into Commercial Default and Vessel Management Default. Carriers were liable for loss or damage to goods caused by Commercial Default, but were not liable for Vessel Management Default.

The Harter Act was the world's first legislative attempt to allocate the risk of loss in sea carriage between carrier and cargo interests.20 By clearly distinguishing between Commercial Default and Vessel Management Default, the statute, not exemption clauses, settled liability for Commercial Default. Even though a prohibition of exemption clauses in cases of Commercial Default had been formerly applied in case law, the importance of the Harter Act is that it prohibited the exemption clause for Commercial Default, dividing defaults incident to sea carriage between a ship owner and the cargo interest.21 Treatment of the two cate-

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15. *Carver, supra* note 9, at 161.
16. *Carver, supra* note 9, at 161; *Scrutton, supra* note 10, at 210.
21. To satisfy cargo interests, the Act made unlawful any form of negligence clause in bills of lading covering shipments between U.S. and foreign ports. On the other hand, it drastically altered the implied warranty of seaworthiness. Although theoretically leaving the warranty intact, the Act in practice held the ship owner to a duty of "due diligence" to make the vessel...
In the early years, the legislation of certain British dominions that were large exporters of raw materials followed the example of the Harter Act. These countries believed that carrier interests in the mother country did not treat shippers fairly. In 1903, New Zealand, then a colony, enacted the first statute modeled on the Harter Act. Similarly, the new nation of Australia enacted its own Sea Carriage of Goods Act in 1904, followed by Canada in the Water Carriage of Goods Act of 1910.

Carriers who objected to the compromise affecting their exemption clauses and the then rudimentary organizations representing shippers opposed the Hague Rules from the outset. However, the crucial need for international uniformity stimulated legislative activity that led to widespread adoption of the Hague Rules.

The Hague Rules have been the only international convention to regulate contracts of carriage of goods by sea for some time, but after three decades of practical experience, discontent surfaced. Since the mid-1950s, businessmen and lawyers in the major maritime states that had ratified or acceded to the Hague Rules began to press for modest reforms to prevent small defects from eventually rupturing the entire scheme. This trend was due to enlargements and diversification in international commodity transactions and to changes in social and economic environments, commercial needs and shipping technology. The Hague Rules compromised the concerned parties' interests. Further, difficulty in legal and technical interpretation led to revision and supplementation of the contents by new case law or usages in trade.

Under these circumstances the 1963 Committee Maritime International Conference, which had played an active role in the adoption of the Hague Rules in Stockholm, adopted an amendment draft to the Hague Rules.

22. See Hellwell, supra note 9, at 358.
23. Act No. 96. 1903 (N.Z.). The 1903 legislation was superseded by the New Zealand Shipping and Seaman Act, 1908 (N.Z.). New Zealand had advanced from the status of "colony" to "dominion" in 1907.
24. The Commonwealth of Australia, comprising the British colonies of New South Wales, Tasmania, Victoria, Western Australia, South Australia, and Queensland, came into existence on January 1, 1901, following twenty years of discussion of federation.
25. The Commonwealth Act, 37. The 1904 legislation was superseded in 1924 by domestic legislation adopting the Hague Rules.
26. See Honnald, supra note 13, at 77-78.
28. The original French text of the mandatory Hague Rules was adopted on August 25, 1924, and signed, subject to ratification, by fourteen nations, including the United States.
The Visby Amendment leaves intact the limited carrier duties and the laundry list of defenses under the Hague Rules, including Vessel Management Default. Thus, the amendment is not the significant overall revision demanded by critics of the Hague Rules.

III. Exemption for Vessel Management Default

The exemption clause for default in navigation or management of a ship originated in the Nineteenth Century subsequent to the advent of steamships and the handling of complicated machinery. Before the Harter Act, United States public policy invalided fault-clauses, partly because cargo interests were relatively powerful. On the other hand, ship-owning nations such as Britain and France continued to allow carriers full freedom to set their own liability terms. The differences between these countries reflects the fact that the United Kingdom dominated the Atlantic (as sailing vessels gave way to steamships) while the United States’ acute shortage of shipping space forced the United States to depend heavily on the United Kingdom’s ships. As a result, a negligence clause inserted in an international bill of lading could be valid in one country and invalid in another, the liability of the carrier depending upon the chosen forum. Whereas charterers and ship owners tend to be in a roughly equal bargaining position, carriers generally are in a much stronger position than shippers under bill of lading. Thus, the terms in the carriage contract tended, especially towards the end of the last century, to favor the ship owners as against holders of bills of lading. Ex-

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30. The original initiative for attempting to modify the old Hague Rules was a reaction against the view taken by the House of Lords in the Muncaster Castle, on the definition of unseaworthiness. The main principles of the Hague Rules and the Hague-Visby Rules have not changed since the original Hague Rules were brought into force in 1924, and many of the old cases are still authoritative. See Todd, supra note 14, at 288.
31. Management was construed to mean activities in connection with the operation of the ship, other than strictly navigational activities. See Bauer, supra note 2, at 55; SCHOENBAUM, supra note 9, at 347.
32. The Harter Act, Feb. 13, 1893, ch. 105, § 3, 27 Stat. 445-46 (stating that “neither the vessels, her owner or owners, agent, or charterers, shall become or be held responsible for damage or loss resulting from faults or errors in navigation or in the management of said vessel . . . .”).
33. See generally Gosse Millard v. Canadian Gov’t Merchant Marine, 1 K.B. 717 (1926) (discussing damage sustained by a steamship carrying cargo under a bill of lading under Carriage by Sea Act, 1924).
35. See Zamora, supra note 2, at 404.
emption clauses became so encompassing as to effectively exclude virtually all liability for loss or damage to goods.\textsuperscript{36}

The Harter Act of 1893 (the first national law designed to provide uniformity of liability by contractually restricting the bargaining power of carriers) made illegal the clauses in bills of lading that exempted carriers' liability from default arising from making a ship seaworthy or from caring for the cargo. Nevertheless, the Harter Act stipulated that for a carrier to be exempt from liability for Vessel Management Default, the carrier must exercise due diligence to make the vessel seaworthy. This stipulation of the Harter Act\textsuperscript{37} also appeared in the Hague-Visby Rules, which stated that neither the carrier nor the ship shall be responsible for the loss or damage arising or resulting from "acts, neglect, or fault of the master, mariner, pilot, or the servants of the carrier in the navigation or management of the ship."\textsuperscript{38}

It may seem irrational to exempt a carrier from responsibility, although the loss or damage resulted from the fault or neglect of a carrier's servants. A plausible reason for exempting a carrier from liability is the maritime situation at the end of the nineteenth century where navigation was specialized work, not under the same control possible by a carrier on land. A small mistake could cause significant problems, like crashing into another vessel. At that time, wooden sailing ships carried cargo, and there were few reliable marine charts and navigational aids. Ship owners could not even communicate with their ships at sea.\textsuperscript{39}

In those days of wooden ships, overseas trading was a dangerous joint venture between the ship and cargo owners. Ship owners risked the ship, the captain and crew risked their lives, and shippers risked their goods.\textsuperscript{40} Under the circumstances, Vessel Management Default was one of the exemptions from liability for the carrier. A mariner or a servant of a ship escaped liability under maritime laws if he did not intend to commit the default. However, there was no exemption if the mariner or ship servant did not exercise due diligence to make the vessel seaworthy, or if he committed Commercial Default. This was the case even though there was Vessel Management Default.

\begin{footnotes}
\item[36] See Todd, supra note 14, at 287.
\item[37] The Harter Act provided that if the owner of a vessel exercised due diligence to make her seaworthy he should not be liable "for damage or loss resulting from fault or errors in navigation or in the management of the vessel." The Harter Act, Feb. 13, ch. 105, § 3, 27 Stat. 445-46.
\item[38] Hague-Visby Rules, art. IV(2).
\item[40] See id. at 512 ; Honnold, supra note 13, at 104.
\end{footnotes}
IV. ESTABLISHING A BASELINE FOR DISTINGUISHING BETWEEN VESSEL MANAGEMENT DEFAULT AND THE COMMERCIAL DEFAULT

Under the Hague Rules, a carrier shall not be responsible for loss or damage arising from an act, neglect, or default of the carrier in the navigation or the management of a ship. The carrier is responsible for the default, when the carrier causes loss or damage arising from loading, handling, stowing, carrying, keeping, caring for, and discharging the goods carried. Treating the two kinds of defaults differently, without clearly specifying their definitions, results in a conflict concerning their distinction. This article now examines the standard for distinguishing Commercial Default from Vessel Management Default by analyzing the precedents in the United States and in the United Kingdom.

A. PRECEDENTS IN THE UNITED STATES

There are two definitions of management of a vessel in United States case law. The first one defines management as control during the voyage of everything with which the vessel is equipped for the purpose of protecting her and her cargo against the inroad of the seas. The second one defines management of the modern steamship as keeping, checking and using machinery to operate navigation to deliver and diligently care for the carriage. Case law, however, did not clearly distinguish Vessel Management Default from Commercial Default.

Two important precedents concern definitions of management of the vessel. The first is the decision in Knott v. Botany Worsted Mills. Here, the plaintiff's cargo of wool bales was loaded in between deck spaces at Buenos Aires. After the cargo was loaded the vessel was trimmed down by the stern. Wet sugar was later loaded onto the vessel at Pernambuco. The wet sugar was put in the space adjoining the wool, separated only by a wooden non-watertight bulkhead - watertight bulkheads not being per-

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41. Hague-Visby Rules, art. VI(2).
42. Normally, of course, negligence is a ground of liability. Not every form of negligence, however, is included. Thus the negligence of the ship owner or his agents as opposed to the master, etc., is not included. Note also that it is not all negligence of the master that is expected, but only neglect or fault in the navigation or management of the ship. See DAVID A. GLASS & CHRIS CASHMORE, INTRODUCTION TO THE LAW OF CARRIAGE OF GOODS 181 (1989).
43. It was stated “faults or errors in navigation or in the management of said ship . . .” in the Harter Act. The Harter Act, Feb. 13, 1893, ch. 105, § 3, 27 Stat. 445-46. This exemption clause is also accepted by Korea. See Commercial Code of Korea, art. 788(2).
44. See Hague Rules, art. III (2)
45. See POOR, ON CHARTERPARTIES AND BILL OF LADING 138 (2d ed. 1930).
mitted or required in these spaces. After the sugar was loaded, the vessel was trimmed down by the bow. After the change in trim, the wet sugar drained onto the wool. The Supreme Court agreed that negligent stowage, rather than negligent navigation or management, caused the damage.\(^{48}\) In so holding, the Court adopted the reasoning of the district court, affirmed by the court of appeals, to the effect that the essential cause of the damage was the negligent stowage. The change of trim was merely incidental to the result of the changes in the loading of cargo, as no attention was given to the effect on the ship’s trim when the cargo was loaded. Thus, the carrier should have anticipated that the trim of the vessel would become unbalanced in loading.

The second precedent is a judgment in The Germanic Case.\(^{49}\) Here, a heavy snowfall occurred in New York after the arrival of a vessel heavily coated with ice. In order to meet the ship’s sailing schedule, all five hatches of the vessel were discharged at the same time the coalbunkers were loaded. Swift action averted listing of the vessel, but five hours later a second list developed. The ship then rolled over so that her coal ports were below the waterline, resulting in the ship sinking, and causing water damage to the plaintiff’s cargo. If the overturning or sinking of the vessel had been due to a failure in controlling the trim, it would have been Vessel Management Default. However, the carrier was responsible for the loss, because discharging a cargo was not part of management of the vessel. The court found that “careless and premature removal of cargo,” made the vessel “top-heavy,” and “instability brought about by the improper unloading, care, and custody of the cargo, is not Vessel Management Default.”\(^{50}\) Thus, unloading cargo was the primary objective, not the ballasting of the vessel. The hurried and imprudent unloading caused the sinking, so that obligation to care for cargo rather than management of the vessel governed the outcome. This case shows that the primary nature and objective of the acts which cause the loss govern the conflict between duty to cargo and the defense of negligent management.\(^{51}\) Discharging cargo is not a deed affecting the vessel but is considered to only affect the cargo itself. Even though the result of the deed affected the ship’s security, it is not Vessel Management Default.

Consequently, the two cases show that intent is a distinguishing standard between Commercial Fault and Vessel Management Default. In practical terms, the purpose of the act can affect either the case for cargo or for the vessel. For example, in the second case, the purpose of the act

\(^{48}\) See id.

\(^{49}\) The Germanic, 107 F. 294 (S.D.N.Y. 1901); The Germanic, 124 F. 1 (2d Cir. 1903); Oceanic Steam Navigation Co. v. Aitken, 196 U.S. 589 (1905).

\(^{50}\) The Germanic, 124 F. 1, 5 (2d Cir. 1903).

\(^{51}\) See Sweeney, supra note 2, at 2.
might be for the discharge of cargo. The fact that the carrier is liable for
the loss does not flow naturally from the fact that the direct purpose of
the act was the discharge. Rather, the cause of cargo loss is negligent
discharge that put the vessel in peril. In this case, during discharge, the
carrier recognized a need to trim and attempted to correct. However, if
an idle or negligent deed sunk the vessel, then Vessel Management De-
fault would have exempted the carrier from responsibility. Nevertheless,
the carrier did not do anything about controlling the trim of the vessel
during the discharge of the cargo and thus, no exemption from the liabil-
ity for Commercial Default is appropriate.

B. PRECEDENTS IN THE UNITED KINGDOM

Two leading cases debated the application of the Harter Act before
the United Kingdom adopted the Hague Rules. These cases help distin-
guish between the two defaults.

The Court in the Ferro case\textsuperscript{52} was the first to construct the term
“management and navigation” of the vessel. A bill of lading had an ex-
emption clause for any “damage from any act, neglect, or fault of the
pilot, master, or mariners in the navigation or management of the vessel.”
Some decayed oranges in the shipment damaged the shipped goods. The
Court found that negligent loading caused the damage. The judgment
recognized that the exemption clause did not cover the stevedore’s negli-
gence. Negligent stowage of the cargo was held not neglect or fault in
“the navigation or management of the vessel.” A number of other cases,
determined before the passing of the Carriage of Goods by Sea Act of
1924,\textsuperscript{53} also considered the meaning of this phrase.

The second case is the Glenochil case,\textsuperscript{54} which also defined the term
“navigation and management.” An engineer pumped water into a ballast
tank to secure the vessel’s stability, without inspecting the pipes. The
cargo was damaged by water leaking from the broken pipes. The Divi-
sional Court held that this default was in the “management,” even if not
made in the “navigation” of the vessel. The Ferro Court judged this case,
and established a clear distinction between “want of care of cargo and
want of care of vessel indirectly affecting the cargo.”\textsuperscript{55} Other courts have
repeatedly cited the principles enunciated in this case\textsuperscript{56} both in the
United Kingdom and in the United States.\textsuperscript{57}

\begin{footnotesize}
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\item 52. The Ferro, 68 L.T.R. 418 (Adm. 1893).
\item 53. See Scrutton, \textit{supra} note 10, at 246.
\item 55. Id.
\item 56. See the Rodney, 82 L.T.R. 27 (Adm. 1900).
\item 57. See Martin Dockray, \textit{Cases and Materials on the Carriage of Goods by Sea}
651 (1987).
\end{itemize}
\end{footnotesize}
The United Kingdom has more clearly interpreted the term "management and navigation" in many cases since adoption of the Hague Rules as domestic law. One leading English case is Gosse Millard Ltd. v. Canadian Government Merchant Marine Ltd. This case that was litigated under the Carriage of Goods by Sea Act of 1924. In Gosse, a bill of lading made under the Carriage of Goods by Sea Act 1924 was applied to a cargo of shipped tinplates. Workmen left the vessel's hatches open so that they could go in and out of the hold to remove the tail shaft liner. The workmen negligently failed to protect the open hatches from rain. Rain came through the hatches and damaged the cargo. The House of Lords held that this was neglect of the cargo rather than neglect of the ship, and held the ship-owner liable for the ensuing rain damage. The Court reasoned that if the carrier were not liable in these circumstances then Article III(2) would be valueless to cargo owners. If the same error affects both ship and cargo, the error implicates the whole venture. These may seem to exculpate the carrier, but the facts of each case are determinative. Perhaps the leading opinion in this area is the dissenting judgement of Justice Greer, in a Court of Appeal's case that was later upheld by the House of Lords. In the case Justice Greer stated,

"If the cause of the damage is solely, or even primarily, a neglect to take reasonable care of the cargo, the ship is liable, but if the cause of the damage is a neglect to take reasonable care of the ship, or some part of it, as distinct from the cargo, the ship is relieved from liability; for if the negligence is not negligence towards the ship, but only negligent failure to use the apparatus of the ship for the protection of the cargo, the ship is not so relieved."

It appears, that the Gosse situation, in the words of Justice Greer, was a case of "failure to use the apparatus of the ship for the protection of the cargo."

The Court in Gosse ruled that the carrier was not responsible for the

58. Introducing a new Carriage of Goods by Sea Act in 1924, the British government, which had been the driving force behind the Hague Rules, put the rules into the statute books before the rest of the world had completed the diplomatic formalities regarding the complete legislation. Other countries in the British Empire soon followed the mother country's lead. Australia enacted its new Sea Carriage of Goods Act later the same year. India enacted its COGSA in 1928. Outside of the British Empire, however, the response to the Hague Rules was less enthusiastic. Before the United States acted in 1936, only Belgium and the Netherlands had recognized the Hague Rules with national legislation. See Michael F. Sturley, The History of COGSA and the Hague Rules, 22 J. MAR. L. COM. 35-36 (1991).
60. See id. (noting that a carrier shall properly and carefully load, handle, show, carry, keep, care for, and discharge the goods carried).
61. See TETLEY, supra note 4, at 398.
63. Id.
64. Id.
damage to the cargo since the decision to leave the hatches open was part of the management of the ship. The House of Lords upheld the dissent of Justice Greer. It recognized that the test was whether there was error in handling of the cargo that was not an error in management of the vessel. Lord Chancellor Hailsham accepted the decisions of The Ferro and The Glenochil cases and, adopting the Hourani v. Harrison and Brown & Co. v. Harrison cases, judged in a similar manner. In short, the standard to distinguish the two types of fault is whether there is primarily neglect of the management of the ship, or primarily an erroneous act directed toward the care of cargo.

An interesting point with regard to the standard of distinction between the two defaults in the above cases involves handling permanent appliances of the vessel, such as a refrigerator. For a long time, precedents about the two types of fault in the United Kingdom recognized a default in management of the vessel when the damage arose from improperly maintaining a permanent appliance used for both a ship purpose and a cargo purpose. Presently however, some limitations apply to this view. The Court in Foreman & Ellams Ltd. v. Federal Steam Navigation Co. did not rule a loss of frozen cargo due to improperly operating a refrigerator to be Vessel Management Default. In this case, Justice Wright relied on the dissent in Gosse, and held that management of the ship did not include the responsibility for the breakdown or improper functioning of refrigerating equipment. Thus the court created a limitation on the interpretation of the errors in management of the vessel. Justice Wright therefore, courageously and correctly took the same position as the House of Lords had taken in reversing Gosse.

Samland is a similar case that dealt with a fault in vessel equipment used for both the vessel and the cargo. Samland reversed the Court of Appeal's decision in Rowson v. Atlantic Transport Co., and held that

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67. See The British King, 89 F. 872, 875 (S.D.N.Y. 1898) (holding that negligent failure of the crew to maintain the ship's pumps was negligence in the management of the ship and the ship owner was not liable).
69. Id.
70. See International Packers London, Ltd. v. Ocean S.S. Co., 2 Lloyd's Rep. 218 (Q.B. 1955) (holding that negligent failure to use the apparatus of the ship for the protection of the cargo was decided not to be negligence in the management of the ship).
71. See Tetley, supra note 4, at 398.
72. The Samland, 7 F.2d 155 (S.D.N.Y. 1925).
73. Rowson v. Atlantic Transp. Co., 1 K.B. 114 (1903) (holding that carelessness in handling the refrigerating apparatus of the vessel, resulting in damage to the cargo, must be regarded as falling within the expression, "management of the ship," on the ground that the refrigerating
liability applies only where the use of the appliance is primarily for the purpose of the ship, as opposed to the cargo.

In the case of *Leech River Tea Co. v. British India Steam Navigation Co.*, a stevedore stole the cover of a storm valve on a sanitary pipe. The Court held that the damage did not occur in the navigation or management of the vessel.

The principle applied in the dissent in *Gosse* has been a universally accepted standard in later cases. It is clear that Western countries have usually followed the United Kingdom's precedents concerning the notion of Commercial Default and Vessel Management Default.

The words of Commercial Default and Vessel Management Default are now defined in the following manner:

Vessel Management Default is fault basically affecting only the vessel. Fault in the navigation or management of the ship might be defined as an erroneous act or omission, the original purpose of which was primarily directed towards the ship, her safety and well-being and towards the common venture generally. These can be acts of fault or mistake where the main purpose is to secure the navigation or the safety of the vessel. If, however, the negligence is not negligence towards the ship but negligence or failure to use the apparatus of the ship for the protection of the cargo, the ship does not receive the relief provided by the exemption.

In comparison, Commercial Default is fault in actions only directed toward the cargo. Examples are faults or mistakes in acts that are carried out to care for and protect the cargo. Generally, these faults or mistakes include fault in loading, keeping, carrying, stowing, handling or unloading cargo. As such, even though repairing a hatch cover is an act on the vessel, the fault is Commercial Default, because the effect of the act is mainly on the cargo.

V. RESPONSIBILITY OF THE CARRIER IN CONFLICTS BETWEEN COMMERCIAL DEFAULT AND VESSEL MANAGEMENT DEFAULT

The problem in trying to distinguish between Commercial Default and Vessel Management Default is how to determine purpose or nature of an act. How can you judge an act that has dual purposes, one for the apparatus was used for the ship's provisions as well as for the cargo, and therefore that negligence in managing it was negligence in management of the ship.


75. *Tetley*, supra note 4, at 398.

cargo and the other for the ship? The following two cases address this conflict. The cases are similar in content, but different in outcome.

In a 1959 case a vessel's cargo was damaged by seawater leakage. In this case, the Court ruled that flooding a cargo compartment, instead of the vessel's ballast tanks, was not Vessel Management Default. The negligence was in handling of the cargo as the ballast tanks were properly watertight and cargo would not have been damaged if the ballasting had been carried out correctly. However, in a 1980 case a master ordered twenty tons of water to be moved from the back tank to the front tank of his vessel in order to correctly ballast the ship. In the transfer water, leaked from a defective connecting part damaging the cargo. The Court held that the damage was due to fault in navigation. The Court reasoned that although ballasting is essentially a navigational operation this does not mean that an error in ballasting necessarily constitutes negligence in navigation. A ballasting error would constitute negligence in navigation only when the ballasting operation is intended for the equilibrium and safety of the vessel. Generally, an error in ballasting is negligence in navigation or management, since the operation is for the safety of the vessel and does not primarily concern the cargo per se or the ship's facilities for handling the cargo. However, ballasting can in some circumstances, concerns both the stability of the vessel and also the safety of the cargo.

In determining the purpose or nature of an act, one of the most widely used methods of interpretation is to apply the supplementary terms, such as "primary" or "sole" purpose. Was the primary or sole purpose of the act concerned with the cargo or the vessel? Another method is to refuse to recognize that Commercial Default and Vessel Management Default can occur simultaneously. For example, even though an act has the dual purpose of securing both the vessel and the cargo: default in navigation results when the primary purpose of the act is for the security of the vessel. Inquiry into this view reveals that Commercial Default creates liability, but Vessel Management Default does not. In reality there is an overlap of the two defaults resulting in the loss. The purpose of the ballasting operation, for example, is to secure navigation. If the ship's hold is used as a ballast tank, however, the purpose of the ballasting operation is to secure the safety of the vessel and an attempt to save the cargo.

The Hague Rules or the Hague-Visby Rules and the carriage of goods by sea acts all require due diligence in the management and operation of vessels. In contrast, only the carriage of goods by sea acts requires

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77. See Cour de Cassation, DMF 274, 276 (Fr. 1959).
78. See id.
79. See Cour de Cassation, DMF 198, 209 (Fr. 1980); Firestone Synthetic Fibers Co. v. M/S Black Heron, 324 F.2d 835 (2d Cir. 1963).
due diligence in the care of the cargo. Thus, these two duties could be separate considerations from the viewpoints of law and concept. Acts that concern both navigation and cargo at the same time may violate both due diligence in navigation and in cargo at the same time. Presently, there is no rule to gauge the effect of an act on either navigation or cargo and to assign the responsibility for the loss.

The Hague Rules and the Hague-Visby Rules simply look at each act in the light of either Commercial Default or Vessel Management Default. However, it is unrealistic to forcibly apportion the effect of an act with simultaneous purposes. Acts taken for the management and navigation of the vessel might also affect the cargo. Since the Hague-Visby Rules do not directly address the concurrence of two kinds of defaults, this article now interprets these acts in accordance with the drafters' intention.

First, it is a principle that the carrier is liable for loss or damage to cargo arising from a carrier’s default. Exemptions for Vessel Management Default should be interpreted strictly, because the Hague and Hague-Visby Rules, only allow an exemption from liability arising from negligence in an exceptional case. The purpose of strictly construing the exception provisions is to preserve the careful balance between carrier and shipper interests in the Hague Rules and Hague-Visby Rules. Second, the Hague Rules and the Hague-Visby Rules provide for exemption from Vessel Management Default only when the default directly causes the loss. Third, the purpose of legislation to exempt the carrier from liability in the case of Vessel Management Default does not exempt the carrier from liability if the same careless conduct affects both ship and cargo. Two of the reasons for exemption for Vessel Management Default: (1) that the compensation for the loss caused by fault could cost a carrier considerable amounts of money and be too harsh; and (2) Vessel Management Default may endanger the whole voyage. For example, sinking of the vessel may also result in a loss of all or almost all of the cargo. In such a case, an exemption for the carrier is reasonable, because the compensation for damages may be too large and too harsh. An error in the navigation or management fundamentally affects the ship. This might be defined as an erroneous act or omission primarily directed towards the ship, her safety and well being, or towards the venture generally. Conversely, an error in the care of the cargo is an erroneous act or omission directed principally towards the cargo. On the other hand, when a negligent act in navigation or management directly causes damage to the cargo

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80. See, e.g., Foreman & Ellams Ltd. v. Blackburn, 30 Lloyd's List L. Rep. 52, 59 (K.B. 1928) (finding that "[a] negligence or exception clause in a statute, as in a contract, ought, I think, to be strictly construed."); TETLEY, supra note 4, at 85.
it should be recognized as an act having a direct effect on the cargo. In such a case, liability of the carrier should not be exempt.

VI. Conclusion

Even if Commercial Default and Vessel Management Default are addressed independently under the Hague Rules or Hague-Visby Rules, the Hague Rules do not address the problems that result from the interplay of its complex lists of carrier immunities and responsibility with these defaults. Generally, the purpose or nature of the act causing the fault allows the drawing of fine lines between Commercial Default and Vessel Management Default. As such, in distinguishing between two kinds of fault, the key criteria include determining: (1) Whether a negligent act was essential to navigation or directly effects the cargo? (2) Whether or not the act's initial purpose was concerned with the vessel or the cargo? (3) Whether or not the act was in the interest of the vessel or of the cargo? and (4) Whether or not the act was only or primarily in the interests of the cargo or of the ship.

These standards, however, might have several interpretations. When the purpose of an act is for the navigation of the vessel or for the safety of the vessel, the negligence should be considered Vessel Management Default. In this case, however, a carrier should still attempt to take reasonable care to protect the cargo from the act whose purpose is only for the safety of the vessel, when the act might cause damage to the cargo at the same time.\(^\text{81}\) Otherwise, the negligence is not in the management of the ship, but in not securing the safety of the cargo. In such circumstances the carrier should be responsible. In other words, an act relating to navigation or management without thought to the cargo is negligence in the management of the cargo. The carrier should check cargo holds periodically when checking the vessel, to ensure that cargo is not lost or damaged. Otherwise, the negligence is in the care of cargo.\(^\text{82}\)


\(^{82}\) See TETLEY, supra note 4, at 405.
Comments

The Intrinsic Flaws of Contemporary Railroad Nuisance Jurisprudence in Terms of the Public Good

Gregory Peterson*

I. INTRODUCTION

In the last decade, the nation's interstate railroads have quietly orchestrated a remarkable resurgence in both freight and passenger traffic. Aggressive investment by railroad management into physical and human capital has increased market shares in shipping sectors previously dominated by other forms of transportation.1 Mergers between the na-

* Boston University School of Law, J.D. candidate 2000; University of Notre Dame, B.A. in Government, 1997; plans to practice litigation in New Jersey following graduation.

1. See William C. Vantuono & Gus Welty, The World's Best Freight Railroad and the Man at the Top: David R. Goode: Railway Age's Railroader of the Year, RAILWAY AGE, Jan. 1, 1998, at 33 ("[W]e should not lose sight of the fact that our industry is poised to go into the next century as the basis of transportation in this country."); see also Christopher Dinsmore, Norfolk Southern Rolls Right on Past a Slowing Economy, VA.-PILOT & LEDGER-STAR, Oct. 26, 1995, at D3 (noting that Norfolk Southern, a railroad operating 14,500 miles of track in 20 states, had earned more in the first nine months of 1995 than it had in every year except the past two); see also Steve Glischinski, Kansas City Southern Fights Back, TRAINS, June 1, 1997, at 60 (explaining that Kansas City Southern captured traffic from other carriers by striking a deal with trucking company J.B. Hunt to move highway trailers by rail on its north-south corridor); Don Phillips, Railroad Customers are Just so Lucky, TRAINS, Feb. 1999, at 15 (commenting that "for many years the railroads have use cost-cutting and downsizing to keep profits strong.").
tions largest railroads have drawn traffic from other carriers while consolidating redundant operations into efficient transportation systems. The railroads' remarkable growth has translated into longer and more frequent trains plying their way through the nation's towns and cities.

As 'quiet' as the recent upturn in business has been for the railroads in terms of national attention, citizens everywhere have expressed outrage over 'nuisances' generated by revitalized railroad operations. The majority of public complaints are brought by homeowners who live within earshot of railroad rights-of-way. A Massachusetts resident who has lived near the tracks for 30 years explains that, "her windows rattle and her china shakes when some of the trains go by." New Jersey residents living adjacent to a rail yard complain of, "[s]hifting wall hangings. A constant hum that incites migraine headaches." A local transit agency recently inaugurated direct service from Northern New Jersey into New York City and other parts of New Jersey. The service expansion has resulted in a total of one hundred and twenty trains a day traveling through many upscale suburban neighborhoods.

Citizens' complaints brought directly to the railroads regarding noise and other nuisances rarely produce any relief for local landowners. As a result, municipalities have enacted legislation placing time and manner...
constraints upon railroad operations. The most common form of regulation prohibits locomotives from sounding a warning whistle as they approach highway grade crossings.

In recent years, both federal and state courts struggled to determine the legitimacy of both local ordinances and individual claims which directly or indirectly constrain railroad operations. At issue in the courts' analyses is the inherent tension between the rights of the individual to enjoy property free of disturbance and the broader notion that interstate commerce should move unimpeded by means of the nation's interstate rail network. This conflict governs nuisance claims brought in tort by individual homeowners and statutory claims adjudicated on behalf of towns and municipalities. In specific terms, nuisance claims against railroads commonly arise out of complaints over noise, vibration, and fumes. Closely related to these traditional nuisance claims are actions brought against railroads under the theories of attractive nuisance and ordinary negligence.

State courts recently adjudicated several cases where the close proximity of residential homes to railroad rights-of-way gave rise to tort claims against the railroads. As previously mentioned, municipalities sought to legislatively remedy railroad nuisances. In determining the legitimacy of the statutory regulations, courts often refer to the touchstone doctrine of federal preemption. Myriad federal statutes contain

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10. See Appellate Summaries: Transportation – ICC Jurisdiction, Chi. Daily L. Bull., Feb. 12, 1998, at 1 (explaining that citizens of Antioch, Illinois attempted to enforce a local ordinance prohibiting the Wisconsin Central Railroad and the Metra commuter railroad from sounding horns as their train approached grade crossings in the city); see also discussion infra Part III.C. (concerning the legitimacy of South Bend and Mishawaka whistle bans).


13. See Rushing, 14 F. Supp.2d at 869.

14. See Gage v. City of Westfield, 532 N.E.2d 62 (Mass. App. Ct. 1988) (focusing on the close proximity of a local playground to railroad tracks in deciding whether the railroad owed a duty to individuals who used the railroad right of way as walking path to reach the recreational area); see also Lopez v. Union Pac. R.R. Co., 932 P.2d 601 (Utah 1997) (finding that the railroad might be liable in tort to trespassers under circumstances where the railroad possesses knowledge that individuals frequently crawled on and over stopped railway equipment).

15. See Gage, 532 N.E.2d at 62; see also Lopez, 932 P.2d at 601.

16. See McClaughry, 695 N.E.2d at 492; Consolidated Rail Corp. v. City of Dover, 450 F. Supp at 966; Rushing, 14 F. Supp.2d at 869; Civil City of South Bend v. Consolidated Rail Corp., 880 F. Supp. at 595.

express language prohibiting a state from regulating certain railroad uses where the specific use has been previously regulated through federal legislation.\textsuperscript{18} This Note explores the courts’ use of federal preemption as a limit on municipal involvement in the movement of railroad commerce.

This is not to say, however, that railroads enjoy complete immunity from local regulation. Judicial discretion ultimately determines the scope of the preemptive language of each federal statute.\textsuperscript{19} Although the results in nuisance related litigation appear skewed in favor of the railroads, the nation’s courts are not, as some allege, ‘paternalistic guardians’ of the railroad industry.\textsuperscript{20} Rather, courts adjudicate nuisance claims against railroads in light of a notion of public good.\textsuperscript{21} The public good, however, may not necessarily be served by protecting the interests of individual homeowners. The courts’ decisions should serve a broader understanding of the public good derived from a utilitarian notion of allocating costs and benefits. In certain instances, the courts consider the public good best served by the unimpeded movement of interstate commerce via the railroads.\textsuperscript{22} In other cases, the burdens imposed upon individual homeowners by railroads justify either judicial or statutory limitations to regulate the debilitating railroad use.\textsuperscript{23} Where courts allocate burdens to the railroads, however, they often miscalculate the aggregate effect of their intervention, thereby undermining the broader public good.\textsuperscript{24} An examination of the sweeping effects of the imposed constraints upon railroads often reveals unintended consequences that actually impair the public good.\textsuperscript{25}

\textsuperscript{18} See id. (discussing the preemptive effect of the Noise Control Act and the Federal Railroad Safety Act).


\textsuperscript{20} See Al Rinkerman, Editorial, Think Lawnmowers Pollute? Try Living Near Tracks, Buffalo News, May 24, 1994, at B2 (contending that “[i]f the U.S. Environmental Protection Agency is truly concerned about air quality, it need only turn to one of the government’s sacred cows: the railroads”) The author admitted that he, “knew full well when I bought my home that the railroad ran through the backyard” but he continues to complain about the noise and other emissions of the trains. Id.

\textsuperscript{21} See discussion infra Part II.A.

\textsuperscript{22} See Rushing, 14 F. Supp. 2d at 869.

\textsuperscript{23} See Southern Pac. Transp. Co. v. Public Util. Comm’n, 9 F.3d 807 (9th Cir. 1993) (analyzing the preemptive effect of several federal statutes concerning railroad regulations, the court ultimately concludes that municipalities in Oregon may limit the railroads’ ability to sound whistles at grade crossings).

\textsuperscript{24} See id. (holding that local municipalities may curb railroad whistle noise, even when statistical data exists that suggests that whistles save lives); Fed. R.R. Admin., U.S. Dep’t of Transp., Florida’s Train Whistle Ban (1990), which studied the effects of whistle bans enacted by Florida towns. The study projected a 25% increase in accidents in towns where whistle bans were enacted.

\textsuperscript{25} See generally Mark A. Stein & Hugo Martin, Horns of a Dilemma: Rail Officials Try to
In Part I, this Note considers historical railroad nuisance jurisprudence and its application to current situations. With the unprecedented growth of railroads, and the corresponding increase in nuisance complaints, courts endeavor to maintain a cohesive analytical framework for the adjudication of nuisance claims. Through examination of case law and corresponding literature, Part II of the Note demonstrates that the courts' attempts to safeguard the public good by limiting obnoxious railroad practices actually undermines a broader notion of the public good embodied in the unimpeded movement of interstate commerce. Parts III and IV of this Note discuss the practical results of the courts' current railroad nuisance jurisprudence by examining its negative consequences to the nation's economic well being. This Note will focus on municipal whistle bans, the most controversial and litigation-creating response to railroad nuisances, as the test cases to demonstrate the imperfections of the courts' current approach.

II. RAILROADS AND NUISANCE LAW

THE HISTORICAL JURISPRUDENCE OF RAILROAD NUISANCE LAW

While today's railroads enjoy unprecedented financial success, the nation's earliest railroads provided the means for American expansion and economic growth.26 Railroads provided the impetus for commercial and residential development in several areas of the country.27 Railroads expanded to serve burgeoning population centers with viable transportation.28 An unfortunate byproduct of the railroad's early successes, however, were the nuisances created by the railroad's operations in residential neighborhoods.29

On May 14, 1914, the United States Supreme Court decided Richards v. Washington Terminal Co.30 In setting forth fundamental guidelines for the application of nuisance law to railroads, the Court

\[\text{Figure Out How to Reduce Train Noise Levels, L. A. TIMES, NOV. 23, 1992, at B1. (discussing that the transportation commission spent $500,000 studying methods to reduce noise emissions).}\]

\[26. \text{See Jessica Gleich, Railroads Helped Springs Gain Steam as Resort Town, COLO. SPRINGS GAZETTE, July 31, 1997, at 17. The author describes how the "[r]ailroads opened the west." Id. Railroads also provided the first opportunity for individuals from cities to visit distant locales. See id.}\]

\[27. \text{James Robinson, Editorial, Railroads Began North Carolina Development, THE RICHMOND NEWS LEADER, May 8, 1991, at 21. According to the author, "no industry more hastened [our] settlement and progress . . . than the North Carolina Railroad." Id. The description of the 223-mile railroad indicates the significant economic and cultural gains brought about by the nation's early railroads. See id. During the 19th century, for instance, the North Carolina Railroad was the State's single largest source of income. See id.}\]

\[28. \text{See id.}\]


\[30. \text{See id.}\]
considered the degree to which local railroad operations constituted an impermissible taking of an individual's property. The plaintiff in the case owned property near, but not directly abutting, railroad property. The railroad operated thirty trains a day through a tunnel located roughly one hundred and fourteen feet from the plaintiff's home. Often trains would stop and idle outside of the tunnel as they waited at switches. The railroad also installed a tunnel ventilation fan near the plaintiff's property that expelled large amounts of fumes from the tunnel. The plaintiff's property was subsequently damaged by large quantities of dense smoke and dirt emitted from the trains and the ventilation fans. The plaintiff's personal and real property depreciated substantially in value as a result of the railroads construction and use of the nearby tunnel.

In determining whether the railroad worked an uncompensated taking of plaintiff's property, the Court posited a fundamental rule regarding the use of nuisance law to regulate railroads in general. The Court stated that because railroads are constructed for public use, they "are not subject to the actions of neighboring property owners for the ordinary damages attributable to the operation of the railroad, in the absence of negligence." The seemingly broad standard articulated by the Court is actually self-limiting. The ordinary damages, which in this case included smoke, vibration, and dirt were the direct result of the railroads normal operation of steam engines.

The Court did not, however, completely absolve the railroad from all liability. With regard to the noxious emissions from the tunnel ventilation system, the Court held that the railroad might be subject to nuisance liability. The Court distinguished between the damaging tunnel fumes and...
and smoke generated by the idling locomotives on the basis of the necessity of the railroad use creating each respective nuisance. That is, because there was no real necessity, in terms of railroad use, for the damage to plaintiff's property resulting from the ventilation fan, the Court approved plaintiff's claim for these damages alone. The Court expresses the distinction in terms of costs and benefits. If the railroad could have prevented the damage without incurring unreasonable expenses, the railroad may not unlawfully burden the plaintiff's free enjoyment of her property.

For purposes of modern railroad nuisance jurisprudence, the Court's opinion drastically restricts the scope of potential claims against railroads. Underlying the decision itself is the Court's unwillingness to exact any burden upon the railroad where, "the practical result would be to bring the operation of railroads to a standstill." This theory remains the fundamental touchstone of railroad jurisprudence. Railroad immunity from nuisance, however, is conditional upon a tenuous distinction fabricated by the Court. The Court presumes that a distinction can be drawn between those railroad uses that are necessary and those that might be amended without seriously undermining the ability of the railroads to operate efficiently. As mentioned earlier, the court sets forth a cost/benefit test to distinguish between uses that the courts may or may not regulate.

In determining whether individuals and municipalities may lawfully regulate the operation of railroads, modern courts struggle to distinguish between acceptable railroad uses and unnecessary nuisances. The inability of courts to recognize the subtle differences between valid uses and excessive railroad noise often results in the courts improperly allocating the burdens of the offensive use to the party who cannot practically shoulder the increased costs.

43. See id. at 554.
44. See id.
45. See id. at 557.
46. See id.
47. See id. at 554 (explaining that by prohibiting the regulation of necessary railroad uses, the Court grants railroads immunities which permit them to conduct business without fear of certain legislative or judicial limits).
48. See id. at 555.
49. See id. (setting forth a cost/benefit test to practically distinguish between uses which the courts may or may not regulate).
50. See id. at 557.
52. See discussion infra Part III.B.
THE MODERN APPROACH TO RAILROAD NUISANCE LAW

Plaintiffs’ difficulty in prevailing against railroads under the stringent Richards’s standard, and the seemingly unjust conditions being imposed on homeowners, caused a subtle shift in the nature of railroad regulatory efforts.53 Today, the number of common law nuisance claims brought on behalf of individual landowners are dwindling while local political entities seek more effective means to curtail railroad noise, smoke, and vibration.54 In some respects, therefore, the nexus of railroad nuisance jurisprudence shifted from individual common law claims to those concerning statutory validity.55 The fundamental issues and difficulties faced by the courts, however, are unchanged.56

In State of New Jersey v. New York Central Railroad Co., the New Jersey Supreme Court considered the validity of a municipal noise ordinance as applied to an interstate rail carrier.57 Such local noise regulations represent a legislative effort to effectuate the rights of individuals to freely use and enjoy their property.58 As such, they closely resemble, in analytical terms, common law nuisance claims.59 The Borough of Dumont enacted an ordinance mandating that, “[w]hatever loud and unnecessary noise which disturbs the public peace, between the hours of Eleven

53. See Richards, 233 U.S. at 556-58. The inability of the Court to directly compensate plaintiff for the substantial harm caused to his property by cinders and smoke emitted by the railroad prompted the Court to distinguish between the ventilation fan emissions and locomotive smoke. See id. The Court itself acknowledges the limits of its doctrine:

No doubt there will be some practical difficulty in distinguishing between that part of the damage which is attributable to the gases and smoke emitted from the locomotive engines while operated upon the railroad tracks adjacent to plaintiff’s land, and with respect to which we hold there is no right of action, and damage that arises from the gases and smoke that issue from the tunnel, and with respect to which there appears to be a right of action.

Id.

54. See generally, Joe Strupp, Railroad Told Not to Park at Siding Colton Residents Had Complained of Fumes, PRESS-ENTERPRISE, July 24,1998, at B1 (explaining that when homeowners complained and enlisted the help of local politicians that were successfully in enjoining Union Pacific’s use of its siding).


56. See Consolidated Rail Corp. v. City of Dover, 450 F. Supp. at 966; Rushing, 14 F. Supp.2d at 869. Both cases indirectly considered the necessity of the railroad use with regard to the costs imposed upon local citizens.

57. See State v. New York Cent. R.R. Co., 116 A.2d 800, 801 (N.J. 1955) (stating that most of the witnesses in the case were local residents who complained of loud noise which was both aggravating and annoying).

58. See id. at 803.

59. See Richards v. Washington Terminal Co., 233 U.S. 546, 556 (1914) (explaining that the court will engage in the same cost benefit analysis employed in a traditional nuisance claim brought on behalf of a aggrieved homeowner).
o'clock P.M. and Seven o'clock A.M. is hereby declared a nuisance and is prohibited."60 The New York Central Railroad maintained a yard in the town where it parked idling locomotives between assignments.61

In determining the railroad's liability under the ordinance, the court considered both the constitutional validity of the ordinance and whether the railroad noise was necessary within the meaning the statute.62 Despite the statute's use of abstract terms such as "loud and unnecessary noise", the court recognized the legitimacy of the ordinance in due process terms.63 In preserving the overall intent of the statute, the court noted that even if terms such as 'loud' could only be defined relative to the circumstances, this fact alone was not sufficient to hold the language ambiguous.64

The New York Central court refused to expressly consider the necessity of the railroad's practice of parking locomotives on a siding adjacent to local homeowner's property.65 The court avoided the complexities inherent in the test by retrospectively shifting the burden of production to the railroad.66 Because the charge in the case "includes a negative aver­ment, the truth or falsity which lies peculiarly within the knowledge of the defendant, the burden of evidence ... rests with the defendant."67 In defense of the alleged statutory violation, the New York Central railroad posited no affirmative evidence establishing the necessity of the contested railroad use.68 Instead the railroad merely attempted to impeach the testimony of homeowners who asserted that the railroad had other tracks in the subject yard where they could store locomotives.69 Accordingly, the court convicted the railroad under the ordinance.70

The result in the New York Central case is exclusively a function of the court's analytical framework for determining a 'necessary use' within the meaning of the city's ordinance. The court did not engage in the requisite balancing test mandated by the Richards court. Instead, the court implied an unnecessary railroad use from the defendant's failure to pro-

61. See id.
62. See id.
63. See id. at 805 (arguing that the court found that such terms as "loud and unnecessary" have acquired specific meaning at common law through nuisance doctrine and the terms were not, therefore, vague or ambiguous when utilized in a criminal statute).
64. See id. at 803.
65. See id. at 805.
66. See id. (referring to the burden upon the railroad to produce evidence demonstrating the necessity of the railroad use).
67. Id.
68. See id.
69. See id. at 802.
70. See id. at 805.
duce evidence to establish such a necessary use. 71

The court's application of the ordinance to the relevant facts demonstrates the inherent difficulties associated with the practical application of the Richards standard. Because the city ordinance is derived from common law nuisance doctrine, the court must consider the facts in terms of nuisance law in determining culpability under the statute. 72 The interaction between the criminal statute and ordinary nuisance law implicates the rules established in Richards for determining a railroad's civil liability. 73

The New York Central court impliedly recognizes the inadequacies of the Richards standard for determining railroad liability. 74 For both common law nuisance and statutorily imposed noise regulations, the court must make a determination as to the necessity the noise generated by the railroad use. 75 Requiring the courts to distinguish between necessary and superfluous railroad activity might undermine the efficacy of the standard itself. 76 In Richards, the court presumed that significant differences existed between necessary railroad uses and that those practices that could be modified without significant cost or inconvenience to the railroad. 77 To determine liability under the ordinance in New York Central, the court was forced to draw the same distinction between necessary and unnecessary railroad uses. 78

More importantly, the New York Central court's analysis undermined the notion of the public good which ultimately governs both common law and statutory railroad nuisance claims. 79 The court's decision essentially decided that the public good would best be served by burdening the railroad at the expense of local homeowners. The court reached this conclusion by implicating a procedural failure on behalf of the railroad without

71. See id.
72. See id. at 803-04 (discussing the common law origin of the terms used in the city's noise control regulation).
73. See id. (explaining the necessity of the noise in terms of the costs of reasonable adjustment to accommodate the needs of the listener).
74. See id. at 805 (stating that the facts regarding the needs of the company lie within the knowledge of the company alone, they are required to produce evidence demonstrating such necessity and the measure attempted to shift the burden of determining necessity from the court to the defendant).
75. See Richards v. Washington Terminal Co., 233 U.S. 546, 555 (1914) (setting forth a cost/benefit test to distinguish between uses which the courts may or may not regulate).
76. See discussion infra Part III.C.
77. See State v. New York Cent. R.R. Co., 116 A.2d at 805 (noting that there is a burden upon the railroad to produce evidence demonstrating the necessity of the railroad use).
78. See id.
79. See id. at 805 (weighing the necessity of the railroad use against the ill-effects created for local citizens by the use).
considering the necessity of the railroad use. A determination of necessity must be made in considering which party should bear the burden of the alleged nuisance. This is not to say that the court might have derived a result which adequately serves the public good if they had performed the proper balancing test, as mandated by Richards. The New York Central court makes a more fundamental error in presuming the most beneficial result without balancing the interests involved.

III. Federal Preemption: The Railroads' Weapon Against Local Law?

The Origin of Federal Preemption

Pursuant to the Supremacy Clause of the Constitution, federal law may preempt state and local regulations under certain circumstances. In instances where Congress expressly defines the extent to which federal law preempts state law, or where state law regulates conduct in a field that Congress intended the federal government to occupy exclusively, or where it is impossible to comply with both state and federal requirements, or where state law poses an obstacle to the accomplishment and execution of Congressional purposes, state or local law shall be preempted. Railroads implicate several of the above criteria when challenging the applicability of local and state regulations of railroad uses. Federal preemption issues most often arise when municipalities, through legislation, attempt to curb railroad noise. Locally enacted whistle ordinances, which either entirely prohibit railroads from sounding locomotive horns, or place time constraints upon the lawful use of whistles, prompted the railroads to argue for preemption by way of the Supremacy Clause of the Constitution.

Several federal statutes regulating railroads contain express or im-

80. See id.
81. See id. (discussing the need for the court to determine necessity to allocate the burden of the alleged nuisance).
82. See id. (shifting the burden of evidentiary production to the railroad so as to avoid making a judicial determination regarding the necessity of the use).
83. See U.S. CONST. art. VI.
85. See discussion infra p.17.
plied language setting forth Congressional intent that federal guidelines should supercede local ordinances. 88 The Locomotive Boiler Inspection Act ("LBIA") allocates power to the United States to regulate all parts and appurtenances of railroad locomotives. 89 The Supreme Court interpreted the LBIA to regulate the design, construction, and materials of every locomotive. 90 In terms of efficiency, by mandating a national standard for locomotive design, the LBIA subjects railroads to a single equipment standard as their locomotives travel interstate. 91

The Ninth Circuit Court of Appeals, however, recently questioned the preemptive effecting of the LBIA. 92 In considering the validity of a local Oregon ordinance that prohibited railroads from sounding horns, the court concluded that the state regulation did not require certain types of equipment on locomotives. 93 As a result, the railroads could not establish that the local regulations interfered with the administration or implementation of the LBIA. 94 With the preemptive effect of the LBIA curtailed by the courts in reference to whistle bans, the railroads have sought protection from other federal legislation containing explicit preemption language. 95

The Noise Control Act ("NCA") of 1972 directs the Environmental Protection Agency ("EPA") to create standards for railroad noise. 96 States may regulate the noise of railroad equipment but only insofar as the state standard is identical to that set forth by the EPA. 97 The Ninth Circuit Court of Appeals similarly limited the preemptive effect of the NCA with regard to whistle bans. 98 Because the EPA has not expressly enacted regulations concerning railroad noise emissions from locomotive horns, state and municipal noise ordinances cannot conflict with the NCA itself. 99 Accordingly, the local regulation represents a valid exercise of a state's police power and may operate free of federal preemption. 100

The Federal Railroad Safety Act ("FRSA") maintains that railroad

88. See id. at 811-12 (discussing examples of statutes with explicit preemption language).
89. 45 U.S.C § 22 – 43(a) (1994).
90. See Napier v. Atlantic Coast Line R.R. Co., 272 U.S. 605, 611 (1926) (holding that Congress intended the LBIA to include whistles as locomotive appurtenances regulated by the legislation).
92. See id. at 810-11.
93. See id. at 811.
94. See id.
95. See id. at 811-13 (discussing railroad use of the Noise Control Act ("NCA") and the Federal Railway Safety Act ("FRSA").
97. See id. at § 4916(c)(1).
99. See id.
100. See id. at 811-12.
safety laws should be nationally uniform to the extent practicable. A state may, in turn, enforce a standard involving railroad safety until the Secretary of Transportation has adopted a rule covering the same subject matter of the state rule. The enactment appears to provide the courts with extensive power to strike burdensome local regulations by way of federal preemption. The U.S. Supreme Court, however, has interpreted the statutory language to limit the preemptive effect of the FRSA. To exercise the broad preemptive powers of the FRSA, the Court required plaintiffs to demonstrate that the federal regulation “substantially subsumes” the subject matter of the state law.

With regard to the “substantially subsumes” standard, federal regulations govern virtually all aspects of railroad operations in the interest of safety. Under the FRSA, each federal mandate would preempt conflicting state orders. Some lower courts, however, have curtailed the preemptive effect of the FRSA by giving a narrow reading to the Supreme Court’s requirement that the federal law “substantially subsumes” state regulation of the same railroad use.

For example, the District Court for the Northern District of Indiana recently considered the railroads’ ability to use the FRSA to strike whistle bans in two northern Indiana communities. The cities of Mishawaka and South Bend, Indiana enacted measures to prevent Conrail and Grand Trunk Western Railroad from sounding whistles at local grade crossings. The railroads relied on specific federal legislation that required a lead locomotive to have an audible warning device of specified capabilities. The court held that the federal statute cannot “substantially subsume” the local whistle ban because it does not directly address the issue of the warning devices. The Court reasoned that “one can

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102. See id.
103. See CSX Transp., Inc. v. Easterwood, 507 U.S. 658, 664 (1993) (explaining that for the railroads to rely upon federal preemption, the state regulations must do more than merely ‘touch upon’ or ‘relate to the subject matter’ of the federal regulation).
104. See id. (explaining that the “substantially subsumes” standard requires that the federal regulation governs virtually all aspects of railroad operations).
105. See, e.g., 49 C.F.R. § 229.129 (1998) (mandating that every lead locomotive be equipped with an audible warning device capable of producing a minimum level of sound 100 feet forward of the locomotive).
108. See id. at 597-98.
109. See id.
possess an audible warning device without sounding it." The failure of
the railroads to establish a conflict between the federal legislation and
local whistle bans rendered the FRSA's preemptive language
inapplicable. The Constitution of the United States offers railroads a direct rem-
edy to overcome intrusive local regulations by means of federal preemp-
tion. The standard established by Article 1 sec. 8, cl. 3 prohibits states
from imposing excessive burdens upon the movement of interstate com-
merce. The United States Supreme Court interpreted this constitutional provision to allow states limited leeway in regulating interstate commerce. The Court held that states may enact evenhanded regulations in the public interest that affect interstate commerce only incidentally.

Certain courts have interpreted the constitutional standard to permit
a wide range of local regulations. The lower courts purport to consider
the actual effect of state or local enactments upon interstate com-
merce. For example, in Civil City of South Bend, Indiana v. Consolidated Rail Corp., the court reasoned that because a local ordinance whistle ban did not forbid the railroads from traveling through the cities or charge them a tariff for doing so, the ordinance did not exact an undue burden upon the movement of interstate commerce. Under the Civil City of South Bend Court's broad standard of review, few local regulatory statutes would 'unduly burden' interstate commerce.

In response to the excessive judicial limitations imposed upon the preemptive effect of the FRSA and other federally created railroad regulatory statutes, Congress enacted the High-Speed Rail Development Act of 1994. The legislation directs the Secretary of Transportation to "prescribe regulations requiring that a locomotive horn should be sounded while each train is approaching and entering upon each public

112. See id. at 601-02 (indicating the local regulations would not govern the horn as hardware of the locomotives, but only the use of the horns under certain circumstances).
114. See U.S. Const. art. 1, § 8, cl. 3.
115. See id.
117. See id.
119. See id. at 602-03.
120. See id. at 603.
121. See id. (suggesting that only the most stringent local ordinances, such as those taxing the railroads, would constitute an undue burden on the movement of interstate commerce).
highway-rail grade crossing." However, any local whistle ban would conflict with the Secretary's mandates, implicating the preemptive effect of the new legislation. In compliance with the Act, final regulations by the Secretary of Transportation will be issued by November 2, 1998.

Although, in Civil City of South Bend, Conrail and Grand Trunk Western argued that the High Speed Rail Act should preempt whistle bans enacted by the cities of South Bend and Mishawaka, the Court was unwilling to recognize the preemptive effect of the legislation as the Secretary of Transportation had yet to promulgate its grade crossing regulations. Despite the imminent passage of the Secretary's individualized provisions for grade crossing safety, the Court would not allow the railroads to invoke a future regulation as the basis for preemption.

**Preemption and the Public Good: The Richards Standard Revisited**

Municipal whistle bans, like other statutory nuisance regulations, implicate the traditional common law adjudicative rules governing railroad noise emissions. In the Richards case, the United State Supreme Court posited a fundamental distinction to serve as the touchstone for railroad nuisance jurisprudence. The Court required a determination of the necessity of each alleged obnoxious railroad use. 'Necessity' involves an examination of what limitations might prevent the railroad from operating efficiently. In terms of costs and benefits, the Court sought to allocate the damages associated with the use or its regulation to the party better able to absorb such social and economic costs.

Unlike common law nuisance claims, challenges brought against lo-
cal whistle bans usually involve issues of federal preemption. Consider, for example, an Oregon statute that permitted city commissioners to ban whistles at any grade crossing already equipped with automatic gates, flashing lights, and audible protective devices. In *Southern Pacific Transportation Co. v. Public Utilities Commission*, the railroad objected to the legislation claiming that the local ordinances were preempted under the LBIA, FRSA, and NCA. In finding for the state, the Ninth Circuit rejected each of the railroad's arguments for federal preemption. In *Civil City of South Bend*, a District Court similarly dismissed each of Conrail and Grand Trunk Western's argument for preemption of a similar whistle ban.

Application of the *Richard's* framework to the courts' preemption analysis demonstrates the notion of the 'public good' underlying railroad nuisance jurisprudence. Whistle bans appear to effectuate the public interest. In *Southern Pacific*, the court reasoned, vis-a-vis its preemption analysis, that the city of Eugene was entitled to ban whistles between 10 p.m. and 6 a.m. The regulation would afford local residents an eight hour respite from railroad noise. The preemption analysis serves as a proxy for the cost/benefit test required by the *Richards* Court. In *Southern Pacific*, for example, the court rejected the railroad's attempt to utilize the preemptive language of the FRSA to invalidate the Eugene whistle ban. Southern Pacific claimed that Federal Railroad Administration guidelines requiring that locomotives be equipped with audible warning devices preempted state whistle bans. The court held, however, that the municipal whistle ban dealt with the use of the locomotive whistles, as opposed to their noise making capacity. Because the federal and state statutes govern fundamentally different aspects of the railroad use, the court held that Southern Pacific could not utilize the FRSA's preemptive effect. The court fabricates this tenuous distinction between the state and federal regulations to eliminate preemption as

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134. See id. at 809-13.
135. See id.
136. See *Civil City of S. Bend v. Consolidated Rail Corp.*, 880 F. Supp. at 595, 600-02. The court found that LBIA offered no preemptive effect as locomotives could still possess a horn without sounding it. See id. The NCA could not apply because the EPA offered noise regulations which might preempt local law. See id. The court found only a minimal effect on interstate commerce and therefore refused to strike the state ordinance. See id.
138. See id.
139. See id.
140. See id. at 812.
141. See id.
142. See id.
143. See id.
a potential means for railroads to strike burdensome local legislation. 144
In consistently rejecting the use of federal preemption, however, the courts have actually undermined the public good. Judicial validation of local whistle bans certainly serves the public interest in a narrow sense. Citizens of affected municipalities enjoy quieter nights while the railroads suffer few impediments to the efficient movement of their trains. After all, the Oregon statute only permitted the whistle ban at crossings which had other protection such as gates or audible warning devices. 145 With other warning devices in place to warn drivers of approaching trains, whistles noise appears superfluous as a means of preventing grade crossing accidents.

Judicial rejection of federal preemption, however, is tantamount to a determination that the railroads should always bear the social and economic costs of curbing the alleged nuisance. In terms of the Richards framework, the courts effectively recognize that the practice of sounding locomotive horns in approach of highway grade crossings is not a necessary railroad use; in rejecting federal preemption of whistle bans, courts presume, in essence, that the public good would best be served by accommodating local homeowners at the expense of interstate rail carriers.

In considering a broader, utilitarian notion of the public good, however, whistle bans run contrary to the public interest. In 1984 the Federal Railway Administration commissioned a study of Florida East Coast Railway’s right-of-way to determine the effects of whistle bans on grade crossing safety. 146 They government study solely considered crossings otherwise equipped with warning devices such as gates, flashing lights, or bells. 147 The study revealed that nighttime train accidents tripled at grade crossings with whistle bans. 148 Quantitatively, thirty-nine grade crossing accidents occurred in the five year period prior to Florida’s adoption of whistle ban statutes. 149 During the five year period after the whistle ban went into effect, there were one hundred and fifteen reported accidents. 150 The Federal Railroad administration attributed the accidents to the whistle bans and issued an Emergency Order requiring the Florida East Coast Railway to sounds whistles at every grand crossing. 151 On the national level, Congress enacted the High Speed Rail Act to enable the

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144. See discussion infra p. 19 (concerning the Court’s unwillingness to recognize the preemptive effect of the FRSA).
147. See id. at 2.
148. See id. at 1.
149. See id. at 10-11.
150. See id.
Secretary of Transportation to override municipal whistle bans at unsafe railroad grade crossings.\textsuperscript{152}

\textbf{THE PRACTICAL EFFECTS OF WHISTLE BANS IN TERMS OF THE PUBLIC GOOD}

Legislative determinations concerning grade crossing safety, unlike judicial interpretation of the validity of whistle bans, recognize a more general notion of the public good. Despite the clear safety threats posed by whistle bans and the imminent implementation of federal whistle ban prohibitions, the court in \textit{Civil City of South Bend} upheld noise bans in South Bend and Mishawaka, Indiana.\textsuperscript{153} In protecting the autonomy of each municipality, the court ignored the dangers associated with whistle bans. A close examination of railroad operations reveals the perils of highway grade crossings. The average one hundred car freight train weighs nearly ten thousand tons.\textsuperscript{154} The same train, traveling at 50 miles-per-hour requires nearly one and one-third miles to stop.\textsuperscript{155} With trains unable to stop at grade crossings, the vehicle operator solely controls her own safety.\textsuperscript{156} Any additional warning that an approaching train might provide by sounding a whistle, therefore, might save the life of an unwary motorist.\textsuperscript{157}

In terms of the public good, legislative efforts to improve grade crossing safety better serve utilitarian notions of public health and safety.\textsuperscript{158} By focusing on state regulatory rights and individual interests in curbing excessive railroad noise, the federal circuit courts ignore the wider ranging, practical dangers of allowing whistle bans.\textsuperscript{159} The distinction between the legislative approach, embodied in the Congressional enactment of the High Speed Rail Development Act virtually eradicating whistle bans, and the judicial viewpoint, manifest in the circuit courts’ approval of municipal whistle regulations, is easily recognized through a cost/benefit analysis.\textsuperscript{160}

\textsuperscript{152} See \textit{Civil City of S. Bend v. Consolidated Rail Corp.}, 880 F. Supp. 595, 602 (N.D. Ind. 1995) (holding that few local regulations constitute a burden upon interstate commerce).

\textsuperscript{153} See id. at 600.


\textsuperscript{155} See id. at 2.

\textsuperscript{156} See id. (finding the inference follows logically from the locomotive engineer’s inability to stop her train).

\textsuperscript{157} See id. (deducing from the two preceding assertions regarding the motorists and grade crossing accidents).

\textsuperscript{158} See discussion \textit{infra} Part III.B.

\textsuperscript{159} See id.

\textsuperscript{160} See \textit{Richards v. Washington Terminal Co.}, 233 U.S. 546, 551 (1913) (explaining that the courts utilize a cost/benefit test to determine the necessity of a railroad use in the context of nuisance jurisprudence).
A close analysis of the costs and benefits associated with whistle ban legislation reveals a significant disparity between the good realized in the judicial and legislative treatment of whistle bans. In *Southern Pacific*, the Ninth Circuit court favored the interests of local homeowners over those of the railroad and the public in general. In upholding City of Eugene whistle bans, the court implicitly recognized that the benefits realized by the public in prohibiting the sounding locomotive horns outweighed the costs that the railroad might incur in not sounding whistles. The primary benefits obtained include the quiet use and enjoyment of property owned by the citizens of Eugene and other municipalities.

The court underestimated, however, the costs to the general public in allowing whistle bans. In light of the information published by the Federal Railway Administration concerning grade crossing safety, whistle bans detract from public safety. The costs of permitting whistle bans are borne not only by the railroads, but by the public themselves. Given the safety improvements realized when locomotives sound their horns while approaching grade crossings, every member of the public stands to suffer when towns impair the useful warning devices.

From a utilitarian perspective, therefore, legislative treatment of municipal whistle bans better protects the public interest. In terms of the public good, serious safety considerations, like those implicit in the grade crossing whistle ban analysis, outweigh concern for citizens who might be stirred from their sleep by a shrill locomotive horn.

The public good, however, goes beyond notions of safety for highway travelers and regulation of excessive aural nuisances. Also at issue in railroad nuisance jurisprudence are secondary and tertiary concerns which contribute to and shape the public good. Courts often ignore these indirect effects in allocating the costs and benefits associated with regulation of obnoxious railroad uses. In order to correctly and efficiently serve the public interest, they must factor these effects into their analysis.

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162. See *id.* (explaining that the local ordinance did not impair the railroad’s ability to operate its locomotives any manner).
163. See *id.*
165. See *id.* at 2-3 (showing that the Federal Railway Administration’s findings clearly demonstrate that a higher incidence of accidents occur at grade crossings with whistle bans in effect).
166. See *Greene, supra* note 125 (indicating that Legislative remedies include congressional enactment of the High-Speed Rail Development Act which afforded the Secretary of Transportation ultimate authority to determine which municipalities can maintain whistle bans); see *Emergency Order Requiring Use of Train Borne Audible Warning Devices, 56 Fed. Reg. 36,190* (1991) (stating that the emergency order eradicating all whistle bans in communities along the Florida East Coast Railway in response to the Federal Railway Administration’s grade crossing safety study, represents an additional legislative measure concerning the legitimacy of whistle bans).
public good through their nuisance jurisprudence, however, the courts should consider these derivative factors relevant to a utilitarian notion of the good.

One such collateral concern, the serious economic repercussions that might result from a train derailment at a highway grade crossing accident, demonstrates the need for consideration of indirect factors in determining the public good. As mentioned earlier, whistle bans dramatically increase the incidence of train-car grade crossing accidents. The higher accident rate, in turn, severely the railroad's ability to operate its trains in an efficient manner. Railroads have undergone a significant resurgence in the past decade. The railroads' revival has also resulted in a substantial increase in the number of trains plying the nation's railroad right-of-ways. Every grade crossing becomes in and of itself more dangerous because of increased train frequency. Whistle bans in municipalities with busy railroad lines further increase the probability of a grade crossing accident.

The utilitarian notion of the good, in recognizing the necessity of whistle bans with regard to the safety of the public, should also take into account extended economic costs resulting from an increased incidence of grade crossing accidents. Grade crossing accidents, in impeding the ability of the railroads to operate efficiently, might create substantial and widespread financial difficulties for both the railroads and the public at large. To remain competitive with over-the-road truck carriers, several railroads have adopted novel shipment philosophies emphasizing just-in-time delivery. Because large shippers no longer store materials at manufacturing locations, trains became rolling warehouses. Similarly, "just in time delivery has a slim margin for error: If a shipment is late, the automaker risks the shutdown of an assembly line." The emergence of just-in-time delivery as the new standard for large customers exacts a de-

168. See discussion infra note 178 (concerning the crippling effects of a derailment upon the physical operation of the railroad).
169. See supra note 1 (discussing several aspects of the railroads economic revival).
170. See Bill Stephens, Automobile Artery, Trans., June, 1996, at 45. On one main line between Chicago and central Ohio, for example, Norfolk Southern increased the number of trains it operated from 15 to 22 per day in the past five years. See id. On its Illinois Division, the railroad operated 27 trains per day in 1991. See id. In 1996 it had increased the number of trains to 42 per day on the same trackage. See id.
172. See Stephens, supra note 170, at 45. (indicating that when the automobile industry, a significant rail shipper, faced competitive pressure, it began using just-in-time delivery to avoid costs associated with pre-production, on-site storage or materials).
173. See id.
174. Id.
manding standard upon the nations’ railroads. Precise scheduling and movement of time sensitive shipments, therefore, play a large role in the railroads’ ability to operate profitably and efficiently.

The increased rate of grade crossing accidents, boosted by municipal whistle bans, pose a significant threat to railroads economic viability in terms of their capacity to make just-in-time deliveries. Vehicle-train accidents inevitably disturb scheduled railroad operations. In many cases, grade crossing accidents result in costly derailments. A 1995 collision between a sixteen car train and a truck stopped on a highway grade crossing resulted in the derailment of two locomotives and fourteen cars. De­rrailments, in turn, can result in astronomical costs and delays for the rail­roads. In a 1997 derailment at Kelso, CA, a Union Pacific freight train derailed sixty-eight cars and several locomotives. In addition to nearly three million dollars of damage to equipment, the derailment wrecked havoc on Union Pacific’s physical plant. The accident damaged both the track infrastructure and signal system, severely curtailing railroad op­erations in the area. In the case of a derailment, railroads cannot meet customer demand as trains carrying time sensitive goods must often wait for damaged track to be repaired. With regard to large customers, such as automobile manufacturers, delayed shipments undercut efficient pro­duction. Unable to provide just-in-time delivery, railroads risk losing lucrative shipping contracts. Large manufacturing corporations, devoid of raw materials, must shut down their production facilities and lose sub­stantial profits. Similar costs and losses trickle down to the market con­sumer. To remain competitive, producers must pass on additional costs to consumers.

175. See id.
176. See id. (describing a scenario where Norfolk Southern railroad “lost the battle for time sensitive auto traffic by shoving hi-cubes [boxcars] through every yard in route and showing up late at the customer’s door.” The railroads failures translated into lost earnings at the expense of trucks who captured the market for movement of the time sensitive traffic.).
179. See id.
180. See id. (stating that the derailment caused 536,000 dollars of damage to track and signal equipment).
181. See Stephens, supra note 170 (referring to statements made concerning the time sensitive nature of auto shipments).
IV. THE PERILS OF CURRENT RAILROAD NUISANCE JURISPRUDENCE

A PRACTICAL EXAMPLE OF MUNICIPAL USE OF NUISANCE LAW TO REGULATE RAILROADS

In refusing to acknowledge all direct and indirect costs associated with regulation of obnoxious railroad uses, the courts’ current nuisance jurisprudence invites unfounded litigation against the railroads. A recent action brought by a New Jersey municipality against the New York Susquehanna and Western Railway (“NYSW”) demonstrates the incentives created by a pro-plaintiff analytical framework for railroad nuisance jurisprudence.

The dispute between the Borough of Riverdale and the railroad arose when Pequannock, a neighboring township, agreed to host a truck-to-rail transfer facility for the shipment of thorium-tainted soil from a nearby Superfund cleanup site. The transfer facility, built on NYSW property, would allow the railroad to load cars of the contaminated soil for transportation out of state. The borough of Riverdale, arguing that the rail transfer station presented a health threat to the region, sought an injunction from a local superior court judge.

The suit filed by the Borough of Riverdale represents a substantial expansion of current railroad nuisance jurisprudence. The potential nuisance, the loading facility, was located, not in Riverdale, but in the neighboring town of Pequannock. Riverdale sought injunctive relief, therefore, on the basis that “[r]ail cars carrying thorium-laced soil would pass through Riverdale en route from the depot in Pequannock to Utah.” Although Superior Court Judge Reginald Stanton denied the town’s request for an injunction, the judge ordered a trial and the railroad ceased operations at the transfer facility for the foreseeable future.

Despite Riverdale’s failure to obtain injunctive relief, the municipality effectively gained its desired result in prohibiting shipments from

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182. See, e.g., Jenkins v. CSX Transp. Inc. 906 S.W.2d 460, 462 (Tenn. Ct. App. 1995). A homeowner living adjacent to a rail yard filed suit against the railroad alleging that he suffered an allergic condition from the fumes of creosote soaked ties that the railroad transported through its yard. See id. The court entered summary judgment in favor of the railroad finding that carrier owed no duty of care to neighbors concerning the ordinary movement of creosoted ties. See id.


184. See id.

185. See id.

186. See id.

187. See id.

188. Id.

Riverdale's actions raise fundamental questions regarding the reach of railroad nuisance jurisprudence. Can towns and cities sharing land with railroad rights-of-way survey the cargo of passing trains and object to shipments simply passing through their borders? Can municipalities seek judicial relief from railroad activities that might, but have not yet, threatened citizens health and safety? Affirmative responses to either of the queries, as the Borough of Riverdale would favor, represent a substantial failure in calculation of both the railroad and public's interest in the implicit balance of equities underlying nuisance law.

The Borough of Riverdale's claims against the NYSW embody the flaws inherent in current railroad nuisance jurisprudence. Although Riverdale lost its action for injunctive relief against NYSW, the Borough gained its desired result of closing operations at the transfer facility.\textsuperscript{191} The Riverdale case, and the circuit courts' holdings in \textit{Southern Pac. Transp. Co} and \textit{Civil City of South Bend}, create dangerous incentives for litigious parties interested in curbing railroad uses.\textsuperscript{192} In failing to consider all direct and indirect costs associated with regulation of railroad uses through nuisance law, courts generate sub-optimal outcomes in terms of the public good.\textsuperscript{193} The results in each of the cases; the curbing of an obnoxious use, invites additional litigation to regulate railroads through more aggressive measures.\textsuperscript{194}

\section*{V. Conclusion}

Contemporary railroad nuisance jurisprudence, although consistent with traditional nuisance law in balancing costs and benefits in attempting to produce efficient outcomes, fails to safeguard the public good. From a practical standpoint, judicial findings regarding railroad nuisance law often disregard the needs of the interstate rail carrier in favor of those of the individual homeowner. This disposition causes a misallocation of

\begin{footnotes}
\footnote{190. \textit{See id.}}
\footnote{191. \textit{See id.} (explaining that the railroad could no longer operate the facility because, in anticipation of the ordered trial, it required the necessary state and federal agency approval to run the site).}
\footnote{192. \textit{See Southern Pac. Transp. Co. v. Public Util. Comm'n}, 9 F.3d 807 (9th Cir. 1993) (finding for local homeowners in upholding railroad whistle bans); \textit{see also}, \textit{Civil City of S. Bend v. Consolidated Rail Corp.}, 880 F. Supp. 595 (N.D. Ind. 1995) (reaching the same result with regard to whistle bans in recognizing local whistle regulations in \textit{Civil City of South Bend, Indiana}).}
\footnote{193. \textit{See discussion infra Part III.C. This portion of the Note addresses the social costs often ignored by the courts in assessing benefits and burdens in railroad nuisance jurisprudence. See \textit{id}. Because the courts fail to consider all costs related to regulation of railroad uses, they often impose unintended burdens upon the public at large. \textit{See id.}}
\footnote{194. \textit{See Dumenigo, supra} note 189 (explaining how Riverdale seeks to regulate the type of cargo that may pass through that town on an interstate rail network).}
\end{footnotes}
costs and benefits associated with obnoxious railroad uses and under-
mines a utilitarian notion of the public good.

The courts should consider indirect effects, such as derailments and
economic loss in determining the public good. By upholding municipal
whistle bans, for example, the courts implicitly condone the higher acci-
dent rate resulting from the bans themselves. The increased frequency of
train-vehicle accidents, in turn, translates into enormous social costs that
detract from a utilitarian conception of the public good. Accidents and
derailments, for example, have substantial effects upon operation of
many of the nation’s industries.195 Such inefficiencies contribute to
higher costs eventually realized by the general public.

By considering indirect costs and benefits associated with obnoxious
uses, courts can more completely capture the public good in utilitarian
terms. Although an analytical framework focused on utilitarian notions
of the good seems to mandate resolution of all nuisance claims in favor of
the railroads, the ultimate ends of the test remain the product of judicial
discretion. This Note suggests however, that the means to this discretion-
ary end require serious expansion to capture notions of the public good
underlying nuisance jurisprudence. With regard to railroad nuisances,
Courts should consider the widespread practical costs associated with reg-
ulation of specific railroad uses. Judicial failure to take into account the
complete costs of curtailing railroad operations sets a dangerous preced-
ent concerning the public good.196 Until the courts begin to adjudicate
railroad nuisance claims in light of a broader, utilitarian notion of the
public good, they inadvertently create social costs in myriad forms.

195. See Stephens supra note 170 (discussing the time sensitive nature of automobile parts
and the affects of delay shipments on the railroad industry).
196. See discussion infra Part IV.
Flying Hospitals: Coffee, Tea or Defibrillation?

David Glynn*

INTRODUCTION

Recently, the public is focusing an increasing amount of attention on the problem of addressing medical emergencies that occur during commercial air flights. While only one in 58,000 airline passengers experience an in-flight medical emergency,¹ the topic has commanded significant interest on the part of the airlines, the flying public and the Federal Aviation Administration ("FAA"). The issue of how much medical service must be provided by a common air carrier is currently being evaluated by the FAA, under the direction of the Aviation Medical Assistance Act of 1998 ("Act").² Interestingly, however, carriers are not waiting for new federal regulations and are instead taking voluntary action to improve aircraft medical kits and emergency services. Such actions, while outwardly appearing merely to fill a gap between current in-flight emergency medical procedures and recent health care technological improvements, may expose carriers to increased liability and a higher duty of care to passengers intended to benefit from these changes. This article will discuss the impact of efforts to expand aircraft medical kits and the potential legal impacts carriers may face as they move toward providing medical


¹ See Jane Costello, U.S. Airlines Step Up Emergency Medical Care, WALL ST. J., Aug. 16, 1999, at B7A.

services previously reserved only for trained personnel firmly planted on the ground.

THE PROBLEM: SERIOUS AS A HEART ATTACK

While the overall percentage of persons requiring medical attention in-flight is low, cardiac emergencies present a particular problem for airlines. Due to the seriousness and time sensitivity of the health threat, more than a third of diverted flights are due to cardiac emergencies. A cardiac emergency involving ventricular fibrillation, or the condition that results when someone's heartbeat goes out of sync, requires immediate medical treatment. Automatic external defibrillators ("AEDs"), portable devices that deliver external shock, electrically stimulate the heart and restore normal rhythm. In addition to AEDs, airlines are upgrading onboard medical kits to include prescription drugs which provide the necessary follow-up care to stabilize the patient until hospital treatment is available and to avoid diverting the flight.

DEFIBRILLATION – A PANACEA, BUT ONLY ONE ELEMENT OF THE SOLUTION

While the cost and ease of use of defibrillators has improved to the point of making the devices capable of being standard equipment in aircraft medical kits, the requirement for administration of prescription drugs after the defibrillation may subject the passenger/patient to incomplete care and the airline to potential wrongful death lawsuits. Flight attendants are trained to operate defibrillators, but federal law prohibits them from administering controlled substances. In the absence of a licensed medical professional on board the flight that is willing to render assistance, treatment may stop at defibrillation. In such a time sensitive, life-threatening situation, the airline's undertaking to provide help that may not completely improve the passenger's chance of survival is legally risky. In response, airlines have addressed the need for professional medical guidance in emergencies by either contracting with hospitals or companies that provide 24-hour radio link to emergency room physicians or maintaining "on call" doctors on staff.

5. See id.
6. See id. at 511.
7. See id. at 512.
One solution for carriers in lieu of maintaining doctors on staff is outsourcing to firms specializing in providing these services. For example, MedAire, a Phoenix-based company provides 24-hour hotline service for 21 commercial airlines. Using satellite phone systems or high-frequency radios, doctors on the ground consult with pilots, flight attendants, and sometimes passengers, who may be anywhere in the world and cruising at 37,000 feet. The process has proved effective, as MedAire estimates that three-quarters of the time a doctor, nurse or medically trained passenger is on board, but regardless, the company’s liability insurance covers anyone who volunteers.

SAVEING LIVES IN THE SKY - AIRLINES VOLUNTARILY IMPROVE IN-FLIGHT MEDICAL SERVICES

Airlines seem to be quite proud of their efforts to expand in-flight emergency medical services. American Airlines (“American”) calls the company’s defibrillation efforts “enormously satisfying” and cites a survival rate of 50 percent (seven successes out of fourteen attempts). American flight attendants who have used a defibrillator to save a passenger’s life wear a special gold pin on their uniforms signifying their heroic achievements. The airline has even brought three of the seven survivors to their training center to speak to new flight attendants. This public advancement of the benefits of enhancing in-flight medical services appears to have created a de facto industry standard requiring defibrillators on all aircraft; however, passengers must be reminded that as yet, neither Congress nor the FAA has enacted any federal regulation mandating these devices on commercial aircraft. Airlines clearly have felt the pressure to comply with this self-imposed standard in lieu of potential regulation.

Less than a month after being sued by the spouse of a passenger who died of cardiac arrest aboard a 1995 United Airlines (“United”) flight, the giant U.S. carrier announced plans to join American and Delta Air Lines by equipping all of its aircraft with defibrillators and enhanced medical kits. Likewise, after a $10 million negligence lawsuit filed by the wife of a Florida man who died of a heart attack on a May 18, 1996 flight, Continental Airlines retreated on its statement that aircraft are not

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10. See id.
11. See id.
12. See Crewdson, supra note 8.
13. See id.
15. See Crewdson, supra note 8.
16. See id.
“flying ambulances”17 and announced it will equip its entire fleet of 361 jet aircraft with defibrillators.18 Public pressure, therefore, is forcing the major carriers to take voluntary action and make pending FAA regulations irrelevant.

ENHANCED MEDICAL KITS WITH DEFIBRILLATORS MAKE GOOD BUSINESS SENSE

In addition to an airline’s need to remain competitive in the industry, other factors support the addition of defibrillators in aircraft medical kits. In the absence of sufficient on board medical aid, a pilot must decide whether an emergency landing is required. In “1996, U.S. carriers diverted 557 flights for medical emergencies, nearly a third of those for cardiovascular problems.”19 These endeavors, in the case of cardiac arrest, are successful only if accomplished expeditiously. Medical experts estimate that with each passing minute of a sudden cardiac arrest, the chances of survival decrease ten percent and the window of opportunity is said to be less than ten minutes.20 Adding to the potential futility of making such a diversion, emergency landings can prove very costly to the airline. In 1995, a United 747 flight from Argentina to Miami returned to Buenos Aires shortly after takeoff because a passenger suffered an asthma attack. Before landing, the plane was forced to dump 100,000 pounds of jet fuel and upon refueling, was delayed on the ground overnight due to fog and flight crew work rule restrictions.21 Obviously the addition of enhanced medical kits can readily be cost justified in such circumstances, but what type of liability are the airlines opening themselves up to by voluntarily providing advanced medical equipment and prescription drugs for use by employees lacking formal medical training or licenses?

CARRIER LIABILITY – A DE FACTO STANDARD MAY BE RAISING THE BAR

Generally, an airline must exercise reasonable care when facing an in-flight medical emergency. If an airline acts without negligence in administering care to a passenger, it will be free of liability.22 The Act pro-

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20. See Buffington, supra note 4, at 505.
22. See Buffington, supra note 4, at 526.
vides an even lower standard by holding a carrier not liable if it performs by obtaining or attempts to obtain medical assistance. Further, the legislation relieves a medically qualified volunteer passenger of liability in the absence of gross negligence or willful misconduct. However, while every state and the District of Columbia have so called “Good Samaritan” laws which provide legal protection to health professionals offering aid during medical emergencies on the ground, these laws do not apply in the air. The lack of a federal “Good Samaritan” law may still expose in-flight medical volunteers to civil litigation despite absence of negligence, but to date, plaintiffs have targeted airlines, not passenger-volunteers, for legal recourse.

Most courts tend to side with the airline if it fulfills its basic duty of care to the passenger. This conclusion may be explained in light of the duty owed by a common carrier. The Restatement (Second) of Torts holds that the special relation of common carriers gives rise to a duty to take reasonable action to protect passengers against unreasonable risk of physical harm and to give first aid after having reason to know the passenger is ill or injured. The court in Gingeleskie v. Westin Hotel Co. applied this standard of care in deciding that an innkeeper was liable for the death of a guest being transported to a hospital in the hotel’s shuttle bus after the guest became ill because the hotel failed to take reasonable steps to care for the man once having knowledge of his illness. This holding implies that “reasonable action” during airline in-flight medical emergencies might include providing enhanced medical kits, if this truly is an industry standard, and failure to equip aircraft with defibrillators might be interpreted as a failure to perform reasonably.

However, in Green v. American Airlines, Inc., a passenger sued the airline for negligence claiming American failed to provide adequate medical care when he suffered a stroke on a flight from Honolulu to Dallas. The plaintiff suffered permanent injury as a result of the stroke. Flight attendants provided some assistance to the passenger, but the flight continued and landed as scheduled in Dallas approximately three hours after Green became ill. The Eight Circuit upheld the district court ruling in finding the carrier not negligent in providing medical assistance.

Likewise, in McDowell v. Continental Airlines, Inc., a passenger suf-

24. See id.
28. See Buffington, supra note 4, at 529.
30. See id.
fered a fatal heart attack on a flight from Newark to Nassau, Bahamas. Despite the fact that both a cardiovascular surgeon and a nurse (passengers on the plane) volunteered emergency medical care, the man died soon after arriving at a hospital in Nassau. The airline medical kit lacked a defibrillator and related supplies. The district court held the airline was not negligent in maintaining an on-board medical kit that complied with FAA regulations, although the kit was inadequate for treating a heart attack victim in-flight. These cases illustrate the courts apparent reluctance to impose upon airlines any liability beyond FAA-mandated requirements, yet the industry has gradually taken steps to improve in-flight medical services despite the absence of a federal requirement to do so.

**DOES "REASONABLE CARE" REQUIRE "FLYING HOSPITALS"?**

Some airlines have already acknowledged a duty to provide defibrillators on board, as these devices are generally accepted in the industry as appropriate, and that there is a liability associated with this duty. Based on case law, this approach seems justified, since carriers adopting the use of defibrillators have not been saddled with any greater duty than that created by the common carrier special relation. However, an airline is subject to liability for failure to perform, in the absence of use of reasonable care.

Uncertainty as to what constitutes reasonable in-flight medical care has airlines asking themselves how far they must go in turning aircraft into flying hospitals. Medical experts have cautioned restraint. Myron L. Weisfeldt, former president of the American Heart Association and Chairman of the Department of Medicine at Columbia University, has said, "We’ll quickly get to where every aircraft is like a coronary-care unit, and that’s ridiculous." Airlines must, however, consider both changing demographic trends and medical equipment advances when establishing their in-flight care policies to meet the subjective "reasonable care" standard used by the courts.

Despite highly publicized airline accidents, statistics show that passengers are more likely to die because of an in-flight illness than an aircraft accident. Over the last three years, only a dozen passengers have died in the U.S. in accidents aboard major scheduled airlines, while at least 300 people may have died of cardiac arrest or other acute illnesses over the same time period. This trend is attributable to several factors,

32. See Brannigan, supra note 19.
33. See Buffington, supra note 4, at 533.
34. Brannigan, supra note 19.
35. See Crewdson, supra note 8.
36. See id.
including an aging population and the growing number of passengers that have chronic medical conditions. Such facts may evidence a carrier's actual notice of the likelihood of encountering life-threatening emergencies in-flight and lead to a duty to include enhanced medical care to meet a reasonableness standard.

**Facing the Inevitable - Defibrillators Are No Longer Just for Hospitals**

In addition to clear evidence of the growing demand for in-flight medical services, a carrier's financial burden associated with enhancing medical kits beyond FAA-mandated standards is progressively minimized through advances in technology and medicine. For example, portable defibrillators have become cheaper and easier to use. Defibrillators are currently available for $2000 to $3000, plus flight crew training expenses. The devices are so technologically advanced that they have been called "idiot-proof," coaching the user through voice and visual prompts, and leading manufacturer's to argue that "harmful effects" are unlikely.

The increasing popularity of defibrillators outside the airline industry adds to the assertion that making these devices available in public places is reasonable under the circumstances. Portable defibrillators are now finding their way into such diverse venues as casinos, manufacturing facilities, offices and even briefcases. While most purchasers of these devices are commercial users, a quarter of the approximately 50,000 defibrillators sold to date are purchased by individuals. In addition, Congress is considering a bill, the Cardiac Arrest Survival Act, which would direct the Secretary of Health and Human Services to promote placement of defibrillators in all federal buildings along with training for their use. In light of these trends, airlines can no longer deny an evolving reality that defibrillators are “reasonable” equipment for an in-flight medical kit and failure to include the devices may be interpreted as a failure to meet a common carrier due care standard.

**Conclusion**

Recent airline efforts to voluntarily enhance in-flight medical kits in the absence of regulations requiring them to do so appear to have not

37. See Costello, supra note 1.
38. See id.
39. See Buffington, supra note 4, at 515.
41. See Deb Kiner, Newport Schools Ponder Purchase, District Could be 1st to Own Life-Saving Devices, Harrisburg (PA) Patriot & Evening News, Nov. 2, 1999, at W01.
increased the carrier's liability to passengers who experience a sudden health emergency while traveling with an airline. Conversely, the growing popularity and affordability of portable defibrillators has increasingly led to an acceptance of such devices as a required standard component of in-flight medical kits as opposed to a complex, technical device usable only by trained medical professionals.

This growing understanding by both the public and government bodies may be establishing a higher threshold for an air carrier's standard of care toward its passengers. This higher standard of care is leading to the conclusion that the absence of defibrillators in commercial aircraft is a breach of the carrier's duty and fails to meet a "reasonable" care level under the circumstances. Hence, in the absence of voluntary medical kit enhancements, airlines may in fact be subject to increased liability to passengers requiring cardiac treatment in flight. Until the FAA completes its investigation pursuant to the Act and promulgates new regulations mandating enhanced aircraft medical kits, carriers must evaluate the costs/benefits of adding defibrillators compare to the associated risks. Certainly nothing on the horizon justifies an airline attempting to turn its aircraft into flying hospitals, but placement of defibrillators and associated drugs on commercial planes is inevitable. Unfortunately, such a consumer-positive approach by airline companies may not accomplish the implied goal of reducing in-flight deaths if required follow-up medical care cannot be administered for lack of a licensed "Good Samaritan" passenger volunteer. Could this be the next litigation exposure for the airlines, once again probing the need to examine the concept of in-flight hospitals? Time will tell.
The National Transportation Safety Board: How Should They Conduct Witness Investigations—The Need for a Privilege

Trowbridge Littleton*

INTRODUCTION

The primary function of the Board is to promote safety in transportation. The Board is responsible for the investigation, determination of facts, conditions, and circumstances and the cause or probable cause or causes of: all accidents . . . . The Board makes transportation safety recommendations to Federal, State, and local agencies and private organizations to reduce the likelihood of recurrences of transportation accidents.1

A DANGEROUS HYPOTHETICAL:

After leaving New York on a transatlantic flight bound for the Middle East, a Boeing 767 suddenly plunges towards the Earth from an altitude of 35,000 feet. Within a matter of minutes, the passenger jetliner has disappeared from the radar screens for no apparent reason, claiming the lives of the 200 people onboard. The National Transportation Safety Board (“NTSB”) swings into immediate action. Their mission: to deter-

* Trowbridge M. Littleton will receive his JD degree in May of 2000 from the T.C. Williams School of Law at the University of Richmond in Virginia. Originally from Middleburg Virginia, Mr. Littleton attended Radford University where he received his Bachelor of Science degree in both History and Political Science.

1. 49 C.F.R. § 800.3(a) (1998).

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mine the cause of the accident and to try and prevent future mishaps from occurring. The NTSB quickly arrives at the crash site to begin answering these two questions. Witness interviews are an integral and necessary part of that investigation. Within days of the crash NTSB investigators begin conducting interviews of the hundreds of people involved with the operations, maintenance, repair, and care of the aircraft. One of these witnesses, John Smith, is a mechanic responsible for the hydraulic systems on the 767. On the day of the accident, because he had been drinking on the job, John Smith had forgotten to perform the routine safety inspection of the hydraulic system in the 767 prior to takeoff. Because of this, the pressure was low and after thirty minutes of flight, the controls became non-responsive, ultimately resulting to the crash. The day before he is interviewed by the NTSB investigator, John reads an article in the New York Times about the 1996 crash of ValuJet Flight 592. The article details how the local prosecutor has charged the cargo loaders with manslaughter. It goes on to say that the primary evidence against the defendants is their own statements to NTSB investigators in which they state that they did not properly store and prepare the oxygen generators for flight. The next day John is asked to speak informally with the NTSB investigator.

One year later, the NTSB issues the final report concerning the Boeing 767 accident. Because of the lack of physical evidence and no other evidence to support any alternate theories as to the cause, the NTSB makes the determination that the crash must have been due to pilot error and no safety recommendations can be made.

Overview

The NTSB was created with the purpose of investigating accidents, determining the cause of those accidents, making safety recommendations and allowing the public access to the results of those investigations. One of the most important aspects of that investigation is the witness statements form all sources: the crew, the mechanics, passengers and even the bystanders. How should those statements be treated? Should they be protected from disclosure to the legal system? What will be the effect to accident investigations by the NTSB if witness statements are released? Does any other investigatory body do something different? Keep these questions in mind. By the conclusion it will be clear that the NTSB needs to make some changes.

The National Transportation Safety Board (“NTSB”)

The primary function of the NTSB is clear. It is the main federal authority which investigates and collects facts on all transportation acci-
idents in the United States. From this investigation, the NTSB is required to analyze and determine the probable cause of the accident. After the accident investigation is completed, the NTSB is charged with the responsibility of creating and publishing recommendations which will reduce the risk of future accidents from similar causes. This is done through cooperation with Federal, State and private organizations.

[I]t is the policy of the Board to make information available to the public to the greatest extent possible. Accordingly, all records of the Board ... are declared to be available for public inspection and copying, as provided in this part. Records are to be made available to the public promptly and to the fullest extent [possible].²

HISTORY OF THE NTSB

Since the beginnings of air travel in the United States, Congress has in one form or another had a Federal Agency responsible for the investigation of aircraft accidents. While the NTSB today is responsible for all transportation safety, in the beginning the only focus was towards air travel safety regulation. This can be traced back to the Air Commerce Act of 1926.³ The Act required the Secretary of Air Commerce “[t]o investigate, record, and make public the causes of accidents in civil air navigation in the United States.”⁴

In 1934, with the rapid growth of the air industry, and trans-continental and trans-Atlantic flights, Congress authorized the Secretary of Air Commerce to hold hearings, conduct official investigations, subpoena witnesses and compel cooperation. The form of the Air Commerce Agency began to take real shape.⁵

The first true accident panel was initiated by the Secretary in 1937. The panel consisted of five members and they were in charge, under the ultimate supervision of the Secretary, of accident investigation. Three members were chosen from the Department of Commerce, while the remaining two were experts chosen for their expertise.⁶ In its most rudimentary form, this is the basic structure of the NTSB as we know it today.

This panel was formalized, in 1940, into the Civil Aeronautics Board (“CAB”), and by 1958 it came under the newly created Federal Aviation Administration (“FAA”).⁷ The purpose of the CAB was now clearly de-

⁴. Id. at 569.
⁶. 14 C.F.R. § 91.20 (1938).
fined - prevent transportation accidents by finding the causes of previous accidents.  

By 1966, the CAB was transformed into the NTSB, as a division under the Department of Transportation. This did nothing to change to relationships between the NTSB and other federal agencies. Then, in 1974, the NTSB became its own separate agency, created by the Independent Safety Board Act of 1974. This was done to avoid any potential conflicts of interests between the NTSB and the FAA, which was clearly needed because the NTSB was increasingly investigating the FAA. While the structure of the NTSB has been slightly modified over the years, for the most part it has essentially remained the same since the 1974 Act.

**NTSB Accident/Witness Investigation**

This portion of this essay will concentrate on the specifics of how the NTSB conducts an investigation, how witness statements are treated, the ultimate admissibility of NTSB witness statements taken by investigators into court and what affect this will have on aircraft investigations in light of the 1996 ValuJet crash and subsequent criminal prosecutions.

Like most administrative agencies of the federal government, the NTSB follows a strict outline for the investigation of aircraft (and other transportation) accidents. The Code of Federal Regulations at Title 49 provides, in general language, how an investigation is to proceed. By no means, however, does it contain any specifics.

As a result of this lack of guidance, the NTSB has adopted a specific manual for guidance. The Airline Pilots Association International ("ALPA"), in cooperation with the NTSB and the Canadian Transportation Board ("Canadian TSB"), has developed the Accident Investigation Handbook. This serves as the primary source for specifics of how an aircraft investigation is conducted. While there are certain differences depending on the circumstances of the accident, the following is the basic structure of an investigation.

Immediately after a major accident, a member of the Board (one of

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8. *Id.* (stating that the purpose of the CAB is "to make recommendations to the FAA Administrator that . . . would tend to prevent similar accidents in the future.").
11. *Id.*
13. *See Id.; see also 49 C.F.R. § 831.4 (1998)* (describing the authority of the NTSB and specifically stating that the NTSB is outside the requirements of the Administrative Procedure Act because there are no adverse parties, and the investigation is not used to determined the rights of any parties).
five appointees) travels to the scene. An investigator in charge ("IIC") is then appointed by the member to head the investigation, and he has complete authority to conduct of the investigation. Following an organizational meeting, a determination is made as to what specific investigation groups will be needed and the Groups Chairmen are selected by the IIC. These Groups are responsible for a specific factor or issue in the accident, such as weather, maintenance or operations. Like the IIC, these Group Chairmen have almost complete authority to conduct their portion of the investigation as needed. During this organizational meeting, other interested parties can petition to be included and participate in the investigation. This is completely at the discretion of the IIC, and that party must bring some expertise to the investigations. As an example, usually the aircraft manufacturer will be included along with the FAA. These groups will then conduct the field investigation which involves photographic evidence, witness interviews, collecting of wreckage and a complete survey of the scene among other things.

After the field investigation is completed, the investigators return to their home office and put all of their observations and findings into document form. First, the Field Notes are created, which contains all of the witness statements notes of every witness investigation. This report then becomes part of the Factual Report which also contains the remaining factual observations and discoveries made by the investigators. After this has been reviewed and agreed to by the investigators, and the Group Chairmen give their assessment as to the cause of the accident. The IIC then reviews the Factual Report, and uses it to make his Final Report, which ultimately contains probable cause information and recommendations for the "Sunshine counsel" (a formal last review stage before release to the public). Once approved, this report becomes the Blue Cover Report which is then released to the public and makes safety recommendations. The purpose of the NTSB is to determine the cause of accidents, and make recommendations for prevention. The NTSB has no enforcement ability with its findings, it cannot mandate changes, impose fine or penalties, revoke or suspend any licensing of any kind nor even compel the FAA to act or promote air safety regulations as simple as installation of smoke detectors. Its only function is to recommend.

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16. Id.
17. Id.
19. See Weston Interview, supra note 15; see also 49 C.F.R. § 800.3(a) (1998) (stating the primary purpose of the Board is to promote transportation safety).
How does the NTSB interview witnesses? Before examining this questions it is important to understand the context of the interview. As mentioned above, the NTSB is a purely information gathering and reporting agency. The NTSB has absolutely no criminal or civil enforcement power beyond issuing subpoenas, and the interviews are conducted and run by the Groups Chairmen or their designee. Like the guidelines from Congress, the ALPA Accident Investigation Handbook has no specific format that must be followed for taking witness statements.\textsuperscript{20} As such, the investigator has almost complete discretion in running the interview, and it varies from investigator to investigator. Some conduct the interviews in a deposition format, with sworn statements and recorders.\textsuperscript{21} However most prefer to do it in a very casual "from the hip" manner.\textsuperscript{22} The investigator asks all of the questions, and can then open the questions to any other parties present at the interview. At any time, the NTSB investigator may stop the questioning or exclude any other party.\textsuperscript{23} Interviewees have two rights during the interview. First, they may be accompanied by one individual, either legal counsel or a non-legal representative (such as a wife).\textsuperscript{24} This representative may not interfere with the interview with the exception of telling the witness not to answer or asking to speak with them alone. Secondly, the witness may have any party excluded from the interview except the NTSB investigator.\textsuperscript{25} Additionally, in situations where witnesses are uncooperative or not forthcoming, the Safety Board has authority to "issue a subpoena, enforceable in Federal District Court, to obtain testimony or other evidence."\textsuperscript{26} In practice, the Group Chairmen have unlimited subpoena power to use at their discretion, which can be enforced in federal court through a contempt of court order. At no time is there any offer to keep witness statements confidential, nor is there any authority which allows confidentiality of those statements.\textsuperscript{27} It is clear that the NTSB has wide authority to conduct witness investigations as it sees fit, with the power to compel testi-

\textsuperscript{20} See ALPA HANDBOOK, supra note 12; see also 49 C.F.R. § 831.9 (1998).
\textsuperscript{21} It important to note here, that the sworn deposition style is true to the definition. However, there is no Fifth Amendment privilege or Miranda style warnings required. This stems from the fact that there is no criminal investigatory purpose to a safety investigation, and the NTSB has no authority to act beyond making safety recommendations.
\textsuperscript{22} See Weston Interview, supra note 15.
\textsuperscript{23} Id.
\textsuperscript{24} 49 C.F.R. § 831.7 (1998).
\textsuperscript{25} See Weston Interview, supra note 15.
\textsuperscript{26} 49 C.F.R. § 831.9(a) (1998).
\textsuperscript{27} The ALPA Handbook contains the format for both the NTSB and the Canadian TSB, and notes the differences in the two organizations. See ALPA HANDBOOK, supra note 12. It states that witness statements taken by the Canadian TSB are considered privileged, and are not discoverable or admissible in a legal proceeding. Id. This approach is taken because it is believed that without such a privilege, witnesses would not be forthcoming.
mony, while offering only a minimal amount of protection to the witnesses themselves. Ultimately, does this reduce the integrity of the safety investigation? We will examine this next.

What is the admissibility of NTSB documents and witness statements in both civil and criminal court? We will examine these both in turn. After an aircraft accident there is a civil trial for damages. In most cases these suits are brought many months if not years after the accident has occurred. In an effort to obtain the best information available on the accident, litigants routinely move, under the Freedom of Information Act, to get the reports of the NTSB.28

In realizing this, Congress enacted legislation to make this process easy on the public, noting that in many cases the NTSB is going to be the only source of critical information gathered shortly after the investigation.29 However, Congress also realized the enormous strain this would put on the NTSB's ability to perform its function. As a result, a balance was struck. In civil trial, NTSB investigators are prohibited from testifying in court. The parties may contact the NTSB and depose the investigator in an adverse setting once.30 That deposition is then available for use at trial. The investigator is allowed to refer to his notes and the factual report during the deposition. Any subpoena issued to an investigator is immediately quashed.31 Additionally, in most circumstance, the Factual Report (which contains the Field Notes) is admissible at trial under the public documents exception to the hearsay rule.32 While this process is somewhat laborious, civil litigants do have access to the Factual Report and the ability to have witness statements admitted at trial through the deposition of the investigator. Criminal trials, however, are treated much differently.

The set of rules which exist for the use of witness statements during a civil trial are virtually done away with in the context of a criminal trial. Investigators are permitted to testify in State or local grand jury hearings or criminal proceedings.33 There is no restriction on availability, nor are

32. See 49 C.F.R. § 835.4(a) (1998); see also FED. R. EVID. 803(8); 49 C.F.R. § 835.3(b) (1998) (allowing the investigator to testify as to his factual observations and what people said but restricting him from giving any opinion as to the causes of the accident); Ritts v. American Overseas Airlines, Inc., 97 F. Supp. 457, 458 (S.D.N.Y. 1947) (stating that the factual findings and witness accounts were admissible but the opinions and conclusions were not).
33. 49 C.F.R. § 835.9 (1998) (noting that the testimony is restricted to factual findings as defined by § 835.3).
Florida State prosecution of the SabreTech mechanics responsible for the improper storage of the oxygen generators.

The 1996 crash of ValuJet flight 592 was a national tragedy. As always, the NTSB was the primary investigative body for determining the cause of the accident. Ultimately, it was determined that the crash was caused by the explosion of oxygen generators (air canisters which provide oxygen to face mask if a plane loses cabin pressure) stored in the cargo hold of the plane. When being shipped, these canisters must have a safety cap to keep them from exploding. SabreTech, the subcontractor responsible for cargo handling, had documented that the caps were installed on all of the canisters. This, however was not the fact. As the NTSB conducted its investigation, it began to interview everyone with relevant information towards the cause of the accident, issuing subpoenas where necessary. Within a few days of the accident, Mauro Valenzuela was interviewed informally by the NTSB. Mr. Valenzuela was a mechanic who was responsible, in part, for making sure the safety caps were installed. In his maintenance reports he indicated that he had followed that procedure. However, during his interview, he stated that he had not installed the caps and had falsified the records. From these statements to the NTSB stem the entire basis of the criminal charges for manslaughter against all three mechanics (including Danny Gonzalez and Eugene Florence) and SabreTech as a corporation. If convicted, there could be a potential ten to fifteen year prison sentence for each of the three men.

What effect will this have on future accidents and the role of the NTSB? The answer is clear. Those who work in the transportation industry, not just the airline industry, will be increasingly reluctant to be forthcoming and frank with NTSB investigators who are investigating accidents. There will be a chilling effect - workers will fear that what they say may put someone they know into jail, or even worse, themselves. Indeed, in some circumstances already, individuals being interviewed get “selective amnesia” and tend to forget certain key facts, or omit important details. Regardless of whether there is a conviction, this amnesia will only increase as the awareness of the use of statements to investigators increases in court.

While it is important for the causes of accidents to be released to the public, should there be a line drawn to protect the integrity of the accident investigation itself, which leads to determining the cause. Can the recommendations be made without making available the witness state-

35. Id. When asked by the safety board investigator, “Did you install the cap?” Valenzuela said “No.” Even though he had written on the records that he had. Id.
36. See Weston Interview, supra note 15.
ments taken by the investigators? The answer to this question is only heightened by the fact that there are no procedural protections of witnesses. Statements are never sworn, no warning is ever issued, and there exists no Fifth Amendment protections as it is not a criminal proceeding and legal representation is mostly restricted.\(^{37}\) Does this help the NTSB conduct a full and complete investigation? No. Thus, there are two solutions to this problem: First, adopt all of the procedural guarantees mentioned above to protect the witnesses, and, second, put them on notice that what they say can be held against them in a court of law. Unfortunately, this would only serve to restrict witnesses even more. The best solution is to approach accident investigation statements in the way the United States military does, to keep all witness statements strictly confidential and forbid their use for any reason against them, whether in a civil, evaluation or criminal proceeding.

**The Concept of Privileged Witness Statements - The Military**

Like the NTSB, the United States Armed Forces have developed a program for the investigation of aircraft accidents. For the purposes of this article, I will look at several branches of the military and how they conduct accident investigations. However, it is important to note that every branch of the military follows the same procedures.\(^{38}\)

The military, in many circumstances, acts as its own autonomous legal entity. This autonomy also exists in military accident investigations. It is important to understand this process to understand the concept of privilege. Thus, what happens when a military aircraft crashes?

Whenever an aviation mishap occurs, two boards are convened, each with its own mission. The first of these boards is the Aviation Mishap Board ("AMB").\(^{39}\) The AMB consists of a senior member and at least four other members who represent different sections of the investigation. At the conclusion of its investigation, a Mishap Investigation Report ("MIR") is produced. The function of the AMB is clear: "[t]o preserve human and material resources."\(^{40}\) The AMB determines the cause of the accident in an attempt to prevent future re-occurrences and puts those findings into the MIR, much like the purpose and structure of the NTSB and the Blue Cover report.

At the same time, a separate Judge Advocate General ("JAG")

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37. U.S. Const. amend. V.

38. DEPARTMENTS OF THE AIR FORCE, ARMY, NAVY AND TRANSPORTATION, PARTICIPA-
TION IN A MILITARY OR CIVIL AIRCRAFT ACCIDENT SAFETY INVESTIGATION: SAFETY (1997).

39. Id.

40. Office of the Chief of Naval Operations Instruction, 3750.6Q, § 102 (Aug. 28, 1989) [hereinafter OPNAVINST].
Manual Investigation is initiated. The primary function of this investigation is to gather and preserve evidence for future legal proceedings, whether military, criminal or civil. Known as the JAG Manual Investigation, this investigation runs separately and simultaneously to the AMB investigation. The purpose of the JAG Manual Investigation is to “obtain and preserve all available evidence for use in claims, litigation, disciplinary action, and adverse administrative proceedings, and for all other purposes except for safety and accident prevention purposes.” Most notably, witnesses are sworn before giving their statements, and they are also advised of their rights, which does not occur with the AMB investigation.

The Aviation Mishap Board (“AMB”)

The AMB has a single concern; the prevention of future accidents. As a result, the AMB investigation is conducted differently from the JAG Manual Investigation. The most important difference between these two investigations concerns the methods used in interviewing witnesses and the uses made of statements by witnesses. With all AMB investigations, witness statements are solicited under a guarantee of confidentiality. Every witness is promised complete confidentiality. Individuals are never advised of their legal rights, nor do they ever give sworn statements to investigators. Additionally, their statements can never be used against them in any fashion, regardless of the circumstances. While the MIR will contain notes on these statements, it is important to realize that only the AMB has access to the complete report and the witness statements.

The rationale behind this “privilege” is clear, as stated by the Navy instruction manual, “[i]ndividuals may be reluctant to reveal information pertinent to a mishap because they believe certain uses of the information could be . . . detrimental to themselves.” The purpose behind the privilege is to encourage witnesses to reveal complete and candid information pertaining to a mishap. Thus, every investigator is required to advise each witness that his or her interview is privileged, and that statements will never be used against him or her in any fashion. This privilege,
however, would be worthless if it were not recognized by the courts.

JUDICIAL REVIEW OF THE PRIVILEGE

This privilege was first recognized by the courts in Machin v. Zuckert.\(^{50}\) In Machin, the sole survivor of a B-25 crash sought discovery of the Air Force equivalent to the Navy MIR. After being subpoenaed to compel discovery, the Secretary of the Air Force refused to turn over the MIR, stating that the information in the report had been obtained through the promise of confidentiality.\(^{51}\) The court found for the Secretary, holding "[w]e agree with the Government that when disclosure of investigative reports obtained in large part through promises of confidentiality would hamper the efficient operation of an important Government program . . . the reports should be considered privileged."\(^{52}\) In this decision, the court recognized an executive privilege with AMB witness statements. This privilege protected the witness statements and the opinions of the investigators from discovery for trial. The ultimate protection, however, was short lived. Three years after the Machin privilege was established, Congress enacted the Freedom of Information Act ("FOIA").\(^{53}\)

FOIA was enacted because Congress felt that the administrative agencies of the federal government were improperly withholding considerable amounts of information from the public which should have been disclosed and made generally available. Originally passed as an amendment to the Administrative Procedure Act, the 1974 amendment re-codified FOIA, making it applicable to all agencies of the government, including the military.\(^{54}\)

With FOIA now permanently in place, the doors for private litigants and civilian prosecutors to subpoena and use privileged witness statements from an MIR, which had been effectively closed by Machin, were now open again for review. Within one year of the FOIA amendments, the issue of investigation privilege was before the courts.

In Brockway v. Department of the Air Force, the court was faced with the identical request that had been denied in Machin.\(^{55}\) However, there

\(^{50}\) Machin v. Zuckert, 316 F.2d 336 (D.C. Cir. 1963).
\(^{51}\) See id. at 339.
\(^{52}\) Id.
\(^{53}\) FOIA was signed into law by President Johnson on July 4, 1966, and became effective exactly one year later. 5 U.S.C. § 552 (1994).
\(^{55}\) Brockway v. Department of the Air Force, 518 F.2d 1184 (8th Cir. 1975).
was a change. Unlike Machin, the plaintiff in Brockway was the father of
an officer killed in a plane crash, who requested that the court compel the
Air Force turn over the entire MIR, as was required by the FOIA. The
district court found this argument compelling, stating that the FOIA was
clear and agency documents were to be made available to the public. 56
The appellate court reversed the district court because of a FOIA
exemption. 57

FOIA has nine distinct exemptions to disclosing agency information
to the public. If the requested information meets the criteria of one of
the exemptions, it is then outside of FOIA. 58 Particularly, the court ex-
amined exemption five, which exempted “inter-agency or intra-agency
memoranda or letters which would not be available by law to a party
other than an agency in litigation with the agency.” 59

The court had two questions to decide: was this MIR an inter-agency
memorandum, and was it one which would not be available at law to a
party? The court found that the nature of the MIR was that of a memo-
randum, since it was created exclusively by and for the AMB. This was
within the memorandum meaning of FOIA. As to the second issue, the
court looked back to the decision in Machin which had recognized the
executive privilege for witness statements making them nondiscoverable,
stating, “there is authority indicating that an executive privilege exists jus-
tifying ‘by law’ the nondiscovery of these witness statements.” 60 From
this privilege, the court found that the statements would not be available
at law to a party. Thus, by using the privilege established by Machin, the
military was able defend the witness statements from a FOIA request.

This issue was again revisited in Cooper v. Department of the Navy. 61
In this case the family made a FOIA request for the MIR of a helicopter
-crash that killed their son. The court denied the FOIA request under
exemption five. The court further went on to state that

[i]to permit a breach of assurances of confidentiality given in order to obtain
answers to such questions as these may perhaps provide access to more in-
formation in that particular case, but common sense tells us that it will likely
also assure that in future cases such information will never see the light of
day and will be of use to no one. Logic argues, then, that in such a circum-
stance as the Aircraft Accident Safety Investigation, where promises of con-
fidentiality have been found helpful and perhaps essential to obtaining

56. See id. at 1187; see also 5 U.S.C. § 552 (1994).
57. See Brockway, 518 F.2d 1184.
59. 5 U.S.C. § 522(b)(5).
60. Brockway, 518 F.2d at 1192.
61. Cooper v. Department of the Navy, 558 F.2d 274 (5th Cir. 1977).
The plaintiff also argued that the factual observation of the safety investigators contained in the MIR were discoverable by FOIA. They stated that while the witness statements may have been given under a promise of confidentiality, the investigators were given no such promise. As a result, the plaintiffs requested a redacted version of the MIR. The court disagreed, and held that the MIR, in its entirety, was nondisclosable and exempt from FOIA because its ultimate purpose was to aid the military in accident prevention. This issue, however, would be visited again.

While the court did not permit the MIR to be disclosed, they did rule that the entire JAG Manual Investigation report was subject to disclosure under FOIA. The main difference here was the fact that there was never a promise of confidentiality. Additionally, the purpose of the JAG Manual Investigation was the finding of facts in an adjudicated forum and not safety factors. Because of this it did not fall under the Machin privilege and was ultimately discoverable.

Five years later, this issue was before the Supreme Court in United States v. Weber Aircraft Corp. Following the rationale of the court of appeals in Cooper, Justice Stevens wrote that "[t]he statements are unquestionably 'intra-agency memorandums or letters' within the meaning of the Exemption, and, since the Machin privilege normally protects them from civil discovery, they 'would not be available by law to a party other than [the Air Force] in litigation with [the Air Force].'" The court continued to follow Cooper, and allowed the JAG Manual Investigation report to be released in its entirety.

Additionally, Weber fell short of the Cooper decision. The court recognized the privilege and its exempt status under FOIA, but only to the extent that it covered the actual witness statements, and not the MIR in its entirety. While Justice Stevens did not specifically state that the redacted factual portions of the MIR were subject to release under FOIA, the court refused to broaden its ruling beyond witness statements which were given under the promise of confidentiality. Instead, the court relied on the logic that

[i]f aircraft mishap investigators were unable to give such assurances [of confidentiality], or if it were felt that such promises were hollow, testimony and input from witnesses and from manufacturers in many instances would be

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62. Id. at 277.
63. See id. at 278-79.
64. See id.
65. See id. at 279.
67. Id. at 792.
The court ultimately recognized the *Machin* privilege as an executive privilege and left the exemption under FOIA, however, it left open the question of what else was protected from release.

Less than one year after the Supreme Court decided *Weber*, the courts were again faced with the problem of what was exempt and what was not. The Court of Appeals for the D.C. Circuit addressed this issue in the case of *Badhwar v. United States Dept. of the Air Force*.69 Taken on appeal four times over two years during the course of the district court trial, the appellate court attempted to define and narrow the Supreme Court's ruling in *Weber*. Finally, in *Badhwar IV*, the court arrived at a median; “[w]e affirm the exemption from disclosure of witness statements of third parties and government employees, and of the findings, conclusions, and recommendations in each of the mishap reports.”70 The court held that only witness statements, opinions, recommendations, conclusions and determinations as to cause were exempt under FOIA because that information would not have been obtained without the promise of confidentiality. This did not apply to factual observations of the investigators, as they were trained to report every detail and did not have any reason to withhold that information or not be forthcoming.71 Also, those investigators are generally the first on the scene.

As a direct result of the *Badhwar* decision, each branch of the military changed their accident safety program to incorporate this ruling, and preserve the *Machin* privilege. As for the Navy, the original safety investigation manual OPNAVINST 3750.6P was replaced by OPNAVINST 3750.6Q.

This new safety investigation manual changed the format of the Mishap Aviation Report ("MIR"). Specifically, the MIR was divided into two sections: Part A would contain non-privileged information (set out by *Badhwar*) that could be released to the public, and Part B would contain privileged information held strictly by the AMB.72 Specifically, Part B would comprise photo coverage, flight surgeons reports, witness statements, aircrew statements and Mishap Board developed information and conclusions.

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68. *Id.* at 797 n.11.
70. *Id.* at 186.
71. *See id.* at 184-85.
72. *See OPNAVINST, supra* note 40, at § 105(e).
In *Hill Tower, Inc. v. Department of Navy*, discovery was sought of both the MIR and the JAG Manual Investigation report. The district court, relying on *Weber, Cooper, and Badhwar* ruled that Part A of the MIR and the entire JAG Manual Investigation report was discoverable, and fell outside the exemption in FOIA and the *Machin* privilege. Since this decision, there has been no change to the AMB, the MIR, or a new judicial approach to its discovery by a party.

In a practical sense, the *Machin* privilege and the confidentiality of the witness statements is the most protected and valuable tool at the AMB’s disposal to investigate accidents. Because of its importance to the military when there is a serious accident that raises the attention of the nation, an AMB investigation will sometimes not be performed. An example of this was the crash of the Air Force jet carrying Department of Commerce Secretary Ron Brown. In a public address, President Clinton stated that all information pertaining to the crash would be made available. Because the Air Force feared that the privilege would come under heavy attack if an accident investigation was conducted, only the JAG Manual Investigation was conducted.

While this seems to be over cautious, it nonetheless shows the military’s deep belief in, and ultimate need for, the confidentiality of the witness statements. However, what would happen if someone’s statement to safety investigators were ever used against them? In the strictest sense, the action, what ever it was, would be undone completely.

**Conclusion**

What lessons are to be learned? Does the NTSB need to adopt a privilege similar to that of the military, and indeed other nations around the world? Accident investigation is an important public necessity for the protection of travelers as well as bystanders. Transportation accidents cost billions of dollars per year, and claim countless numbers of lives. The International Civil Aviation Organization, a multinational organization, which proscribes rules for accident investigations to other countries, sums up the need for such a privilege in the NTSB.

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74. Telephone Interview with Commander Brian Woods, Aviation Safety School (Oct. 5, 1999).
75. *Id.*
76. *Id.*
the investigative process and seriously affect flight safety. 77

77. INTERNATIONAL CIVIL AVIATION ORGANIZATION, AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION - ANNEX 13 (8th ed. 1994).
INTRODUCTION

There are over 500 airline alliances worldwide. The number of alliances has increased about twenty-five per year for the last decade. In 1999, there were $6.8 billion worth of global airline merger and acquisition transactions. The number of alliances is accelerating because of the competitive intensity caused by the alliance movement itself. Although strategic airline alliances provide benefits for consumers and efficiencies for airlines, some believe alliances will become de facto cartels, business combinations that coordinate activities and capacities, eventually reducing competition and increasing prices. This essay explores the United States ("U.S.") antitrust enforcement policies regarding strategic alliances and compares two situations involving alliances: the successful

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* University of Denver College of Law, J.D. candidate 2001; Boston University, B.A. in Psychology and B.S. in Communication, 1997; career interests in both litigation and antitrust.
4. See Miller, supra note 1.
5. See id.
Northwest Airlines/KLM Royal Dutch Airlines ("KLM")/Alitalia-Linee alliance, and the abandoned British Airways/American Airlines alliance.

**AIRLINE ALLIANCES GENERALLY**

Foreign regulations prohibit foreign ownership of U.S. carriers. For example, non-U.S. investors cannot own more than twenty five percent of an U.S. airlines' voting stock. The nature of these and other restrictions has forced airlines to form strategic alliances. Alliances consist of two categories, equity alliances and joint venture alliances. In equity alliances, airlines take equity or part ownership in other carriers. In joint venture alliances, airlines have route specific marketing arrangements. The alliances differ in degree. While some only have joint marketing plans, others are seen as a quasi-merger, sharing vital business data, such as prices, strategic plans and capacity.

Members of an alliance desire to create a seamless integration of procedures, products and services to benefit the traveler. The objective is to add value to each member’s offerings while achieving economies of scale by reducing capital expenditures and overall costs through more efficient use of assets. For example, alliance members may save capital expenditures by reducing an airline's fleet. Consumers benefit most when the alliance shares end-to-end routes as opposed to overlapping routes. Most often, "these alliances are largely contractual and involve code sharing, coordination of routes and scheduling, integration of marketing and advertising, joint product development, coordinated frequent flyer programs, and other integration that will help increase network efficiency." Code sharing involves the sharing of designator codes, assigned by the International Air Transport Association. These designator codes, that both identify the carrier and provide a number representing the flight and destination, are used for reservations, schedules

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6. See Gawlicki, supra note 3.
7. See id.
8. See id.
9. See Kolasky, supra note 2.
10. See id.
11. See id.
14. See id.
15. See id.
16. See Kolasky, supra note 2, at 503.
17. Id.
and other commercial purposes.\textsuperscript{19} These arrangements enable carriers to sell and market seats on the same flights operated by the code-sharing partner.\textsuperscript{20} Consumers can then travel on multiple carriers as if flying on one airline.\textsuperscript{21}

**Antitrust Enforcement**

Airline alliance partners share price, planning strategy and other confidential corporate information. These activities are subject to the antitrust laws that prohibit anticompetitive behavior. Parties in proposed alliances must receive the approval of both the carrier's country and the host country. In the U.S., air carriers must receive approval from both the Department of Transportation ("D.O.T.".) and the Department of Justice ("D.O.J.").

**Department of Transportation**

From its creation in 1938, until promulgation of the Airline Deregulation Act of 1978, the Civil Aeronautics Board ("C.A.B.") regulated most commercial aviation activities.\textsuperscript{22} In particular, the C.A.B. regulated "routes, rates, mergers, acquisitions, consolidations, interlocking relationships and intercarrier agreements."\textsuperscript{23} When regulating mergers and acquisitions, the C.A.B. had authority to grant antitrust immunity.\textsuperscript{24} The Airline Deregulation Act phased out most of the C.A.B. jurisdiction and granted D.O.T. authority over mergers, consolidations, acquisitions, and intercarrier agreements on January 1, 1985.\textsuperscript{25}

The D.O.T. currently exerts jurisdiction over international intercarrier agreements.\textsuperscript{26} Air carriers seeking to form an alliance are required to seek D.O.T.'s approval.\textsuperscript{27} D.O.T. will approve the agreement, or grant the parties antitrust immunity, provided D.O.T. determines the exemption is required by the public interest.\textsuperscript{28} The D.O.T. must determine the agreement is not adverse to the public interest and not in violation of the statute before granting approval.\textsuperscript{29} The D.O.T. may not approve agreements that substantially reduce or cause competitive harm unless the

\begin{itemize}
  \item \textsuperscript{19} See id.
  \item \textsuperscript{20} See id.
  \item \textsuperscript{22} See id. at 275.
  \item \textsuperscript{23} Id.
  \item \textsuperscript{24} See id.
  \item \textsuperscript{25} See id.
  \item \textsuperscript{26} See 49 U.S.C. § 41308 (1999).
  \item \textsuperscript{27} See 49 U.S.C. § 41309(a)(b) (1999).
  \item \textsuperscript{28} See 49 U.S.C. § 41308(b) & 41309(b) (1999).
  \item \textsuperscript{29} See id. See also, Comments of Department of Justice on the Joint Application of British
agreement is necessary to address a serious transportation need or to achieve important public benefits that cannot be met by reasonably available alternatives that are materially less anticompetitive. Although a reviewing court will usually defer to D.O.T.'s expertise, D.O.T. may not grant an antitrust exemption to actions that are anticompetitive.

**DEPARTMENT OF JUSTICE**

In 1989, Congress vested D.O.T.'s merger jurisdiction to the D.O.J. The D.O.J. evaluates airline mergers, acquisitions, consolidations and interlocking relationships. D.O.J. evaluates airline alliances as it does mergers and acquisitions in other U.S. industries. Nevertheless, D.O.T. has jurisdiction over code-share agreements, fare regulations and international intercarrier agreements. Both D.O.T. and D.O.J. apply the antitrust laws when determining whether a proposed alliance is anticompetitive and should be blocked.

U.S. antitrust law developed from the public outcry against corporate trusts. These trusts allowed competitors to combine and set prices. The first antitrust law, the Sherman Act, was adopted in 1890. Section One of the Sherman Act prohibits "contract[s], combination[s] . . . or conspirac[ies] in restraint of trade or commerce among the several States, or with foreign nations . . . ." Likewise, mergers and acquisitions are subject to Section One if they constitute a contract, combination or a conspiracy. Section Two of the Sherman Act prohibits monopolization or attempted monopolization. The first Supreme Court case decided under the Sherman Act was *United States v. E.C. Knight Co.*, where the Supreme Court held the government failed to demonstrate that the sugar trust's monopoly was a direct restraint of trade.

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33. See [Dempsey & Gesell, supra note 21, at 276.](http://www.usD.O.J.atr/public/comments/1777.htm) [hereinafter Comments].


31. See *Aloha Airlines v. Hawaiian Airlines*, 489 F.2d 203, 211 (9th Cir. 1974).

32. See *Dempsey & Gesell, supra* note 21, at 276.

33. *See id.*

34. *See id.*

35. *See id.*


38. *See id.*


41. *Id.*

42. *Id.*

43. *United States v. E.C. Knight Co.*, 156 U.S. 1, 16 (1895).
Congress passed the Clayton Act in 1914.\textsuperscript{44} The Clayton Act prohibits mergers or acquisitions that may substantially lessen competition or tend to create monopolies.\textsuperscript{45} The original Clayton Act condemned a corporation's acquisition of another corporation's stock if the acquisition's effect was to substantially lessen the competition between the two companies.\textsuperscript{46} The Clayton Act was amended in 1950 through the Celler-Kefauver Amendments.\textsuperscript{47} The amendments changed the language to read "substantially to lessen competition" and to include both stock and capital acquisitions.\textsuperscript{48} Whereas the Sherman Act prohibits activities that actually restrain trade, the Clayton Act is directed at preventing activities that may tend to restrain trade.\textsuperscript{49}

There are two types of offenses under the Sherman Act, per se offenses and rule of reason. The Supreme Court has defined per se unlawful agreements as agreements having the sole objective to restrain competition and enhance or maintain prices.\textsuperscript{50} These agreements, "because of their pernicious effect on competition and lack of any redeeming virtue are conclusively presumed to be unreasonable . . . ."\textsuperscript{51} Price fixing, market division, boycotts, bid rigging and tying arrangements have been found per se illegal.\textsuperscript{52}

All antitrust-violative conduct which does not consist of a per se offense is judged by the rule of reason, or the reasonableness of the activity.\textsuperscript{53} Even if the activity is otherwise unlawful, if a court determines the action is ancillary to some lawful activity and it is procompetitive, the action may not violate the antitrust laws.\textsuperscript{54} The rule of reason involves a balancing test.\textsuperscript{55} The government must first show the agreement is likely to substantially lessen competition.\textsuperscript{56} Afterwards, the proponents of the agreement must prove the agreement has procompetitive benefits.\textsuperscript{57} If the proponents are sucessful, the burden shifts back to the government to prove the competitive benefits would occur absent the agreement.\textsuperscript{58}

\begin{thebibliography}{99}
\item\textsuperscript{44} 15 U.S.C. §§ 12-27 (1999).
\item\textsuperscript{46} See Sullivan & Hovenkamp, supra note 37, at 818.
\item\textsuperscript{47} See id.
\item\textsuperscript{48} Id.
\item\textsuperscript{50} See United States v. Addyston Pipe & Steel Co., 85 F. 271 (6th Cir. 1898), aff'd, 175 U.S. 211, 243 (1899).
\item\textsuperscript{51} See Northern Pac. R.R. Co. v. United States, 356 U.S. 1, 5 (1957).
\item\textsuperscript{52} Sullivan & Hovenkamp, supra note 37, at 187.
\item\textsuperscript{53} See id. at 189.
\item\textsuperscript{54} See National Soc'y of Prof'l Eng'rs v. United States, 435 U.S. 679, 690-92 (1978).
\item\textsuperscript{55} See id. at 690.
\item\textsuperscript{56} See Kolasky, supra note 2, at 506.
\item\textsuperscript{57} See id.
\item\textsuperscript{58} See id.
\end{thebibliography}
MERGER GUIDELINES

In 1992, D.O.J. and the Federal Trade Commission ("F.T.C.") outlined their enforcement policy concerning horizontal acquisitions and mergers through the Horizontal Merger Guidelines.59 "The unifying theme of the Guidelines is that mergers should not be permitted to create or enhance market power or to facilitate its exercise."60 Market power is a seller's ability to profitably maintain prices above competitive levels for a significant period of time.61 Both D.O.J. and F.T.C. will usually prohibit a merger or a strategic alliance if the market in which the parties compete is heavily concentrated.62 Market concentration is a function of the number of firms in a market and their respective market shares and is a useful indicator of the likely competitive effects of a proposed merger.63 Both D.O.J. and F.T.C. use the Herfindahl-Hirschman Index ("HHI") of market concentration to evaluate the degree of concentration attributable to a merger or acquisition. HHI is determined by summing the squares of the individual market shares of all market participants.64 In evaluating horizontal mergers, agencies will calculate the pre-merger and post-merger market concentration.65 HHI are divided into three categories: unconcentrated (HHI below 1000), moderately concentrated (HHI between 1000 and 1800) and highly concentrated (HHI above 1800). Mergers in unconcentrated and moderately concentrated markets are least likely to lessen competition, thus mergers in these markets will not be contested.66 Mergers in highly concentrated markets that increase the HHI by 100 points or more are presumed to be anticompetitive, which can only be overcome by a showing the merged entity will be unable to have market power.67 Mergers and strategic alliances in concentrated markets will usually require agency investigation.

BILATERAL AIR TRANSPORT AGREEMENTS

In addition to conducting a merger analysis, D.O.T. requires the airline's host country to have a bilateral air transport agreement with the U.S. before granting antitrust immunity to the strategic alliance.68 France

60. Id. at 41,553.
61. Id.
62. See id. at 41,558.
63. See id.
64. Id. at 41,557.
65. See id. at 41,558.
66. See id.
67. See id.
and Germany formulated the first air transport agreement in 1913.\textsuperscript{69} By the 1990's, "1,200 bilateral agreements between nearly 200 nations around the world [had been established], including more than 70 U.S.-negotiated agreements."\textsuperscript{70} The U.S. began to advocate the liberalization of aviation markets in the 1970's.\textsuperscript{71} Aviation liberalization agreements are frequently called open skies agreements.\textsuperscript{72} The D.O.T. has defined open skies as having the following elements:

Open entry on all routes;

Unrestricted capacity and frequency on all routes;

Unrestricted route and traffic rights (the right to operate service between any point in the U.S. and any point in the European country, including no restrictions as to intermediate and beyond points);

Double-disapproval pricing in third and forth freedom markets (whereby both governments must disapprove a proposed rate, else it becomes effective);

Liberal charter arrangement (the least restrictive charter regulations of the two governments would apply, regardless of the origin of the flight);

Liberal cargo regime (criteria as comprehensive as those defined for the combination carriers);

Conversion and remittance arrangement (carriers would be able to convert earnings and remit in hard currency promptly and without restriction);

Open code-sharing opportunities;

Self-handling provisions (right of a carrier to perform/control its airport functions going to support its operations);

Procompetitive provisions on commercial opportunities, user charges, fair competition and intermodal rights; and

Explicit commitment for nondiscriminatory operation of and access for computer reservations systems.\textsuperscript{73}

For example, on November 11, 1998, U.S. Transportation Secretary Rodney E. Slater and Italian Minister of Transport and Navigation Tizi-

\textsuperscript{69} See DEMPSEY \& GESSELL, supra note 21, at 305.
\textsuperscript{70} See id.
\textsuperscript{71} See id.
\textsuperscript{72} See id.
ano Treu initialed an open skies agreement.\[74\] This agreement enables U.S. and Italian airlines to operate to all cities in both countries, with no restrictions on the number of flights they operate or the prices they can charge.\[75\] The 1998 agreement supplants the U.S.-Italy 1990 agreement allowing U.S. and Italy to create new U.S. gateways to Italy and expand air service and customer choice in the U.S.-Italy market.\[76\] Since the 1990 agreement, traffic in the U.S.-Italy market has grown by seventy percent.\[77\] The D.O.T. used the new open skies agreement as a means to tentatively award Delta Airlines authority to open a new U.S. gateway to Italy with Atlanta-Rome service.\[78\] On December 6, 1999, Rodney Slater and Tiziano Treu signed the open skies agreement into law following the D.O.T.'s grant of antitrust immunity to the Alitalia and KLM Royal Dutch Airlines alliance. The creation of the open skies agreement has enabled Northwest, American Airlines, United Airlines, Continental Airlines and UPS to seek authority for new or expanded service in the U.S.-Italy market.\[79\]

**Three Attempted Airline Alliances**

*KLM/Northwest*

Northwest Airlines ("Northwest"), headquartered in Minneapolis-St. Paul, is a major carrier with significant operations in the Pacific and several trans-Atlantic routes. KLM is the principal carrier in the Netherlands. In 1989, KLM purchased Northwest's holding company, NWA Inc., recently renamed Northwest Airlines Corp., by Wings Holdings.\[80\] In 1992, KLM and Northwest applied to the D.O.T. for antitrust immunity for an agreement whereby the two carriers would integrate their services and operate as if they were a single carrier.\[81\] Under their agreement, KLM and Northwest would integrate their operations by entering into a number of agreements, including joint marketing, schedule and pricing coordination, inventory management, the creation of a unified travel agency commission program, pooling of revenue, and the use of

\[74\] See Transportation Secretary Slater announces U.S.-Italy Open Skies Agreement, available in 1999 WL 789058 (D.O.T.).
\[75\] See id.
\[77\] See id.
\[79\] See U.S. Transportation Secretary Slater Signs U.S.-Italy Open Skies Agreement, available in 1999 WL 1124007.
\[81\] See id. at *3.
joint trademarks and branding. In determining whether this alliance would be anticompetitive, D.O.T. first noted the open skies agreement with the Netherlands. The open skies accord permits any U.S. carrier to serve any point in the Netherlands from any point in the U.S. and allows any Dutch carrier to serve any point in the U.S. from the Netherlands. The D.O.T. believed this accord would encourage more competitive service to the Netherlands and encourage other European countries to liberalize their bilateral agreement with the U.S.

Using Clayton Act’s Section 7 analysis, D.O.T. inquired whether the alliance would “substantially lessen competition” by eliminating actual or potential competition in the relevant market. Northwest and KLM currently operate nonstop service between Amsterdam and Detroit and Amsterdam and Minneapolis-St. Paul. Northwest also operates flights to Amsterdam from Boston, while KLM serves Amsterdam from Atlanta, Baltimore-Washington, Chicago, Houston, Los Angeles, New York City and Orlando. The D.O.T. found Northwest and KLM represent 4.1 and 3.9 percent of the total seats offered in the U.S.-Europe market, ranking eighth and ninth among trans-Atlantic carriers in total seat share. A combined Northwest and KLM would rank fifth in the market in seat share. The alliance would result in an unconcentrated market with a HHI of 974.

The only possible lessening of competition could be the Amsterdam/Detroit and Amsterdam/Minneapolis-St. Paul market, where the parties compete with one another. The D.O.T. found that other carriers would unlikely enter this market because “no other carrier besides Northwest has a hub at either U.S. gateway.” However, D.O.T. found that Northwest and KLM would unlikely exert market power because of carriers such as British Airways and Air France, who offer connecting service from Detroit and Minneapolis-St. Paul. Moreover, because D.O.T. reviews applications using the public interest standard, it found the possible

82. See id.
83. See id.
84. See id.
85. See id.
86. See id. at *7.
87. See id. at *11. The only markets where KLM and Northwest are actual competitors are transatlantic markets. See id.
88. See id.
89. See id. at *10.
90. See id. at *7.
91. See id. at *10.
92. See id. at *12.
93. Id.
94. See id.
anticompetitive effects are outweighed by the public benefits of offering better service and the airlines operating more efficiently.\textsuperscript{95} After comment and review, D.O.T. approved the strategic alliance on January 11, 1993.\textsuperscript{96} Northwest Airlines began to add KLM nonstop flights to Amsterdam in September of 1994.\textsuperscript{97} The KLM/Northwest joint venture resulted in, "traffic [rising] 10% more than other transatlantic routes in the years 1992 to 1993 and doubling the total industry traffic growth of 7%."\textsuperscript{98} Flights to Europe also increased "from 70 to 136."\textsuperscript{99} Consequently, the alliance’s revenue in 1993 amounted to $16 billion.\textsuperscript{100}

\textbf{KLM/Northwest/Alitalia-Linee}

In November of 1999, Alitalia-Linee Aeree Italiane-S.P.A. ("Alitalia") filed an application for antitrust immunity to join the KLM/Northwest Airlines alliance.\textsuperscript{101} D.O.T. first noted that U.S. and Italy initiated an open skies agreement. D.O.T. further explained: "[T]he predicate for our approval and grant of antitrust immunity for the Northwest-Alitalia alliance is the existence of the expansive, new aviation agreement between the United States and Italy."\textsuperscript{102} The proposed agreement provided for a virtual merger, the coordination of all functional and operational activities, although allowing the airlines to retain their individual ownership and control.\textsuperscript{103}

D.O.T. found four carriers provide nonstop service from the U.S. to Italy.\textsuperscript{104} Alitalia provides more nonstop service from the U.S. to Italy than any other carrier, comprising thirty-eight percent of the U.S./Italy market.\textsuperscript{105} Northwest and KLM do not provide nonstop service to Italy, but only provide connecting service to Italy over Amsterdam.\textsuperscript{106} However, the U.S. and Italy recently negotiated a new open skies agreement providing for unrestricted competitive opportunities in the U.S./Italy market.\textsuperscript{107} Alitalia is not a major competitor of Northwest or KLM on
trans-atlantic routes. The combined entities’ market share for nonstop passenger service in the U.S.-Europe market would be ten percent. The HHI would increase from 1,307 to 1,342, an increase of concentration by 2.7 percent. This increase is based on the assumption that no new entry would occur in the U.S.-Europe market. However, given the nature of the new open skies agreement, significant increases in competition are expected.

The relatively low probability of anticompetitive effects was balanced with the public benefits of the transaction. The alliance would enable Northwest to begin nonstop flight service between Minneapolis and Italy and between Detroit and Italy. The initiation of these services would “richly benefit the people of Minneapolis, Detroit and their service areas by bringing substantially improved service to Italy.” Based on these and other public benefits and the unlikelihood of anticompetitive effects, D.O.T. approved the alliance on December 3, 1999.

This alliance was Europe’s first cross-border merger since 1996. However, “delays in developing a joint hub at Milan’s new Malpensa Airport” have stalled the approved alliance. KLM is delayed in transferring flights from Linate Airport to Malpensa Airport. The Italian government obstructed the transfer in December 1999 after receiving criticism from rival airlines. The delay is currently costing Alitalia around $30 million per month. If the problem is not solved within two to three months, the merger may unravel.

American Airlines and British Airways

American Airlines and British Airways are two of several carriers in the OneWorld alliance. However, in order for British Airways and American Airlines to code-share on areas where they compete, they must
apply to D.O.T. for antitrust immunity.123 British Airways and American Airlines both serve London's Heathrow Airport from the U.S.124 On January 10, 1997, American Airlines and British Airways filed an application for antitrust immunity in order to strengthen their current alliance.125 On January 7, 2000, almost three years after the initial application, D.O.T. determined additional information was necessary in order to conduct the required public interest evaluation.126

The American Airlines and British Airways alliance proposal is significantly different from others, as the U.S. and the United Kingdom ("U.K.") do not have an open skies accord, and American Airlines and British Airways are direct competitors in a highly concentrated market. Under the current U.S./U.K. treaty, ("Bermuda II"), only two U.S. airlines, American Airlines and United Airlines, and two U.K. airlines, British Airways and Virgin Atlantic, are allowed to operate direct, scheduled flights between the U.S. and London's Heathrow airport.127 Allowing the alliance to proceed would leave Heathrow, the world's busiest international airport, with three carriers.128

Further, American Airlines and British Airways are direct competitors in three markets: nonstop service, service to Heathrow Airport and service to JFK Airport.129 According to D.O.J., nonstop service is a separate market because time sensitive travelers would not switch to connecting service in response to a price increase in nonstop service.130

Moreover, frequent flyer preferences, corporate discount programs and service factors (such as schedule convenience) is evidence that connecting

123. See id.

124. See id. American Airlines, United Airlines, Virgin Atlantic and British Airways are the only carriers with scheduled service to London's Heathrow Airport from the U.S. See id. Bermuda II, the current U.S./U.K. bilateral treaty prohibits other airlines from serving the U.S./Heathrow route. See id. Trans-World Airlines, Northwest Airlines, Delta Airlines, Continental Airlines, US Airways and American Airlines also fly to London's Gatwick airport. See id.


126. See Joint Application of American Airlines and British Airways, D.O.T. Order 2000-1-8, available in 2000 WL 29395 (D.O.T.) at *2. U.K. regulators forced the airlines to release 267 weekly slots at Heathrow and Gatwick Airports before the alliance would be approved. See also, Terry Maxon, Airline Alliance Progresses: European Regulators Outline Restrictions on British Airways-American Proposal, DALLAS MORNING NEWS, July 9, 1998, at 1D. Combined, British Airways and American Airlines have 5,013 slots at Heathrow and Gatwick Airports. See id. However, British Airways was unwilling to relinquish any slots "because it believes it will lose more by doing so than it would gain by deepening its alliance with American Airlines." Mathews & Michaels, supra note 12.


128. See id.

129. See Comments, supra note 29.

130. See id.
service is not a reasonable substitute for nonstop service.\textsuperscript{131} D.O.J. also believed service to Heathrow Airport is another separate market due to its location.\textsuperscript{132} Two airports serve London: Gatwick Airport and Heathrow Airport.\textsuperscript{133} While Gatwick airport is sixty-four minutes from the central London business district, Heathrow is thirty-eight minutes away.\textsuperscript{134} According to D.O.J. time sensitive travelers would not switch from Heathrow airport to Gatwick airport if there were a price increase on air service to Heathrow Airport.\textsuperscript{135} D.O.J. also classified service to JFK airport as a possible relevant market. Although relative price information from New York's international airports is not clear, D.O.J. found many business passengers prefer JFK Airport to Newark Airport.\textsuperscript{136}

Additionally, British Airways and American Airlines are direct competitors on several U.S./Heathrow routes. British Airways and American Airlines serve flights from Boston, New York, Miami, Chicago, Dallas and Los Angeles to Heathrow Airport.\textsuperscript{137} Combined market shares for these routes would be 100 percent for Boston, Dallas and Miami, 80 percent for Chicago, 60 percent for New York and 53 percent for Los Angeles.\textsuperscript{138} The post merger HHI for each route is 10,000 for Boston, Dallas and Miami, 6,750 for Chicago, 4,037 for New York and 1,578 for Los Angeles.\textsuperscript{139} Given the highly concentrated nature of the U.S./Heathrow market, the proposed alliance would substantially lessen competition.\textsuperscript{140}

British Airways and American Airlines are not giving up. On January 20, 2000, the airlines and U.S. and British air transport officials initiated talks aimed at improving air relations between the two countries.\textsuperscript{141} Officials created a proposal, called a mini-deal or Bermuda 2 \textsuperscript{1/2}.\textsuperscript{142} The mini-deal would enable US Air to receive a Pittsburgh-Heathrow slot,
enable British Airways to obtain a limited code-share agreement with American Airlines and enable a couple of U.S. carriers at Gatwick Airport to secure landing slots at Heathrow Airport.\textsuperscript{143} The mini-deal would also allow British Midland to start four new daily services to the U.S. from Heathrow Airport.\textsuperscript{144}

Despite these efforts, recent news sources report U.S. and U.K talks have failed.\textsuperscript{145} In response, British Midland applied with D.O.T. for an antitrust exemption to code share on United Airline's flights into Heathrow airport from seven U.S. cities on January 31, 2000.\textsuperscript{146} Meanwhile, British Airways and American Airlines are still urging U.S. and U.K. officials to liberalize air transport agreements, in order for D.O.T. to approve their proposed alliance.\textsuperscript{147}

\section*{Conclusion}

Consumers will see more airline alliances in the next decade. Although air alliances provide efficiencies for air providers and enable them to better compete in international markets, some alliances may still cause competitive harm to consumers, and will have to be blocked. For instance, allowing British Airways and American Airlines to deepen their alliance at Heathrow Airport may significantly concentrate the market, leaving only three significant carriers setting prices, resulting in higher prices for consumers. However, encouraging alliances in unconcentrated or moderately concentrated markets may enable airlines to save capital expenditures and gain other efficiencies leading to lower prices. Moreover, alliances in these markets may enable air carriers to enter new mar-

\begin{itemize}
\item \textsuperscript{143} Carl Mortished, \textit{Open Skies Dogfight Brings Bad Blood Across the Atlantic}, TIMES OF LONDON, Feb. 11, 2000, at 33. British Airways would be allowed to code-share with American Airlines because the mini-deal would lift Bermuda II's restrictions at Heathrow Airport. See \textit{id}.
\item \textsuperscript{144} See Michaels, supra note 141.
\item \textsuperscript{146} See \textit{id}. Lufthansa, the largest airline in Germany, purchased a twenty percent stake in British Midland from Scandinavian Airlines in November, 1999. Daniel Michaels, \textit{British Midland Changes U.K. Market}, WALL. ST. J. EUR., Nov. 10, 1999, at 7. Lufthansa is also partnered with United Airlines in the Star Alliance. See \textit{id} The Star Alliance also includes Scandinavian Airlines, Air Canada, Thai Airways and Singapore Airlines. See \textit{id}. Lufthansa purchased the twenty percent stake in order to expand its landing slots at London's Heathrow Airport. See \textit{id}. Adding British Midland's fourteen percent share to the alliance enables Star to control twenty four percent of the landing slots at Heathrow Airport. See \textit{id}. However, although both United Airlines and British Midland can fly from Heathrow Airport, only United Airlines is allowed to fly from Heathrow to the United States. \textit{Lufthansa Irks British Airways with Courtship}, Wall St. J. Eur., Oct. 21, 1999, at 14. Although British Midland has applied to initiate a code-share agreement with United Airlines, and therefore seek entry into the U.S./Heathrow market, Bermuda II may foreclose any such opportunities. See \textit{id}.
\item \textsuperscript{147} See U.K., U.S. Officials Start Talks on Transatlantic Air Links, supra note 127.
\end{itemize}
kets or to expand service to additional destinations thereby increasing consumer choice in air travel.

Liberalizing air markets through bilateral treaties remain an important element in the success of strategic alliances. Bilateral air treaties ensure the airline marketplace remains competitive. Because each alliance is unique, regulatory agencies should closely scrutinize proposed alliances to insure pro-competitive alliances producing consumer benefits are approved.
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Symposium

Symposium on Intermodal Transportation:
Introduction

Joseph S. Szyliowicz*
Paul Stephen Dempsey**

The National Center for Intermodal Transportation is pleased to present this special peer reviewed Symposium issue of the Transportation Law Journal. Transportation is among the world's most important infrastructure industries. Without transportation, commerce would grind to a halt, and whole economic systems would fall into decay. But in a global, competitive economy, efficient and seamless transportation flows facilitate economic growth and prosperity. They link together distant producers and consumers, providing consumers with a wider array of goods at lower cost. Intermodalism offers a promising means of stimulating productivity and efficiency, thereby facilitating trade and contributing to broader economic growth.

Trade routes have always been important to the progress of civilization. From the Silk Road across Asia, to the merchant trading ships of the Phoenecians, trade has stimulated economic growth and cultural in-

* Professor, Intermodal Transportation Institute and Graduate School of International Studies, University of Denver. Professor Szyliowicz was founder of the Intermodal Transportation Institute.

** Professor of Law & Director of the Transportation Law Program, University of Denver; Director, National Center for Intermodal Transportation.
teraction, and made possible the creation of vast cultural and economic Empires.

Crossing the vast oceans was a major barrier overcome only in the last half Century. Events involving ships have had a major impact upon the world. The most obvious example is Christopher Columbus’s famous voyage in 1492. His discovery of America forced Europeans to develop a new view of the world and of their place in it. It also led to numerous other voyages of discovery and the subsequent emergence of new patterns of international trade.

Another less well known voyage which has had a great impact upon people’s lives, albeit in a more restricted way, was the journey that a ship called the Ideal X made in 1956. For the first time, goods were transported in containers. That voyage transformed the ways in which goods moved, for once the feasibility of using containers was demonstrated, the numerous advantages involved led to the rapid diffusion of this innovation. Before long, ships were hauling containers across the oceans and a new industry was created that profoundly affected all aspects of the existing transportation system.

That voyage marked the beginnings of freight intermodalism – the seamless movement of goods from origin to destination, using several modes. However, no such dramatic developments have yet taken place on the passenger side. While sending a package from Des Moines to Timbuktu involves a simple phone call to a carrier, broker or freight forwarder, moving one’s person between these points is no easy matter, requiring numerous inquiries about bus or shuttle service to an airport, connections to numerous flights, and arranging for surface transportation at the destination. In short, passenger transportation is by no means seamless. Nevertheless, social, economic and environmental pressures have been growing that are leading to the development of new policies and initiatives in the U.S. and elsewhere to facilitate the seamless movement of people.

Though progress has been made, many governmental and private sector institutions remain stubbornly stratified and segregated along modal lines. Funding, planning, and coordination continue to be based primarily on intramodal considerations. Yet, as the benefits of intermodalism have become more apparent, and as various transportation firms have demonstrated its superiority in terms of productivity, efficiency and time, it has become a world-wide phenomenon that has gained the attention of policy makers, private sector leaders, and transportation professionals.

Today intermodalism is a concept whose time has come. There is widespread agreement on the shortcomings of the existing passenger system, of the need to eliminate bottlenecks that remain on the freight side,
and of the need to view the passenger and freight system from a holistic, comprehensive perspective. Nevertheless the educational world has paid rather limited attention to this topic. Most transportation programs in the United States, and indeed, in the rest of the world, remain modally oriented. In order to fill this gap, the Intermodal Transportation Institute was established at the University of Denver. Subsequently, the National Center for Intermodal Transportation, a cooperative effort between the University of Denver and Mississippi State University was established by the Transportation Equity Act for the 21st Century.

ITI and the NCIT are committed to educational, outreach and research activities in intermodalism. ITI has worked to fill this gap by developing a unique Master of Sciences program and holding various conferences. Two are particularly noteworthy. The first, held in October 1997, brought together, for the first time, the Secretaries and Ministers of Transportation from Canada, Mexico, and the U.S. They also met with distinguished leaders of the intermodal industry, many of whom today serve on the ITI Board of Directors. In 1999, concerned with the limited attention being paid to the history of this dynamic industry, ITI organized the “Founding Father’s of Intermodalism” conference which brought together, also for the first time, the pioneering entrepreneurs who created the intermodal freight industry. These sessions were recorded and videotaped and form a rich and unique resource for future historians.

This volume is an important part of the effort to contribute to the development of an intermodal science, for it is surprising how few compiled works deal with intermodalism. Although there is a voluminous literature scattered among various periodicals, including many scholarly articles, there is only one comprehensive textbook dealing with intermodal freight and none on intermodal passenger issues. Accordingly, we felt that it was important to bring together a group of academic experts who could deal with the many issues and aspects of intermodalism as we enter the new millenium. However, this is not a traditional law journal issue, for all the articles in this Symposium have been carefully peer reviewed.

The contributors deal with a range of important issues confronting intermodalism as well as many topics of concern to scholars working in this area. The most obvious is that intermodalism is a work in progress. Despite all that has been achieved, many obstacles and barriers will have to be overcome before the intermodal vision that many aspire to can be realized. That is the topic of the Szyliowicz chapter, “Intermodalism: The Challenge and the Promise”. He points out that passenger intermodalism lags behind the freight sector. Goetz and Vowles’ “Progress in Intermodal Passenger Transportation” focuses on this question, emphasizing the ways in which the private sector is pursuing initiatives that
promise to at least begin to close the gap. Intermodalism is a new concept but goods and people have utilized two or more modes for centuries. Arthur Donovan's "Intermodal Transportation in Historical Perspective" provides important insights into how modalism became intermodalism and why it emerged at a particular point in history. Holguin Veras and Passwell in their "New York Regional Intermodal Freight Transportation Planning" note, however, that intermodal freight transportation also confronts serious bottlenecks and they present an important case study of the issues confronting planners in the New York area.

Because it is a new concept, there is little agreement on the precise meaning of intermodalism. In "Developing a Standard Definition of Intermodal Transportation" Jones, Cassady and Bowden discuss the various definitions and seek to derive one that can become standardized. Not only is there a need for conceptual clarity, there is also a need for persons at all levels and sectors of the transportation enterprise with the necessary skills to develop, operate, and maintain an intermodal system. In "Intermodal Education in Comparative Perspective," Jervell, Szylowicz and Sherry report on a pioneering study carried out for Asia Pacific Economic Cooperation (APEC) that analyzes the kinds of skills that will be required and the limited degree to which educational institutions are presently providing the requisite skills and knowledge. Dempsey's "The Law of Intermodal Transportation" looks explicitly at the legal issues and traces how the present situation evolved and the issues and gaps that remain to be addressed.

The appeal of intermodalism has been based on the benefits that it offers. Yet, there have been few efforts to analyze these and to measure them against the costs of such a system. Yevdokimov's "Measuring Economic Benefits of Intermodal Transportation" analyzes this question and suggests ways in which further research could help provide a better understanding. Such an understanding will inevitably involve computer simulations and in their piece, Graham et al, "Modeling Intermodal Transportation Systems" explicitly discuss how to overcome a fundamental problem that presently limits progress in this area – the lack of a common terminology.

Taken together these articles provide important insights into the present state of intermodalism and many of the key issues that it confronts. Hopefully this volume will be of interest to practitioners and of use to scholars and teachers working in this area. Most importantly, we hope that it will stimulate further work in these and related areas so that those of us who teach intermodal transportation will have a wealth of materials to choose from.
Intermodalism: The Challenge and the Promise

Joseph S. Szyliowicz*

I. INTRODUCTION

This paper discusses the state of intermodalism in the U.S. today – its achievements, the expectations that it arouses, and the issues that must be dealt with if the U.S. is to achieve the intermodal system that is required to meet the challenges generated by domestic needs and by the changes that are sweeping the world. The U.S. has succeeded in building an extensive transportation system based on the development of individual modes – rail, road, air, and water. Now the challenge of blending the separate modes into a national intermodal system is being confronted. Precisely because it possesses this rich heritage, the U.S. must confront all the issues and difficulties associated with bringing about change to well established and entrenched modal systems. Furthermore, any transportation system is shaped by a country’s political system so that the U.S. must deal with specific issues that are the result of its system of government. Nevertheless, despite such differences and regardless of the level of development of the existing system and the different modes, the U.S. case is of more than academic interest for the creation of an intermodal system for freight and passenger involves dealing with general issues that are universal.

Accordingly, I shall first discuss the factors that make intermodalism an ever more important element in transportation. Then I shall turn my

* Dr Joseph S. Szyliowicz is the Founder of the Intermodal Transportation Institute and Professor in the Graduate School of International Studies, University of Denver.
attention to the state of the U.S. intermodal system and the challenges that it confronts. In the process I shall try to draw some general conclusions about the issues that the U.S. or any country seeking to develop intermodal transportation must deal with.

II. THE PRESSURES FOR INTERMODALISM

Intermodalism has emerged as a major new approach to the planning of transportation systems and its further development is inevitable for all countries, regardless of the quality and efficiency of the various modes, because domestic and international pressures are creating a need for such a system.¹

To begin with, it is obvious that the existing infrastructure in the U.S. and in many other countries is being strained to the limit and that it will be no easy matter to expand the existing system. The demand for both passenger and freight transportation continues to grow steadily, placing increasing pressures on ports, airports and highways. For example, while the population increased by about 20% between 1977 and 1995, the number of domestic trips increased by 92%, of international trips by 131%, in the same period.² Future projections suggest that this demand will continue and even accelerate. For example, it is estimated that freight traffic will increase by an estimated 21% by 2006.³ Accordingly, policy makers in governmental and corporate organizations are paying renewed attention to rail travel for passengers and to moving freight through truck/rail combinations. Their goal is not to minimize the existing modes but to leverage the enormous investments that have already been made. Integrating the modes and using each to its best advantage is a strategy to optimize the existing resources and to create new capabilities.

A second major driving force is the nature of modern economic systems, which are characterized by increasing pressures to reduce costs by increasing productivity and reducing inefficiencies. In the search for ways to do so, attention naturally becomes focused on the ways in which transportation is integrated with the production process. Hence, such developments as "just in time" production have become commonplace as businesses seek to reduce inventory and other costs. Now suppliers have to meet the needs of their customers in new ways, ways that place new

demands on transportation systems. Passenger transportation is also subject to similar pressures, as people demand ever faster and more reliable travel service.

These developments are taking place on a global scale as resources and markets are becoming increasingly connected through global supply chains. Levels of international trade and economic interactions continue to climb while existing patterns are being transformed as competition becomes increasingly international in scope. National economies are becoming ever more integrated into a global system and corporations possess an international perspective so that production, assembly, outsourcing all takes place in countries that offer competitive advantages. Such global markets require new kind of transportation systems and it is increasingly obvious that national development no longer depends solely on the ways in which productive sectors operate but also on their ability to distribute their products rapidly and efficiently to international markets. This requires national transportation systems with sophisticated port and other infrastructures to handle international trade.

These developments have been spurred by deregulation, which greatly accelerated the trend towards intermodalism. It is a new industry created, largely, by imaginative pioneers who perceived market opportunities and founded such major corporations as UPS, FedEx, and JB Hunt to exploit them. Essentially freight intermodalism in the US has been a private sector activity, which emerged because of the realization that intermodalism was economically advantageous. Its roots can be traced back to the 1950s when trains began to carry trailers. But the real revolution started in 1956 when a ship called the Ideal X sailed from New Jersey to Texas with a load of containers. This marked the beginning of the container revolution. Soon ships were sailing across the Atlantic and Pacific with containers rather than break bulk cargo. Those containers were moved by rail – a new business for the railroads, which possessed underutilized capacity. Deregulation accelerated this process by eliminating numerous rules and regulations, which had prevented carriers from innovating and competitors from entering the market. A host of new companies became active and new patterns of cooperation and competition have emerged. Concomitantly, important technological innovations, such as double stack trains, further spurred the revolution whereby air, ship, rail and truck became intertwined.

On the passenger side, deregulation resulted in an explosive growth in air travel and tourism creating, in the process, well known problems of air traffic congestion and access to airports but modal integration lags well behind developments in the freight sector and stands in sharp contrast to the European scene. The last major new airport built in the U.S., the $5 billion Denver International Airport, does not have a transit link.
The contrast with Europe is striking. Passengers using Charles de Gaulle airport in Paris have access to both a metro station and a high-speed rail station. Similarly, Frankfurt airport is directly connected to the local underground and intercity rail. Many individuals and groups are seeking to create a passenger intermodal system in the U.S. that will be as effective and efficient as the European one. They anticipate that such a system will be based on a high-speed rail network that is linked to other transportation modes through intermodal terminals that provide travelers with easy access to several modes. However formidable barriers will have to be overcome before this goal is achieved.

Social concerns are also influencing the drive towards intermodalism for worries about the environment and with the social costs of existing transportation systems are evident everywhere. Transportation is now widely viewed not merely in traditional economic terms but in terms of its sustainability, in terms of how it impacts environmental and ecological systems as well as the society as a whole. Because of such concerns, it is today practically impossible to envisage, in the U.S., a program to greatly expand the highway system. Nor is it likely that the severely constrained airport capacity will soon be eased to any significant degree. Accordingly, there is a renewed interest in railroads because of their many advantages in terms of fuel efficiency, pollution, and other environmental impacts.

All these considerations have had a profound impact upon U.S. policy makers. By the end of the 20th century, the U.S. was definitely committed to intermodalism for Congress responded to the changes, which were taking place by making intermodalism an explicit element of its transportation policy. The key event was the passage of the landmark Intermodal Surface Transportation Efficiency Act (1991) that moved policy away from the traditional emphasis on specific modes, notably the highways, towards intermodalism. It stated:

"It is the policy of the United States to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the Nation to compete in the global economy, and will move people and goods in an energy efficient manner. The National Intermodal Transportation System shall consist of all forms of transportation in a unified, interconnected manner."

For the first time, federal legislation recognized the constraints and negative consequences imposed by traditional modal policies and the

5. Cited in POIFT, p. 156
need for a new approach that emphasized flexibility, innovation, and greater public involvement.

Such a vision could obviously not be achieved easily or quickly. One important gap that was immediately apparent was the limited understanding of the actual state of intermodalism and the role of various actors as well as the barriers and obstacles, which hindered its development. Accordingly, several important conferences and commissions were convened to study and discuss such issues. Some of the most important were:

- The National Commission on Intermodal Transportation (1994)
- National Conference on Setting an Intermodal Transportation Research Framework (1996)
- Intermodal Transportation Education and Training (1997)
- Committee for the Study of Policy Options to Address Intermodal Freight Transportation (1998)

Their very titles suggest the problem areas that concerned government officials and other experts concerned with the growth of intermodalism – the status of the existing system, regulatory and institutional issues, educational and research questions, and the special problems of freight. Their findings and conclusions reinforced each other and will be discussed below. Suffice it to say that there was strong agreement that considerable progress has been made but also great concern with the barriers and obstacles that had to be overcome if the vision of a true intermodal system were to be realized. The passage of new legislation, TEA-21 in 1998 reinforced the principles of ISTEA but implementation has remained troublesome in many areas and the achievement of the intermodal vision is still dependent on the resolution of many difficult issues.

III. OBSTACLES AND BARRIERS

A. THE CONCEPT

Perhaps the most elementary source of difficulty is the high degree of confusion about the very concept of intermodalism. Many definitions abound ranging from very narrow to more expansive ones. The most restricted focuses on the role of the container and defines intermodalism as the "...transport of goods in containers"6 A somewhat broader but inadequate definition because goods have been shipped in this manner for centuries and because it also ignores people is: “any shipment of goods

6. POIFT, p. 14
that involves two or more modes of transportation during a single journey.” 7 A broader and better definition which recognizes passengers is: “the coordinated passage of goods and people by way or two or more of the primary modes of transport (sea, air, rail, road) from origin to destination as defined by the passenger or the shipper and consignee, with a single travel directive bill of lading or ticket) and a single price covering the entire trip.” 8 A broader and improved definition which reflects a concern with such factors as the efficient use of resources, safety, quality, and cost is the one developed by the National Center for Intermodal Transportation: “an approach to planning, building, and operating the transportation system that emphasizes optimal utilization of transportation resources and connections between modes. . . . what matters is the quality, cost, timeliness, and safety of the trip. Still broader is a definition that includes such critical elements as choice and inclusiveness: “a system that is both safe and efficient and productive and flexible in responding to the needs for good movements and . . . offer(s) people choices and flexibility in their personal movements.” This system must also be international, intelligent and inclusive.” 9 Yet, in my view, even this definition lacks a critical element for it fails to recognize explicitly the externalities of transportation. It is possible to develop a system that is safe, efficient, flexible, intelligent, international, and inclusive but which does not promote sustainable development for it continues to pollute and waste energy. Accordingly, I propose the following definition:

An intermodal system is one in which the individual modes are linked, governed, and managed in a manner that creates a seamless and sustainable transportation system. Such a system should be economically efficient, environmentally sound, safe and secure and ethically based.

The issue of definition is more than a semantic quibble. It has profound practical consequences. Without clarity and agreement on just what is meant by a concept, it is difficult to discuss it intelligently, let alone move to implement it. Many experts believe that the lack of consensus creates confusion in the planning process. Also, it becomes extremely difficult to educate and train people or, to build the level of public support that will be required to create an intermodal system. A precise vision needs to be clearly defined and widely disseminated.

B. EDUCATION AND TRAINING

Such an effort clearly involves the educational system. This repre-

7. POIFT, p. 118
8. Alt et al., p. 34
sents a second important gap that limits the development of intermodal­
ism. There are several dimensions to this issue. At the most general
level, there is general awareness. Since it is a relatively new concept and
since there is no consensus on its content, it should not be surprising that
most people have not been exposed to the concept or the vision embod­
ied therein. The common reaction when I use the term is to ask me what
I mean. Indeed my word processor believes that intermodalism is a mis­
spelled word and underlines it in red. Yet it is not feasible to expect that
an intermodal transportation system can be realized unless the public is
educated to the promise of intermodalism and accepts the importance of
engaging in the kinds of behaviors that are required. It is the public that
an intermodal system is designed to serve, it is the public that influences
decisions concerning transportation projects and policies, and it is the
public that will make a new transportation system an effective one.

But more than public awareness and support is required. An in­
termodal system needs persons who are educated in intermodalism, who
possess the skills required to help plan, manage, and operate intermodal
systems, who understand the ethical issues involved. At present it is
widely acknowledged that there is a shortage of such people; most educa­
tion in American universities is still modal in orientation. Few programs
focus on intermodalism or provide the kind of total systems perspective
that is required. Hence, "...we perpetuate the old paradigms instead of
training transportation professionals for the 21st century."10

There is also a need for in-service training for people presently work­
ing in transportation organizations. Few people knowledgeable about in­
termodalism are to be found in state departments of education,
metropolitan planning agencies, or private sector transportation compa­
nies. And, because of continuing modal orientations, which I will discuss
below, most staff time is inevitably devoted to short-term problems and
operations of particular modes.

C. Technology

One area requiring particular educational attention is technology for
it is clear that new and emerging technologies have to play a key role in
dealing with the numerous physical impediments that constrain the seamless flow of passengers and freight. Congestion, especially in urban areas
is commonplace and, though efforts continue to ease the problem by building new roads, such efforts are severely constrained by the limited

tailed analysis of the educational situation in regards to intermodalism in the APEC countries see the chapter in this volume.
amounts of land available for such improvements and the growing realization that it is simply not possible to build one's way out of congestion. Accordingly increased attention is being paid to rapid transit for passengers and such innovative schemes as full road pricing.

To be effective such schemes will require not only different policy mechanisms but also the implementation of new technologies to ensure that the innovations work effectively and well.

There is an obvious need for further technological developments. Technologies have already had a profound impact on the development of intermodalism – double stack trains, super container ships, large aircraft, the operations of such innovative companies as UPS and FedEx - and there is little doubt that new technologies such as satellite communications specifically and information and communication technologies generally will have a similar impact in the future.

Recognizing that information and communication technologies will be essential components in the realization of the intermodal vision, the US government is making large investments in ITS. These activities are already having an impact. New computer models, simulations and other technologies are becoming available daily that help planners and managers. 11

However, much remains to be done. For passenger intermodalism to succeed, for example, it is not sufficient to build transit systems; an appropriate information infrastructure that facilitates a seamless journey is required. This kind of infrastructure exists for automobiles in the form of road signs, maps, driver education programs, news of traffic conditions and the like. Someone using public transit, on the other hand, has no such aids readily available. The traveler is forced to develop the necessary information by identifying transfer points and checking one or more schedules. There is often a lack of clear and precise information on how one can shift from one mode to another, especially where airports are concerned. To cite a personal example, I recently flew into Baltimore and wanted to take the train to Washington, D.C. Putting aside the fact that the train station was not located in the airport, it proved very difficult to find information on how to get to the train station or to obtain train schedules. New developments in communication and information hold great promise for facilitating such journeys by integrating information systems and ticketing systems but many issues of standardization and coordination still have to be overcome. 12

Similar promise and failure to achieve it characterize the freight side.

11. See B. Nault, "Information Technology for Freight Transportation Coordination", POIFT, pp. 234-257.
Despite significant technological advances by the private sector, the EDI capability remains inadequate, primarily because of the limited coordination between modes and the problems posed by a lack of common standards. Nor can one overlook the need for persons with the requisite skills to deal with the new technologies which has been revealed in a series of studies sponsored by the USDOT to determine the existing level of professional capacity in ITS. These essentially demonstrate that agencies need greater awareness and understanding of ITS and that many professionals do not yet possess the necessary skills.

In many respects these are similar to those required by professionals working in intermodalism. Above all the ability to deal with technological innovations is required, for a high rate of technological change continues to sweep intermodalism but most individuals and organizations are not oriented towards technological innovation. In addition to training people to deal with new technology, there is also a need to develop a new culture within transportation organizations, one that is hospitable to innovation.

D. Coordination and Integration

In addition, on both the passenger and freight side, the effective use of the new technologies requires a high degree of coordination and integration of resources. This is perhaps the most challenging task not only in terms of technological implementation but, indeed, for the future of intermodalism itself. Achieving coordination is never easy but it is essential for the achievement of intermodalism because of the variety of actors who are involved in developing and implementing intermodal policies and projects.

These can be divided into three general groups—governmental officials, the private sector, and the public and various interest groups. The first category includes not only the USDOT but also all the state DOTs, the MPOs, city councils, and numerous other local government structures such as regional transportation districts. The second includes the shippers and the modal carriers. The third involves a group that has increasingly come to play an important role in transportation planning for there is growing recognition that the public should be involved in transportation decisions in a meaningful way. Bringing all these groups together so as to achieve a consensus on projects and policies is obviously no easy matter. At the most elementary level, coordination between the private and pub-

lic sectors is required as well as between modes. However, this is difficult to achieve because of the competitive nature of the relationships as the case of combined ticketing — an obvious and desirable goal — illustrates.

Basically there are two ways in which coordination can be achieved. The first is called vertical integration and involves total control of an entire system. This is how UPS, for example, operates. It owns its own vehicles (planes and trucks) as well as the information and communication infrastructure. This approach has many advantages including the ability to invest large sums and to develop proprietary systems (UPS hand held scanners are a good example). It also facilitates dependability and efficiency for there is no need to deal with other organizations, each with its own goals and resources. However, this approach works only when dealing with certain standardized items; more common are cooperative arrangements, which bring different transportation groups together.

Many experts believe that such arrangements are the way of the future because the trends discussed above which are making intermodalism inevitable — new trade patterns, decentralized production and distribution — make vertical integration difficult to achieve and implement. It becomes a high-risk strategy despite its many benefits. On the other hand, cooperation makes control difficult (as seen in the relationship between airlines and airport shuttles) since each actor has its own interests, which it seeks to promote. By and large most cooperative arrangements have emerged within modes, and even here often only after difficult and complex negotiations. This situation has important implications for intermodalism, which requires cooperation across modes as well as project planning which I will discuss below since a large number of actors, public and private, are inevitably involved. The difficulties in bringing the Alameda corridor project to fruition provide a fine example. Despite widespread agreement on the vital need for the future of the region to provide a better rail link between the ports of Los Angeles and its rail yards to eliminate the need to move containers by road it proved no easy matter to bring the project to fruition. Each actor — the ports, the railroads, the state government, the federal government, and various counties, to name a few — wanted to minimize its own costs and risks. Similar problems arise when dealing with information technologies for there is an obvious need for shared databases and uniform standards but many organizations are unwilling to share proprietary information for fear of giving competitors an advantage.

E. INSTITUTIONAL STRUCTURES

Further complicating the achievement of horizontal cooperation are

15. Alt et al., op. cit., pp. 48ff.
the institutional arrangements which presently prevail and which represent powerful barriers. These take many forms. The most fundamental is the continuing dominance of the individual modes. Until passage of the ISTEA act, national and state policy was modally oriented and all agencies were organized around modes so that policies and resource allocations were all limited to single modes; they never cut across modes. Even today, the existing policy and planning systems are inadequate. The USDOT still operates by modes – there is an Office of Intermodalism within the Secretary’s office but each mode also has its own intermodal office. Under these conditions, getting intermodal projects and plans approved and funded at the national level is not as easy as it should be. As the National Commission on Intermodal Transportation noted, “planning and policies, particularly at the Federal level, do not encourage and accommodate intermodalism. . . . federal government institutions are organized along modal lines, which inhibits planning and developing an intermodal transportation system.”

The barriers, however, extend well beyond federal policy making structures. Because of this history, each mode possesses its own organizations, cultures, constituencies and powerful interests who benefit from a modal focus. Congress and its committees also reflect modal interests and are responsive to these groups. State/local units also are linked to modal interests. Hence, while there are powerful forces supporting each mode, there are few politically effective intermodal groups and the balance of power remains heavily biased in favor of the specific modes, especially highways. Furthermore, particular modal cultures are deeply embedded in most organizations, including state Departments of Transportation. Under these conditions it should not be surprising that it has proven a difficult task to get these actors and agencies to work together so as to create an effective and efficient intermodal system, locally, regionally, or nationally. Given this history, the nature of the industry and the structure of government in the U.S., overcoming these barriers remains a challenge that will not be rapidly overcome.

This problem is also evident at the state level, particularly in the relationships between the state Departments of Transportation and metropolitan planning organizations. ISTEA increased the power of MPOs but these organizations often possess inadequate staff, tools, and experience to promote intermodalism, even though they usually understand the necessity for such a system in their regions. Hence, they possess a different perspective from that of state DOTs that often remain oriented towards

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16. TNITS, pp. 40 ff., 70ff.
17. TNITS, p. 12.
18. Alt et al., p. 33
highways so that conflicts often occur over the priorities that should be allocated to various projects. The state DOTs, however, tend to emerge victorious for they control most of the funding for transportation. Creating genuine partnerships between these agencies has proven very difficult because each has its own interests, culture, resources, goals, and political alliances. Nor can one overlook the degree to which cooperative planning efforts are an innovation so that those seeking to work together have limited experiences to draw upon. Moreover, land use and transportation are closely related but different agencies have jurisdiction over the former so that even more actors have to be involved in any meaningful attempt to achieve an integrated system at any level. And, freight issues are commonly slighted because most agencies oriented towards passengers. The need to resolve this complex of issues is widely recognized but recognition has not yet led to resolution.

Aggravating the problem of modal relations are the differing private/public sector perspectives and the public attitudes towards new transportation projects. Not only is the private sector fragmented and competitive, it possesses a different planning perspective from that of the public sector, being oriented towards the short term rather than the long term. Nor can one ignore the position of labor unions, which often view intermodalism negatively because the new arrangements often mean a loss of jobs. Furthermore, many intermodal policies and projects are regional in scope and cover several states or urban areas, which usually involves extensive negotiations between many governmental actors for seldom does a single institution administer the entire area.

The need is obvious — to move towards cooperative arrangements and partnerships. But this is easier said than done for the different actors must trust each other. Unfortunately trust is in short supply because of the historic conflictual relationship between the private and public sectors and between labor and management and, indeed, between governmental institutions as well. Incentives for cooperation and coordination between various actors and for people to interact intermodally would be very helpful but, at present, there are, at best, only limited rewards for such behavior.

F. LAWS AND REGULATIONS

Rather than positive incentives, there are numerous regulatory and legal barriers. Despite the great degree of deregulation which has taken place in the U.S. and is underway in many other countries, and which facilitated the emergence of intermodalism, many regulations and laws still hinder the development and implementation of intermodal policies
and projects. It is generally acknowledged that there are numerous unnecessary, inconsistent, and complex regulations not only at the Federal level but also at the State and local levels as well.

G. INFRASTRUCTURE

If a better intermodal system is to be created, serious infrastructure problems will have to be resolved. The most important of these involves eliminating existing bottlenecks and building linkages between modes in the form of the nodes where the modes come together, namely freight and passenger terminals. The capacity of the existing freight terminals is, in many cases strained and new ones are urgently required. Building such facilities, however, is no easy matter. There are many reasons for this state of affairs (most of which have been discussed above); particularly noteworthy are the many actors (public and private) involved, the tendency by MPOs to favor passenger projects, the public concern with externalities and difficulties in securing the necessary financing.

H. FINANCING

Obtaining the funds to resolve infrastructure problems has proven to be extremely difficult so that financing is a major impediment to the creation of an intermodal system. Several reasons have been identified for this state of affairs. Many localities confront a shortage of funds and in some cases even highway projects are being neglected, although funding is historically allocated by modal agencies and highways have always been favored. Even when funds are available, these are often limited to specific projects, usually modal ones, so that intermodal projects, which tend to be large and expensive cannot be financed. In addition, state DOTs, which have control over the bulk of the financial resources, are often DOTs in name only, usually functioning essentially as highway departments. Even if favorably disposed towards intermodalism, they may be restricted by regulations, which prevent spending on non-highway projects. In the absence of such restrictions, intermodalism often means, even with the passage of ISTEA and TEA 21 legislation, shifting funds from the highway mode to another such as transit. Under these conditions it is not surprising that there is so much opposition to spending on intermodal freight and passenger projects.19

Intermodal freight projects must overcome another barrier – these are expensive projects and it is generally accepted that the private sector cannot finance these projects by itself. Its resources are restricted because many transportation companies enjoy limited profitability. Accordingly, the question of the role of government in financing

19. POIFT, pp. 77-90; 172ff.
infrastructure development is an important and complex one that forces us to re-think the relationship between the government and the private sector and raises many complex questions. These include: 1) How to identify the private sector activities that deserve governmental support for many possibilities exist ranging from rail facilities to roads leading to terminals; 2) How should the funding be arranged? Here too many possibilities can be identified ranging from tolls to user charges to limited partnerships to the issuance of tax-exempt bonds to the establishment of trust Funds. 20

I. Research

If an effective and efficient intermodal system is to become a reality, we must overcome significant gaps in our knowledge by enhancing the amount of research on numerous intermodal issues. Experts have identified several important gaps. First, we possess inadequate data regarding many intermodal activities. One reason for this phenomenon is that most research is conducted modally by modal agencies. As I have noted, there is a lack of awareness of intermodalism, especially the freight side, by decision makers and even transportation professionals so relatively little detailed data is being gathered. Furthermore, the issue of trust is an important one in this regard for private sector firms which control much of the needed data are often reluctant to share information with competitors or to provide proprietary information to governmental agencies. Thus there is a lack of reliable information and there is a great need to develop and disseminate reliable and timely data and data bases for passenger movements and for freight planning in such areas as shippers, receivers, and transportation companies, commodity flows, and their economic value. Such information, especially that dealing with freight movements is urgently required for planning purposes and to legitimize needed investments. The freight data situation is especially serious for the kind of information, methodologies and, simulations that are utilized for planning passenger transportation are not available for freight. Specific priority areas include such topics as methodologies to assess proposals requiring government involvement, measuring the performance of the existing freight system, evaluation of economic benefits, and regulatory and operational issues, including airport and port privatization, and the desirability of various funding mechanisms. 21

Second, we know little about the "best practices" and research to identify such information concerning passenger and freight movements in such areas as operations, financing, technological innovations, and institu-

tional relationships. The area of technology certainly deserves attention for we possess only a limited understanding of role of new technologies, including the impact of new vehicles and vessels, of the fit between new technologies and existing institutions, or of the changes that will be necessary to accommodate the innovations. Finally, we need models to measure intermodal mobility and to assess how intermodal projects compare to modal projects.22

If they are to be useful, the findings of such research cannot be confined to library shelves; they need widespread dissemination so that they are actually utilized as benchmarks. Such mechanisms as workshops, conferences, courses, and educational programs are all useful and could be used to prepare the transportation community to move more effectively and efficiently towards intermodalism.23

J. The International Dimension

Intermodalism is today a global enterprise and, as such, the solution to many problems discussed above is complicated further. Reaching a consensus and implementing a solution is far more difficult then when dealing with a domestic problem for actions by many actors in many different countries are required. To cite but one obvious example standardization across national boundaries would greatly facilitate the flow of passengers and goods but different national structures, policies, and interests make this very difficult to achieve. Even problems involving only two countries such as congestion at the U.S. Mexican border prove difficult to resolve. And, since many of these issues require multi-national solutions, international organizations are involved but it is not at all clear that the existing international structures are adequate for the task of helping to create a global intermodal system that is effective, efficient, and ethical.24

IV. Towards Intermodalism

Although these are serious obstacles to the development of a true intermodal system in the U.S. — and in many other countries — important steps have been taken to create such a system. However, it is necessary to build upon what has been accomplished if these efforts are to be successful. In order to do so certain conditions will have to be met. The first and most basic is the issue of trust between the key actors. The time has obviously come to replace the conflictual relationship that has existed between government, industry, and labor for so many decades with a new
culture that recognizes the common interests that they share and promotes win-win situations so that all can benefit from intermodalism. Although the situation differs in various countries owing to particular histories and cultures, the issue exists in many places and has obvious international implications. Similarly, the development of appropriate intermodal policies, projects, and structures deserves to be a universal priority.

Achieving these goals will require leadership. The call for leadership is often is often a substitute for specific recommendations. However, in this case, it should be clear that an elite consensus must be forged on the need for a common intermodal vision and that this consensus must be supplemented by widespread support for the vision among all relevant publics including elected officials, community leaders, the private sector, public interest groups, the media and the public at large. There is an obvious need to educate these and many other actors at all levels to the intermodal vision.

Nor can one overlook the urgent need is to develop organizations that are committed to intermodalism and possess the characteristics and human and financial resources for effective intermodal management and planning. In other words, the present policy making structures with their modal emphases deserve careful scrutiny and, possibly, reorganization. This is certainly true of the U.S. case; many have expressed concern with the modal structure of the USDOT and with weaknesses at the state and local level — the lack of integration of relevant agencies, the absence of an appropriate intermodal orientation and culture, and a lack of staff and resources required for successful intermodal planning and implementation. Specific procedural steps that can be taken include: 1) examining and revising federal, state, and local regulations, laws, guidelines to facilitate intermodalism, 2) providing federal funding as incentives to intermodal efforts, 3) developing system performance measures that allow comparisons to be made across modes and 4) developing appropriate educational programs at all levels and initiation of research in priority areas.

In addition to considering plans and policies, one must also focus upon the ways in which infrastructure projects are planned and implemented, for, as emphasized above, new intermodal facilities, especially terminals are required. Thus renewed attention must be paid to the ways in which decisions are made about the mega projects that form the backbone of the transportation sector for it is important to utilize an approach that permits mega projects such as airports and intermodal terminals to be implemented in a manner that allows them to meet the original objec-

25. TCRP #14, passim.
tives in a timely and cost effective manner. Two issues are paramount — the intermodal emphasis and a process that leads to better outcomes. Unfortunately, numerous cases in many countries illustrate the extent to which large transportation projects encounter unexpected difficulties and do not achieve their goals. Examples range from transit systems (San Francisco’s BART, Miami’s MetroRail) to highway projects (Embarcadero Freeway in San Francisco, London’s motorways) to airports (Kansai, Mirabel) to the Chunnel linking England and France.

These cases highlight the complexities involved in planning for intermodalism. To cite but three obvious obstacles: 1) Intermodal projects are usually mega projects with major impacts upon the environment, social, economic, and ecological, so that they often generate widespread public opposition, 2) intermodal projects often involve many, often conflicting, agencies and actors, 3) forecasts are seldom marked by high degrees of accuracy, a phenomenon which raises many issues, including ethical ones.

Under these conditions the traditional “Rational Actor” approach to transportation planning is inappropriate and it is necessary to consider a new paradigm. This approach recognizes that a focus on optimal efficiency is not efficient, that there are numerous advantages to incorporating redundancy, developing prompt and precise feedback mechanisms, maintaining flexibility and creating organizational cultures that emphasize learning and adaptation. While accepting the rational model as a useful organizational framework, it is also essential to appreciate the role of powerful actors and the importance of consensus, of identifying appropriate local project selection criteria and facilitating widespread and productive local participation. Such an approach is particularly relevant not only because of its relevance to specific project decision making but because the future of intermodalism rests, ultimately, upon the emergence of a popular consensus and the only way to create such a consensus is through the development and implementation of planning and policy approaches that permit people to participate in a genuine and meaningful way. Although such considerations may not apply to all countries since decision making procedures and political cultures vary widely, they are certainly relevant to democratic societies and the global trend towards democratization suggests that peoples everywhere are demanding an increasing voice in shaping public policies in all sectors, including transportation.
Intermodal Transportation in Historical Perspective

Arthur Donovan

Introduction – Modalism and Intermodalism

Intermodal transportation as the term is used today first gained currency in the 1960s when the use of trailer-sized containers began transforming the way freight is packed and loaded on trucks and ships.\(^1\) Cargoes had of course been transferred between different modes of transportation long before the introduction of modern containers. A number of arrangements for carrying truck trailers piggy-back on flatcars and for moving loaded boxcars overseas on ships had been established, but for the most part the task of shifting cargoes between modes still required that the boxes, barrels and bags in which goods were packed be unloaded from one carrier and then reloaded on the train, ship or truck that would carry them on the next leg of their journey. This slow, laborious process had changed little over time and was only partially mechanized by the mid-1950s, when modern containerization was first introduced. Given this level of disjunction between modes, freight transportation has normally been described in terms of the separate modes employed rather than by the activities at the interface between modes. Transportation was about the different ‘ways’, vehicles and sources of

\(^1\) See David R. McKenzie, et al., *Intermodal Transportation – The Whole Story* (Omaha, Nebraska: Simmons-Boardman Books, 1989), p.7: “The container certainly deserves the credit for focusing attention on intermodalism.” The idea of using standard-sized cargo containers and attempts to coordinate road-rail shipments of less-than-carload-lots predate the introduction of the kind and size of containers that are so widely employed today.
power used to move cargoes from one location to another; it was not about shifting cargoes from one mode to another.

By the mid-1970s truck-trailer-sized containers were becoming the standard cargo boxes for surface freight transportation. By the end of the twentieth century containers were carrying over 95% of general cargoes moving between continents and the percentage of other cargoes carried in containers was steadily increasing as well. The circulation of millions of containers worldwide focused attention on two problems: 1) determining which modes to use when moving containerized cargoes, and 2) minimizing the time and expense of shifting containers between modes. The rapid growth of containerization amplified the importance of these core concerns. The enormous capital costs of containers and the equipment used to handle them, combined with intense competition for cargoes, kept profit margins slim while forcing constant innovation. Cities, states and regions made large infrastructure investments in containerports and other intermodal facilities as they struggled to remain players in an industry that was simultaneously expanding and consolidating. The triumph of containerization has irreversibly shifted the focus of freight transportation from modalism to intermodalism. But whether ‘intermodalism’ is precisely the right label for the contemporary freight transportation industry remains an open question.

Using the term intermodalism to refer to freight transportation in general tends to perpetuate the view that the industry is fundamentally composed of modes whose differences are more important than their common concerns. This perception prevailed during the first 60 years of the twentieth century, but today emphasizing the differences between the modes seems rather archaic given that the industry is rapidly transforming itself into a highly integrated system. During most of the nineteenth and twentieth centuries the different modes of transportation carried goods largely on their own terms. Steamship lines, for example, told their customers to leave their cargo at a dockside warehouse or on the dock. It would then be loaded aboard ship and carried to the designated port, where it would be offloaded to the dock or a warehouse to await pick-up, all according to rates and specifications detailed on a separate manifest.

Containerization has profoundly changed this incremental conception of transportation. Through shipment from origin to destination is now emphasized, not the movement of goods by a series of independent modal carriers. The use of common containers is transforming the different modes into a seamless network that moves freight from its origin to its destination with unprecedented speed and efficiency. Shippers now think of transportation as a service that, like all other components of a company’s supply chain, needs to be integrated into the firm’s overall operations. Carriers no longer think of themselves as operating in a single
mode. Service is king in the transformed world of freight transportation and the term intermodalism, which originally directed attention to modal operations and modal interfaces, needs to be replaced by a more global term that emphasizes continuity and through service. Of course a mere change of names will not solve the daunting technical and managerial problems encountered in providing reliable, swift, efficient transportation by a network of carriers, but a more comprehensive term – the leading candidate appears to be logistics – would more accurately describe the nature of the system that is currently being constructed.

If in the future intermodalism is replaced as the organizing concept for freight transportation by some term that does a better job of capturing the contemporary emphasis on continuity and service, modalism will nonetheless continue to play an important role in the history of transportation. Transportation’s heritage, as enshrined in history books and journals, in museum collections and exhibits, and in associations of dedicated amateurs, is thoroughly modal. Maritime historians seldom have much to say to railroad historians, and those who know a great deal about pioneering highway programs and early automobiles and motor trucks rarely have more than a passing knowledge of commercial aviation. Such monomodal identification is not surprising nor should it be condemned, for historians characteristically back into the future with their eyes fixed firmly on the past. But recognizing that the history of transportation remains adamantly modal while the contemporary industry is struggling to reorganize itself into a comprehensive system helps explain why no serious attempt has yet been made to reinterpret the history of surface freight transportation in a way that moves beyond the vocabulary of modalism. A few well-documented books and articles on containerization and intermodalism have been published, but they are primarily valuable as accounts of the attempts to stretch one mode, in most cases rail transport, to encompass another, usually road transport. But if the history of transportation is to stay in touch with contemporary developments it will have to come to grips with intermodalism at the conceptual level. Change in the present creates pressure to reexamine older accounts of the past; that’s what drives historians back to their sources and justifies the construction of new interpretations of the past. It is time that historians of transportation begin thinking outside the modal box.

This paper suggests one way in which the history of surface freight transportation might be recast so as to link the past to the present in a more convincing manner. Forty years of intermodalism has shown it is possible to think of freight transportation without forcing the subject into modal categories. Conceptually, this is one of intermodalism's enduring achievements and it deserves to be given a prominent place in historical accounts of twentieth-century transportation. But having broken the mold of modalism, intermodalism may have done all the work it can in today's transportation industry. I suggest that like other once useful organizing ideas in transportation history, ideas such as mercantilism and grants of public lands, the concept of intermodalism be honorably retired. The freight transportation industry can then shed its outdated fixation on modes and move more confidently into the beckoning post-modal future.

The different modes employed in moving freight are human inventions, rather than systems whose defining characteristics are given by nature or their technologies, and each of the modes has its own history. The historical sequence in which the different modes appeared and the ways they have intersected and interacted over time go a long way toward explaining why modal separation and competition have so long been considered fundamental to freight transportation. Our first task, therefore, is to examine more closely how the modal perception of transportation arose and achieved intellectual dominance. We need to think of the modal conception of transportation as contingent and problematic rather than given. Before asking how modalism was transformed into intermodalism, we need to understand how modalism itself gained ascendency. This is a question that would not have arisen had containerization not forced all those engaged in freight transportation to pay more attention to intermodalism. Once again we see how recent developments recast the questions historians ask and keep the study of the past alive and interesting.

A comparison may help clarify what is being proposed. Modern nation-states, like the various modes of transportation, are historical entities; their points of origin can be identified and how they have developed over time can be explained. For centuries in Europe, and for different periods of time elsewhere, nation-states have been the atomic units of world politics. States are traditionally regarded as autonomous and sovereign; there is no higher secular authority to which they must answer. So long as the world has been divided geographically and politically into sovereign nation-states, the power of more general councils that seek to address regional and global issues has been severely limited, the most notable contemporary example being the United Nations. While diplomats employing the protocols of international relations do succeed in arranging alliances and other forms of agreement among states, in the
modern state system no state willingly surrenders its fundamental freedom of action.

Today, however, the concept of national sovereignty is slowly and steadily being transformed. Global commerce and communications, and the development of regional trade agreements in Europe and North America, are in fact reducing the freedom of action of the nations involved. We may be witnessing the end of the nation-state as the irreducible sovereign unit in world politics, just as in transportation the various modes can no longer function with complete autonomy. The benefits that flow from trade and industrial efficiency are persuading political leaders that they must be prepared to bargain away aspects of their independence so they can share in the wealth available to members of larger economic communities. No one knows precisely where these trends are taking us, but in transportation, as in world politics, it appears that new and very different attitudes and organizations are gaining ascendancy. Internationalism and intermodalism prepared the way for profound institutional changes that now sustain new forms of political and industrial coordination on a global scale. New forms of self-description will seem natural to those who come to maturity in this new world, while only historians and those who worked in the transportation industry before containerization and deregulation will continue to be aware that a profound cultural and institutional shift has taken place. Today a history of the world that focuses entirely on the rise and fall of nation-states would rightly be considered inadequate. So would a history of transportation that speaks only of modes and their interactions.

**Freight Transportation Before the Age of Modalism**

Modern freight transportation uses machines, natural resources and human skills to move cargoes over considerable distances. Because each of the different modes employs a different mix of technologies, each has its own characteristics and capabilities. In certain circumstances two or more modes may compete head-to-head for cargoes awaiting shipment, but in most cases there is, for technical and economic reasons, little direct competition between modes. Rails simply cannot be built across oceans, while airplanes are not competitive when it comes to moving low-value commodities. Intermodalism addresses the problem of selecting the best mode of transport when more than one mode can or must be utilized. It also deals with the physical transfer of cargoes from one mode to another. In historical terms, however, significant modal competition is largely a modern phenomenon, one that only became a matter of some importance following the mechanization of overland transport.

Freight is heavy and the vehicles in which it is loaded must be
strongly supported while offering relatively little resistance to horizontal motion. When distinguishing among the modes it is therefore best to begin by focusing on the ‘way’ used by each mode. Prior to the industrial revolution most overland carriage relied on animal power to carry the weight of the goods being transported and to move them forward. Certain devices, such as rowed galleys and wheeled wagons, used inanimate means to support the vehicle’s weight as it was propelled forward by muscle power, but the tempestuousness of the seas and the roughness of roads built before the twentieth century severely limited their utilization. Two of the industrial revolution’s great achievements were the manufacture of compact and increasingly efficient steam engines and the production of large quantities of relatively low-cost iron, and both technologies contributed to profound advances in freight transportation. In the twentieth century further technological advances added to the ways available to move freight, so that today one can choose among waterways, railways, highways, and airways, as well as such less flexible but nonetheless important modes as pipeways and beltways.

Waterways have been used to move freight since time immemorial. Peoples who lived along rivers learned to build rafts and canoes, load them with trade goods, and float them downstream. The water supported the weight of the cargo, so long as the vessel stayed afloat, while offering little resistance to motion along its surface. In time humans learned to make larger and stronger boats and use sails to capture the force of the wind. Wherever water passage was possible on rivers, along coasts, in enclosed bays and seas, and ultimately across oceans, the evolving technologies of shipbuilding and sailhandling made it possible to carry men and goods to lands both near and far. Later on waterways were extended inland by constructing canals. A variety of industries arose to exploit the possibilities made available by different types of waterways, but they were all part of a single mode in the sense that they all used water as their ‘way’.

In an abstract sense coastal navigation competed with overland transportation, but as Adam Smith emphasized in *The Wealth of Nations*, so long as overland transport depended on highways and draft animals, there really was no competition. Writing in the 1770s Smith examined the cost of moving freight between London and Edinburgh, a city served by the port of Leith.

A broad-wheeled wagon, attended by two men, and drawn by eight horses, in about six weeks time carries and brings back between London and Edinburgh near four ton weight of goods. In about the same time a ship navigated by six or eight men, and sailing between the ports of London and Leith, frequently carries and brings back two hundred ton weight of goods.
After working out the relative costs involved, Smith concludes:

Were there no other communication between those two places, therefore, but by land-carriage, as no goods could be transported from the one to the other, except such whose price was very considerable in proportion to their weight, they could carry on but a small part of that commerce which at present subsists between them, and consequently could give but a small part of that encouragement which they at present mutually afford to each other’s industry.  

Smith then extends his argument to regions in which overland carriage is not possible, his point being that in the absence of reasonably priced transportation, or of any form of transportation at all, there is no trade. This was the vision that informed the age of European maritime empires from the mid-fifteenth century until the end of the Second World War. At that stage in the history of transportation, the growth of trade was promoted and shaped far more by the possibilities opened up by new modes of transportation than by marginal advantages among competing modes.

The railroad was the new way to go in the nineteenth century. The ‘way’ involved was manmade, the key technology was the flanged iron wheel rolling on an iron rail. Metal rails support the weight of vehicles and cargo while imposing far less resistance to horizontal motion than the rough highway surfaces of the time. In North America two types of railroads were built. The earliest connected existing cities and towns and carried passengers and freight in both directions. These roads were often built parallel to existing canal routes and turnpikes and in most cases offered faster, cheaper and more reliable service than the canals or roads could provide. Here, as along the coasts, real modal competition emerged, and in all but a few cases the railroads prevailed. But railroads were also built, usually with government land-grant support, from cities and towns ‘at the end of the line’ out onto the open prairies and plains and up into the mountains. The companies that built these roads were betting on the future and trusting that commerce would flourish once the continent’s mountain ranges had been breached and its interior had been settled and made productive. In one sense then, the pioneering age of railroading was the continental equivalent of the classic age of European maritime enterprise. When a means had been found to provide fast, efficient overland freight transportation, commerce expanded to make full use of its possibilities.  

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But there were also profound differences between waterways and railways. With the exception of canals and improvements needed to make rivers and harbors navigable, the waterways used by the maritime industries were provided by nature at no cost. And so long as ships continued to harness the winds, the power that propelled them was available free of charge. Of course this reliance on nature made maritime commerce dependent on the weather in all its variability, but the salient point is that the comparative entry and operating costs of water transport remained low. Furthermore, ships could go wherever their capabilities and economic opportunities took them; ocean-going ships could look for cargoes and markets wherever they could sail, so long as pirates and politicians did not pillage or exclude them. The low cost of entry in the maritime trades and the flexibility and range of coastwise and oceanic commerce were of great use to North Americans in their colonial and early national periods, and they made the most of them.

When railway development began in the 1830s, America was a thinly settled nation with relatively little capital to invest in its infrastructure and railroad building was therefore left to private enterprise. The captains of industry who took the lead in this new mode of transportation, many of whom would later be pilloried as 'Robber Barons,' built the overland transportation system that created modern America. The cost of doing so was enormous. Railroad companies had to acquire rights of way, construct road beds, and lay the tracks on which their trains ran. Land costs, building costs, and the maintenance and operating costs of the ways themselves obliged the railroads to raise capital at levels never before required by American private enterprise. British investors provided a large portion of the needed funds, while America's capital markets were rapidly mobilized to support the building of the new nation's transportation infrastructure. Overbuilding, ruinous competition, bankruptcy and consolidation roiled the railroad industry until the end of the nineteenth century as the national rail network was being constructed and the great railroad companies were figuring out how to manage America's first big business. It was a story of epic proportions, one that largely obliterated from national memory the earlier, less capital-intensive achievements of America's maritime industries.

The fact that the railroads, unlike the maritime carriers, built and owned their 'ways' was enormously important. Once the first wave of railway building had been completed, comprehensive railroad companies were created largely by buying and integrating smaller companies that

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owned key segments of track on developed routes. In the maritime trades, at least before the age of iron ships, those who wished to enter the business could simply build new vessels at relatively low cost and bid for cargoes wherever they were allowed to trade. The railroads had huge sunk costs, and opening a new route or abandoning an old one involved significant commitments or losses. While the railroads wielded great power over the towns and regions they served and could claim a large percentage of the commercial wealth generated within them, their geographical fixedness made them easy political targets, especially when they were popularly viewed as being rapacious monopolies. The railroads' size and power exposed them to far greater public scrutiny and political interference than the waterway's industries had to face. As a result, it was the railroad companies rather than the maritime industries that forced Americans to come to grips with the consequences of relying on private corporations to build and operate the burgeoning national economy's transportation infrastructure.

But it would be a mistake to suppose that the great railroad builders thought of themselves as restricted to one mode only. Although widely known for their successes as captains of the railroad industry, many of the pioneering railroad managers thought of themselves as entrepreneurs in the broadest sense and were ready to expand into any form of transportation that offered a promising return. The model for this kind of heroic system building was one of Great Britain's most notable engineers, Isambard Kingdom Brunel.6

In 1833, when only 27 years old, Brunel was appointed engineer to the recently formed Great Western Railway Company. Railroad building was then in its infancy and the British had not yet agreed upon a standard track gauge. Brunel decided to build 'broad gauge' on the fairly level run from London to the western port of Bristol and he laid his tracks 7 feet, one-half inch apart. When later in the century he was forced to conform to the 4 foot, 8.5 inches gauge that had become widely adopted as the standard, Brunel considered containerizing rail freight to facilitate shifting it between cars running on different gauges. While building the Great Western Railway Brunel began thinking about steam navigation, and even before 1841, the year the railway was completed, the company had agreed to build trans-Atlantic steamships that would make the western terminus of the railroad New York City rather than Bristol. The first of these, the Great Western, was a paddle-wheeled steam auxiliary having an immensely strong wooden hull; on its maiden voyage in 1838 it crossed the Atlantic in 15 days. The second ship, the Great Britain, had an iron hull and a screw propeller; it was launched in 1843 and can be seen today

gloriously restored in the Bristol drydock in which it was built. The third in this series was the mammoth and troubled Great Eastern, designed to circumnavigate the globe without refueling and to carry an entire year’s exports to India; it was finally launched in 1858. These ships were built to connect Britain’s railroads to the world; they were products of a vision of transportation that was not constrained by modal thinking or modal regulation.

Similar stories can be found in the history of American railroading. The Pennsylvania Railroad was organized in 1844 to cross the mountains in the middle of the state and link the eastern seaport of Philadelphia to the booming industrial city of Pittsburgh, located at the head of the Ohio-Mississippi River system. Much of the railroad’s capital came from Philadelphia merchants who had succeeded in maritime ventures, and it was realized that the best way to increase the railroad’s traffic flow was to improve Philadelphia’s standing as a seaport. This was first done by expanding the trade in anthracite coal brought down from the hills to the west of Philadelphia. In 1850 the Pennsylvania Railroad’s west-bound traffic received a boost when Great Britain’s Inman Steamship Company began bringing immigrants from Liverpool to Philadelphia. By that time J. Edgar Thompson had become the railroad’s president and was vigorously consolidating his control while expanding his vision. By 1870 the railroad had grown from the 400 miles of track connecting Philadelphia to Pittsburgh into a 6000-mile network linking the northeast to the midwest. As Thompson looked east he saw the ocean as a resource to be utilized rather than as a barrier to growth; the time had come, he decided, to move offshore.

New York City had for decades been the dominant seaport on the Atlantic Coast, and after the Civil War it appeared ready to capture nearly all the north-Atlantic trade and funnel it onto the rail system that linked the seaport and the midwest; indeed, seven years after inaugurating its Philadelphia service, the Inman Line had shifted that service to New York. In 1871 the leaders of the Pennsylvania Railroad, together with other prominent Philadelphia merchants and bankers, moved to counter New York’s hegemony by creating the American Steamship Company, the nation’s first post-Civil War transatlantic liner service. By the end of the year the company was soliciting bids to build four iron steamships the size and speed of the finest British liners in service at that time. This was the largest American steamship order placed in the 1870s and all four shipbuilders in the Delaware Valley, the center of iron shipbuilding in the United States at that time, submitted bids. The contract

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was awarded to Cramp & Sons and the Pennsylvania, the first of the four liners to be built, was launched in 1872. Two years later all four ships were in service and the Philadelphia waterfront was being transformed by their coming and going. These ships, which were not the company’s only maritime ventures, served the Pennsylvania Railroad and the city for over 35 years, a clear demonstration that the vision of nineteenth-century transportation leaders was not restricted to a single mode.

The pattern was repeated on the Pacific Coast. James J. Hill got his start working on Mississippi River packets and then ran a steamboat service on the Red River in the 1870s before gaining control of a railroad system centered on St. Paul, Minnesota. As president of the Great Northern Railway Company he opened much of the Northwest and pushed his line through to Seattle in 1893. Looking north, he saw the Canadian Pacific Railway operating its Empress liners from Vancouver to the Orient, while in Tacoma to the south his main American rival, the Northern Pacific Railway, connected with the trans-Pacific service operated by the Northern Pacific Steamship Company. Hill promptly sent agents to Japan and China for a year to compile a detailed record of ship and cargo movements. In 1896 he sent a trusted associate to Japan to sign an agreement with the leading Japanese shipping company, Nippon Yusen Kaisha (NYK), to provide monthly service between Seattle, Hong Kong and Japanese ports for traffic generated by the Great Northern Railway. The first Japanese ship arrived in Seattle a month after the agreement was signed.

Hill saw the Orient as an boundless market for American goods that his railway would carry to Pacific ports; he believed he held the link between America’s limitless ability to produce wheat, cotton, and steel and the nations that needed them. Like Brunel, his wanted to operate the biggest ships possible to keep his transportation costs to a minimum. In 1900 he proposed to build four ships for the Great Northern Steamship Company, his new liner company, and signed contracts for the only two that were actually built; both were to be half-again as large as the biggest merchant ship ever built in the United States and larger than any ship in the world operating at that time. They were constructed in Groton, Connecticut, on the site now occupied by the submarine builder Electric Boat Company. Wide, deep, blunt and slow, his ships were designed to produce profits by moving enormous cargoes. It took longer to build them than Hill expected and by the time the Minnesota was launched in 1904 Hill was growing weary. As he told a Merchant Marine Commission in 1905, the steamship company “is really an incident to our railroad enterprise,
and we did not go into it with a view of entering the shipping business." Hill clearly thought of himself as operating in the transportation industry rather than in a single mode, but experience taught him that American shipbuilding was one aspect of the industry he would do well to avoid. As he told the Commission, "I would rather undertake to build a thousand miles of railway than to build two ships." 9

These brief stories make a single important point: in the nineteenth-century transportation system builders did not think in terms of modes, they thought in terms of markets, traffic flows and costs. Of course these entrepreneurs knew precisely what the differences were between the two major modes used to move freight, but they all thought of the enterprises they were building as coordinated multimodal systems. It did not occur to them to restrict their thinking to a single mode, especially when opportunities for opening new markets abounded; modal thinking was a constraint that had to be imposed, learned and enforced. If for venturesome entrepreneurs there is a 'natural' approach to freight transportation, it is comprehensively systematic rather than modal. There must therefore be particular historical reasons that the transportation industry came to be thought of in modal terms. Modal thinking is not a simple reflection of the existence of several modes, it is a consequence of specific legal limitations and operational practices that were adopted as the American political system responded to the challenges posed by the new forms of transportation made possible by the advance of industry. The rise of modalism is not a simple story, but it is an important and instructive one.

Federal Intervention and the Construction of Modalism: Regulation, Mobilization, Depression

Although the story of federal transportation regulation from the 1880s through the 1930s is exceedingly complex, certain overarching themes are visible. One theme is that during this period legislative acts restricting certain forms of competition and system building within the freight transportation industry had the effect of transforming maritime shipping, the railroads and the motor truck industry from private entrepreneurial enterprises into closely regulated quasi-public utilities. In the decades before the First World War the federal government responded to citizen complaints about the growing power of corporations by setting itself up as a countervailing force responsible for defending the public interest, which of course it then had to define and find suitable means to defend. What emerged from this crusade was a web of bureaucratized intervention and supervision that radically altered the way the regulated industries ran their businesses.

9. Ibid., p.192.
The government responded especially strongly to public dismay over the growth of combinations and trusts. Businessmen promoted such combinations as a way of controlling excess capacity and coordinating supply and demand in the emerging national economy; consumers and small businessmen, however, saw such combinations as monopolies and restraints on trade, conspiracies against the common good. Except in times of national emergency, federal officials seldom argued for public ownership and operation of industry, which industrialists were of course determined to avoid, but gradually regulatory strategies were developed for managing what came to be called 'natural monopolies' as public utilities. Although close regulation of such businesses was widely favored, no one foresaw that the forms of regulation adopted would so constrain the industries involved that their innovative and dynamic features, which everyone expected would continue to generate wealth and increased efficiency, would in fact be effectively destroyed. As the federal government responded to the new world of industry, Americans began to learn through experience the limitations of Progressive social theory and the costs of attempts to link closely political interests and economic activity.

The story of regulation and antitrust enforcement rings with righteous antagonism, misunderstanding, mistrust, unintended consequences, and striking ironies, and although passions ran high for generations, the time for searching for villains has long passed. The government's efforts to control the impact of industry led to bureaucratization and a loss of entrepreneurial vigor, yet its concerns also reflected real public pain and anxiety, and the regulatory machinery it created appeared reasonable at the time. The government was responding to particular problems associated with the growth of industry, it was not attempting to create a comprehensive plan for national economic development. Laws were passed and administrative machinery was created to deal with concrete problems and it took years for all the consequences of these actions to become apparent. Inevitably government regulation slowed the growth and modernization of the regulated industries. In the freight transportation industry, for instance, the government identified problems and proposed remedies on a mode-by-mode basis, a strategy that soon saddled the regulators with the task of rationalizing and sustaining each mode separately. The move from seeing a variety of modes as merely a feature of freight transportation to seeing modalism as the organizing principle of the industry occurred between the 1880s and the 1930s. The government did not set out to create bureaucratic walls between the various modes, but its policies nonetheless had this effect.

Federal regulations addressed a variety of concerns, many of which were widely shared and not causes of contention. The least contentious issues concerned the safety of passengers and, later, of workers. Ship
wrecks, boiler explosions, train wrecks, fires, and highway collisions were dramatic events that managers could hardly excuse as acts of god and there was little political opposition to regulations designed to reduce the loss of life and limb in the increasingly mechanical modes of transportation being employed. Laws designed to prevent and punish dishonest dealings in corporate governance and in the trading of railway securities were also popular, and while only a few Americans owned stocks, legal pursuit of buccaneers who exploited investors and ruined companies was always well received.

The task of controlling the way businesses priced their goods and services and managed their day-to-day affairs was a more challenging matter. The problem generally did not arise when freight was being moved on waterways, for if American ships were allowed to call at a port, new entrants could always provide additional service when rising rates justified doing so. After the First World War this was also true for the motor truck industry, for the roads and highways it used were publicly built and maintained. But as canals and railways pushed west, towns grew up along them like pearls on a string, and in the absence of competing transportation services there was a strong temptation to price the services provided to those towns at whatever the market would bear. But since the products shipped from these areas had to compete in regional and national markets with products from areas where competition kept freight rates low, shippers who were charged high rates complained they were being exploited by the carriers. Here was a challenge to fairness that Congress was eventually forced to confront; the response that emerged addressed both monopoly power and the setting of freight rates.

The constitution gives the federal government sole authority over interstate commerce and this was the power Congress invoked when it took up the issue of railroad freight rates. Setting the rates that customers are charged for service is a matter of crucial importance to businesses. The costs of providing service and the opportunities presented by the marketplace must be taken into account. Congress was concerned primarily with the fairness of rates, but it lacked the information needed to determine what rates should be. It therefore decided to create a panel of experts modeled on the commissions that had previously been set up by several states to regulate railway rates. The Act to Regulate Commerce, passed in 1887, created the Interstate Commerce Commission (ICC), the first of the many federal commissions that were to follow. The Act granted the ICC quite restricted powers, but as shipper complaints increased and the Progressives became more assured of their ability to regulate business, Congress strengthened the ICC’s hand. A series of laws passed in the years before the First World War gave the ICC authority to set new rates after voiding unfair rates, to initiate proceedings on its own and set aside
rates temporarily while investigating their fairness, and to establish the physical value of railroad property as a base for calculating a fair level of earnings.10

The government, through the ICC, had established a firm grip on the railroad industry’s ability to generate revenue and it showed no inclination to let go. Appeals to the Commission for rate increases were repeatedly denied on the ground that the railroads could get by with the existing rates if they simply cut costs and trimmed their dividends. There may have been some truth in this, but the industry’s requests for rate hikes were not entirely motivated by greed and sloth. A long period of declining prices had ended at the turn of the century and fifteen years of inflation put the railroads in a serious financial squeeze. The railroads, so recently haughty and powerful, were, as industrial enterprises, being forced into decline, a fact that the government only admitted when it seized and operated them during World War I.11 When the U.S. entered the war the powers of the ICC were suspended and Wilson appointed his Treasury Secretary William McAdoo as Director of the Railroads. In 1918 McAdoo granted the railroads a sizable rate increase to keep them economically viable.

In 1890, three years after creating the ICC, Congress passed the Sherman Antitrust Act. Unlike the earlier Act to Regulate Commerce, the Sherman Act did not set up a regulatory commission to enforce its provisions. The Act declared Illegal “every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce,” and defined as criminal “every person who shall monopolize, or attempt to monopolize . . . any part of the trade or commerce among the several States, or with foreign nations.”12 Enforcement was left with the Department of Justice, which during the following two decades chose to prosecute primarily small firms that colluded to fix prices and labor unions that engaged in strikes, rather than the giant trusts that dominated such industries as tobacco, petroleum and steel.

By 1910 it was becoming clear that an expert commission was needed to interpret the broad language of the Sherman Act and insure that antitrust enforcement focused on the right targets. After much debate two supplemental bills were passed in 1914. The Clayton Act clarified what kinds of business practices constitute restraint of trade, while the Federal Trade Commission Act created a board of five commissioners (FTC) to

interpret antitrust law and determine in specific cases what methods of commercial competition were unfair and, when necessary, to order offenders to 'cease and desist' from using those methods. Since a regulatory regime had already been created for transportation, the FTC was not given authority in this area. But its creation 27 years after the ICC was set up clearly indicates that the Progressive regulatory program was still being vigorously implemented.

Building the Panama Canal was one of the heroic engineering projects of the early twentieth century and the federal government attached great strategic and commercial importance to this new inter-oceanic waterway. But as the canal neared completion it was realized that the railroads would oppose the anticipated revival of intercoastal maritime competition and that they were likely to do whatever they could to defend their dominance of the coast-to-coast freight business. Should the government stay out of this competition between modes and let it be settled in the marketplace? Not likely, for Washington, having invested so much money and hope in this project, felt compelled to defend the canal's commercial prospects. It therefore passed the 1912 Panama Canal Act, which amended the Interstate Commerce Act by specifically prohibiting railroad companies from having any interest in water carriers operating through the Panama Canal, especially if they transported cargoes the railroads might otherwise have carried.13 Evidently Congress had come to see the ICC, which was initially established to determine and enforce fair railroad rates, as the tablet on which it could inscribe whatever policies it felt were necessary for the domestic freight transportation industry. It was a way of using this commission that Congress would employ again in the 1930s as it struggled with the consequences of the depression.

When President Wilson decided the United States needed its own merchant marine to carry its overseas trade, the issue of combination in restraint of trade had to be addressed. Iron-hulled steam-powered ocean-going ships are, like railroads, expensive industrial artifacts that have to be continually earning revenue to cover their costs and provide a return on investment, yet as in other areas of transportation at the end of the nineteenth century, excess capacity and unrestricted competition among steamship lines repeatedly drove cargo rates down to levels that threatened to bankrupt the weaker firms. Liner companies responded to this threat by forming conferences that set freight rates on specific trade lanes, allocated cargo among members, and sometimes pooled and shared profits. These international cartels also defended their control of trade routes by deploying 'fighting ships' that carried cargoes at a loss when

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necessary to prevent other operators from forcing their way into the trade. All foreign governments allowed such conferences to exclude non-members, but such an arrangement would clearly violate U.S. antitrust law. U.S. ocean carriers soon discovered that antitrust regulation was not a matter of domestic concern alone.

In 1916 Congress passed three ‘preparedness’ bills submitted by the Wilson administration. Having had no success in getting the warring nations in Europe to heed his pleas for peace negotiations, Wilson concluded the Great Powers of Europe would only listen to the United States if it too became a Great Power. He still hoped to avoid being drawn into the war in Europe, but he realized that a lack of preparedness was being interpreted as a sign of weakness and an absence of resolve. Wilson therefore asked Congress to pass a Navy Act, an Army Act, and a Shipping Act. The first two expanded the armed services, the third authorized the building of a world-class merchant marine. Prior to this the United States had relied on foreign shipping lines to carry almost all of its overseas trade. When Europe went to war in 1914, the U.S. found itself without carrying services while its export cargoes rotted on its docks. The 1916 Shipping Act therefore authorized the building of a fleet of merchant ships at government expense, to be privately operated when possible, that would provide adequate carrying service for the nation’s foreign commerce and for its armed services in times of peace and war.

The Shipping Act created a five man Shipping Board that was given broad powers to deal with antitrust issues. Companies operating U.S.-flag ships could join conferences, but only if the conference agreed not to use fighting ships or provide deferred rebates. The law also required that any conference that included U.S.-flag ships must be open to any steamship company that wished to join and that trade with U.S. ports be open to all carriers, whether members of the conference or not. All U.S. liner companies were also required to file their rate schedules with the Shipping Board. The restrictions attached to the antitrust exemption granted to U.S. carriers engaged in foreign trade thus eliminated many of the advantages of the conference system. Although the Shipping Board did not control ocean freight rates as directly as the ICC controlled railroad rates, it required that they be published and that competition be open to all. The railroads already had their regulatory commission and now the ocean-carrying industry had its. Modalism, reinforced by the creation of separate bureaucracies to regulate and enforce compliance in each mode, had been firmly institutionalized.

The First World War gave the United States its first taste since the Civil War of a mobilized and centrally directed economy. The govern-

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ment seized and operated the railroads and, having committed itself to a massive deployment overseas, poured money into the construction of an enormous merchant fleet. By the time its shipbuilding program was shut down, the nation had spent more than twice the value of the entire world’s pre-war commercial fleet on building a new U.S. merchant marine. When the war was over the railroads and much of the merchant shipping were returned to private corporations, but the possibility of direct public control was not forgotten. America had moved far from the days of enterprising Yankee shipbuilders, innovative ship operators, and free-wheeling railway managers. The transformation of freight transportation from an entrepreneurial private enterprise to a regulated public utility appeared irreversible; government oversight of industries ‘affected with a public interest’ was becoming ever more constraining.

As demobilization proceeded following the First World War, the government tacitly acknowledged that it had an obligation to set policy for the industries it regulated, yet it was ill-equipped to do so. The Transportation Act of 1920, the Esch-Cummins Act, provided for the return of the railroads to private operation, but it also greatly strengthening the powers of the ICC.15 The Commission could now set minimum as well as maximum rates and was instructed to see that the railroads obtained a fair rate of return. The Commission was also to supervise the issuing of railway securities and proposals for consolidation. The government also announced its determination to make the industry healthy, and rather than leaving that job to management and market competition, it told the Commission to move toward consolidating the country’s railroads into a limited number of systems. The 1920 Act also created a nine-man Railroad Labor Board to address the industry’s intractable labor problems. Although the bill was called a Transportation Act, it in fact addressed the problems of a single mode. The government was still dealing with transportation problems mode-by-mode, as it had done when creating its original regulatory commission.

The Merchant Marine Act of 1920 did much the same thing for its industry.16 It authorized the sale of government ships to private companies, defined the nation’s maritime policy, and strengthened federal oversight of the industry. Popularly known as the Jones Act, the 1920 Act restated and strengthened the exclusion of non-U.S. ships from trade be-

tween U.S. ports, including those in the nation's offshore territories, thereby reserving these trades for ships built in the United States and owned and crewed by U.S. citizens. The 1920 Act also reinforced the nation's commitment to providing U.S.-flag service on all essential trade routes and strengthened the antitrust penalties for conferences that did not abide by its rules. As with the railroads, the government forthrightly stated its intentions for merchant shipping in 1920, but it did so within an entirely modal conception of freight transportation. Formulating a comprehensive and truly national transportation policy was not yet part of the federal agenda.

During the 1920s the number of cars, trucks and hard-surfaced roads and highways increased rapidly. This hurt the railroads as they lost passengers to cars and buses and as trucks captured an increasing percentage of the lucrative small-lot freight business. Trucks, like ships, did not have to build their 'way'; they were free to go wherever there were adequate roads and to adjust their routes to suit their customers. Trucks offered better service and quicker delivery than the railways could provide. The motor truck industry consisted of thousands of small-scale enterprises, many of them single truck operations, and it was not burdened with the regulatory constraints, deferred maintenance, or enormous sunk costs that weighed down the railroads. The railroads tried to hold on to their customers by starting their own trucking companies and by carrying truck trailers on flatcars, but they soon ran afoul of requirements that they operate in only one mode, and in most cases they simply could not match the service provided by the truckers. Just as the coastal and inland waterways had earlier lost much of their passenger and freight trade to the railroads, so too did the railways lose passengers and general freight to cars, buses and trucks. This would not have been fatal had the core sectors of the railroad business been in good shape when the motor truck industry began to grow. It was not modal competition that put the railroads in peril in the 1930s, it was the constraints imposed by rate regulation and the absence of vigorous management that kept them economically weak. Regulated and slow to respond, the railroads were ill-prepared for the rigors of the depression.

The prolonged collapse of industry during the Great Depression changed everything. Whereas the ICC had been created to serve the cause of justice by restraining the railroads' use of monopoly power, the government's task in the 1930s was to revive industry and the economy it served. The transportation industries were no longer wild horses that had to be brought under control, they were ailing beasts of burden that needed to be nursed back to health. Protection and subsidy of key industry sectors was called for, not close supervision of powerful monopolies and cartels.
New Deal legislation brought the government’s modal organization of the transportation industry to a culmination, but it did so in a way that radically undermined the public interest assumptions that had informed this program at its outset. Regulation was originally imposed to protect the public interest against the economic power of 'natural monopolies' such as railroads that provided towns with their only freight service. But nearly fifty years of regulatory experience and technological change had transformed the original regulatory apparatus into a powerful opponent of modal competition. Federal transportation policy made no effort to plan and implement a coordinated, rational, efficient national transportation program, nor, alternatively, did it favor deregulation and letting the marketplace determine the allocation of transportation investments and services. It was instead committed to protecting from modal competition the various modes of transportation that had developed up to the time of the depression. This was a reasonable goal at the time, for the most pressing need then was to get industry working again and the men back on the payroll. But when the depression was over the walls that isolated the different modes from each other remained. Modal autonomy had become institutionalized by law, bureaucratic regulation, and federal protection and subsidy; it had also become deeply ingrained in the corporate culture of the modal industries. This is the entrenched legacy of modalism that the transportation industry is still struggling to overcome.

The dire condition of the railroads was first addressed in the June 1933 Emergency Railroad Transportation Act. In addition to altering some of the ICC’s powers, the Act created the temporary position of Coordinator of Transportation. This individual was to be appointed by the President, would work with the ICC, was subject to the scrutiny of federal courts, and was charged with rationalizing the nation’s rail system. The veteran ICC Commissioner Joseph Eastman was appointed as the first Transportation Coordinator, but despite his skill and experience he was not able to make much progress on the impossible task he had been given. As one commentator has noted,

[Eastman] succeeded only in coordinating opposition to him and his office. He shrewdly analyzed those opposing cooperation as management, unable to break old habits of thought; railroad officials and laborers, afraid to lose their jobs; communities, apprehensive about service; supply companies, worried about collective railroad scientific research and purchases; and large shippers, anxious to play railroads against each other.17

In his annual reports Eastman argued against nationalization of the railroads and urged instead that trucking and inland-water carriers be brought under ICC regulation and that the ICC be reorganized. The 1935

17. Hoogenboom, p.128.
Motor Carrier Act was the most significant achievement to flow from these proposals. It provided for extensive regulation of trucks operating as common carriers, that is to say those that accepted cargo from all who offered it and carried it at published rates; truckers who carried cargo under private contracts were subject to lesser levels of regulation. The 1935 Act also gave the ICC the power to issue the certificates required to operate as common carriers and to set maximum and minimum rates and other standards for management and operations. Only minimum rates could be set for contract carriers. Determined to revive industries that had been knocked flat by the depression, Congress wanted the ICC to prevent a rate war between truckers and railroads. Truck rates were therefore tied to existing rail rates, a decision that pleased the railroads but cost them dearly as truckers began providing superior service for the same cost.

The Merchant Marine Act of 1936 provided that industry with a highly elaborated program of regulatory oversight and a program of construction and operating subsidies designed to make U.S.-built ships operating under U.S. registry competitive in international trade.\textsuperscript{18} It remains the organic act for U.S. maritime policy today, although its subsidy programs have been almost entirely eliminated.

The increase in the ICC's workload was such that by 1937 a committee recommended President Roosevelt create a new department of transportation, but nothing came of it. This increase in the ICC's workload was one of the reasons that when Congress turned its attention to aviation, it decided to create a new Civil Aeronautics Board (CAB) rather than simply assigning this additional responsibility to the ICC. Established under the Civil Aeronautics Act of 1938, the CAB was expected to follow 'the usual system of economic regulation [according to] the recognized and accepted principles of the regulation of public utilities, as applied to other forms of transportation.'\textsuperscript{19} Congress' goal was to bring stability to the airline industry, and so it did. The 1938 Act and CAB regulation effectively cartelized the airline industry in a form that remained essentially unchanged for the next forty years. Once again it became clear that federal regulation, as codified in the New Deal, imposed an enduring if inefficient structure of modalism on the transportation industry.

This New Deal legislative program was completed by the Transportation Act of 1940, which gave the ICC jurisdiction over coastwise, intercoastal, inland, and Great Lakes common and contract water-carriers engaged in interstate and foreign commerce. Bulk cargoes were exempted from regulation, however, which greatly limited the impact of this

\textsuperscript{18} For details, see Gibson and Donovan, chapter 7.
\textsuperscript{19} McCraw, p.262.
extension of the ICC's authority. The overall result of this program was that a number of traditional freight carriers that could not have survived in unregulated competition acquired a politically-based vested interest in legislation passed to restart the transportation industry during the depression. Long after the depression had faded into history they continued to oppose any changes that would reduce the protection the federal government afforded them. Modal competition had been trumped by depression and shippers would pay the bill for years to come.

The main thrust of the interpretation presented above is nicely summarized in the following two paragraphs in which the historian Ellis Hawley describes what he calls the 'perversion of the public utility concept'. This phrase could serve as the epigraph for the story of how the federal government inadvertently but effectively imposed a rigid and enduring modal structure on the American freight transportation industry.

In the United States the term 'public utility' generally conjures up a vision of an inherently monopolistic industry providing essential public services, one in which the nature of the service, the large amounts of capital required, and the presence of high fixed costs all combine to produce large economies of scale and make any competitive duplication of facilities wasteful and inefficient. It is usually conceded, too, that in dealing with such 'natural monopolies,' society may resort to public regulation. Since the purpose of this presumably is to protect consumers, the industries concerned are expected to resist its establishment as long as possible. But under depression conditions like those of the nineteen thirties, these commonly held assumptions were of doubtful validity. On the contrary, for a number of declining, overly competitive, or particularly depressed industries, the status of a public utility became a means of economic salvation, a way to enter the haven of publicly regulated monopoly and use the power of the state to stabilize prices, reduce competition, and insure profitable returns on overcapitalized structures.

One field in which this perversion of the public utility concept was especially noticeable was that of transportation. Under depression conditions and in view of the threat posed by newer forms of transport, the leaders of the older transportation industries had begun advocating a broad extension of the public utility approach, an extension they justified by appealing to past precedents, arguing that transportation was a 'natural monopoly,' or stressing things like public safety or national defense. And the result was a mixture of controls, protection, subsidies, and publicly sponsored cartels, a system in which the government became not only a regulator, but a protector, supporter, and provider as well.

Federal regulation of freight transportation made modalism the organizational model for the industry as a whole and preserved that structure by minimizing competition both from other modes and from new entrants. The modes were separated in practice by the persistence of labor-intensive cargo handling at modal interfaces and in principle by regulatory constraints that prevented companies from operating in more than one mode. Of course several different modes still had to be used when moving cargoes long distances over land and water, but each segment of such voyages was managed by a different firm using machines and procedures specific to the mode being employed. Since no single firm was responsible for the entire move and the methods of cargo packing and handling were not designed to serve all phases of the system, shipments that required two or more modes can be said to have been multimodal rather than intermodal. Goods were moved, to be sure, but freight transportation was making little progress toward becoming a comprehensive integrated system. The costs and losses in freight transportation remained high; attempts to alter standard practices and increase efficiency were few.

The mold was broken by two developments. The first of these, introduced in the 1950s and by the 1970s widely accepted as the best way to pack and move general cargoes, was containerization. The second development, articulated by economists in the 1950s and written into the legislation that deregulated the transportation industries in the last three decades of the twentieth century, stressed the need to seek economic efficiency by comparing costs across modes. Containerization promoted intermodalism by placing cargoes in standard-sized boxes that could be moved by all three modes of surface transportation without being opened and repacked. It provided the technology that made intermodalism possible and cost-efficient. The economic critique of the established regulatory regimes demonstrated how illogical their conception of the industry had become from the point of view of business and economics. The deregulatory legislation generated by the economists' critique eliminated much of the regulatory overload that hampered business decision making and allowed companies to operate in more than one mode. It then became possible to create companies whose mission was to engage in intermodal freight transportation and achieve some of the cost reductions and efficiencies the economists were calling for.

Although Malcom McLean was neither the first person to propose packing cargoes in standard-sized boxes nor the only carrier to do so in the 1950s, he quickly became the foremost entrepreneur of the container revolution, the man whose innovative vision and entrepreneurial drive
created a new and stunningly more efficient way to transfer cargoes from one mode to another.

McLean was a successful trucker and his approach to containerization was largely guided by his experiences in the trucking industry. His trucking firm carried freight up and down the east coast. He was familiar with the consequences of road congestion and delays in ports when delivering cargoes to be loaded aboard ship, and he was looking for a way to avoid these problems. What he wanted was a way to move loaded trailers in lots so they would not have to be hauled individually over the highway. They could of course go piggy-back on trains, but the Southern Railway rebuffed him when he suggested they explore the possibility of working together. McLean knew that carrying freight over water is the least expensive way to move it, but maritime freight service along the east coast was moribund. He therefore decided to get hold of his own ships and carry his boxes in large lots from port to port. Since the ICC regulated coastal service and was disinclined to allow anyone new into the trade, McLean bought a steamship company that already had the necessary operating certificates. He fitted out an old tanker to carry containers on deck, expecting that he could also carry oil or oil products on the trip north from Texas, but the Coast Guard would not allow it. Like Brunel, Thompson and Hill, McLean thought of his steamship company as an extension of his overland firm, but the ICC told him he could only operate in one mode. McLean then proved himself a true entrepreneur, a man willing to bet everything on a new idea, by selling his trucking company and plunging into his new venture whole hog. He went on to make a huge success of the company he called Sea-Land Services, and in doing so he made the use of containers mandatory worldwide for general cargoes moving in liner service whether on water, rails or highways.

McLean did not set out to make intermodalism possible, he simply wanted to move his cargoes cheaper, faster and with less damage. He had made his way in the world of modalism and never expected the freight transportation industry would be radically deregulated. He conformed to all the rules and regulations that were in place, yet managed to effect a revolution by transforming the way longshore work was done, a sector of the industry that had never been considered a natural monopoly and hence was not closely regulated. It was fortuitous that McLean launched his new company in the coastal shipping trade, for that freed him from foreign competition, yet when he later began overseas service he was also successful, for by then he had a novel product he knew how to sell. McLean purposefully avoided seeking construction or operating subsidies from the government when building ships for international trade, for subsidized ships could not be switched to new trade lanes without permission from Washington, which if granted at all usually came only after many
months. McLean managed his fleet of ships as nimbly as he had managed his earlier fleet of trucks and insisted on being free to deploy his assets as he saw fit. Smart, hard-driving, a wizard at finance and a first-rate recruiter, McLean demonstrated how lots of money could still be made in a highly regulated industry. McLean gave the freight transportation industry a tool of fundamental importance to the transition from modalism to intermodalism, but he used it in a highly individualistic way. He enjoyed first-entrant advantage as the originator of the new technology and made most of his money by capturing market share from the steamship lines that were handling cargoes in the traditional breakbulk manner. McLean was a shrewd innovator whose cost-driven view of the world frequently revealed opportunities overlooked by those more interested in fighting old fights and maximizing the protection and support they received from the government. McLean found a way to operate as an old-fashioned entrepreneur in a highly regulated industry. It was an unusual performance at the end of two generations of regulatory constraint. There weren't many like him.

Deregulation was more tidal than individual, a change brought about by a spreading sense of dysfunction and business failure rather than by aggressive innovation or political action. The word itself is negative, implying a loss of faith, and indeed there were many reasons for thinking that a belief system that had been expanding for nearly a century was built on sand. But churches, once established, do not crumble at the first whiff of heresy, and there were a great many workers, legislators, managers, and bureaucrats who had figured out how to make regulated industries work for them and were in no hurry to see them change. It was finally functional collapse rather than academic critique that brought down the regulatory regimes, but it was important to the success of deregulation that the economists had developed a rationale for abandoning these regimes when they failed.

One of the earliest economic studies that put regulation in the crosshairs was written in 1958. The authors begin with a claim that their subject has recently become a matter of some urgency:

The problems of the United States transportation industries have become in recent months a major concern of domestic policy. In a certain sense, the recent discussions have been very much like previous debates on transportation policy: dire predictions are made of impending bankruptcies, abandoned communities, stranded commuters, and curtailed services. Even proposed solutions are much the same. The search continues for some magic panacea that quickly cures all woes. These turn out to be such familiar suggestions as government ownership, large-scale mergers of existing compa-

nies, tax exemption for all transportation properties, Federal loans, and increased and stricter regulation of everyone and anyone (other than the proposer) who might have anything to do with the transportation of people or property.22

The irreverent tone with which the authors begin indicates that the established regulatory regimes were no longer considered sacrosanct. While the book presents a good deal of technical analysis to buttress its policy recommendations, the authors repeatedly recast the issues under consideration in ways that make the received forms of regulation appear distinctly odd. The chapter on "the rational allocation of transportation resources" begins with the straight-forward claim that "the objective of public regulation in the transportation field is generally accepted to be the satisfaction of the transportation requirements of the economy with a minimum use of economic resources."23 ‘Generally accepted?’ What happened to the tension so central to Progressive policy between public and private interests? Evidently these economists see a community of interest where Progressive politicians saw antagonism.

By 1970 economists had, as Thomas McCraw has put it, restored ‘the market’ to intellectual respectability within universities and were beginning to apply their analyses of how markets work to social arrangements that had previously escaped close economic scrutiny.24 In that same year Alfred E. Kahn published the first volume of his study on The Economics of Regulation, a work that laid out the position he adhered to during his subsequent years as a leading figure in the deregulation of public utilities.25 Appointed chairman of the Civil Aeronautics Board in 1977, Kahn learned first hand what he was up against. He already knew from his experience with the New York Public Service Commission that commissioners, under the tutelage of lawyers, emphasize procedural due process rather than economic efficiency. At the CAB he found the greatest resistance to deregulation came from the airline labor unions, who had used the cost-plus thinking and protectionist policies of the Commission to raise their members’ wages to exceptional levels.26 Testifying before a House committee in 1977, Kahn listed examples of the kinds of ‘picayune decisions’ the CAB was routinely asked to make. He ended by saying, “Is it any wonder that I ask myself every day: is this action necessary? Is this what my mother raised me to do?” A year later he answered his own question with a sweeping indictment of the entire regulatory enterprise:

Control price, and the result will be artificial stimulus to entry. Control entry

22. Ibid., p.v.
23. Ibid., p.145.
26. McCraw, pp.244, 270.
as well, and the result will be an artificial stimulus to compete by offering larger commissions to travel agents, advertising, scheduling, free meals, and bigger seats. The response of the complete regulator, then, is to limit advertising, control scheduling and travel agents' commissions, specify the size of sandwiches and seats and the charge for inflight movies. Each time the dike springs a leak, plug it with one of your fingers; just as a dynamic industry will perpetually finds ways of opening new holes in the dike, so an ingenious regulator will never run out of regulatory fingers.²⁷

Intellectually, the debate over regulation was turning into a rout.

Academic criticism alone would not have brought down the regulatory regimes that created and sustained modalism in transportation; it was institutional and business failure that finally made action unavoidable. By the mid-1970s the evidence of such failure was undeniable. Ari and Olive Hoogenboom began their history of the ICC, published in 1976, with the following summary judgment:

Nearly everyone agrees that the Interstate Commerce Commission (ICC) has failed. The disintegration of freight and passenger service; the dependence on highways, interstate trucking, and automobiles in the midst of a growing energy shortage and an ecology movement; the chaos of rates and regulations bearing little or no relation to costs all contribute to a massive transportation crisis that wastes billions of dollars annually. Established in 1887 as the first independent regulatory agency – and becoming the model of subsequent ones – the ICC did not fulfill its founders' hopes that it solve the railroad problem. Despite having been charged further in the 1920s with building up a system "prepared to handle promptly all interstate traffic of the country," the ICC planned nothing.²⁸

Could the ICC survive such categorical condemnation? Regulatory regimes are not without their defenders, whatever the charges laid against them, and even when bureaucracies perish, they do so slowly. For the ICC the end came in 1995 when the oldest of all the federal regulatory commissions was eliminated and the few of its tasks that did not disappear with it were passed on to its successor agency, the Surface Transportation Board, or parceled out to other offices.²⁹ By that time much of the legislation needed to deregulate the various transportation industries had already been passed and several of the regulatory bodies that had created and sustained modalism had been consigned to history. The creation of Intermodal firms and the construction of efficient and economic global transportation systems now became possible and is indeed proceeding apace. The range of federal regulatory intervention has been greatly reduced, the range of market-based decision making has been greatly ex-

²⁷. Ibid., p.272.
²⁸. Hoogenboom, p.ix.
²⁹. For a brief summary, see Muller, p.47.
panded. In one sense the transportation industry is now operating with a freedom it has not enjoyed since the closing years of the nineteenth century; in another sense it is now working with technologies that are so novel they make comparisons with the past completely unhelpful. Yet however the future is described and whatever its relation to the past, freight transportation in the post-modal era promises to be full of surprises.

**EPILOG – A ROLE FOR HISTORY**

Late in December 1999, Mr. Floyd Norris, the chief financial correspondent of *The New York Times*, wrote an article listing the “12 biggest business blunders of the past 100 years.” He describes the first of these, titled ‘Railroads’ Narrow Track’, as follows:

For the first half of the [twentieth] century railroads were the undisputed masters of national transportation. But since they thought of themselves as railroads rather than transportation companies, they never tried to expand into either trucking or airlines at a time when their capital could have given them the edge. In mid-century, many of the rails went through bankruptcy reorganization, and it was decades before they began to make good money through intermodal service – the shipping of goods by a combination of rail and trucks.

Could anyone familiar with the history of American railroads say they were ‘the undisputed masters of national transportation’ in the first half of the twentieth century? Was intermodal service something that was just waiting to be put into effect? Mr. Norris’ ignorance of the history of transportation is breathtaking. What he has done, in the absence of any sense of what really happened, is project the present on the past by assuming that the railroads simply did not do what they could easily have done, that is initiate the kinds of intermodal service that has served them so well since deregulation. So much for history.

There is no need to hammer Mr. Norris for this stumble, but it does provide a useful reminder of how quickly past constraints, once removed, are forgotten and how easily reasons are concocted and blame is assigned once an informed sense of the past has been lost. An awareness of the complex historical relations between the government and the transportation industry needs to be kept alive and passed on precisely because it is a troubled and inescapable relationship. If we do not learn from the past, we will go into the future as blindly as Mr. Norris, unwittingly, would have us do.

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Developing a Standard Definition of Intermodal Transportation

W. Brad Jones  
Department of Industrial Engineering  
Mississippi State University  

C. Richard Cassady, Ph.D.  
Department of Industrial Engineering  
Mississippi State University  

Royce O. Bowden, Jr., Ph.D.  
Department of Industrial Engineering  
Mississippi State University  

ABSTRACT

Despite the growing emphasis being placed on intermodal transportation by government and industry, a consensus definition of intermodal transportation does not exist. The purpose of this paper is to propose a standard definition for intermodal transportation. Several definitions for intermodal transportation are presented, compared and critiqued. Themes common to this cross-section of definitions are combined with other potentially important concepts to develop a definition that captures the full scope of intermodal transportation. A thorough analysis of each element of the definition, along with reasoning for its inclusion, is also presented.

1. INTRODUCTION

The United States Department of Transportation has recently placed an increased emphasis on intermodal transportation. This emphasis is
captured in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Section 2 of ISTEA states:

“It is the policy of the United States to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the Nation to compete in the global economy, and will move people and goods in an energy efficient manner.

The National Intermodal Transportation System shall consist of all forms of transportation in a unified, interconnected manner, including the transportation systems of the future, to reduce energy consumption and air pollution while promoting economic development and supporting the Nation’s preeminent position in international commerce.”

One impact of ISTEA has been a tremendous increase in the number of research projects related to intermodal transportation. Despite these activities, a consensus definition for intermodal transportation does not exist.

The Eno Transportation Foundation, a nonprofit organization that is devoted to improving transportation and responsible for publishing Transportation Quarterly, concludes that the meaning of intermodal transportation depends on the viewpoint of the definer [1]. Consequently, companies specializing in rail transport tend to classify intermodalism as a function of rail cars, while trucking companies describe it in terms of trailers. Even within specific transportation arenas, there are conflicting opinions with regard to the importance of specialized containers in intermodalism. This myriad of perspectives, according to Jennings and Holcomb [2], means “a large number of ‘definitions’ are present in the research literature, suggesting that a fundamental interpretation of this term does not currently exist”.

This paper illustrates the lack of consensus by presenting several existing definitions of intermodal transportation. Each definition is critiqued, and a new definition of intermodal transportation is formulated. This definition incorporates the strengths and common themes of the existing definitions. In addition to being a standard description for intermodal transportation, this new definition is constructed such that it can become the foundation upon which future research in the area is conducted.

2. Existing Definitions of Intermodal Transportation

Merriam-Webster defines intermodal transportation as “being or involving transportation by more than one form of carrier during a single journey” [3]. This definition contains the fundamental characteristic of intermodalism – multiple carriers during a single journey. However, the definition lacks sufficient detail to be used as a basis for intermodal trans-
transportation research. Containerization, which is considered by many to be a cornerstone for intermodal transportation, is not discussed. In addition, freight and passengers are not mentioned as the prospective entities being transported in this manner.

Norfolk Southern, a rail-based transportation provider, offers the following definition for intermodal transportation on its web site: “The movement of trailers and containers on rail cars” [4]. This definition illustrates the problem cited by the Eno Transportation Foundation with regard to intermodal transportation being characterized from the definer’s viewpoint. In addition to rail bias, this definition has another serious flaw. Only one mode of transportation, rail, is mentioned in the definition. This is a fundamental untruth, as it suggests only one mode of transportation is involved in the container and trailer movement. The first half of the word intermodal, inter, suggests more than one mode is involved. This definition, therefore, should be considered inappropriate.

McKenzie, North and Smith, the authors of Intermodal Transportation – The Whole Story declare “the shipment of containerized cargo using more than one mode” as “the popularly accepted definition of modern intermodal transportation” [5]. This is an unbiased definition in that it is not geared toward one particular mode of transportation. In addition, the fact that more than one mode must be involved in the transport is specified. Like Webster’s definition, this definition is a good general description of intermodal transportation. It is slightly more detailed than the Webster’s definition, however, because of the mention of “containerized cargo.” This phrase implies that intermodal transportation involves containerized freight movement only (no bulk freight or passenger movement).

In a report to the US Federal Highway Administration, Norris [5] defines intermodal transportation as “a coordinated transport of goods in containers or trailers by a combination of truck and rail with or without an ocean-going link”. Jennings and Holcomb characterize this definition as being too narrow and a constraint for potential research in the area. They conducted a study to examine the role, if any, that non-containered freight practices should have in intermodal transportation discussions. There was a distinction made between intermodal transportation with and without containers. “Because of the differences between intermodal container movements and the non-containered method, the latter type has acquired its own terminology and name – transloading” [2]. Therefore, while Jennings and Holcomb acknowledge that non-containered freight movement using more than one mode should be considered in intermodal research, they are careful to distinguish between containerized and non-containered movement. They classify intermodal as “mul-
timodal one-container” transportation, while transloading is classified as “multimodal non-containered” movement [2].

CNC transports, a French company specializing in intermodal transportation and logistics services, presents the following definition for intermodal transportation on their web site: “The conveyance of goods via a combination of at least two transport modes within the same transport chain, during which there is no change in the container used for transport and in which the major part of the journey is by rail, inland waterway, or by sea, whereas the initial and final part of the journey is by road and is as short as possible” [6]. This is a very detailed description of the term. It indicates that there are at least two modes of transportation involved in the movement of a container whose contents are never disturbed during the “journey”. While this definition has merit, it is a bit narrow. For instance, by specifically outlining rail, inland waterway, and sea as the modes used during most of the movement, air is excluded as a possible mode. In addition, the initial and final parts of the “journey” are assumed to be by road. While in most instances this is probably the case, there are certainly some instances where it is not. A definition should not exclude those possibilities. In addition, this definition did not specifically mention containerized or non-containerized freight. It only spoke of “goods” in general. This aspect of the definition makes it more suitable for research, as it does not have limits on the type of freight being transported.

On its web site, the United States Department of Transportation (USDOT) has definitions for both intermodal transportation and intermodalism. The USDOT defines intermodal transportation as: “Use of more than one type of transportation; e.g. transporting a commodity by barge to an intermediate point and by truck to destination” [7]. Intermodalism is defined in three different contexts.

Context 1: “... containerization, piggyback service, or other technologies that provide the seamless movement of goods and people by more than one mode of transport.”

Context 2: “... the provision of connections between different modes, such as adequate highways to ports or bus feeder services to rail transit.”

Context 3: “... a holistic view of transportation in which individual modes work together or within their own niches to provide the user with the best choices of service, and in which the consequences on all modes of policies for a single mode are considered. This view has been called balanced, integrated, or comprehensive transportation in the past” [7].

The DOT’s definition for intermodal transportation is too broad, as it does not contain any parameters characterizing the movement (no mention of entities being moved or a single journey). The second and
third contexts for intermodalism explain the logistics and interdependence associated with intermodal transportation. The first context of intermodalism, however, is actually a suitable description for intermodal transportation. It contains containerization and more than one mode of transport, which seems to be a common theme among the definitions. This definition, however, considers an entity that the aforementioned ones do not – people. Intermodal transportation is not limited to freight. People often use varying modes of transportation to travel between locations. This viewpoint allows research in the area to be expanded without substantially deviating from the basic meaning.

The DOT's definition also introduces another concept that is not incorporated in the other definitions – seamless movement. Seamless movement is a critical element of intermodal transportation. In addition to providing movement from origin to destination, intermodal transportation is also concerned with the smooth transfer of entities between modes during the journey. Incorporating the phrase "seamless" into the definition emphasizes the importance of this concept.

3. SUMMARY EVALUATION OF THE EXISTING DEFINITIONS

Containerization is a common theme across the myriad of definitions presented. This probably stems from the origins of intermodal transportation – the movement of containerized freight. This also explains why, with the exception of the Department of Transportation's definition, the entity involved in intermodal movement was strictly limited to freight and people were excluded. With the exception of air, most of the definitions presented were inclusive regarding the modes of transportation involved. Some mentioned specific modes, while others incorporated the mode element in broader terms. The fact that these definitions are so varied and dependent on the definer's perspective confirms that there is currently no consensus definition for intermodal transportation.

4. A NEW DEFINITION OF INTERMODAL TRANSPORTATION

By extracting common themes from the definitions presented and infusing ideas that should promote research vitality, the following definition could fill the void as a standard definition. Intermodal transportation should be generally defined as:

the shipment of cargo and the movement of people involving more than one mode of transportation during a single, seamless journey.

The framework of this definition is borrowed from McKenzie, North and Smith, with "containerized" being subtracted to allow for the possibility of non-containerized movement. The concept of people movement being
a component of intermodal transportation is borrowed from USDOT and incorporated as well. To incorporate the element of multiple modes, the phrase “more than one mode of transportation” is used instead of specifically outlining the four common modes of transportation (road, rail, air, and sea). The phrase “single, seamless journey” is partially borrowed from the Merriam-Webster’s definition for “intermodal” [3]. This addition implies a smooth and coordinated transition between modes, which is a primary goal of intermodal transportation.

5. CONCLUSIONS

The definition of intermodal transportation proposed in this paper is unique in that it captures three important concepts related to multimodal transportation. First, the movement of people is relevant to the study of intermodal transportation. Second, all types of cargo transportation are relevant to the study of intermodal transportation. Third, an intermodal journey is a seamless journey in that transitions between modes occur smoothly with minimal delay.

Although people movement is not a common theme among existing definitions, it should be included in a standard definition of intermodal transportation. The potential benefits of coordinating the four traditional methods of transportation – road, rail, water, and air – into a system that promotes the seamless transition of people between modes are enormous. Incorporating the human element into a meaning for intermodal transportation may provide the impetus toward the realization of such a transportation network.

Non-containered freight movement should be included in the definition for intermodal transportation as well. Jennings and Holcomb point out that “While this type of movement may be considered by some to be routine and reflect an older, less efficient way of doing business, carriers seem to be expanding their interest in the method” [2]. The exclusion of non-containered freight movement from most definitions of intermodal transportation probably stems from the necessity to distinguish between containered and non-containered movements, since many of their components and characterizations are different. The fundamental truth, however, is that if non-containered freight moves via more than one mode, it moves intermodally. In addition, efforts should be made to promote the seamless transition of these goods between modes as well, which is the primary goal of intermodal transportation.

Finally, the concept of seamless movement should be included because the goal of intermodal transportation is to move the entity to its destination using multiple modes as efficiently as possible. The efficiency of an intermodal transportation system is likely to be a function of
smoothness with which the entities are transferred between modes during the journey.

6. REFERENCES


7. ACKNOWLEDGEMENTS

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8. AUTHOR BIOGRAPHIES

Mr. W. Brad Jones is a Research Assistant for the National Center for Intermodal Transportation (NCIT) and is an industrial engineering student at Mississippi State University. He is the 2000 NCIT Outstanding Student of the Year. Additionally, he is a member of four honorary fraternities: Phi Kappa Phi, Golden Key National Honor Society, Mortar Board, and Alpha Pi Mu.

Dr. C. Richard Cassady is Assistant Professor of Industrial Engineering at Mississippi State University. His research interests are in reliability and maintainability engineering, statistical quality control, and applied operations research. He has a B.S., M.S., and Ph.D., all in industrial and system engineering, from Virginia Tech.
Dr. Royce Bowden is Associate Professor of Industrial Engineering and Director of the Simulation and Advanced Computation Laboratory at Mississippi State University. His research in the area of systems modeling and analysis is funded by numerous organizations including the National Science Foundation. Dr. Bowden’s research provided the foundation for the optimization component of PROMODEL’s SimRunner simulation optimization package, which helped fuel the proliferation of commercial software that combines simulation and optimization to design transportation, manufacturing, and service systems.
Modeling Intermodal Transportation Systems: Establishing a Common Language

D. Wesley Graham
C. Richard Cassady, Ph.D.
Royce O. Bowden, Jr., Ph.D.
Stephen A. LeMay, Ph.D.

I. INTRODUCTION

"It is the policy of the United States Government to encourage and promote development of a national intermodal transportation system in the United States to move people and goods in an energy efficient manner, provide the foundation for improved productivity, growth, strengthen the Nation's ability to compete in the global economy, and obtain the optimum yield from the Nation's transportation."

—Intermodal Surface Transportation Efficiency Act of 1991

The conduct of technical research requires terminological common ground — widely accepted, clearly defined terms. This paper takes the critical first steps toward developing this common ground in studying intermodal transportation, especially for mathematical modeling of intermodal systems. The terms lay the foundation for mathematically modeling intermodal transportation, making their definition and delineation crucial to the efficient development of useful models for policy analysis and decision-making.

The lack of common terminology arose from the lack of coordination that characterized the development and persists in the operation of the
current transportation system. Each of the principal transportation modes uses an independent terminology, which militates against integrated computer models. While the independent terminologies are based in history, they confuse model developers and users in the context of an intermodal future.

According to Barnhart et al. [4], a common terminology base will ease the communication among the different entities involved in intermodal transportation and its study. This terminology base should contain all terminology necessary for describing an intermodal transportation system. This paper briefly reviews the literature on mathematical modeling and assessment of intermodal transportation systems, especially as it helps to define the terminology for constructing mathematical models of intermodal transportation systems. The paper also offers common terms and definitions that cross modal and other disciplinary lines. The paper gives a brief history of the intermodal problem, a short literature review of mathematical modeling of intermodal systems, and describes and defines the terminology necessary to support effective modeling of intermodal systems.

II. A BRIEF HISTORY OF THE PROBLEM

Four modes of transportation, each with advantages and disadvantages, carry freight and passengers in the U.S.: water, air, rail and road. Water transport inexpensively moves bulk cargo and large numbers of passengers at limited speeds to limited destinations. Air transport rapidly moves cargo and passengers in limited quantities and numbers to limited destinations. Rail transport moves large quantities of cargo over long land routes to limited destinations. Road transport moves cargo and passengers to virtually any destination in limited quantities. This is basic to any understanding of the U.S. transportation system.

Each mode developed independently and even now a separate government agency administers each mode. This independent evolution meant a lack of coordination among the modes that still limits the efficiency of the national transportation system. The independence and lack of coordination underlie USDOT's recent emphasis on intermodal transportation and intermodalism. USDOT hopes that increased modal coordination and study will increase the efficiency and effectiveness of a transportation system [1].

Intermodalism "refers to a transportation system in which the individual modes work together or within their own niches to provide the user with the best choices of service, and in which the consequences on all modes of policies for a single mode are considered" [2]. The potential benefits of an intermodal transportation system include reduced fuel con-
sumption, air pollution, and traffic; increased access to infrastructure through better coordination of bus, rail, and air schedules; and reduced pressure on infrastructure. To help achieve these ends, mathematical modelers will attack systems analysis and design problems like vehicle scheduling, material handling, passenger movement and queuing, resource allocation, inventory control, and maintenance planning. These types of problems exist in other industries and have been successfully addressed using computer simulation, queuing analysis, mathematical programming, probabilistic analysis, graphical analysis, and other approaches.

III. **Mathematical Modeling of Intermodal Transportation: A Short Literature Review**

The literature on modeling intermodal transportation emphasizes facilities over networks, and although it includes both freight and passenger intermodal facilities, the language, input requirements, and outputs of the models differ greatly even within these categories.

Ship terminal models dominate the intermodal freight literature, with work by Kondratowicz [5], Holguin-Veras and Jara-Diaz [9], Kraman et al. [10], and Park and Noh [12]. Kondratowicz [5] simulated a ship-to-rail intermodal freight terminal using a knowledge base and a set of algorithms. The knowledge base consisted of the physical elements of the terminal and the terminal operations processes—specifics about the loading and unloading of equipment, the type of vessels arriving to the terminal, the storage facilities, the type of cargo being handled, and the interactions among these elements. Kondratowicz defined the vehicle, its arrival frequency and time of first arrival, its economic cost, and its required operations. He described processes by the type of cargo transfer (storage to vehicle, vehicle to vehicle, etc), the type of cargo, a process efficiency measure, and the terminal elements required to carry out the process.

Ward [8] simulated a dockside container intermodal terminal using three sub-models - two container throughput models and a gate complex traffic demand model. The models assume a terminal throughput of 500,000 containers per year. One throughput model predicts capacity requirements, the other optimal operating procedures and equipment for handling the container traffic. The gate complex model determines the lanes, queuing space, and workers required to avoid overloading truck lanes. The simulation produces net productivity of all dock cranes (containers/hour), total net productivity of all rail yard cranes (containers/hour), and the mean cycle time of trucks in the yard (minutes). These measures help determine the best equipment and the best procedures.
Holguin-Veras and Jara-Diaz [9] presented a linear programming model of an intermodal container terminal. The model estimates storage charges to maximize a “pricing” function subject to the storage capacity for containers. They classify containers according to marginal operating costs, space requirements, and price elasticity of dwell times. The objective function is evaluated according to the storage charges placed on each container classification. This price function may maximize profit, or profit subject to a breakeven constraint. The model is constrained by a function of the average stack height, dwell time, and input rate for each container classification.

Kraman et al [10] present a probabilistic model of a port intermodal terminal. An ideal port terminal has enough berths to prevent arriving vessels from having to wait to dock. The model balances the cost of the berths against ship waiting costs, with the optimal number of berths reached when the costs are equal. From this optimal number of berths, an estimate of container throughput can be calculated.

Park and Noh [12] simulated a bulk cargo port. The model evaluates the existing port's capability to support future predicted demand and to evaluate proposed changes in the port’s operations. The simulation evaluates the port’s performance according to projected future demands and performs the same evaluation for any modification that may be made within the port. An economic analysis determines whether or not the proposed change is economically feasible.

Models of intermodal passenger facilities included work by Lott [6], DiFebbraro et al. [7], Boile et al. [11], and Jim and Chang [14]. Lott [6] simulated an intermodal train terminal with personal vehicle, taxi, regional and local bus, courtesy vehicle, rail rapid transit, commuter rail, and high speed rail. The simulation represented segments or passenger interaction areas: waiting lines and areas, corridors, entry/exit areas, open spaces, concessions, restrooms, baggage claim areas, ticketing areas, bus and train platforms, taxi stands, etc. The model delivered information on passenger activity on the bus and train platforms, such as boarding and de-boarding rates and percent occupancies, in up-to-the-minute form or in a complete history of the simulation. The model also gave the average segment time for a passenger, flow rate in/out of a segment, queue lengths and waiting times for service segments, and occupancies in restroom and concession areas, demand for services and total terminal occupancy.

DiFebbraro et al [7] simulated an intermodal passenger transportation system. The model provided passengers on-line, real-time information concerning the status of the system. The system modeled three modes of transportation: buses, underground rail, and above-ground rail. The model defined nodes, macronodes, links, inner links, and events.
Nodes represent a station that serves a mode of transportation. Macronodes represent a combination of nodes. Links represent the paths over which a mode of transportation can travel. Inner links refer to the path taken by a passenger to transfer between two nodes within a macronode. Events are defined as anything that may cause a change in the system. They can represent normal traffic conditions and/or stochastic occurrences within the system. Normal events are arrivals and departures of vehicles to a node. Stochastic events are breakdowns and congestion (for buses).

Boile et al [11] presented a nonlinear programming commuter model of an intermodal network. The model evaluated proposed modifications to an intermodal network based on user and operator costs. The intermodal network consists of auto, auto-to-rail, and pure (walk to rail) rail modes. It is based on a commuter system that consists of five origins and one destination. Paths from the five origins to the one destination include three major highways, several smaller roads, and one rail line with a connecting station at each origin. The model minimizes user costs. The constraints are rail and terminal capacity, demand conservation, and link flow conservation. Also, no passenger can unilaterally change routes or unilaterally change modes. The user costs and capital costs from the model help to determine if the proposed change to the network is acceptable.

Jim and Chang [13] presented a computer simulation model of an airport passenger terminal. The model evaluates the design of a passenger terminal based on passenger flow. The model begins with passenger flow diagrams and uses flight schedules, passenger characteristics, and facility information. The model outputs include statistics on the waiting times, queue lengths and occupancy counts at each service counter.

IV. TERMINOLOGY

This section defines the terminology for modeling intermodal transportation systems. The terminology base includes transportation terminology as well as mathematical modeling terminology. The terms included in this base are underlined.

INTERMODAL TRANSPORTATION SYSTEMS

The lack of a consistent definition of intermodal transportation has inhibited the development of a national intermodal transportation system. If the constituencies involved in the development of the system differ on what intermodal transportation means, then the successful implementation of the system will be complicated. Bragdon [15] defines intermodal transportation to be "the safe and efficient integrated move-
These definitions cover the broad spectrum of transportation, but some definitions are limited to specific issues in transportation. Jennings and Holcomb [17] argued that these definitions apply "to containers designed to incorporate all modes of transportation.

In this research, intermodal transportation is defined in an attempt to incorporate all modes of transportation. Intermodal transportation is the shipment of cargo and the movement of people involving more than one mode of transportation during a single, seamless journey. An intermodal transportation system is a collection of passengers and cargo moving via multiple modes of transportation, the vehicles that move them, the routes along which they are moved, the terminals at which they are stored, transferred, etc., and the processes which they experience while being moved. These terms are essential to the framework for constructing mathematical models of intermodal transportation systems.

MATHEMATICAL MODELING

Constructing mathematical models of intermodal transportation systems falls under the domain of operations research. Operations research can be defined as the "professional discipline that deals with the application of scientific methods of decision making, especially the allocation of resources" [3]. The primary activity in an operations research study is the formulation of a mathematical model of a system.

A system is a collection of items that act together toward the accomplishment of some end. The system is the study of the subject of interest, and the focus of this study helps to determine the system boundaries. For example, if the system in question is the operation of an airport terminal, the boundaries will be the walls of the terminal. If the system in question is the operation of a service area within the terminal (ticketing, security, baggage, etc.), the boundaries will be drawn around the area that includes the service activities (the queue area, the service center, and the servers). A model is a simplified representation of a system. There are three basic types of models: iconic, analog, and symbolic. Iconic models are scale models, and analog models use different systems with similar behavior to model the system of interest. Symbolic models are based on the logical
relationships that drive system behavior. Symbolic models are often referred to as mathematical models.

A mathematical model of a system describes system behavior using only equations and logical relationships. Types of mathematical models include probabilistic models, mathematical programming models, and simulation models. In addition to the functional and logical relationships that describe system behavior, mathematical models include several other components. Decision variables are the quantities over which the decision-maker (or system manager) has control. Parameters are values over which the decision-maker has no control. Examples of decision variables are the number of cranes to be installed at a container berth, or the number of parking spaces at an airport terminal. Examples of parameters are the service rate of an agent at a ticket counter, or the arrival rate of trucks to a container terminal. Identifying the decision-maker for a system is an important step in the modeling activity. If the president of a distribution company is the decision-maker, the location of a warehouse might be a decision variable. If the decision-maker is the warehouse manager, then the location of the facility is a parameter.

Constraints are any limitations that may be placed on the decision variables. Examples of constraints are area limitations for dockside cranes at a container terminal, budget limitations for operating an airport terminal, and towing capacity limitations of the trucks used in an intermodal system. A constraint may limit a single decision variable or it may involve two or more decision variables.

Performance measures are quantities that capture the level to which the system is operating. Examples of performance measures are throughput, waiting times, equipment utilization, operating costs, and inventory levels. An objective function identifies an important performance measure and the optimization goal (maximize or minimize) for the measure. For example, an objective function may maximize utilization of yard tractors, minimize operating costs of an airport terminal, or maximize the profit generated from a container terminal. In a mathematical model, decision variables, parameters, constraints, performance measures, and objective functions are all captured using equations and/or logical relationships.

Transportation Terminology

The following transportation terms are needed to complete the terminology base for modeling intermodal transportation systems. The terms in this section are essential for modeling intermodal transportation systems.
Cargo

Cargo is any commodity being transported [2]. Cargo may be handled loosely and unpacked, or it may be consolidated and loaded into containers or handled with pallets. A container is a structure into which cargo is packed. The container, therefore, may serve as the transfer unit rather than the cargo contained therein [2]. A pallet is a platform, with or without sides, on which a number of packages or pieces may be loaded to facilitate handling by a lift vehicle [2].

Passengers

A passenger is defined as a person being transported. As passengers are transported across the transportation system, some are associated with passenger cargo. Baggage is defined as the trunks, bags, luggage, etc. of a traveler, especially when packed and being used on a trip. [18]

Movement

A movement is defined as the process of transporting passengers and/or cargo from one point to another. A movement may represent a train moving along a rail line, an airplane moving through an airway, a passenger walking through a concourse, a container being moved from a ship to a chassis, etc.

Vehicles

A vehicle is any equipment used for transporting passengers and/or cargo from one location to another. Each of the different modes of transportation involves a different type of vehicle. An aircraft is a vehicle used for traveling through the air. A vessel is a vehicle used for traveling via water. A train is a vehicle used for traveling over a rail line. An automobile is a vehicle used for traveling over a road. Some types of vehicles involve a separate power source from the passenger/cargo hold. Power transports are vehicles in which the power source and the passenger and/or cargo hold are comprised by one unit. Unpowered transports are vehicles that require an external power source. Transport power sources are vehicles used to push or pull unpowered transports. A towboat is a transport power source for water transportation. A barge is an unpowered transport for water transportation. A locomotive is a transport power source for rail transportation. A railcar is an unpowered transport for rail transportation. Some railcars are power transports. Examples of these types of railcars are subway cars propelled by an electrical current. A tractor is a transport power source used for road transportation. Both chassis and trailers are unpowered transports used for road transportation. Chassis are coupled with containers to accommodate transport.
Trailers have the cargo hold and wheel frame permanently attached. A fleet represents the collection of all the vehicles of a given type involved in a transportation system.

**Routes**

A route is the course or way that is, or is to be, traveled. An airway is a route along which aircraft travel. A waterway is a route along which vessels travel. A rail line is a route along which trains travel. A road is a route along which automobiles travel.

**Terminals**

A terminal is any location within an intermodal transportation system where cargo and/or passengers originate, terminate, or are handled in the transportation process [2]. Terminals include facilities that accommodate a wide range of terminal processes (ticketing, inspection, maintenance, vanning/devanning, etc.) or simple loading/unloading processes (bus stops). Within terminals, a process is any activity that passengers and/or cargo may encounter. There are many different types of processes. An entrance represents the process of passengers and/or cargo arriving to the system boundaries. An exit represents the process of passengers and/or cargo leaving the system. Storage represents the process of passengers and/or cargo being temporarily stored in some location. A storage process may represent queuing areas, waiting areas, warehouses, and parking areas. Both service and wait until represent the process of relying on a server to complete a process. The difference in the two processes is the activity of the passengers and/or cargo and the server. In a service, the server remains at a stationary location and the passengers and/or cargo move to the server. In a wait until, the passengers and/or cargo wait at a stationary location until the server arrives to the location. An example of a service is a ticketing counter where a ticketing agent remains stationary. Passengers proceed to the counter as ticketing agents become available. Once the passengers arrive to the counter, they are processed. An example of a wait until is the activity around intermodal loading tracks. This activity involves containers arriving to the loading track area via train or yard tractor. The containers are either parked on the track (resting on the flatcar) or alongside the track (resting on chassis). Once parked, the containers wait until a crane moves to the parking location to be moved from chassis to flat car or vice versa. Load/unload represents the process of passengers and/or cargo being loaded onto and/or unloaded from a vehicle. A decision represents the process of selecting from the different routes available at the intersection and/or split of modal routes.
INFRASTRUCTURE

The infrastructure of a terminal is comprised of the components and areas that accommodate the processes and movements within the terminal. There are infrastructure components related to each mode. A runway is a straight path on land, used for the landing and takeoff of airplanes [2]. A helipad is a designated area for the landing, takeoff, or parking of helicopters [2]. A taxiway is a defined path established for the movement of aircraft from one part of an airport to another [2]. Aircraft gates are locations where an aircraft parks to accommodate the loading/unloading of cargo and/or passengers. Arrival/departure tracks are rail tracks used to accommodate the arrival and departure of trains into a terminal. Lead/tail tracks are rail tracks used to accommodate switching operations within a terminal. Loading tracks are rail tracks alongside which trailers and/or chassis/container combinations are parked to accommodate trailer-on-flatcar/container-on-flatcar operations. A train berth is a space designated for a train to occupy at a terminal platform to accommodate the loading and unloading of passengers. A vessel berth is a space where vessels tie up to a terminal pier to accommodate the loading and unloading of passengers and/or cargo. A stevedoring area is a landside area used to accommodate the movement of containers from a vessel to chassis via crane. Automobile entrance/exit gates accommodate the processes that automobiles must encounter upon arriving to or departing from a terminal. A parking lot is a location where automobiles may be temporarily placed into storage. A warehouse is a place for the reception, delivery, consolidation, distribution, and storage of cargo [2]. Ground storage areas are places where cargo and/or containers are placed in storage, without shelter.

MATERIAL HANDLING EQUIPMENT

Material handling equipment represents vehicles used for cargo movement within a terminal. A conveyor is a moving belt upon which material may be placed for movement. The movement of the belt may be continuous or may be controlled by an operator. A crane is machine for lifting or moving heavy weights by means of a movable projecting arm or horizontal beam traveling on an overhead support [18]. A yard tractor (doodle bug, yard mule, tug, hustler) is a small tractor used to move trailers, bombcarts, and chassis/container combinations around a terminal yard [2]. A bombcart is a wheeled cart pulled by a yard tractor on which cargo, baggage, etc., are placed for transport around a terminal. A forklift is a vehicle equipped with hydraulic driven, protruding metal blades that are used to raise and lower palletized cargo [2]. A reach stacker is a vehicle with a front-end lifting device used to load and unload containers.

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from chassis and flatcar railcars. A yard locomotive (switch engine) is a locomotive that is operated only to perform switching functions within a single terminal area [2]. A tug is a vessel with towing knees for moving larger vessels.

**Passenger Handling Equipment**

Passenger handling equipment represents equipment used for the purpose of moving passengers within a terminal. An elevator is a cage or platform and its hoisting machinery for conveying people to different levels [18]. Elevators may also be used to move cargo to different levels. An escalator is a power-driven set of stairs arranged like an endless belt that ascend or descend continuously [18]. A moving sidewalk is a continuous moving, power-driven belt upon which passengers are moved. Moving sidewalks are located within walking corridors and provide an alternative to walking. People movers are power-driven vehicles that follow a defined path (usually rail) in moving passengers from one point within a terminal to another. Carts (golf carts, wheelchairs, etc.) are wheeled vehicles that provide transport for passengers unable to walk under their own power.

**Personnel**

An operator is a person who controls the use of any vehicle or material or passenger handling equipment. An operating crew is the group of operators required to operate a transportation vehicle. Examples of operators are airplane pilots, train engineers, truck drivers, and crane operators. A server is a person who provides the service required for a service or wait process. Examples of servers are ticketing agents, security officers, and baggage handlers.

**Miscellaneous Equipment**

Miscellaneous Equipment refers to all other resources beyond vehicles, material handling equipment, and passenger handling equipment that are necessary for passengers and/or cargo to complete some process. Examples of equipment are computers, maintenance tools, and fuel trucks.

**Procedures and Policies**

Procedures and policies are sets of rules or procedures that govern the behavior of an intermodal transportation system. Examples of procedures and/or policies are traffic regulations, hazardous materials legislation, flight schedules, and maintenance plans.
DISRUPTIONS

Disruptions are stochastic events that disrupt the normal operations of an intermodal transportation system. Examples of disruptions are weather events, equipment failures, and vehicle accidents.

V. CONCLUSIONS

While the ultimate goal of defining a language that is broadly accepted by analysts and the intermodal industry will be difficult to achieve, the terminology base presented in this paper covers a majority of the elements and activity involved in the operation of intermodal transportation systems and provides a foundation for building models of such systems. Undoubtedly, future research will reveal additional terminology and refinements to facilitate the modeling and analysis of intermodal systems. However, an efficient national intermodal transportation system will not be realized unless real problems are defined, models of these problems are constructed, and analysis of model outputs are used to identify and implement the most efficient solutions. The terminology base presented in this paper establishes a common language from which analysts can begin this important endeavor.

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**AUTHOR BIOGRAPHIES**

Mr. D. Wesley Graham is a Research Assistant for the National Center for Intermodal Transportation and a graduate student in the Department of Industrial Engineering at Mississippi State University. He
recently applied his modeling research to influence the design of a new cruise ship being built by Ingalls Shipbuilding. He is a member of several honorary fraternities including Alpha Pi Mu—Industrial Engineering Honor Society.

Dr. C. Richard Cassady is Assistant Professor of Industrial Engineering at Mississippi State University. His research interests are in reliability and maintainability engineering, statistical quality control, and applied operations research. He has a B.S., M.S., and Ph.D., all in industrial and system engineering, from Virginia Tech.

Dr. Royce Bowden is Associate Professor of Industrial Engineering and Director of the Simulation and Advanced Computation Laboratory at Mississippi State University. His research in the area of systems modeling and analysis is funded by numerous organizations including the National Science Foundation. Dr. Bowden’s research provided the foundation for the optimization component of PROMODEL’s SimRunner simulation optimization package, which helped fuel the proliferation of commercial software that combines simulation and optimization to design transportation, manufacturing, and service systems.

Dr. Steven LeMay is a Professor of Marketing in the College of Business and Industry with extensive expertise in logistics systems designs, logistics personnel issues, and services marketing. He recently completed a project for the Council of Logistics Management (CLM), which included using a fundamental research program on the growth and development of logistics personnel in American industry. An unusual aspect of the CLM project is its final product—a book to be sold to the CLM membership. The Growth and Development of Logistics Personnel became available in October 1999.
The Law of Intermodal Transportation: 
What It Was, What It Is, 
What It Should Be

Paul Stephen Dempsey*

I. INTRODUCTION

The United States has assumed a position of world leadership in its efforts to reduce or eliminate tariff barriers, trade inhibitions, and investment restrictions, enabling goods, technology, services, and capital to move freely between States in the international arena.1 As a part of this effort, the United States has sought to reduce, to the extent practicable, domestic impediments in the field of transportation so as to optimize the unobstructed transit of commodities between inland origins and overseas destinations and between overseas origins and inland destinations. The U. S. also has concluded formal and informal bilateral and multilateral

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* Dr. Paul Stephen Dempsey is Professor of Law and Director of the Transportation Law Program at the University of Denver. He is Director of the National Center for Intermodal Transportation. He formerly served as an attorney with the Interstate Commerce Commission, and the U.S. Civil Aeronautics Board. The author of 10 books and more than 50 scholarly articles, Dr. Dempsey holds the following degrees: Bachelor of Arts (1972) and Juris Doctor (1975), University of Georgia; Master of Laws (1978) George Washington University; Doctor of Civil Laws (1987) Institute of Air & Space Law, McGill University. He is admitted to practice law in Colorado, Georgia and the District of Columbia.

1. The foreign policy of the United States on this issue has been based upon the assumption that world output would be maintained at its optimum level if the movement of capital was unimpeded or uninhibited. Dempsey, Legal and Economic Incentives for Foreign Direct Investment in the Southeastern United States, 9 Vand. J. Transnat'l L. 247, 252-53 (1976).
agreements designed to minimize the barriers which obstruct the free flow of commerce between nations, and to minimize domestic restraints on transnational commercial activity. As a result of these efforts, we are witnessing a spectacular increase in the importation and exportation of goods.

These overwhelming increases in foreign trade have been brought about, in part, by a diminution in transport inhibitions. In a circular fashion, the present reexamination of the existing legal framework in the field of transportation is, to a certain extent, attributable to these massive increases in foreign commercial activity and the concomitant demands for an efficient and economical transportation network which have inevitably arisen therefrom.\(^2\) It is this contemporary evaluation of traditional legal and technological concepts in the field of international transportation to which this essay is addressed.

In our era of rapidly diminishing impediments to the free flow of capital, goods, technology, and services between nations, transnational commercial activity has become extremely important to our national economy. New frontiers are being broken as raw materials and manufactured products move more freely between nations which have heretofore shared little in culture, history, religion, race, or economic and political philosophy. Certainly, governmental initiatives designed to eliminate trade inhibitions are responsible for much of this growth. Tariff walls are crumbling. The world economy is prospering. The interdependencies that flourish between members of the world community as a result of bilateral and multilateral trade agreements enhance the possibility of achieving long-term political stability, economic growth, and global peace. It has become the position of the United States that increased international economic cooperation will inevitably lead to increased political toleration and peaceful coexistence.

Innovations in the field of transportation have made possible increased commercial activity promoting greater interdependency between nations. Intermodal transport innovation in the United States has been of essentially two kinds: (1) technological innovation, enabling commodities and individuals to move with greater speed, efficiency, and economy; and (2) regulatory innovation by Federal agencies responsible for regulating the rates and routes of international carriers.

Of the technological innovations, the “container revolution” is perhaps the most significant, for it has done more to foster the growth of

\(^2\) The Uniform Commercial Code has also implicitly recognized the contemporary increase in intermodal transportation. For example, the U.C.C. provides that a valid C.I.F. contract may be consummated which involves an intermodal land-sea movement under a through bill of lading, and that shipment from the specified inland point pursuant thereto is timely despite an inadvertently delayed loading aboard the ocean vessel. U.C.C. § 2-320, Comment 13.
international trade than any other single intermodal breakthrough. Containerization permits individual commodities to be loaded by the consignor at the point of origin without interim handling again until the container arrives at its ultimate destination and is unloaded by the consignee. Between the points of origin and destination, the trailer or container may be transported as a single unit by motor, rail, water, or air carriers with a substantial reduction in transit time, expense, loss, damage, and theft from that experienced under traditional break-bulk carriage.\(^3\) Containerization may also produce greater energy efficiency in

3. In *Berry Transport, Inc., Ex. – Containers*, 124 M.C.C. 328, 337-38 (1976), evidence was adduced demonstrating the following characteristics of containerized movements:

1. Containerization of ocean cargo provides a faster, safer, more reliable door-to-door service at lower costs. The major economic advantage of containerization lies in its potential to reduce greatly the unit costs. Containerization transforms general cargo into a uniform size and shape which is provided by the container. In terms of unloading costs, containerization saves approximately 1.0 man-hour per ton of cargo, or 19 man-hours per container in handling. At a direct labor rate of $7 per man-hour, containerization saves over $13 on each ton of cargo loaded for labor alone.

2. U.S. trade in containerable commodities has been increasing steadily in the past 5 years. Containerable imports increased by 49 percent and exports by 38 percent from 1967 to 1970.

3. Year by year, increasing percentages of liner cargo have been containerized on all major U.S. trade routes. The annual capacity of full containerships in the Pacific Coast-Far East trade route will total 450,000 40-foot container equivalents in each direction by 1975. This capacity is of the order of 5 million long tons in each direction annually.

4. The large, fast containerships have high daily cost. Therefore, it is especially important to minimize port time through investment in shore-side container handling equipment. Based upon a ship’s discharging and loading 780 containers, 2 extra days in port would cost $30 additional per container for just the ship’s time, and does not include additional costs for berth rental time.

5. Containership berths with high productivity are very expensive to equip and require high throughput to achieve economical unit costs. One hundred percent utilization of a two-crane berth results in a cost of $12.50 per container; when utilization is reduced to 50 percent, the handling costs for each container is [sic] increased to $25.

6. The combination of high containership daily costs and high container terminal throughput requirements makes it economically feasible to transfer cargo overland between nearby ports at lower total cost than by moving the ship. A containership which operates at 25 knots, and which is loaded and unloaded at each terminus in 3 days, completes a trans-Pacific round trip voyage totaling 9,000 miles in 21 days. This totals 17 voyages annually. However, if the time required for loading and unloading is increased to 5 days at each port terminus, the time required for each round trip increases to 25 days, and the number of annual voyages are [sic] reduced to 14.25, a reduction in productivity of 15 percent.

7. Containerized cargo increases the market for truckers’ services for pickup and delivery or for transfer between relatively close ports. Handling costs per ton are reduced for truckers vis-à-vis conventional cargo, but line-haul costs per ton are increased because container dimensions are not optimal for over-the-road movements. Long hauls of containers appear to be unattractive to truckers. The primary role of motor carriers in container operations is the pickup and delivery of container loads at distances from the ports of less than about 400 miles, and the transfer of containers between nearby ports to save costly ship calls. In order to preserve inherent advantages to the shippers of through container movements it is necessary to provide for
transportation and stabilize transport costs.\(^4\) By the late 1970s, containerized trailer-on-flatcar [TOFC] movements represented 7.2 percent of tonnage moved by rail;\(^5\) it was anticipated that air/motor through movements would exceed 6.5 million billion-ton miles during this period, a growth rate of approximately six percent.\(^6\) Moreover, there are a number of recent developments that may cause this trend to accelerate.\(^7\) By the late 1990s, rail intermodal transportation was a $7.3 billion business with an anticipated annual growth rate of between 6-8%.

Intermodal transportation utilizes the inherent advantages of each mode involved, creating synergies and efficiencies not otherwise attainable. The service provided is different from and superior to that available from either mode alone. Carriers joined in intermodal combinations seek to provide a complete, “seamless” intermodal through service from origin to destination. Carriers whose services have historically been restricted to one mode of transportation are transforming into large multi-modal companies through joint ownership\(^8\) or contractual agreement. Whether used to create new types of service, to lower rates to attract more traffic, or to lower costs to increase profitability, these arrangements are reshaping transportation.

Among the more dramatic contemporary shifts in transportation patterns has been the growth of multimodal international movements. For import or export traffic that is originating from or destined to U.S. points, rail/water/motor carrier combinations are often employed. Moreover, the United States has become a “land bridge” for a substantial amount of traffic that neither originates from nor is destined to U.S. shippers, but instead is moving between Europe and the Far East.\(^9\)

\(^7\) The largest innovation in intermodal hardware was undoubtedly the switch from bulk liner cargo service to containerization in the maritime industry. The change is little short of revolutionary. After initial innovations the railroads have operated a standard 89-foot line-haul vehicle for almost 20 years. That industry now appears to be on the brink of major innovations in line-haul piggyback equipment. *Id.* at 7-8.
\(^8\) These include combinations of rail/barge/shipping/truck (e.g., CSX now owns American Commercial Barge Lines, Sea-Land, and its own trucking company), truck/air (e.g., Consolidated Freightways now owns Emery Worldwide; Roadway Services now owns Roadway Air), rail/truck (e.g., Norfolk Southern now owns North American Van Lines; Union Pacific Railroad now owns Overnite Trucking), and shipping/truck combinations (American President Companies now owns a trucking company).
\(^9\) The introduction of double stack railcars in 1984 propelled this trend. By 1993, there were 150 trains per week dedicated exclusively to containerized traffic moving on double stack railcars eastbound from the U.S. West Coast, for example.
Statutory and regulatory innovation has also contributed to the enormous contemporary growth of transnational commercial activity. This latter type of innovation shall be explored in this essay. After this introduction, the article is divided into three primary sections. In the first, we examine the origins of intermodal law and regulation. In the second, we review the contemporary legal landscape on intermodal transportation. In the third, we recommend several potential improvements in the legal regime.

II. INTERMODAL TRANSPORT LAW: WHAT IT WAS

THE PRE-DEREGULATION DIVISION OF REGULATORY RESPONSIBILITIES: ICC, CAB, & FMC

Prior to deregulation there was a tripartite division of regulatory responsibility over foreign commerce transportation in this nation among three separate Federal administrative agencies: the Interstate Commerce Commission [ICC], the Civil Aeronautics Board [CAB], and the Federal Maritime Commission [FMC]. Prior to its sunset in 1996, the ICC was by far the largest of the three, regulating the surface transportation of over 18,000 railroads, motor carriers, pipelines, domestic water carriers, brokers, and freight forwarders. Prior to its sunset in 1985, the CAB had jurisdiction over the transportation of direct air carriers (airlines) and indirect air carriers (e.g., air freight forwarders) operating within, to, and from the United States. More than eighty domestic air carriers were subject to the jurisdiction of the CAB. The FMC regulated all United States flag and foreign flag carriers operating in foreign commerce, and United States carriers serving Alaska and Hawaii. Almost forty domestic


maritime carriers were subject to regulation by the FMC.\textsuperscript{15} Today, the agency holds jurisdiction over ocean transportation, in domestic-offshore and foreign commerce, by vessel operators, non-vessel operators [NVOs], and independent ocean freight forwarders.\textsuperscript{16}

**The National Transportation Policy**

In 1887 Congress promulgated the Act to Regulate Commerce,\textsuperscript{17} creating the ICC and affording to it the primary responsibility to prevent and correct rate discriminations by railroads. It was not until the Transportation Act of 1920,\textsuperscript{18} however, that Congress articulated a specific declaration of policy for the agency. That Act required the ICC "to promote, encourage and develop water transportation, service, and facilities in connection with the commerce of the United States, and to foster and preserve in full vigor both rail and water transportation."\textsuperscript{19} After 1920, the scope of Interstate and foreign commerce subject to the jurisdiction of the ICC expanded dramatically. For example, the Motor Carrier Act of 1935\textsuperscript{20} brought for-hire common and contract motor carriers within the ambit of ICC regulation. The Transportation Act of 1940\textsuperscript{21} brought Interstate water carriers within the Commission's jurisdiction. Two years later, freight forwarders were brought within the regulatory scheme.\textsuperscript{22}

It was in the 1940 legislation that Congress expressed its most significant declaration of the national transportation policy up to that time. It directed that the ICC should:

Provide for fair and impartial regulation of all modes of transportation subject to the provisions of this Act . . . so administered as to recognize and preserve the inherent advantages of each; to promote safe, adequate, eco-


\textsuperscript{17} Ch. 104, 24 Stat. 379 (1887), as amended by 49 U.S.C. §§ 1-27 (1970) (known as part I of the ICA). As originally enacted, it consisted of only nine printed pages. During the intervening years, Congress added over 200 amendments so that the ICA and its index now consist of over 700 printed pages. Moreover, an additional 120 printed pages of regulatory responsibilities were enacted in the Railroad Revitalization and Regulatory Reform Act of 1976, Pub. L. No. 94-210, 90 Stat. 31.

\textsuperscript{18} Ch. 91, 41 Stat. 456.

\textsuperscript{19} Ch. 91, § 500, 41 Stat. 499 (49 U.S.C. § 142 (1970)).

\textsuperscript{20} Ch. 498, 49 Stat. 543 (49 U.S.C. §§ 301-327 (1970)).

\textsuperscript{21} Ch. 722, 54 Stat. 898 (49 U.S.C. §§ 901-923 (1970)).

\textsuperscript{22} Part IV of the Interstate Commerce Act, ch. 318, 56 Stat. 284 (1942) (49 U.S.C. §§ 1001-1022 (1970)). Not only has the enormous regulatory responsibility conferred by Congress upon the ICC grown dramatically since 1920, but this nation's transportation requirements have also become increasingly sophisticated and complex. The ICC today regulates over 18,000 transportation entities engaged in Interstate and foreign commerce. See I.C.C. 89th Ann. Rep. 120 (1975).
This expression of policy delegated to the ICC the responsibility for coordinating all modes of transportation, including those not subject to its regulation.

In contrast, however, the Federal Aviation Act of 1958\(^2\) confined its policy declaration to air transportation and directed the CAB to coordinate transportation between air carriers. More specifically, it required:

(a) The encouragement and development of an air-transportation system properly adapted to the present and future needs of the foreign and domestic commerce of the United States, of the Postal Service, and of the national defense.

(b) The regulation of air transportation in such a manner as to recognize and preserve the inherent advantages of, assure the highest degree of safety in, and foster sound economic conditions in, such transportation, and to improve the relations between and coordinate transportation by, air carriers;

(c) The promotion of adequate, economical, and efficient service by air carriers at reasonable charges, without unjust discriminations, undue preferences or advantages, or unfair or destructive competitive practices;

(d) Competition to the extent necessary to assure the sound development of an air-transportation system properly adapted to the needs of the foreign and domestic commerce of the United States, of the Postal Service, and of the national defense;

(e) The promotion of safety in air commerce; and

(f) The promotion, encouragement, and development of civil aeronautics.\(^2\)

Similarly, the Merchant Marine Act of 1936\(^2\) emphasized that the FMC should concern itself with but a single mode of transportation:


\(^{25}\) Id. § 1302.

It is necessary for the national defense and development of its foreign and domestic commerce that the United States shall have a merchant marine (a) sufficient to carry its domestic water-borne commerce and substantial portion of the water-borne export and import foreign commerce of the United States and to provide shipping service essential for maintaining the flow of such domestic and foreign water-borne commerce at all times, (b) capable of serving as a naval and military auxiliary in time of war or national emergency, (c) owned and operated under the United States flag by citizens of the United States, insofar as may be practicable, (d) composed of the best-equipped, safest, and most suitable types of vessels, constructed in the United States and manned with a trained and efficient citizen personnel. It is declared to be the policy of the United States to foster the development and encourage the maintenance of such a merchant marine, and (e) supplemented by efficient facilities for shipbuilding and ship repair.27

As can be seen, the ICC was given a unique responsibility to foster the coordination of a national transportation system by all modes. Of the several regulatory agencies, the ICC alone was charged with the duty to consider all transportation modes in the exercise of its regulatory functions, and not only those within its jurisdictional ambit. The ICC recognized that the “development of a truly coordinated transportation system must, within the terms of [its] statutory mandate, take precedence over the more narrow interests of those carriers directly subject to the Interstate Commerce Act.”28 The ICC recognized that “[t]he shipping public must have available not only a ready choice of all modes of carriage, but also a workable flexibility which will enable them to utilize to the fullest the inherent advantages of each mode in coordinated movements of single shipments.”29 The ICC was subject to a unique statutory directive to protect the competition among the different modes of transportation subject to its regulation. It could maintain the rates of one carrier to protect the traffic of another if necessary to protect an “inherent advantage” of the latter.30

27. Ibid. § 1101.

Under its power to establish minimum rates, the ICC could disapprove non-compensatory rates so as to avoid rate wars or destructive competition. Missouri Pac. R.R. v. United States, 203 F. Supp. 629, 635 (E.D. Mo. 1962). However, the ICC was prohibited from nullifying the
Within this multi-agency network, the emergence of the container revolution and the growth of foreign trade created a need for efficiency and cooperation among the Federal regulatory bodies.\textsuperscript{31}

**Facilitating the Container Revolution**

Containerization, which has undergone an enormous growth in recent decades, represents an expeditious, economical, and efficient means of facilitating intermodal transportation. In its simplest form, it involves the shipment of freight as a unit from origin to ultimate destination in vans or boxes.\textsuperscript{32} The typical containerized export movement, for example, might involve (a) the loading of widgets by their manufacturer into a single van-type container, (b) the movement of the container by motor carrier from the manufacturer's inland domicile to the port facilities of

\textsuperscript{31} Schmeltzer & Peavy, Prospects and Problems of the Container Revolution, 1 J. Mar. L. & Com. 203, 205 (1970). In contrast to its "open door" policy with respect to international investment in most industries, the United States Congress has promulgated legislation specifically designed to prohibit or inhibit foreign investment in the field of transportation. Pursuant to the Jones Act, 1920, 46 U.S.C. §§ 861-889 (1970), the coastal and fresh water shipment of commodities or passengers between points in the United States or its territories must be accomplished in vessels which are constructed and registered in the United States, and which are owned by citizens of the United States. Before a corporation will be permitted to register a ship in the United States, the corporation's principal officer and chairman of the board must be U.S. citizens and 75% of its stock must be held by U.S. citizens. 46 U.S.C. §§ 802, 833a, 888 (1970). Exemptions exist with respect to shipments incidental to the principal business of a foreign-controlled corporation which is engaged in mining or manufacturing within the United States, and with respect to the intercoastal transport of empty containers where the nation of the vessel's registry grants reciprocal privileges to U.S. vessels. 46 U.S.C. § 883 (1970).

Foreign ownership is similarly restricted in the field of air transportation. Thus, a foreign air carrier is prohibited from acquiring control of a company engaged in any phase of aeronautics within the United States unless approval is obtained from the CAB. Ownership of 10% or more of the voting securities gives rise to a presumption of control, and aggregate foreign ownership is limited to 25%. 49 U.S.C. §§ 1301, 1378(f) (1970). A foreign air carrier is generally prohibited from performing domestic air transportation within the United States. 49 U.S.C. §§ 1371, 1401(b), 1508 (1970). Such domestic transportation is limited to domestically registered aircraft. Eligibility to register such aircraft is limited to (a) U.S. citizens, (b) partnerships in which all members are U.S. citizens, or (c) U.S. corporations in which the president and at least two-thirds of the board of directors and other officers are U.S. citizens, and at least 75% of the voting stock is owned by U.S. citizens. The Conference Board, Foreign Investment in the United States: Policy, Problems and Obstacles 15 (1974); The Institute for International and Foreign Trade Law, Georgetown University Law Center, Legal Environment for Direct Investment in the United States 28 (1972). But see Dempsey, Economic Aggression & Self-Defense in International Law: The Arab Oil Weapon and Alternative American Responses Thereto, 9 Case W. Res. J. Int'l L. 253, 294 (1977); Dempsey, Legal and Economic Incentives for Foreign Direct Investment in the Southeastern United States, 9 Vand. J. Transnat'l L. 247, 254-55 (1976).

Savannah, (c) the placement at Savannah of the container aboard a maritime vessel destined for Hamburg, (d) the movement at Hamburg of the container from the maritime vessel to a rail flatcar destined for Stuttgart, and (e) the unloading at Stuttgart of the container’s contents by the consignee. Had the widgets in the above example not moved via container, their transport would have necessitated individual loading and unloading at each of the aforementioned points, thereby increasing labor costs, time consumption, and damage and loss claims.\textsuperscript{33} Containerized transportation, in contrast, obviates the need for individualized handling of commodities at points other than the ultimate origin and destination. Containerization thereby substantially reduces transit time, handling and export packaging expenditures, and the possibility of damage and pilferage.\textsuperscript{34} It permits freight to be loaded at inland origins and remain untouched throughout the journey until the containers arrive at inland destinations. Its utilization promises predictability of overall transportation costs, improved control and coordination of intermodal shipments, and rate reductions.\textsuperscript{35}

Although containerization has heretofore had its greatest impact in the maritime industry, an increasing volume of United States foreign trade is now transported by air. The loading and handling efficiency of containerized shipments is a natural complement to the speed of air transportation. New jumbo jets are capable of handling even the bulky containers, and are therefore able to provide coordinated movements in conjunction with surface carriers.\textsuperscript{36}

Containerization has had a profound impact, not only upon the technology of transportation and facilitation of international trade, but also upon the procedures of those governmental entities charged with regulating and coordinating foreign commerce movements. Moreover, its full potential has not yet been realized. It is estimated that eighty percent of all general freight cargo in foreign commerce is containerizable.\textsuperscript{37}


\textsuperscript{34} See Lamer, Public Policy in the Ocean Freight Industry, in Promoting Competition in Regulated Markets 113 (A. Phillips ed. 1975).


\textsuperscript{36} Lang, Demand and Supply: The Technology of Transportation, in The Future of American Transportation 54 (E. Williams, ed. 1971).


For a succinct examination of the myriad problems the container revolution and the recently increased utilization of intermodal transportation have posed for the traditional international
With the growth of TOFC operations, the ICC acquired some measure of regulatory expertise in the coordination of containerized intermodal shipments. TOFC transportation, more popularly known as "piggyback" service, is a bimodal operation involving the movement of commodities, trailers, or semi-trailers of motor carriers and on the flatcars of rail carriers. Such transportation combines the expeditious and economically advantages associated with rail transport with the versatility of motor carriage. The Interstate Commerce Act authorized the voluntary establishment of just and reasonable through routes and joint rates, charges and classifications between motor and rail carriers, or between motor and water carriers (including FMC regulated ocean carriers transporting commodities between Alaska and Hawaii and the contiguous forty-eight States). The ICC readily approved such arrangements, and its regulatory efforts were a substantial contribution to the expansion of innovative concepts in surface transportation.

The ICC frequently acknowledged that containerization is a progressive innovation which facilitates the intermodal coordination of operations and the efficiency and economy of transportation, and should therefore be encouraged. Thus, where a public need existed which can-

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38. TOFC transportation is not a recently developed form of carriage, but has been in existence since the inception of motor carrier regulation. See, e.g., *Trucks on Flat Cars Between Chicago and Twin Cities*, 216 I.C.C. 435 (1936).


40. *Note*, *Coordination of Intermodal Transportation*, 69 Colum. L. Rev. 247, 248 (1969).


42. A through or joint rate has been defined as a total combined charge for the entire journey of a shipment from point of origin to the ultimate consignee. Such transportation involves the performance of several carriers, frequently of different modes, and ordinarily constitutes a lesser charge than the sum of the single line rates. *McLean Trucking Co. v. United States*, 346 F. Supp. 349 351 (M.D.N.C. 1972), *aff’d*, 409 U.S. 1121 (1973).

43. In re *Tariffs Containing Joint Rates and Through Routes for the Transportation of Property Between Points in the United States and Points in Foreign Countries*, 341 I.C.C. 246, 254 (1972). The voluntary nature of the establishment of such joint rates was emphasized and the ICC was prohibited from requiring their institution. See *Great Western Packers Express, Inc. v. United States*, 246 F. Supp. 151, 154-55 (D. Colo. 1965). However, once two or more carriers have voluntarily entered into through routes and joint rates and have filed such rates and charges with the ICC, neither carrier could subsequently terminate the routes or cancel the rates without demonstrating that the proposed change would be just and reasonable. T.I.M.E.—DC, Inc. v. United States, 352 F. Supp. 1238 (N.D. Tex. 1972).

not adequately be satisfied by existing transportation services, authority was granted for the transportation of empty containers between port cities and inland points.\textsuperscript{45} The grant of authority to transport empty containers along with loaded containers obviated the necessity of deadheading containers in return movements to seaports and maximized the efficiency and economy of such operations by permitting the free transfer of containers from interior breakbulk to stuffing points.\textsuperscript{46} The grant of authority in such circumstances frequently had the effect of advancing the development of intermodal maritime-land operations consonant with the Commission's declared policies.

In summary, prior to deregulation U.S. economic regulation of transportation in foreign commerce was divided among three separate regulatory agencies. The ICC had jurisdiction over some 18,000 rail, motor, and water carriers, brokers, and freight forwarders. By far the largest of the three "sister" agencies, it performed its regulatory responsibilities pursuant to the Interstate Commerce Act \textsuperscript{[ICA].}\textsuperscript{47} The Civil Aeronautics
Board regulated domestic and international direct air carriers (airlines) and indirect air carriers (e.g., air freight forwarders).\(^{48}\) Then as now, the Federal Maritime Commission had jurisdiction over common carriers operating United States and foreign flag vessels [VOs, or maritime carriers] and non-vessel operators [NVOs, or ocean freight forwarders].\(^{49}\) The inevitable legal problems that arose as a result of this overlapping jurisdiction stimulated quasi-judicial and quasi-legislative activity in each of the three agencies.

Of these three agencies, the ICC was charged by Congress with a unique statutory directive to promote the coordination of all modes of transportation, even those not subject to its jurisdiction.\(^{50}\) Thus, it was recognized that the development of a coordinated system of transportation must take precedence over the more narrow interests of those carriers directly subject to ICC jurisdiction.\(^{51}\) Similarly, the ICC noted that

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the public must have available not only a multiplicity of transport modes from which to choose, but also a working flexibility that permits an optimum utilization of each mode of transportation in coordinated through movements.\textsuperscript{52} Moreover, the ICC further recognized that it is in the public interest to adopt regulatory policies that promote the free flow of international commerce between the United States and its neighbors.\textsuperscript{53}

As noted, the ICC developed great regulatory expertise in intermodal transportation even before the advent of the "container revolution," for it had regulated trailer-on-flatcar or "piggy-back" service for a considerable period. TOFC essentially involves the bimodal transportation of trailers on rail flatcars for a portion of a through movement, and the movement of the trailers attached to the tractors of motor carriers for the remainder thereof.\textsuperscript{54}

The ICC frequently acknowledged the innovative nature of containerization, which permitted the efficient and economical coordination of intermodal operations.\textsuperscript{55} In \textit{Zirbel Transport, Inc., Ext.—Containers} the Commission emphasized, with particularity, the benefits to be derived from increased employment of containerized operations:

[I]t has always been the policy of this Commission to encourage the development of intermodal transportation, and we believe that containerization is a useful, innovative tool in that development. The services proposed in this and other recent applications offer numerous benefits directly to the shipping public. Among these benefits are: a reduction in packaging requirements; increased shipment integrity resulting in a reduction in loss, damage, and pilferage; less handling and warehousing; avoidance of terminal congestion and interchange delays; faster transit times; energy conservation; and more efficient use of equipment. The bottom-line benefit is, of course, less costly transportation of goods for the public at large.\textsuperscript{57}

\begin{itemize}
  \item \textsuperscript{52} C.O.D. and Freight-Collect Shipments, 343 I.C.C. 692, 729 (1973).
  \item \textsuperscript{53} See Transfer of Equipment or Traffic at or near ports of entry on the United States-Canadian and the United States-Mexican International Boundary Lines, 110 M.C.C. 730, 742 (1969) [hereinafter cited as International Boundary Lines].
  \item \textsuperscript{56} 125 M.C.C. 663 (1976).
  \item \textsuperscript{57} Id. at 677.
\end{itemize}
Similarly, in *AAA Transfer, Inc., Ext. – Cargo Containers*, the ICC recognized the following characteristics of containerized transportation:

The benefits to be derived from the utilization of intermodal transportation of freight in containers include reduced (1) costs, (2) transit time, (3) in-transit damage to lading, (4) difficulty in affixing responsibility for loss and damage, and (5) incidence of components becoming separated from concurrently shipped base commodities. Successful containership service depends to a substantial degree upon rapid operation of vessels between ports and concomitantly, reduction of the time consumed in port for unloading and loading cargo. Containerships now generally call only at the largest of ports, and often hundreds of containers are unloaded at one time from a single vessel. Offloaded containers must promptly be removed from the port facilities, and arriving containers must be delivered according to the water carrier’s loading schedule if they are to make the intended sailing. Coordination of movements is also required in the repositioning of empty containers and of chassis and flat-bed trailers. In addition, certain receivers of freight require timed pickups or deliveries in order to facilitate the unloading or loading of shipments and to prevent disruption of plant production. Without expeditious motor common carrier service the full potential benefits of intermodal containerized freight service cannot be realized.

This regulatory philosophy facilitated a tremendous increase in the employment of containers in through intermodal carriage. Moreover, the ICC explicitly emphasized its policy of promoting containerization, intermodal coordination, and cooperation in transportation. Operating authority was granted for the movement of empty containers between port facilities and inland points, thus maximizing efficiency by permitting the freer transfer of containers between break-bulk and stuffing points. Authority was not required for the return movement of empty containers to the point of origin when the containers have been utilized in authorized outbound transportation. Operating authority was required, however, for the transportation of empty containers to a point other than the origin of the initial loaded container shipment.

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58. 120 M.C.C. 803 (1974).
59. *Id.* at 818.
FOREIGN COMMERCE REGULATION AND THE LAND BRIDGE EXEMPTION

Pursuant to the Interstate Commerce Act, the ICC had jurisdiction over the transportation of passengers and property by motor carriers engaged in foreign commerce. Foreign commerce was defined by section 203(a)(11) of the ICA as

Commerce, whether such commerce moves wholly by motor vehicle, or partly by motor vehicle and partly by rail, express, or water, (A) between any place in the United States and any place in a foreign country, or between places in the United States through a foreign country; or (B) between any place in the United States and any place in a Territory or possession of the United States insofar as such transportation takes place within the United States.\(^65\)

This statutory definition created the land bridge exemption, which exempted commerce moving from a foreign country in a continuous movement through the United States to another foreign country from economic regulation by the ICC.\(^66\) For example, commodities originating in London and destined for Toronto could be transported from the port of New York to points on the international boundary line between the United States and Canada as an exempt motor carrier movement. The exemption might also encompass a much more lengthy segment of surface transportation. Thus, for example, commodities manufactured in Hong Kong might be transported by an FMC regulated ocean vessel to Oakland, thence across the United States by motor carrier to Norfolk in

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\(^65\) 49 U.S.C. § 303(a)(11) (1970). The term “foreign commerce” is also defined to include transportation between points in a foreign country, or between points in two foreign countries, insofar as such transportation takes place within the United States. Such movements are, however, subject to regulation for purposes of insurance, designation of an agent for service of process, qualification and working hours of employees, and safety. Id. Motor carriers operating in foreign commerce were also required to file with the ICC a certificate of insurance, surety bond, proof of qualification as a self-insurer, or other securities or agreement to pay final judgment for bodily injuries or for the loss or damage of property. 49 C.F.R. 1043.11 (1976).

Although Puerto Rico is not a foreign nation, it is a place outside the United States within the purview of part III of the ICA. It was declared by specific legislative enactment that the ICA is inapplicable to Puerto Rico. 48 U.S.C. § 751 (1970). Thus, the issue of whether a public need exists for transportation to and from points in Puerto Rico is beyond the jurisdiction of the ICC. Trans-Caribbean Motor Transport, Inc., Common Carrier Applic., 66 M.C.C. 593, 596 (1956). However, transport operations performed between points in the continental United States and points in Puerto Rico appear to fall within the definition of “foreign commerce” contained in ICA § 303(a)(11), 49 U.S.C. 303(a)(11), to the extent that such operations are performed within the United States. Moreover, through transport movements between Puerto Rico and foreign nations which traverse the continental United States appear to fall within the land bridge exemption, although no ICC decisions have specifically so held.

an unregulated exempt movement, and then by FMC carrier to Rotterdam.

The land bridge exemption was consistent with article V of the General Agreement on Tariff and Trade [GATT], which provides, inter alia, that "[t]here shall be freedom of transit through the territory of each contracting party, via the routes most convenient for international transit, for traffic in transit to or from the territory of other contracting parties." The exemption was also alluded to in most treaties of friendship, commerce, and navigation [FCN], into which the United States has entered with numerous nations. The FCN treaty between the United States and Japan, for example, includes the typical provision regarding freedom of transit. Article XX provided:

There shall be freedom of transit through the territories of each Party by the routes most convenient for international transit . . . for products of any origin en route to or from the territories of such other party. Such persons and things in transit . . . shall be free from unnecessary delays and restrictions. 69

INTERMODAL MERGERS & ACQUISITIONS

The Interstate Commerce Commission authorized numerous intermodal acquisitions that have created integrated transportation companies. 71

**Acquisitions of Motor Carriers.** The Interstate Commerce Act stated that the ICC "may approve . . . [a rail application to acquire a motor carrier] only if it found that the transaction was consistent with the public interest, would enable the rail carrier to use motor carrier transportation to public advantage in its operations, and would not unreasonably restrain competition." 72 Traditionally, the ICC interpreted this provision to allow only the acquisition of motor carriers providing operations "auxiliary and supplemental" to rail services, and not to authorize the approval of a motor carrier having unrestricted operating rights in the absence of "special circumstances." 73

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69. Id. at 2078, T.I.A.S. No. 2863.
71. For example, the Commission approved the CSX's proposals to purchase American Commercial Lines (one of the nation's largest barge operators) and Sea-Land (one of the largest carriers of oceanborne, containerized freight).
73. Pennsylvania Truck Lines, Inc., Acquisition of Control of Barker Motor Freight, Inc., 5...
Hence, the ICC traditionally viewed the Interstate Commerce Act as permitting rail carriers to hold non-rail-related motor carrier operating authority only when warranted by compelling public need for service not offered by existing motor carriers.\textsuperscript{74} The purpose of Congress' general prohibition on dual authority, as upheld by the Supreme Court,\textsuperscript{75} was to protect motor carriers from domination by their more powerful competitors, the railroads.\textsuperscript{76} As the ICC explained: "The main purpose for the policy...was to prevent the railroads from acquiring motor operations through affiliates and using them in such an manner as to unduly restrain competition of independently operated motor carriers."\textsuperscript{77}

In 1982, the ICC abandoned the special circumstances doctrine in the issuance of unrestricted operating authority to motor carrier subsidiaries of railroads.\textsuperscript{78} In 1983, the Denver & Rio Grande became the first rail carrier to receive unrestricted operating rights for its trucking subsidiary.\textsuperscript{79} In 1986, Burlington Northern, Inc., a railroad holding company, received ICC approval to acquire six motor carriers.\textsuperscript{80} That same year,
the ICC approved the Norfolk/Southern Railway's $370 million acquisition of North American Van Lines, the nation's largest household goods carrier.81 In 1986, Union Pacific Corporation announced an agreement to acquire the nation's fifth largest motor carrier, Overnite Transportation Co., for $1.2 billion.82

In an important opinion rendered in the fall of 1986, *International Brotherhood of Teamsters v. ICC (Teamsters I)*,83 the Court of Appeals for the District of Columbia Circuit held the ICC's eradication of the special circumstances doctrine inconsistent with the provisions of the Interstate Commerce Act governing rail acquisition of motor carriers.84 The Act imposed a tripartite test upon such transactions: (1) they must be in the "public interest"; (2) they must "enable the rail carriers to use motor carrier transportation to public advantage in its operations"; (3) they must "not unreasonably restrain competition."85 The second prong of that test led the court to remand the ICC's approval of Norfolk/Southern's acquisition of North American Van Lines.86

Applying the methodology announced earlier by the Supreme Court in *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*,87 the District of Columbia Circuit found the first and third criteria sufficiently ambiguous that it could rely on the ICC's interpretation.88 However, the court deemed the second criterion precise enough to reflect a clear congressional intent regarding the question at issue: that "rail carriers...be allowed to acquire only motor carriers that would be useful in rail operations."89 In its 1984 policy statement, the ICC had erroneously concluded that the statutory requirement would be satisfied if the acquired motor carriers would be used in its "overall transportation operations."90 Because many of North American's operations were, and would continue to be, unrelated to supplementing rail services, the rail acquisition violated the statute's requirement that railroads may acquire motor carriers only for purposes of improving rail operations.91

83. 801 F.2d 1423 (D.C. Cir. 1986).
84. 49 U.S.C. §11344(c) (1982).
86. International Bhd. of Teamsters v. ICC, 801 F2d at 1423-26.
87. 801 F.2d at 1427.
88. Id. at 1427.
90. International Bhd. of Teamsters v. ICC, 801 F.2d at 1430. For discussion of the reaction
After remand, a curious rider was attached to anti-drug legislation in the closing days of the ninety-ninth Congress. The rider effectively grandfathered approval of any acquisition of a motor carrier by a railroad agreed to before the District of Columbia Circuit’s opinion in Teamsters I.\textsuperscript{92} Apparently the several railroads that had such acquisitions pending utilized their political power to open the window wide enough for them to pass through.

Shortly thereafter, the ICC sought withdrawal of the Teamsters I opinion on grounds that the legislation had turned it into a mere advisory opinion, the acquisition issue was moot, and the question was nonjusticia­ble. In International Brotherhood of Teamsters v. United States (Teamsters II),\textsuperscript{93} the court declined to withdraw its prior opinion, on grounds that there were other unresolved issues appropriate for remand. But in light of the supervening legislation, it reversed those portions of its decision relevant to section 11344 (c).\textsuperscript{94} Nonetheless, the two decisions appear to revive the “special circumstances” doctrine, at least for rail acquisition not shielded by the 1987 anti-drug legislation.\textsuperscript{95}

**Acquisitions of Water Carriers.** Two sections of the Interstate Com­merce Act governed ICC jurisdiction over rail acquisitions of water carriers. The first was the general provision applicable to all mergers or acquisitions of control not involving two class I railroads. The ICC was required to approve the transaction unless it concluded that:

1. As a result of the transaction, there is likely to be a substantial lessening of competition, creation of a monopoly, or restraint of trade in freight surface transportation in any region of the United States: and
2. the anticompetitive effects of the transaction outweigh the public interest in meeting significant transportation needs.\textsuperscript{96}

The second section was more specifically directed to water carrier acquisitions. No carrier could acquire a competing water carrier unless, with respect to carriers that do not operate via the Panama Canal, the

\textsuperscript{92} Apparently the several railroads that had such acquisitions pending
\textsuperscript{93} In an opinion highly critical of the Interstate Commerce Commission, the District of Columbia Circuit also circumscribed the ICC's ability to approve intermodal acquisitions through the exemption mechanism. See Regular Common Carrier Conference v. United States, 820 F.2d 1323 (D.C. Cir. 1987).
ICC concluded that such acquisition “will still allow that water common carrier or vessel to be operated in the public interest advantageously to interstate commerce and that it will still allow competition, without reduction, on the water route in question.”97

In 1984, the ICC approved CSX’s $725 million acquisition of American Commercial Lines, Inc., which had as a subsidiary the nation’s largest inland water carrier, notwithstanding the fact that there was extensive intermodal competition between the two.98 In June of 1986, CSX acquired Sea-Land Corporation for $800 million.

EXEMPTIONS

The Staggers Rail Act of 1980 conferred broad exemption authority upon the Interstate Commerce Commission. Commodities and services that have been exempted include all traffic moving in boxcars or in “piggyback” (trailer-on-flatcar/container-on-flatcar, or TOFC/COFC) service,99 and a long list of individual commodities, such as motor vehicles, fresh fruits and vegetables, lumber, furniture, poultry and meats, butter and cheese, sand and gravel, and most manufactured products.100 Thus, intrastate movements made by an Interstate railroad on railroad-owned trucks have been exempted from regulation.101 The Commission also extended its approval of an agreement among various rail carriers for the pooling of intermodal cars.102 However, the Congress has denied the STB authority to exempt carriers from the intermodal ownership prohibitions, from “full liability” terms in cargo loss and damage, or from labor protection obligations in line sales, mergers or acquisitions.103

R A T E R E G U L A T I O N

The existence of intermodal competition became an important threshold factor in determining whether the ICC would exert regulatory oversight of railroad rates. The Staggers Rail Act of 1980 reduced the ICC’s jurisdiction over rates significantly by providing that the Commission had jurisdiction over them only if the traffic was “market dominant”

97. Id. § 11321 (a), (b).
98. See Crounse Corp. v. ICC, 781 F.2d 1176 (6th Cir.) (affirming the ICC’s decision), cert. denied, 197 S. Ct. 290 (1986); D. Sweeney, C. McCarthy, S. Kalish & J. Cutler, Jr., supra at 26-27.
100. 49 CFR §1039.
102. TTX Co., et al. - Application for Approval of the Pooling of Car Service With Respect to Flat Cars, Finance Docket No. 27590 (Sub-No. 2) (ICC served Aug. 31, 1994).
103. 49 U.S.C. §10505(e),(f),(g).
and the proposed rates were more than 170% of variable costs.\textsuperscript{104} Railroads were free to raise or lower rates at well unless, with respect to an increase, the carrier had market dominance over the traffic, or with respect to a decrease, the rates would be lowered below a "reasonable minimum" (if the rate was above the variable costs of providing the service, it was conclusively presumed to contribute to "going concern value" and therefore be above a reasonable minimum). Staggers also frees railroads to enter into contracts with shippers covering rates and levels of service.

The ICC defined "market dominance" in such a way that it was rarely deemed to exist. According to the Commission's interpretation, it did not exist if there was intermodal competition, intramodal competition, product competition, or geographic competition.\textsuperscript{105} The Commission also took the position that carriers should be generally free to raise rates until they either become "revenue adequate" or "stand alone costs" are achieved.\textsuperscript{106} Stand alone costs are essentially what it might cost an electric utility, for example, to lay its own rail line to a coal mine. The net result was that, in the vast majority of cases, shippers could obtain no relief from what they believed were onerous rail rates.\textsuperscript{107} Producers of coal and electric utilities called for legislative relief from this administrative deregulation or, failing that, a sunset of the Interstate Commerce Commission.

**Sunset of the Interstate Commerce Commission; Emergence of the Surface Transportation Board**


\textsuperscript{105} Western Coal Traffic League v. United States, 719 F.2d 772 (5th Cir. 1983), cert. denied, 466 U.S. 953 (1984).

\textsuperscript{106} Potomac Electric Power Co. v. ICC, 744 F.2d 185 (D.C. Cir. 1984).

lation of the trucking industry. Moreover, TIRRA expanded the ICC's exemption authority to embrace many aspects of trucking regulation. The ICC Termination Act of 1996 sunset the Interstate Commerce Commission, deregulated and amended certain functions, and transferred jurisdiction over rail, motor, bus, broker, freight forwarder and pipeline services to the newly created Surface Transportation Board [STB] and the DOT office of Motor Carrier Information analysis [MCIA]. The STB is a three-member quasi-independent panel within the U.S. Department of Transportation. The MCIA was a part of the DOT's Federal Highway Administration. Jurisdiction over railroads and pipelines is now vested in the STB. Jurisdiction over motor carriers, water carriers, brokers and freight forwarders is now vested in the Secretary of Transportation.

CREATION OF THE U.S. DEPARTMENT OF TRANSPORTATION

Discussions about creating a Federal Department of Transportation [DOT] began as early as 1940. In the 1960s, the Landis Report cited the need for an office to coordinate and develop a national transportation policy. In 1961, the Doyle Report recommended not only creation of a Department of Transportation but also the merger of all transportation regulatory functions into a unified, fully intermodal regulatory body. This led President Kennedy to ask his aides to offer suggestions concerning transport policy. Legislation passed by Kennedy in 1961 provided the first Federal program of urban transit support. With Kennedy's assassination, the task force on transportation advised President Lyndon Johnson that no focal point for transportation existed in the Executive Branch, and that therefore a cabinet-level Department of Transportation should be created. The bill creating the DOT was signed on October 15, 1966, and the agency was established on April 1, 1967, with Alan S. Boyd as the first Secretary of Transportation.

The DOT essentially was created from an amalgamation of several

pre-existing governmental agencies. From the Interstate Commerce Commission was transferred the Bureau of Railroad Safety (which formed a part of the Federal Railroad Administration [FRA]), and the Bureau of Vehicle Safety (which formed a part of the Federal Highway Administration [FHWA]). The independent Federal Aviation Agency (which had earlier been split off from the Civil Aeronautics Board) became DOT's Federal Aviation Administration. The Commerce Department gave DOT the St. Lawrence Seaway Development Corporation, surrendered to the FHWA the National Highway Safety Bureau, and gave the FRA the Office of Groundspeed Transportation. The Treasury Department gave it the Coast Guard. The Department of Interior gave the FRA the Alaska Railroad. A new quasi-independent agency, the National Transportation Safety Board, was also housed within DOT.\footnote{114} III. Intermodal Transport Law: What It Is

The Intermodal Surface Transportation Efficiency Act of 1991

As noted above, in the Transportation Act of 1940, Congress set forth a Statement of national transportation policy, which included an obligation that the Interstate Commerce Commission [ICC] (which regulated the surface modes of transportation) shall "provide for a fair and impartial regulation of all modes of transportation . . . all to the end of developing, coordinating, and preserving a national transportation system by water, highway, and rail, as well as other means, adequate to meet the needs of the commerce of the United States . . . ."\footnote{115} Though Congress would embrace intermodal facilitation as an important policy goal in several subsequent legislative acts, several decades would pass before intermodalism would take center stage in national policy.\footnote{116}

As the Interstate Highway System neared completion in the early 1990s, the focus in transportation priorities shifted away from new highway construction. Congressional attention turned instead to alternatives to the single-occupancy vehicle [SOV] to satiate the public's desire for mobility. Concerns over congestion, sprawl and pollution, all of which defied political jurisdictional boundaries, emerged as political issues.

\footnote{114. Donald Witnah, U.S. Department of Transportation: A Reference History 11 (Greenwood 1998).}


\footnote{116. An Interagency Committee on Intermodal Cargo was created in 1973 to coordinate the activities of the DOT, ICC, CAB, and FMC on intermodal issues. See Paul Dempsey, The Contemporary Evolution of Intermodal and International Transport Regulation Under the Interstate Commerce Act, 10 Vanderbilt J. Transnat'l L. 505, 555 (1977).}
Congress also recognized that the separate and isolated modal networks were not linked together well. Seamless connectivity between modes might well allow Americans to enjoy the inherent advantages of all modes.

The Intermodal Surface Transportation Efficiency Act of 1991 [ISTEA] established new national priorities in areas of economic progress, cleaner air, energy conservation and social equity, requiring that the intermodal transportation system be "economically efficient and environmentally sound . . ." as well as "energy efficient . . . ."\textsuperscript{117} In the legislation, Congress declared that it is in the "national interest to encourage and promote the development of transportation systems embracing various modes of transportation in a manner which will efficiently maximize mobility of people and goods within and through urbanized areas and minimize transportation-related fuel consumption and air pollution."\textsuperscript{118}

Significantly, the Intermodal Surface Transportation Efficiency Act of 1991 was the first highway bill in the nation's history to have expunged the word "highway" from its title. This legislation provided enhanced flexibility for State and local governments to redirect highway funds to accommodate other modes and modal connections.\textsuperscript{119} In ISTE A's legislative history, Congress concluded:

An intermodal transportation system . . . to enhance efficiency will be the key to meeting the economic, energy and environmental challenges of the coming decades. The nation will not be able to meet all of those demands through continued reliance on separate, isolated modes of transportation.

Development of an intermodal transportation system will result in increased productivity growth the nation needs to compete in the global economy of the 21st Century. We can no longer rely on a transportation system designed for the 1950s to provide the support for American industry to compete in the international marketplace.\textsuperscript{120}

By placing the word "intermodal" (as opposed to the historical "highway" term) in the title of the bill, Congress sought "to bring the need for intermodalism to the forefront of the nation's transportation and

\textsuperscript{118} 23 U.S.C. § 134(a).
\textsuperscript{119} Though ISTE A emphasized a national policy of promoting a seamless system of intermodal transportation, facilitation of intermodalism may be proceeding sluggishly in certain regions.
economic debate.\textsuperscript{121} ISTEA authorized $156 billion for fiscal years 1992-
1997, but not just for highways. It shifted Federal transportation policy from traditional highway funding for automobiles to a system which
creates intermodal systems that include highways, rail and mass transit in a
comprehensive system, with seamless connectivity between modes.\textsuperscript{122} IS-
TEA enhanced State and local governmental flexibility in redirecting
highway funds to accommodate other modes and pay for transit and carpool projects, as well as bicycle and pedestrian facilities, research and
development, and wetland loss mitigation.\textsuperscript{123} It created flexible guide-
lines that cut across traditional boundaries in allowing expenditures on
highways, transit and non-traditional areas (e.g., vehicle emission inspection
and maintenance).\textsuperscript{124} According to DOT, “This flexibility will help
State and local officials to choose the best mix of projects to address air
quality without being influenced by rigid Federal funding categories or
different matching ratios that favor one mode over the other.”\textsuperscript{125}

ISTEA discouraged continued reliance on the automobile and ex-
panded highways while encouraging the seamless movement of people
and goods between modes of transportation.\textsuperscript{126} For example, the Federal
match for new or expanded facilities to be available for single-occupancy
vehicles is reduced to 75\% (compared with an 80\% Federal match on
other highway projects).\textsuperscript{127} The transit match is increased to 80\% to
achieve parity in matching ratios between the modes.\textsuperscript{128}

ISTEA also gave Metropolitan Planning Organizations [MPOs] ex-
panded funding for planning purposes and authority to select projects for
funding, thereby significantly expanding their jurisdiction by authorizing
MPOs to allocate Federal highway funds. Under ISTEA, the MPO, in
consultation with the State, selects all Federal highway, transit and alter-
native transportation projects to be implemented within its boundaries,
except for projects undertaken on the National Highway System and pursuant to the Bridge and Interstate Maintenance programs. Projects on the National Highway System and pursuant to the Bridge and Interstate Maintenance Program are selected by the State in cooperation with the MPO. ISTEA also required MPOs to "begin serious, formal transportation planning", and to "fiscally constrain" their long-range plans and short-term Transportation Improvement Programs [TIPs], requiring MPOs to create realistic, multi-year agendas of projects which could be completed with available funds.\(^{129}\) An opportunity for public comment must be provided in preparation of both the long-range plan and the TIP.\(^{130}\) Prepared in cooperation with the State and the local transit operator, and updated every two years, TIPs must include all projects in the metro area to be funded under a Title 23\(^{131}\) and the Federal Transit Act, and be consistent with the long-range plan and the Statewide Transportation Improvement Program [STIP]. The STIP usually covers a time frame of about three years and describes specific projects or project segments, as well as their scope and estimated cost. States must also prepare a long-range transportation plan which identifies the State’s transportation needs and proposed projects over a period of 20 years.\(^{132}\) Under ISTEA, the MPO’s planning process, at minimum, had to consider the following factors:

- efficient use of existing transportation facilities
- energy conservation goals;
- methods to reduce and prevent traffic congestion;
- effect on land use and land development;
- programming of expenditures for transportation enhancement activities;
- effects of all transportation projects regardless of sources of funds;
- international border crossings and access to major traffic generators such as ports, airports, intermodal transportation facilities, and major freight distribution routes;
- connectivity of roads within the metropolitan area with roads outside the metropolitan area;
- transportation needs identified by management systems;
- preservation of transportation corridors;
- methods to enhance efficient movement of commercial vehicles;

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The Transportation Equity Act for the 21st Century of 1998 [TEA-21] reaffirms and retains the planning provisions and MPO structure of ISTEA, with its emphasis on Federal-State-local cooperation and public participation, though significant changes were made in funding levels. TEA-21 replaced ISTEA’s fifteen factors to be considered in TIP preparation with seven:

1. Support the economic vitality of the metropolitan area, particularly by enhancing global competitiveness, productivity, and efficiency;
2. Increase the safety and security of the transportation system for motorized and nonmotorized users;
3. Increase the accessibility and mobility options available to people and freight;
4. Protect and enhance the environment, promote energy conservation, and improve the quality of life;
5. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
6. Promote efficient system management and operation; and
7. Emphasize the preservation of the existing system.

**Federal Policies Promoting Intermodal Transportation**

Congress has declared that among the transportation policies of the United States is “to encourage and promote development of a national intermodal transportation system ... to move people and goods in an energy-efficient manner, provide the foundation for improved productivity growth, strengthen the Nation’s ability to compete in the global economy, and obtain the optimum yield from the Nation’s transportation resources.”

Congress created the U.S. Department of Transportation to “make easier the development and improvement of coordinated trans-

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135. William Vantuono, TEA 21: Uncomplicated Answers for Complicated Questions, Railway Age (Sept. 1, 1998), at 16; American Public Transit Ass’n, TEA 21: A Summary of Transit Related Provisions 6 (1998). For example, under the $217 billion authorization bill (the largest infrastructure bill in U.S. history), funding was significantly increased for the Congestion Mitigation and Air Quality Program (by 35%) as well as for transit (by 50%). Bud Shuster, Shuster Applauds Gore’s “Better America Bonds”, Press Release (Jan. 11, 1999).
136. Emphasis supplied.
portation service . . .” 138 The Secretary of Transportation is required to coordinate Federal policy on intermodal transportation, and promote creation and maintenance of an efficient U.S. intermodal transportation system. 139 He is also obliged to consult with the heads of other Federal agencies to establish policies “consistent with maintaining a coordinated transportation system . . .” 140 The Secretary is required to “encourage the development and use of intermodal transport, using containers constructed to facilitate economical, safe, and expeditious handling of containerized cargo without intermediate reloading which such cargo is transported over land, air and sea areas.” 141

Among the aviation statutes is a recognition that it is the policy of the United States “to develop a national intermodal transportation system that transports passengers and property in an efficient manner.” 142 Congress has declared that “A national intermodal transportation system is a coordinated, flexible network of diverse but complimentary forms of transportation that transport passengers and property in the most efficient manner. By reducing transportation costs, these intermodal systems will enhance the ability of the industry of the United States to compete in the global marketplace.” 143 Further, Congress has recognized that, “An intermodal transportation system consists of transportation hubs that connect different forms of appropriate transportation and provides users with the most efficient means of transportation and with access to commercial centers, business locations, population centers, and the vast rural areas of the United States, as well as providing links to other forms of transportation and intercity connections.” 144 The Wendell H. Ford Aviation Investment and Reform Act for the 21st Century amended this provision to provide for the encouragement and development “of intermodal connections on airport property between aeronautical and other transportation modes to serve air transportation passengers and cargo efficiently and effectively and promote economic development.” 145 Congress also has decided that the U.S. “must make a national commitment to rebuild its infrastructure through development of a national intermodal transportation system.” 146

In ISTEA, Congress set forth a detailed national policy to establish a National Intermodal Transportation System “that is economically effi-

cient and environmentally sound, provides the foundation for the United States to compete in the global economy, and will move individuals and property in an energy efficient way." 147 The National Intermodal Transportation System shall:

- "consist of all forms of transportation in a unified, interconnected manner . . . to reduce energy consumption and air pollution while promoting economic development and supporting the United States' preeminent position in international commerce"; 148
- include the Interstate highway system and the principal arterial roads; 149
- include public transportation; 150
- provide improved access to seaports and airports; 151
- give special emphasis to the role of transportation in increasing productivity growth; 152
- give "increased attention to the concepts of innovation, competition, energy efficiency, productivity, growth and accountability"; 153
- be adapted to new technologies wherever feasible and economical, giving special emphasis to safety considerations; 154 and
- be the centerpiece of a national investment commitment to create new national wealth. 155

All DOT employees are required to be given a copy of the National Intermodal Transportation System Policy, and it is required to be posted prominently in all offices of the Department. 156

In the Amtrak Reform and Accountability Act of 1997, Congress declared that "intercity rail passenger service is an essential component of a national intermodal passenger transportation system" and that Amtrak and intercity bus providers should work together to "develop coordinated intermodal relationships promoting seamless transportation services which enhance travel options and increase operating efficiencies." 157

Congressional policies governing the Surface Transportation Board require that it "ensure the development, coordination, and preservation of a transportation system that meets the transportation needs of the United States . . . ." 158 In overseeing these modes, the STB must "recog-

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nize and preserve the inherent advantages of each mode of transportation”,¹⁵⁹ and must “promote intermodal transportation.”¹⁶⁰

The U.S. Postal Service has also been given freedom to contract with carriers by any mode it deems appropriate for carriage of the mail.¹⁶¹

**Transportation Planning**

ISTEA significantly enhanced the role of Metropolitan Planning Organizations [MPOs] in transportation planning by giving the larger MPOs¹⁶² principal authority to select projects for certain “pots” of Federal money in consultation with the State, while requiring the State to cooperate with the MPO on allocating Federal money in those “pots” over which the State had primary jurisdiction, and the local transit provider to do the same.¹⁶³ The MPO has responsibility for allocating STP-metro, and in some States, CMAQ,¹⁶⁴ and enhancement (e.g., bicycle, pedestrian) funds in “consultation” with the State DOT; the State has jurisdiction over the National Highway System, Bridge, and Interstate Maintenance funds, which it selects in “cooperation” with the MPO. The MPO was required to engage in formalized planning of two types — a 20-year long-range plan, and a short-term Transportation Improvement Program, covering transportation projects to be implemented over at least a three-year period.¹⁶⁵ The TIP must be updated at least every two years.

Thus, beginning in 1991, MPOs were transformed from advisory institutions, into institutions that actually have direct influence over the distribution of money — from voluntary planning organizations, to organizations that have their fingers on some of the purse strings. In IS-


¹⁶². Those classified as Transportation Management Areas, or generally, those with a population of 200,000 or more.

¹⁶³. Two important structural changes were added by ISTEA. First, it required MPOs to include several new types of stakeholders (including transportation providers and the public) in the planning process. Second, it required an expansion of the boundaries of the planning area to include space for the next 20 years of expected urban growth, and to encompass the area in the air quality region (if the region experiences air quality problems).

¹⁶⁴. CMAQ fund allocation is the responsibility of the State DOT. Project selection should occur cooperatively between the MPO and the State DOT.

¹⁶⁵. The LRP and the TIP must be financially constrained (meaning they should only include projects for which full funding can reasonably be expected). They must also include public participation in their preparation, including participation by citizens and transportation providers. In air quality non-attainment areas, the LRP and TIP must conform with the State’s air quality implementation plan. The TIP incorporates all Federally-supported projects in the metropolitan area, including those for which the State has primary responsibility. Once the TIP is approved by the MPO, it must be approved by the State Governor, and incorporated into the State Transportation Improvement Program [STIP].
TEA, and expanded in TEA-21, MPOs were empowered with the ability to directly designate projects for the Federal dollars under their primary jurisdiction. Though the “pots” of Federal money over which the MPOs exercise jurisdiction are small relative to those controlled by the State, it is clear that such empowerment over money caused many local jurisdictions to take the MPO process and their participation therein far more seriously than they had theretofore.

All this gave transportation planning a new perspective. The Interstate and inter-regional “top-down” highway planning process of the Federal and State governments, respectively, and the localized “bottom-up” street and road planning process of the cities and counties, would now be coupled with a third regional process which was a bit of both, expanded beyond highways, streets and roads into a comprehensive transportation planning process that took into account all modes, as well as a number of related social, economic, and environmental issues.

Metropolitan planning organizations are required to develop transportation systems and facilities “that will function as an intermodal transportation system for the metropolitan area and as an integral part of the intermodal transportation system for the State and the United States.”166 State plans and programs must do the same.167 In developing transportation plans, MPOs must consider several factors, including access to intermodal transportation facilities.168 Federal regulations require that the metropolitan transportation planning process include a long-term transportation plan addressing at least a 20-year planning horizon including both short- and long-range strategies leading to the development of an integrated intermodal system which facilitates the efficient movement of goods and people.169 The MPO’s long-range plan must include an identification of transportation facilities, including intermodal facilities, that should function as an integrated metropolitan transportation system, emphasizing those facilities that serve important national and regional transportation functions. Federal regulations provide that MPO boundaries shall, at minimum, include the UZA(s) and contiguous geographic area(s) likely to become urbanized within the 20-year forecast period

169. The plan should be reviewed and updated at least triennially in nonattainment areas, and every five years in attainment areas to confirm its validity and its consistency with current and projected transportation and land use conditions and trends during the forecast period. After an adequate opportunity for public official and citizen involvement in the development of the plan, it must be approved by the MPO. 23 CFR § 450.322(c); 23 CFR § 450.322(a). In non-attainment and maintenance areas for transportation related pollutants, the MPO, FWHA and FTA must make a Clean Air Act conformity determination of any new or revised plan. 23 CFR § 450.322(d); see 40 CFR Part 51.
covered by the transportation plan. Before determining the MPO's boundaries, the planning areas in use for all transport modes shall be reviewed, and adjustments made to foster an effective planning process that assures intermodal connectivity, reduces modal disadvantages, and promotes efficient transportation investment strategies.\textsuperscript{170} The content of the plans and programs for each metropolitan area must provide for the development, integration, and management of all forms of transportation, allowing the metropolitan transportation system to function as an integral part of an intermodal transportation system serving the metropolitan area, the State, and the United States.\textsuperscript{171}

The States' long-range 20-year transportation plan must provide for the development and implementation of the intermodal transportation system of the State.\textsuperscript{172} The Secretary of Transportation shall make grants to the States to develop model State intermodal transportation plans, which shall include systems for collecting data related to intermodal transportation.\textsuperscript{173} States are required to 2% of Federal highway appropriations to planning and research of, inter alia, "highway, public transportation, and intermodal transportation systems."\textsuperscript{174} Emphasizing the importance of highway, public transport and intermodal systems, Congress mandated that not less than 25% of such funds shall be expended by the State shall be devoted to research and development of these systems.\textsuperscript{175} In ISTEA, Congress also required DOT to promulgate regulation for State development, establishment and implementation of a system for managing its intermodal transportation facilities and systems.\textsuperscript{176} A State's intermodal management system "shall provide for improvement and integration of all of a State's transportation systems and shall include methods of achieving the optimum yield from such systems, methods for increasing productivity in the State, methods for increasing use of advanced technologies, and methods to encourage the use of innovative marketing techniques, such as just-in-time deliveries.\textsuperscript{177}

The Secretary of Defense is required to ensure that all of the Department of Defense's studies and reports concerning sealift and related intermodal transportation requirements take into account the full range of transportation and distribution resources available to U.S.-flag merchant vessels.\textsuperscript{178} Emergency Preparedness statutes and Executive Orders is-

\textsuperscript{170} 23 \textsc{CFR} § 450.308(c).
\textsuperscript{171} 23 \textsc{U.S.C.} §§ 134 (a)(3), 217 (g)(1); 49 \textsc{U.S.C.} § 5303 (a)(2) (2000).
\textsuperscript{172} 23 \textsc{U.S.C.} § 135 (2000).
\textsuperscript{173} 49 \textsc{U.S.C.} § 5504(a) (2000).
\textsuperscript{174} 23 \textsc{U.S.C.} § 505 (2000).
\textsuperscript{175} 23 \textsc{U.S.C.} § 505(b)(1) (2000).
\textsuperscript{176} 23 \textsc{U.S.C.} § 303(a) (2000).
\textsuperscript{177} 23 \textsc{U.S.C.} § 303(e) (2000).
\textsuperscript{178} 10 \textsc{U.S.C.} § 2631a(a) (2000).
sued thereunder require the Secretary of Transportation to be prepared to provide direction to all modes of transport in national security emergencies, including intermodal transportation systems. Working with the Secretary of Defense, the Secretary of Transportation is required to establish an Emergency Preparedness Program. The transportation resources to be made available thereunder include “intermodal systems and equipment”, as well as “intermodal and management services”.

**INFRASTRUCTURE TO FACILITATE INTERMODALISM**

The National Highway System is required to “serve major population centers, international border crossings, ports, airports, public transportation facilities, and other intermodal transportation facilities . . .” Intermodal surface freight transfer facilities, other than seaports or airports, which are located on or adjacent to the National Highway System or connections thereto are explicitly eligible for Federal funding.

Equipment or a facility for an intermodal transfer facility is explicitly included within the term “capital project” for which Federal money may be spent for mass transportation.

ISTEA allocated resources for Federal funding of up to 80% of at least three demonstration projects for conversion of rail passenger terminals into intermodal transportation terminals. To be eligible for Federal funding, such facilities needed to include, as appropriate, facilities to handle motorbus transportation, mass transit, and airline ticket offices and passenger terminals providing direct access to area airports. The Secretary is also instructed to encourage various governmental and private institutions to develop plans to convert rail passenger terminals into intermodal transportation terminals. Grants may also be made to preserve an existing rail terminal may also be made if such facilities are reasonable capable of conversion to intermodal facilities. DOT may provide financial assistance to States seeking to build rail intermodal freight terminals. Loans and loan guarantees may be made by DOT to finance the acquisition, improvement, rehabilitation, development or establishment of intermodal equipment or facilities, or to preserve or en-

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hance intermodal service to small communities or rural areas.\textsuperscript{190}

DOT may provide up to 50\% of the costs incurred by a public agency for high-speed rail corridor planning.\textsuperscript{191} Among the eligible corridor planning activities are intermodal terminals.\textsuperscript{192} Amtrak was given eminent domain power to build an intermodal transportation terminal at Washington, D.C.'s Union Station.\textsuperscript{193}

The Federal Aviation Act requires that public airports accepting AIP funding agree that all revenue generated by the airport be used exclusively for the capital or operating costs of the airport, the local airport system, or facilities owned or operated by the airport directly and substantially related to the air transportation of persons or property.\textsuperscript{194} The question has arisen whether airport funds spent on building or operating transit or rail lines or stations are to be owned or operated by the airport and directly and substantially related to the air transportation of passengers.

Federal Aviation Administration regulations provide that airport access projects must preserve or enhance the capacity, safety or security of the national air transportation system, reduce noise, or provide an opportunity for enhanced competition between carriers.\textsuperscript{195} Such projects must also be for exclusive use of the airport patrons and employees, be constructed on airport-owned land or rights of way, and be connected to the nearest public access of sufficient capacity.\textsuperscript{196} The Federal Aviation Administration [FAA] insisted that AIP funds be limited to landside expenditures, "which encompasses the area from the airport boundary where the general public enters the airport property to the point where the public leaves the terminal building to board the aircraft. Typical eligible landside development items include such things as terminal buildings, entrance roadways and pedestrian walkways."\textsuperscript{197} As we shall see, more recent interpretations by the FAA have liberalized this rather constricted view of the types of landside projects which are appropriate for Federal airport funding.

In 1996, the FAA approved the request of the Port Authority of New York and New Jersey to use PFC funds to extend Newark Airport's light-rail line 4,400 feet to an Amtrak/New Jersey Transit station off airport

\begin{itemize}
  \item \textsuperscript{190} 45 U.S.C. § 822(c)(6) (2000).
  \item \textsuperscript{191} 49 U.S.C. § 26101(a) (2000).
  \item \textsuperscript{194} 49 U.S.C. § 47107(b).
  \item \textsuperscript{195} 14 C.F.R. Part 158.
  \item \textsuperscript{196} FAA Order 5100.3A, para. 553(a), AIP Handbook (Oct. 24, 1989).
  \item \textsuperscript{197} Quoted in U.S. Dep't of Transportation, Intermodal Ground Access To Airports: A Planning Guide 16, 202 (Dec. 1996).
\end{itemize}
Among the largest intermodal projects approved by the FAA for PFC funding was in 1998 for a $1.5 billion rail line linking New York’s John F. Kennedy International Airport with the Long Island Rail Road and the E, J and Z subway lines to Manhattan at Jamaica Station, and to Howard Beach. The FAA concluded that PFC expenditures on the JFK rail link would satisfy the statutory and regulatory requirements by alleviating ground congestion on airport roadways and terminal frontages, by enhancing the efficient movement of airport employees, by freeing up capacity on the roadways for additional passengers, and by improving the airport’s connection to the regional transportation network. It found, “Where ground access is shown to be a limiting factor to an airport’s growth, a project to enhance ground access may qualify as preserving or enhancing capacity of the national air transportation system.” The FAA found that the rail line would enable an additional 3.35 million passengers to use JFK annually by the year 2013, and “therefore must be construed to have a substantial capacity enhancement effect on JFK, as measured in air passengers accommodated by the airport.”

The FAA concluded that the rail line would “serve to preserve or enhance the capacity of JFK and the national air transportation system . . . .” The $3 per ticket Passenger Facility Charge would generate about $45-50 million a year, enabling the airport to pay off the cost of the line in 20 years.

Rail lines at Atlanta, Chicago, Cleveland and Washington, D.C., have been financed by transit systems rather than airports. The ISTEA legislation included a special appropriation for extension of the Bay Area Rapid Transit System [BART] to San Francisco International Airport [SFO]. The Federal Transit Administration committed $750 million, or about 64% of the $1.2 billion project. The remaining $417 will come from


199. The Port Authority of New York and New Jersey alleged that the line would create “a more efficient vehicular flow at the airport by removing buses, shuttle vans, and private autos currently used by air passengers, airport visitors, and airport employees at JFK . . . .”, and that without the line, “ground access congestion would constrain projected O&D passenger growth at JFK and adversely affect the national air transportation system.” Letter from FAA Associate Administrator Susan Kurland to Port Authority Executive Director Robert Boyle of Feb. 9, 1998, at 20.

200. Id. at 21.
201. Id. at 24.
202. Id.
State and local funding sources. The FAA approved airport funding for construction of a BART station at SFO. The 8.7-mile extension, the largest since BART was built in the early 1970s, will have four stations. About 68,000 riders a day are expected to use the line when it opens in 2001.

The Federal Transit Administration has also committed to contribute 72% of the construction costs of the $399 million extension of the St. Louis Metrolink to Mid-America Airport in St. Clair County, Illinois. This light rail system already connects to St. Louis Lambert International Airport.

The ISTEA legislation provided for flexible funding (up to $70 billion of Federal highway funds and $10 billion of Federal transit funds over six years) to support multimodal planning and project development. Though only $6 million was transferred from the highway trust funds to transit in the year preceding promulgation of ISTEA, by 1995, more than $802 million was being transferred annually. Flexible funding allowed the various Federal, State and local transportation units to coordinate development of the Miami Intermodal Center, for example, which seeks to facilitate seamless passenger connections between air, rail, bus and ferry modes.

The Federal Highway Administration is financing 80% of the $11.6 billion 7.5-mile highway/tunnel extension of the Interstate highway link to Boston Logan International Airport. Federal and State highway departments have partnered successfully with airport authorities to connect road networks with airports at many cities, including Las Vegas and Pittsburgh. More than $300 million in PFC funding was approved for building an access road and tunnel at Las Vegas McCarran International Airport, while National Highway System funds were used to construct the highways outside the airport property.

In summary, Federal funding of an airport with the surrounding

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205. Letter from FAA Associate Administrator Susan Kurland to SFO Airport Director John Martin (Oct. 18, 1996).
209. Id. at 13.
highway, rail or transit networks can come from the FAA, FHWA, or the FTA. ISTEA's effort to foster more cooperation between these agencies has had limited, but significant, success.

The President of the United States is authorized to provide financial assistance to the independent States of the former Soviet Union, inter alia, for “improving intermodal transportation systems for the safe and efficient movement of people, products and materials.”

INTERMODAL RESEARCH

Developing partnerships with public and private sectors, the Secretary of Transportation must develop an advance research program that shows the potential benefits for improving the durability, efficiency, environmental impact, productivity and safety of the intermodal transportation system.

The coordination of U.S. government research on intermodal transportation is to be done by the Director of the DOT Office of Intermodalism. He is also required to provide technical assistance to States and MPOs in collecting data related to intermodal transportation. The Secretary of Transportation may also give the Administrator of the DOT's Research and Special Programs Administration additional duties, “including such multimodal and intermodal duties as are appropriate.”

The DOT's Bureau of Transportation Statistics is required to compile a comprehensive set of statistics suitable for conducting cost-benefit studies, including comparisons of individual transport modes and intermodal transportation systems. DOT is required to assess the relative efficiency of the various modes of transportation. The Bureau must establish and maintain an intermodal transportation data base which includes information on the volume and pattern on the movement of people by all modes and intermodal combinations, information on the location and connectivity of transportation facilities and services, and expenditures and capital stocks of each mode and intermodal combinations. The data bases prepared by the Bureau must be able to support intermodal network analysis.

Under Chapter 55 “Intermodal Transportation”, of Title 49, Congress created several University transportation research centers. Among

several specific intermodal studies have been required by Congress:

- The DOT Secretary is required to investigate railroad spurs and switches which connect with water terminals in order to develop the types most appropriate for transferring passengers and property between rail and water carriers more expeditiously and economically, and to investigate inland water carriers to determine the extent to which they are interchanging traffic with railroads.\(^{222}\)

- In granting research and development contracts on maglev or high-speed rail technology, the Secretary must consider the extent to which a proposal includes the "integration of high-speed ground transportation with other modes of transportation.\(^{223}\)

- In its advanced vehicle technologies program, the Secretary is to encourage and promote the research, development and deployment of technologies that will use technological advances in multimodal vehicles.\(^{224}\)

- Within 60 days of promulgation of ISTEA in 1991, the Secretary of Transportation was required to commission a study by the National Academy of Public Administration to study options for organizing DOT to improve intermodal coordination among surface-related agencies.\(^{225}\)

- Congress also mandated a study assessing existing data and data collection needs with respect to the movement of loaded containers and trailers in intermodal transportation in violation of Federal and State vehicle weight laws, and how those intermodal movements compare with other overweight domestic highway freight movements.\(^{226}\)

- Within 180 days after promulgation of the National Highway System Designation Act of 1995, the Secretary of Transportation was required to submit modifications to the National Highway System proposed by a State that consist of connectors to major ports, airports, international border crossings, public transit facilities, Inter-

state bus terminals, and rail and other intermodal transportation facilities.227

- Within two years of the enactment of the requirement for an intermodal freight connectors study in 1998,228 the Secretary of Transportation was to have reviewed the conditions of connectors in the National Highway System that serve airports, seaports and other intermodal freight facilities designed to facilitate the efficient movement of freight between transport modes, to identify impediments to improving connectors serving intermodal facilities, and make recommendations for improvement thereof.

- The Secretary is also directed to conduct a comprehensive program to accelerate the integration of intelligent transportation systems, funding projects, inter alia, that will serve as models to improve and increase the flow of intermodal travel at ports of entry.229

- Research on automotive propulsion also focuses on “intermodal adaptability”, defined as the characteristics of an automobile which enable it to be operated or carried by or on an alternative mode of transportation.230

- The Secretary is required to evaluate whether modifications should be made to the loss and damage provisions of the Interstate Commerce Act, and in so doing, consider international and intermodal harmony.231

- A comprehensive study on waterway improvements by the Army Corps of Engineers including an appraisal of improvements needed to optimize the system and its intermodal characteristics.232

The Federal Maritime Commission is required to investigate whether any laws or activities of foreign governments or foreign carriers providing maritime-related services (including intermodal operations) in a foreign country adversely affects U.S. carriers in oceanborne trade.233

**Regulation**

Under the Interstate Commerce Act, the Surface Transportation Board (formerly the Interstate Commerce Commission) is authorized to exempt transportation provided by a rail carrier that is part of a continu-

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ous intermodal movement.\textsuperscript{234} The term “intermodal” is defined as “of or relating to the connection between rail service and other modes of transportation, including all parts of facilities at which such connection is made.”\textsuperscript{235} A “railroad” is defined to include intermodal equipment used by or in connection with it.\textsuperscript{236} Similarly, “maritime-related services” includes intermodal operations.\textsuperscript{237}

The transportation of empty intermodal cargo containers is specifically exempted from regulation.\textsuperscript{238} One who tenders an intermodal container in excess of 29,000 pounds is required to notify the receiver of the gross cargo weight and provide a reasonable description of its contents.\textsuperscript{239} Intermodal freight containers are also included under the definition of “equipment” in the Geneva Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be used for Such Carriage of 1970.\textsuperscript{240} The Secretary of Transportation may make grants to States to enforce of their commercial motor vehicle size and weight restrictions at ports where intermodal shipping containers enter or leave the United States.\textsuperscript{241}

The Federal Maritime Commission is authorized to promulgate rules and regulation affecting shipping in foreign trade in order deal with conditions unfavorable to its facilitation, including those in intermodal transportation.\textsuperscript{242}

Notwithstanding any other provision of law (including the antitrust laws) Amtrak and motor carriers have been freed “to coordinate schedules, routes, rates, reservations, and ticketing to provide for enhanced intermodal surface transportation.”\textsuperscript{243}

\section*{IV. INTERMODAL TRANSPORT LAW: WHAT IT SHOULD BE}

ISTEA created a solid foundation on which to build a comprehensive intermodal system. But more should be done, particularly in two areas: (1) consolidating governmental functions and institutions along two broad lines—passenger and freight; (2) harmonizing laws among modes, particularly liability and labor laws; and (3) requiring intermodal planning for all large transportation projects.

\begin{thebibliography}{99}
\bibitem{239} 49 U.S.C. § 5902(b)(2000).
\bibitem{240} 7 U.S.C. § 4402(3) (2000).
\bibitem{243} Pub. L. 105-134; 111 Stat. 2574 (Dec. 2, 1997).
\end{thebibliography}
All modes of transportation (i.e., air, rail, highway, transit, and maritime), and their corresponding Federal institutions, tend to jealously guard their independent source of infrastructure financing. The segregation of funding along modal lines inherently creates institutional roadblocks to the facilitation of intermodal connections, as the Federal Aviation Administration seeks to have airport trust funds dedicated to airport infrastructure, the Federal Highway Administration seeks to have highway trust funds dedicated to highway construction, and the Federal Transit Administration seeks to build transit. All three agencies are subsidiaries of the U.S. Department of Transportation, which should have the foresight and ability to facilitate seamless transportation between modes, among the fundamental purposes of the institution as set forth in its statutory charter. As the following table reveals, transport infrastructure and regulatory responsibilities remains fragmented among public and private sectors, and among federal agencies and Congressional committees:

The DOT has established a special unit within the Office of the Secretary to facilitate intermodal connections. Congress in 1991 passed the Intermodal Surface Transportation Efficiency Act to facilitate intermodal transportation, requiring the establishment of an Office of Intermodalism within DOT, as well as an Intermodal Transportation Advisory Board consisting of the Secretary and the Administrators of the FHWA, FAA, Maritime Administration, FRA, and FTA. ISTE A also created funding flexibility enabling more highway dollars to be allocated to non-highway projects. In the Clinton Administration, the Department created a “One DOT” policy and logo in an effort to better focus the agency on its central mission – to create a unified, seamless, efficient, economical and environmentally benign intermodal system.

But creating a unified approach to transportation issues was among the principal reasons for creation of the DOT in 1966. More than three decades later, it remains largely an unfulfilled dream. Jurisdictional turf battles and bureaucratic inertia inevitably inhibit seamless connections. If DOT is to fulfill its promise to build a seamless intermodal system, it could begin by dividing itself into two divisions — a passenger division, and a freight division — for these are more appropriate distinctions than modal distinctions. Ideally, Congress would divide its oversight and appropriations committees along similar lines. Undoubtedly, this would require coordination between the passenger and freight divisions in areas of

highway, airport and rail infrastructure planning and development, so the divisions would have to work together on these issues. But the movement of a passenger from an automobile to an airport to a train to a transit vehicle is an intermodal movement which requires seamlessness; a container movement from a truck to an ocean vessel, to a rail car, to a truck requires the same. Unified funding and planning would encourage the creation of such seamlessness. Moreover, all regulatory functions now held by DOT, the STB, and the FMC should be consolidated in an independent Intermodal Transportation Commission so that the legal and regulatory requirements remain uniform between modes.

THE NEED FOR LEGAL HARMONIZATION

By definition, intermodal movements involve the movement of passengers or freight from one mode of transportation to another. Freight can be lost or damaged in transit. The question then becomes, what are the legal rules under which liability is assessed? The problem is that the
legal rules governing carrier liability for loss and damage in transit were developed historically on a mode-by-mode basis.\textsuperscript{246}

For example, the Harter Act of 1906 governs domestic water transport; the Carriage of Goods by Sea Act (the domestic equivalent of the 1924 Hague Rules) governs international ocean transport to or from U.S. ports; the Warsaw Convention of 1929 governs international air transport; the Carmack Amendment of 1906 governs domestic rail and motor carriage. Though liability rules for the latter two modes were relatively harmonious until promulgation of the Motor Carrier Act of 1980, the Staggers Rail Act of 1980, and the Trucking Industry Regulatory Reform Act of 1994, now the Carmack rules apply differently between rail and motor carriers. Each of these statutes imposes different carrier obligations, has different bases of liability, burdens of proof, limitations of liability, exemptions, defenses, and amounts recoverable. Carriers’ and shippers’ attorneys vie for the modal regime that most benefits their clients. In circumstances where the identity of the carrier which caused the damage is at issue, one may find the maritime regime more favorable, while the other may argue in favor of the rail regime.\textsuperscript{247}

The law can become more complicated still in international transportation. In Europe, international motor carriage is governed by the Convention on the Contract of International Carriage of Goods by Road; rail transport is governed by the Convention Concerning the Carriage of Goods by Rail. A number of countries have adopted updated versions of the Hague Rules (the Visby or Hamburg Rules); while others have adopted updated versions of the Warsaw Convention (the Hague Protocol, or Montreal Convention). The Multimodal Liability Convention of 1980, which sought to harmonize many of these laws, has not been widely adopted.

The net result is a legal Tower of Babel, one which needlessly and wastefully taxes the free flow of commerce. Congress should promulgate one unified domestic liability regime for all modes of transport, while the Executive should attempt to reach a comprehensive unified body of law governing all modes internationally.

Another area which could use harmonization is labor law. Railroads and airlines are governed by the Railway Labor Act. All other modes of transport are governed by the National Labor Relations Act. Each has different rules governing union formation, collective bargaining and dispute resolution, and different governing boards. For example, the National Mediation Board regulates railroad and airline labor-management

\textsuperscript{246} U.S. Dep’t of Transportation, Cargo Liability Study (Aug. 1998).
\textsuperscript{247} Some of this problem can be, and sometimes is, ameliorated by the insertion of a contractual provision, such as a Himalaya Clause, which identifies the legal regime which will govern the shipment from origin to destination.
The Need for Intermodal Planning in All Large Transportation Projects

In the National Environmental Policy Act of 1969, Congress developed a streamlined process for considering environmental concerns in all major federal projects. In a situation where a federal or federally-funded activity will significantly affect the quality of the human environment, an Environmental Impact Statement must be prepared. Comprehensive federal environmental regulation began with the National Environmental Policy Act of 1969, (signed into law on January 1, 1970), which established the Environmental Protection Agency [EPA], and required that an environmental assessment [EA], and environmental impact statement [EIS] be prepared, the latter for any “major federal action significantly affecting the quality of the human environment.” The EA determines whether potential impacts are significant, explores alternatives and mitigation measures, and provides essential information as to whether an EIS must be prepared. The EA focus attention on potential mitigation measures during the planning process, at a time when they can be incorporated without significant disruption.

If the governmental agency concludes that there are no significant adverse environmental impacts, or that with appropriate prevention or mitigation efforts they will be minimized, it issues a “finding of no significant impact” [FONSI]. If however, the FAA concludes the impacts are significant (which is sometimes the case in a major airport project), the agency prepares an EIS. The EIS must include an assessment of the environmental impacts, and evaluate reasonable alternatives and suggest appropriate mitigation measures.

It must review such issues as the impact of the project on noise, air quality, water quality, endangered species, wetlands and flood plains. How-


ever, the thrust of the statute is process; there is no mandatory obligation to implement mitigation measures, even if they are feasible.\textsuperscript{254}

Congress has made fostering intermodalism a central policy of the federal government. But as yet, the comprehensive implementation of that goal has remained stubbornly unfulfilled. Many State Departments of Transportation are still effectively State Highway Departments, no matter what they are called. One way to incorporate intermodal considerations into all major transportation projects is to require the preparation of an "Intermodal Impact Statement" in the planning process of all major federal transportation projects. Thus, no major new highways would be built without consideration of access to transit lines, seaports and airports. No new airport projects would be built without consideration of access to modal alternatives other than the automobile. As in environmental regulation, it would not mean that a project could not be built without intermodal facilitation; it would mean that no major project could be built unless intermodal facilitation had been considered. That would require many governmental institutions to plough new, and fertile, ground. In so doing, many more projects would be made intermodal in design.

V. CONCLUSIONS

As the gateways to an increasingly global market, transportation corridors are the arteries through which we and everything we consume flow. Transportation networks stimulate trillions of dollars in trade, commerce, and tourism. In a global economy, they enable specialization in the production of goods and services which, under the law of comparative advantage, stimulates broader economic growth.

By shrinking the planet, transportation also facilitates the intermingling and integration of disparate economies and cultures. Cultural interaction enhances international understanding which promotes global peace which, in a thermonuclear world, is essential for survival of our species. It offers hope for the creation of a global village of friends and neighbors rather than enemies and adversaries. Cultural interaction also stimulates intellectual social and artistic creativity, making the world a more interesting and richer place in which to live.

As a fundamental component of the infrastructure upon which economic growth is built—the veins and arteries of commerce, communications, and national defense—a healthy transportation system serving the public's needs for ubiquitous service at reasonable prices is vitally important to region and the nation it serves. It is for this reason that governments the world over have promoted, encouraged, and facilitated its

provision by providing essential infrastructure, research and development, protective regulation, subsidies and, on occasion, outright ownership. Historically, government has facilitated transportation by guiding the airports, the seaports, the rail and transit lines, subsidized their operations where necessary, and established the basic codes and rules under which the industry serves the public. If done thoughtfully and well, government planning can facilitate creation of an efficient and productive transportation infrastructure better able to satisfy the broader needs of the public for safe, secure, seamless, expeditious and reasonably priced transportation service.

The tourism and travel business is arguably the world’s largest industry. It accounts for 5.5% of the world's GNP, 12.9% of consumer spending, 7.2% of worldwide capital investment, and 127 million jobs, employing one in every 15 workers. The ripple effect of transportation activity—the indirect and induced economic and employment stimulation—is vastly larger than the prices paid directly by passengers or shippers. Transportation creates and transports wealth far in excess of its own facial value. In other words, the tacit benefits of economic stimulation created by transportation networks far exceeds its costs.

In this sense, transportation has profound externalities, both positive and negative. For example, a city with abundant airline, motor carrier and railroad networks radiating from it like the spokes of a wheel, enjoys a wide economic catchment area stimulating trade, commerce and wealth for its citizens. Conversely, a community with poor, declining or deteriorating access to the established and prevailing transportation networks will wither like a human limb or organ starved of oxygen by an artery made impassable by a tenacious blood clot.

On a macroeconomic level, these observations are true for all nations and all regions, and arguably for all time. An expeditious, efficient, and economical transportation network will facilitate the public’s need for mobility and will ordinarily advance economic productivity and growth. Conversely, a deteriorating transportation infrastructure will produce sluggishness in overall economic productivity and retard economic growth.

The United States has invested enormous unrecoverable resources in a transportation infrastructure devoted to the wasteful and insatiable demands of highways and automobiles. Though highways can enhance individual mobility, as automobiles become ubiquitous, highways become clogged in congestion, requiring the devotion of greater and greater resources to satiate its insatiable thirst for asphalt. The net result of a profigate dependence on the single occupancy vehicle is that highways become wider and wider as waves of congestion demand more traffic lanes, while suburban sprawl devours more and more real estate. In the
United States, disbursed suburban housing patterns make the automobile indispensable, while denying transit the population densities to support rail service. Land use, congestion, and pollution have become chronic problems in many urbanized areas of the United States.

Moreover, a nation such as the United States, wedded to the automobile, suffers adverse consequences beyond congestion. The automobile not only consumes land insatiably, it pollutes the air. In many of our cities, the automobile has made the air nearly unbreathable. These problems of gridlock and pollution are chronic both in 1st world cities like Los Angeles, and 3rd world cities like Bombay.

The burning of hydrocarbons like gasoline also spews greenhouse gases, trapping the sun's heat, thereby contributing to global warming. During the 20th Century, world energy consumption increased more than 12 times. Fuel consumption by the transportation sector increased at a rate of 2.6% a year. It shows no signs yet of slowing.

Fuel consumption at this rate not only creates environmental hazards, it degenerates national economic wealth for petroleum-importing nations. Given the high cost of oil, a nation's excessive demand can only erode its national wealth by requiring a never-ending devotion of economic resources to the insatiable demands for filling the automobile tank with gasoline.

An external effect of a transaction is a positive or negative impact upon a person not a party to it. The negative externalities of automobiles are felt by other users of finite road and highway resources, and the environment. Garrett Hardin, in his powerful essay, "The Tragedy of the Commons," provides insight as to the economic forces leading a rational wealth maximizer to advance his own economic interests by externalizing his costs:

Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily for centuries because tribal wars, poaching, and disease keep the numbers of both man and beast well below the carrying capacity of the land. Finally, however, comes the day of reckoning, that is, the day when the long-desired goal of social stability becomes a reality. At this point, the inherent logic of the commons remorselessly generates tragedy.

As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks, "What is the utility to me of adding one more animal to my herd?" This utility has one negative and one positive component.

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(1) The positive component is a function of the increment of one animal. Since the herdsman receives all the proceeds from the sale of the additional animal, the positive utility is nearly +1.

(2) The negative component is a function of the additional over-grazing created by one more animal. Since, however, the effects of overgrazing are shared by all the herdsmen, the negative utility for any particular decision-making herdsman is only a fraction of 1.

Adding together the component partial utilities, the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another . . . . [b]ut that is the conclusion reached by each and every rational herdsman sharing a commons. Therein lies the tragedy. Each man is locked into a system that compels him to increase his herd without limit—in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedoms of the commons. Freedom in a commons brings ruin to all.256

The city streets are commons, drivers are herdsmen, and the automobiles themselves are cattle. Every additional automobile on the street brings the owner enhanced satisfaction of his desire for mobility. According to Hardin, “Ruin is the destination toward which all men rush, each pursuing his own best interest in a freedom that believes in the freedoms of the commons.”257

Hardin’s main thesis is not about the economic decline of herdsmen, but of the negative externality of another sort—pollution. He says:

In a reverse way, the tragedy of the commons reappears in problems of pollution. Here it is not a question of taking something out of the commons, but of putting something in. . . . The calculations of utility are much the same as before . . . . Since this is true for everyone, we are locked into a system of ‘fouling our own nests,’ so long as we behave only as independent, rational, free-enterprisers.258

A comprehensive plan for an expeditious, efficient and sustainable intermodal transport system for passengers would include high-speed intercity rail linking major cities and their airports, connecting at multimodal terminals with intracity busses, light rail, subway transit networks, and bicycle lanes. For freight, it includes the building of rail and highway networks linking industrial centers with seaports and airports in a way that enhances the smooth and quick movement of containers between trucks, railroads, ocean vessels and aircraft.

Seamlessness must be the goal of an efficient intermodal system. In

order to achieve seamlessness, intermodal planning must include what we refer to as the four C's:

1. CONNECTIONS – All modes must be connected with one another to accomplish the convenient, expeditious and efficient movement of commodities and people. Connecting should work well both from geographic and temporal perspectives—that is, the connecting points should be proximate to each other, and timed to facilitate movements from one mode to another.

2. CHOICES – The intermodal network should allow its users to select that mode which can most efficiently satisfy their transportation needs.

3. COORDINATION – Transportation infrastructure must be planned, designed and built in a way that brings the modal networks together within sufficiently close proximity that connections between them are relatively effortless. Transportation providers must coordinate their schedules to reduce dwell time between intermodal movements.

4. COOPERATION – There must be collaboration between transportation providers to ensure that the needs of the users for seamless service is realized.

By integrating the separate transportation modes into a seamless, unified intermodal network, transportation can not only meet the economic and mobility needs of a society, but it can also alleviate the problems of pollution, congestion, safety, and energy consumption. The strengths and weaknesses of each mode should be identified, means must be developed to minimize negative impacts and maximize strengths, and an efficient and integrated transportation system should be established that is consonant with the goal of sustainable development.

Each mode has its inherent advantages in terms of speed, range, efficiency, and energy consumption. Generally speaking, light rail transit works well within a range of about 50 kilometers. Automobiles work well within 100 kilometers. Intercity rail transportation has inherent strengths within a range of approximately 500 kilometers. And air transportation works well at distances beyond that.

To take advantage of the inherent advantages of alternative modes of transportation, each must be available to users, and each should be seamlessly connected to one another. A passenger stepping off an aircraft should be able to proceed to baggage claim, and there catch a bus or train to the central city, or an intercity train to another city. A container offloaded from an ocean vessel should be moved expeditiously and directly to a flat bed truck trailer or rail car for its beyond movement to its ultimate destination.

The inherent advantages of one mode of transportation should not be mutilated by the inefficiencies of another. The primary advantage of air transportation, for example, is speed. It must be remembered that time is man's most important commodity.
clogged in gridlock, more time can be consumed on the ground than in the air. Surface transit times between Don Muang Airport and central Bangkok, for example, can consume several hours. Transportation movements are from origin-to destination, and are the sum of the time consumed by each mode in the through intermodal movement, plus the dwell time between modes. Time is money. Opportunity costs are the economic costs of lost time. An efficient transportation system in a competitive economic environment requires that each mode moves as expeditiously as possible, that each modal network is seamlessly connected to every other network, and that distance and dwell time between modes are reduced. The comfort and convenience facilitated by intermodal transportation planning will ensure that each mode is used based on its inherent advantages of cost, speed, and environmental attributes by consumers having ample choices and receiving proper pricing signals.

Law and regulation must serve the needs of commerce for predictability of rules which make commercial sense, facilitate efficient transactions, and do not burden commerce. To that end, streamlining of regulatory responsibilities and rules across modes will do much to promote the seamless intermodalism for which the nation should strive. Only in this way can the enlightened policies fostering seamless intermodalism embraced by Congress be implemented.
Intermodal Education in Comparative Perspective

Jonathan B.L.K. Jervell III, J.D.
Anthony Perl, Ph.D.
Patrick Sherry, Ph.D.
Joseph S. Szyliowicz, Ph.D.*

The New Science of Intermodalism

Intermodalism, in its simplest notion, involves the transport of both people and goods from origin to destination, be that within the same city or across the globe. Implicitly, however, it also involves the interface of multiple modes of transportation, and the interchange of people and goods between them. Some have come to refer to it as multimodalism. Yet, it is greater than multi-, it is intermodalism, involving the linkage and integration of existing transportation modes such that they become a seamless conveyance and distribution system from origin to destination. Such a system offers the potential of using each mode to its best advantage to generate safe, physically secure, energy efficient, environmentally benign and economically sustainable mobility. There is no simple definition for intermodalism, nor sadly, is there a universally accepted one. We

* Patrick Sherry is an Associate Professor in the College of Education, University of Denver and a Psychologist. Joseph Szyliowicz is a Professor in the Graduate School of International Studies (GSIS), University of Denver. Both are members of the ITI faculty. Anthony Perl is Associate Professor of Political Science at the University of Calgary, Alberta, Canada, where he directs the Research Unit for Public Policy Studies. Jonathan Jervell is a Colorado attorney, a Ph.D. candidate at GSIS, and has contributed to several ITI research projects.
impute intermodal to subsume all of the foregoing aspects and characteristics.

While we see vestiges of intermodalism in antiquity, presently we are really only at the half-century mark in its global manifestation, for it has been some fifty years since the interstate highway system came into being in the United States, and almost fifty since Malcolm McLean’s grand experiment in containerization. These two independent events heralded the age of intermodalism in the United States and thrust it onto the world stage.

If containerization be the hallmark of intermodalism, then beyond doubt we are well into the intermodal age in terms of freight movement. Every interstate highway is an endless ribbon of tractors pulling containers on trailers. Parallel to the roadways run railroads, which also transport considerable numbers of containers, the very same containers as on the trucks, which will later be offloaded and hauled to final destination by truck, or delivered to the quay. At any seaport in the world – be it Long Beach, Singapore, or a smaller one such as Port Klang or Bangkok – these containers are stacked ten high at the wharf, awaiting transfer into the hulls and onto the decks of ships.

In the realm of passenger transport, intermodal advances are less dramatic, but the infrastructure for connecting roads, rails, air and sea ports has steadily advanced. For example, today a traveler could leave the Loop in downtown Chicago, board the subway to O'Hare Airport, change to a non-stop airplane to Frankfurt-am-Main, pass through customs, and then have several easy options: within a short walking distance within the same terminus he could hail a taxi or board a bus, or board a train to downtown Frankfurt there connecting with the local metro, or he could board an inter-city express train for Hamburg or Berlin. Fifty years ago, this degree of connectivity was rare, where it existed at all.

Thus, intermodalism, as a process, is at work and appears to be working – certainly so among the more prosperous nations of the world. However, in less affluent areas of the world, the seeds of intermodalism have yet to germinate. With technology rapidly advancing, there is an ongoing calculus. The areas and economies of the world that lag in current intermodal skills and technology have an expensive game of catch-up that needs to be undertaken. In terms of global trade, if they do not catch up, they will remain in the world’s economic “hinterland”, with more expensive goods, less favorable trade and lower income. Now, such economies need not only catch up to the present, but even more they need to advance to the ever new and changing intermodalism, else the game is lost.

This is a tall order, even for a deep pocket in economic terms. Conceptually, it is even taller. It has been told that a scientist, once asked to define “electricity,” replied, “I can’t tell you exactly what it is, but I can
tell you how it works.” Fifty years later, the “new science of intermodalism” shares the same state of mind. This article explores the current state of intermodal education and suggests steps to advance the state of the discipline.

**Overview of the Study**

In January 2000, the Asia Pacific Economic Cooperation (APEC) awarded a contract to researchers at the University of Denver and the University of Calgary, in Alberta, Canada, to identify needed intermodal skills, and to assess the degree to which educational and training programs supply such skills to the workforce within the APEC member economies. The resulting study, of which this is a summary, was presented to the Transportation Working Group of APEC at its October 2000 meeting in Miyazaki, Japan. The study itself is a “case of first impression,” for in reviewing the literature we found that no similar trails have been blazed before. There have been several efforts to identify and enumerate specific intermodal skills required of the industry workforce, and while there have been some efforts to identify courses, degree and training programs in individual national contexts, we found none to have undertaken to do so comparatively across national and economic boundaries.

The study has two major foci, which we pursue broadly in the context of supply and demand. The first, the demand side, delves beneath the process of intermodalism, to identify whether there are any particular skills or knowledge needed of the intermodal workforce, and to identify the skill sets involved. The second is to identify degree and training programs that are in place, and which supply the skills identified.

The remainder of this paper will summarize the four major steps that we followed in prosecuting the study: (I) Literature Review, (II) Data Collection (Demand for Skills v. Supply of Training Programs), (III) an Analysis of Training Gaps Identified n Steps II and III, where supply and demand do not meet, and (IV) General Conclusions.

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1. APEC was established in 1989, in response to the growing interdependence among Asia-Pacific economies, and has since become the primary regional vehicle for promoting open trade and practical economic cooperation [http://www.apecsec.org.sg]. The current member economies of APEC, in alphabetical order, are as follows: Australia, Brunei Darussalam, Canada, Chile, People’s Republic of China, Hong Kong, China, Indonesia, Japan, Republic of Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Republic of the Philippines, Russia, Singapore, Chinese Taipei, Thailand, United States and Vietnam.

2. Throughout this report, the term “economy” is used. For our purposes, it is interchangeable in meaning and content with the term “nation,” or “country.” For political and diplomatic reasons, APEC – the organization commissioning this study – refers to its constituent members as “economies.” We necessarily follow.
I. LITERATURE REVIEW

The study began with an extensive survey of all the existing activities relating to intermodal education ranging from workshops and conferences to published reports and articles. These could be divided into four general groups – those dealing explicitly with intermodal education, those dealing with logistics education, those focusing on intelligent transportation systems, and those concerned with transportation education in general.

A. INTER MODAL EDUCATION

The first category — dealing with intermodal education directly — was very limited, and of quite recent vintage. A search of the literature revealed just five publications, only one of which — the 1998 Transportation Research Board (TRB) Report discussed below — was less than 15 years old and directly relevant to our concerns. This report summarized the results of a workshop that we had attended. It was the fifth in a series sponsored by the TRB focusing on intermodalism explicitly and the only one that dealt directly with issues of education and training. The proceedings were published as “Intermodal Transportation Education and Training, TRB Conference Proceedings #17, 1998.” The Workshop concluded the following:

- Many transportation professionals are not graduates of university transportation programs.
- Existing core business curricula do not adequately incorporate logistics and intermodal transportation courses.
- Given the nature of the intermodal industry, educators must become familiar with real life experiences.
- Education must include the articulation and dissemination of an “intermodal vision.”
- Intermodal education and training requires participation by the public and private sectors.
- Continuing education and lifelong learning are essential elements.
- Professionals must learn to manage technology and innovation.

Of all the papers presented, the most germane to our concerns was the report by L. Pignataro and L. Hoel entitled “College and University Transportation and Logistics Programs, (pp. 60-63), focusing on the extent to which intermodalism had been incorporated into transportation education. The authors concluded that most programs were located in engineering departments, that interdisciplinary cooperation was not always adequate, and that administrative support for interdisciplinary programs was “sporadic.” Altogether, 28% of the institutions surveyed
stated that they had "always incorporated" intermodalism in their pro-
gram, another 43% had recently made course additions, and 29% had
made no changes at all. This study may well have overestimated the de-
gree to which intermodalism has been incorporated into educational pro-
grams, because the authors assumed that courses dealing with subjects
such as "systems," "policy," "management," and "logistics" reflected an
intermodal focus.

Two recent surveys of intermodal education are also relevant. The
first was carried out by the United States Merchant Marine Academy, in
order to assess the industry's perspective on intermodal education and
training needs. In their sample of 43 respondent organizations, responses
were tabulated with the following results:

- Existing academic programs were not viewed as providing the kind
  of education that an intermodal work force requires. When asked
to rank the programs' performance on a scale of one to five (very
poorly to very well), the responses placed the existing programs
below the midpoint, at 2.1.

- The most important subjects identified for entry-level personnel
  (obtained at the undergraduate level) were logistics (13%), modal/
intermodal operations %), financial and characteristics (9%), and
financial management, marketing, business management, with 5-
6% each.

- Mid level personnel also required advanced (graduate level) train-
ing in logistics (15%), financial management and information tech-
ology (9% each), followed by labor relations, modal/intermodal
characteristics and operations, and terminal operations.

- The two areas of training of most interest to the responding firms
  were logistics and modal/intermodal characteristics and operations
(10% each), intermodal marketing (8%), and such topics as trans-
portation economics, information technology, software applica-
tions, and international transportation (6% each).

The Intermodal Transportation Institute, University of Denver, car-
rried out the second major study of intermodal education needs in prepa-
ration for its new Master of Science in Intermodal Transportation Studies.
The members of its Board of Directors, drawn primarily from industry,
were asked to identify the specific skills that the program should provide
to its students. The leading indicators were marketing and financial/eco-
nomic analyses (14% each), followed by logistics and intermodal oper-
tions (10% each). Also emphasized were legal and regulatory issues
(including liability, preventing loss and damage), negotiating, planning,
knowledge of information and other technologies, and the ability to carry
out forecasts. An important point made by the respondents was the need
for individuals in the intermodal industry to have some knowledge of the operational capabilities of different modes.

B. LOGISTICS EDUCATION

Given the importance attributed to logistics, it was deemed useful to examine the literature dealing with logistics education. Fortunately, the rapid changes that are taking place in transportation have resulted in major studies of logistics education. The most important and detailed of these was carried out by the Canadian Professional Logistics Institute. A report of the study was authored by Alan Law, “Canadian Logistics Labour Market Information Study,” Canadian Logistic Journal, Vol. 4, pp. 1-88. The study involved interviews with almost 600 logistics professionals, a survey of over 100 logistics employees, and five focus groups with 33 logistics practitioners in order to identify skills, knowledge, and aptitudes required by the logistics professional, as well as educational needs. Three key sets of skills were identified:

- Information Technology
- Business Management
- Planning, Developing and Implementing Strategies

Detailed modules for introductory, intermediate, and advanced level courses for all aspects of logistics were developed including one for transportation. Each module specified skills and specific objectives. These were published as “National Curricular Standards in Logistics,” and Canadian Professional Logistics Institute, 1995.

C. INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

The effort to harness technology to improve existing transportation systems inevitably involves education. Accordingly, a number of studies have been carried out seeking to identify the nature of the skills required and the degree to which existing educational programs provide them. These studies are particularly relevant, because they are analogous to intermodalism along several different dimensions – both require a concern with (1) systems issues, (2) physical infrastructure, (3) technological innovation, and (4) customer relations.

One typical study, “Building Professional Capacity in ITS: An Assessment of ITS Training and Educational Needs, the Transit Perspective,” U.S. Department of Transportation (USDOT), ITS Joint Program Office, April 1999, conducted 70 interviews and identified the following critical skill areas:

- Technological Options
- Creating Organizational Change
Planning and knowledge required for intermodalism and the degree to which these are being met by educational and training programs, requires a consideration of their context. Accordingly, we studied the state of transportation education generally.

There has been a growing awareness that the rapid changes taking place demand changes in transportation education. The TRB sponsored a number of conferences on this topic. In the “Proceedings of the First Annual Forum on Transportation Education and Training: Responding to the Changing Needs of the Profession,” TRB Circular # 495, January 2000, the Forum sought answers to the following questions: (1) What factors are affecting transportation and changing education needs? (2) What actions are being taken to respond to the changing environment? And, (3) What do tomorrow’s professionals need to know? The Forum concluded:

- Needs are diverse, include many levels and careers, and are changing rapidly.
- Graduate degree programs for entry-level professionals should consist of a core and electives.
- Graduate certification programs should be developed for mid-level professionals.
- Skills can roughly be divided into technical and non-technical categories.

A follow-up workshop, in which we also participated, was held in the summer of 1999 at the University of Minnesota in cooperation with the Council of University Transportation Centers. Various presentations were made, the most important of which — from our perspective — involved a report of the top needs based on 200 interviews. These were essentially the ones identified by the ITS research and included Systems Integration, Organization/Institutional Change, Systems Analysis and Design Applications, Managing Contractors, Financing, Communications (including Wiring Specifications), Planning and Integrating Regional Systems, Coalition Building, Data Analysis and Management.

Notably, the Groups also concluded that: (1) professional degrees, such as MBAs and MPAs are available, but they are not adequately oriented towards transportation needs, and (2) mid-career training is deficient. In short, there is an urgent need to expand peoples’ horizons.

Another important conference we attended was held at the University of Washington, July 15-16, 1999. Entitled “Educating the 21st Century Transportation Professional,” the focus was on using technologies in
transportation education.3

The Second Annual Forum on Transportation Education and Training was held in conjunction with the January 2000 TRB meeting. A number of experts gave reports on various aspects of the topic. On the basis of our participation, we found the following points to be particularly relevant:

• It is essential to consider that people will be dealing with very different systems than those that exist today. They will be more complex and diverse, and will require different managerial and people skills.
• Education should be differentiated from training in that the incumbent pays for the former and the employer pays for the latter.
• New approaches, such as course modules and web-based learning are essential.
• Industry today is at a real crossroads and the actions taken now will shape developments for the next 20 years.
• Management skills must expand beyond traditional “business” to include ethics, customer service, and strategic partnerships.
• Transportation management, organizational structures, and institutional arrangements need to be revamped.
• Faculties still teach the “Old Transportation.” New textbooks and curricula materials are required, as well as the integration of new disciplines and topics such as technology transfer.
• There are two general categories – professional staff and operating staff – each with its own skill requirements. There is also a need for visionaries – people who understand the “Big Picture”— and the nature and rate of change that is impacting transportation.

D. OTHER RELEVANT PUBLICATIONS

A number of other publications also deserve mention. “Innovative Practices for Multimodal Transportation Planning for Freight and Passengers,” NCHRP Report #404, 1998, provides a useful survey of innovative approaches to planning that suggest that new skills will be required by intermodal planners. These include systems management, measurement ability, financing, and public engagement. Descriptions of various educational programs and projects are also to be found in the Jan/Feb 1999 issue of TR News (#200), entitled “Preparing Tomorrow’s Transportation Workforce.” Finally, “National Transportation Science and Technology Strategy,” National Science and Technology Council, April 1999, further emphasized the following points:

3. The report is available at the following website: http://www.depts.wash.edu/transnow.
• The need to understand technology and technological developments.
• The importance of organizational transformation.
• The impact of globalization on transportation.

Of additional interest are the "Millennium Reports," prepared by the numerous TRB Committees. Although many mention education, three are particularly significant: (1) "Urban Freight Movement," by R. Czerniak, J. Lahsene and A. Chaterjee, emphasizing the importance of developing not only new skills, but also new attitudes – if the problems of urban freight are to be resolved; (2) "Intermodal Freight Transportation," by W. DeWitt and J. Clinger, emphasizing the importance of understanding intermodal operations and procedures, and of technological innovations, especially in the area of information and communication; and (3) The Report, by P. Manning, "Transportation Education," is, of course, the most germane. It makes the following points:

• A shift towards policy areas, away from purely technical areas, is underway.
• Transportation education is a lifelong learning process.
• New technologies are bringing about fundamental changes in teaching methods and delivery systems.
• Globalization is forcing an international orientation.
• Future transportation professionals will need such non-traditional skills as the ability to identify and measure impacts in such areas as the environment, energy and community, and the ability to apply technologies in infrastructure, communications, and product design in a global setting.

Although the authors of The Report note that intermodalism represents "another important change," they do not discuss this issue in any detail – merely remarking that "the needs of the profession in this area offer challenges for transportation education."

II.A. DATA COLLECTION – INDUSTRY DEMAND FOR INTERMODAL SKILLS

Beyond the review of existing literature, data collection involved interviews with leading industry experts, interviews with several intermodal (hereafter, "IM") stakeholders located in Australia, Malaysia and Japan, and an email survey of transportation professionals. We also undertook two further activities. First, we conducted an analysis of job descriptions in the transportation industry. This was accomplished through a search of job openings posted on company web sites. Several airlines and trucking
companies were researched, together with several key intermodal companies, such as FedEx and UPS. In all, 204 jobs were analyzed.

Second, we organized two workshop focus groups, one held in Long Beach CA and the other in Singapore. Some 30-50 persons participated in each, representing government, industry and stakeholders. Participants were asked to define specific IM job descriptions, delineate the tasks to be performed in these jobs, and then enumerate the skills that would be required of an incumbent in those jobs. Combining the output of these workgroups with the prior data collection efforts, we defined a nine-point set of core competencies, required by the IM specialist:

- Understanding Ethical Principles
- Systems Analysis Skills
- Managerial Skills
- Environmental Analysis
- Knowledge of Computer Applications
- Knowledge of Technologies
- Communications Skills
- Knowledge of Different Modes of Transportation
- Knowledge of Planning

These competencies group into four separate categories of skills: Foundational, Analytical, Technical and Interpersonal, and within these categories of competency, a total of 32 separate skills were identified.4 In the research methodology, these 32 skills constituted the industry skill demand, against which the supply of educational and training programs would be measured.

II.B. DATA COLLECTION – INVENTORY OF SUPPLY OF EDUCATIONAL AND TRAINING PROGRAMS

We inventoried educational programs offered by universities and training institutions, both in North America and in Asia. Criteria of selection were that the training program be a recurring program of instruction, that it have identifiable intermodal content, and that it be listed and described on an internet web page in the English language, the official lan-

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guage of APEC. For those courses and programs that appeared on our "scopes," we ascertained the level of study (undergraduate/MA/PhD/diploma or certificate program), the program course requirements, and identification of any intermodal courses. Courses identified in the latter two categories were matched against the 32 skill requirements, to determine on an aggregate and regional basis, the degree to which available programs met identified industry skill needs.

We noted that, in North America, some 13 educational institutions provide training in some fashion, 10% offering certificate programs, 30% bachelor's degree programs, 40% master's programs, and 20% doctoral programs. While many of the courses are offered within the context of a larger transportation program, few actually provide course work dealing with IM skills.

No programs were identified within the Latin American economies. That is not to suggest that none exist, but rather that we could not detect them among the information networks that yielded curricular information on all other APEC regions. Among the Asian economies, we identified 101 separate programs of instruction: 10% short courses, 12% certificate programs, 26% bachelor's degree programs, 27% master's programs, and 9% doctoral programs. Two-thirds of these program opportunities were offered in only three economies: Australia (34%), Singapore (19%) and Hong Kong (14%).

II.C. INTEGRATION OF IM SKILLS DEMAND AND EDUCATIONAL PROGRAM SUPPLY

Several general observations stem from our analysis thus far. Integrating the demand for IM skills in the workforce and the supply of educational programs, the following points emerge:

Persons applying for positions in the IM industry may develop a wide range of skills through a number of different avenues. Entry-level educational requirements range from secondary school or equivalent or even job-specific skills – such as Aircraft & Powerplant license or a commercial driver's license – to MBA or Master's level skills. Skills expected of persons at lower or entry-level positions appear more specifically related to the skills required to perform specific operational tasks.

However, as one moves up the industry ladder, a person moves from very specific modal tasks to tasks and duties that require more of an IM perspective. These IM skills may be acquired through various mechanisms and programs, job experience, and on-the-job training, on a full or part-time basis. Figure 1 depicts the various avenues of education and training available to the transportation industry in general.

Entry-level IM skills then, are usually required in positions that are not necessarily "entry level" in the general sense. Most persons at the entry level of intermodal are in fact already established and have expertise in a particu-
lar mode. They then seek to augment that expertise with additional training and skill development that will apply to different modes and more complex IM problems.

The complex interrelationship between skills, position level and type of training is depicted conceptually in Figure 1.

![Figure 1](image)

**FIGURE 1**

Intermodal Training within the Transportation Industry

III. ANALYSIS OF TRAINING GAPS.

It became apparent that the supply of programs did not meet the demand for skills in any comprehensive or meaningful manner. In short, there are gaps, which we next sought to identify and explore. An overview of these gaps appears below:

Acquisition of intermodal skills, in the aggregate, is at best limited. If the goal of intermodal skills development is to meet demand with supply, then integrated programs should be provided in locations where individuals have need of training. That is, workers should be able to learn without quitting their employment, and students should be able to gain a complete set of IM skills in one program or course of study in a single loca-
tion. Unfortunately this condition exists only in a few places. The only locations where a person could probably get all the training needed, without relocating for an extended period of time would be New York, Charleston, Denver, Seattle, Hong Kong, Singapore, Sydney or New Zealand. In some of these locations, well-developed degree programs are complemented by industry-based and commercial training courses, designed to address specialized and often customized, skills development needs.

Despite that, within these centers, even programs that focus explicitly on intermodalism vary in scope and content, and no single university or training program in any APEC economy provides all the necessary skills. While the Report itself considers these matters both on an aggregated and on a regional basis, for present purposes, aggregated data will make the point. Considering 10 of the APEC economies, we identified 121 training programs. The following table shows the availability of training programs by type within the APEC economies.

### Table 1

<table>
<thead>
<tr>
<th>Intermodal Skill Categories</th>
<th>Widespread Opportunities</th>
<th>Limited Opportunities</th>
<th>Few Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundational</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analytical</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Within the 121 training programs, we identified a total of 440 courses that had intermodal content – that is, the course title or description was such that we could ascribe it as addressing the 32 IM skills. The following table shows this relationship.

### Table 2

<table>
<thead>
<tr>
<th></th>
<th>PhD</th>
<th>MA</th>
<th>BS</th>
<th>Diploma</th>
<th>Certificate</th>
<th>Short Courses</th>
<th>Distance Learning</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>48</td>
<td>6</td>
<td>1</td>
<td>9</td>
<td>11</td>
<td>2</td>
<td>-</td>
<td>20</td>
<td>17%</td>
</tr>
<tr>
<td>Australia</td>
<td>18</td>
<td>1</td>
<td>9</td>
<td>11</td>
<td>2</td>
<td>2</td>
<td>34</td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td>13</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>8</td>
<td>7%</td>
</tr>
<tr>
<td>Taipei</td>
<td>11</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Japan</td>
<td>11</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Korea</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>7</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>P.R. China</td>
<td>14</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>5%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>-1</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>-</td>
<td>14</td>
<td>12%</td>
</tr>
<tr>
<td>Singapore</td>
<td>14</td>
<td>2</td>
<td>9</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>19</td>
<td>16%</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>12</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>6</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>35</td>
<td>19</td>
<td>26</td>
<td>14</td>
<td>10</td>
<td>4</td>
<td>121</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>11%</td>
<td>29%</td>
<td>16%</td>
<td>21%</td>
<td>12%</td>
<td>8%</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Within the 121 training programs, we identified a total of 440 courses that had intermodal content – that is, the course title or description was such that we could ascribe it as addressing the 32 IM skills. The following table shows this relationship.
Overall, it appears that the largest gaps between needed skills and educational and training programs are in the following areas: Identification of Legal Issues, Ethical Analysis, Labor Relations, Intermodal Computer Applications, Intermodal Transportation Experience, Communications Skills, Listening and Coalition Building Skills, Forecasting and Futures Analysis, and Policy Analysis. These were the largest gaps identified. However, further inspection of the results also reveals that there is a shortage of courses dealing with important topics, and that these are often located in only a few member economies. For example, only 15 courses are available that deal with legal issues throughout all of APEC, and 6 of these are in the U.S. The same is true for courses in understanding the global business environment. Thus, it appears that there is a need to enrich existing education and training programs throughout the APEC region.

The foregoing discussion concerned itself with gaps in course offerings. There is another dimension to this gap, and that falls into the realm of educational program/course availability. That is, IM skills development courses need to be available to an individual when and where he/she needs it, in progressing up the industry ladder.

Table 2, which shows educational programs by individual APEC economy, is our starting point. While there is some suggestion that diploma courses are available to personnel at all levels of an organization, it is clear that available skills training and educational experiences are
targeted towards individuals who (1) have already entered the work force in a specific modal area of transportation and are seeking additional training, or (2) individuals who are seeking a college level degree in order to enter the workforce at the professional level.

This is a critical point in understanding one important training gap – namely, expanding the knowledge base for people who perform IM functions within the transportation system, and therefore require skills training beyond the simple entry level. This mismatch between skill upgrading needs and training opportunities for IM transportation is distinct from the relationship between entry-level skill needs and training availability within the traditional modal transport sector.

Consequently, in terms of intermodal careers, there is still a training gap for skills needed at the entry level of intermodal transportation – that is, when people make the leap from traditional modal transportation work to IM operations, planning, management, etc. That set of “entry level” (or “foundational”) IM skills is still in shorter supply than some of the advanced IM skills development opportunities. This state of affairs is depicted below, in Figure 2.

![Figure 2](image)

Additionally, Figure 2 illustrates that, while entry into the transportation industry comes through modal expertise originally, persons who are developing “entry level” IM skills generally begin receiving training
through specific short courses or some type of on-the-job training. Additional training experiences are generally provided to middle and executive level personnel through college courses and degree programs.

**Table 4** Availability of training experiences by degree level and by region

<table>
<thead>
<tr>
<th>Degrees Level</th>
<th>NA (US, Can)</th>
<th>LA (Mex)</th>
<th>Oceania (Aust NZ)</th>
<th>Asia-Developed (S, HK, T, J)</th>
<th>Asia-Developing (C, M, T, K)</th>
<th>TOT</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS and above</td>
<td>Exec</td>
<td>18</td>
<td>15</td>
<td>16</td>
<td>18</td>
<td>49</td>
<td>40%</td>
</tr>
<tr>
<td>Diploma</td>
<td>Middle</td>
<td>21</td>
<td>11</td>
<td>15</td>
<td>0</td>
<td>26</td>
<td>21%</td>
</tr>
<tr>
<td>Certificates</td>
<td>Entry</td>
<td>2</td>
<td>1</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>10%</td>
</tr>
<tr>
<td>Short Courses</td>
<td>Entry</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>10</td>
<td>8%</td>
</tr>
<tr>
<td>Distance</td>
<td>Entry</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>Learning</td>
<td>Total</td>
<td>20</td>
<td>1</td>
<td>42</td>
<td>39</td>
<td>20</td>
<td>16%</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td>16%</td>
<td>1%</td>
<td>34%</td>
<td>32%</td>
<td>16%</td>
<td></td>
</tr>
</tbody>
</table>

Inspection of Table 4 shows that in certain regions of APEC, there is greater availability of training programs for certain positions within organizations than with others. For example, 40% of the course offerings and programs containing those offerings are targeted towards persons who already have an undergraduate degree. In many economies this is the educational background required for a middle or upper level management position.

The foregoing analysis may be summarized succinctly: *It appears that the preponderance of intermodal skills training is targeted towards middle and upper middle management level, and not at the entry level professional.*

**IV. Conclusions.**

It should be kept in mind that the APEC member economies represent a cultural, educational, and socio-economic diversity, whereby there are no common solutions even to relatively identical problems as between economies. The best that can be offered are general guidelines that may be used in defining particular solutions within individual economies. Accordingly, the conclusions reached by the Report purport to be general guidelines, addressing both the skills needs in a complex and changing intermodal environment, and the form, format and content of programs to meet those needs.
IV.A. CHANGING SKILL NEEDS IN THE INTERMODAL ENVIRONMENT.

• General Competencies

The intermodalist is primarily concerned with integrating the dynamic process of transportation across time and space.

The general competencies required of the IM specialist are not dissimilar from those required in mode-specific jobs. However, because intermodal positions by definition include several modes, the intermodalist needs not only those general competencies, but also the ability to apply them in a more comprehensive setting.

The intermodalist integrates the dynamic process of transportation across time and space, which requires the application of managerial, analytical and interpersonal competencies in a variety of settings, with a variety of different constituencies, and at varying levels of responsibility. Hence, IM requires a wide range of both new and existing skills.

• Operations Management

New basic skills will be required to design, operate and manage the new and emerging intermodal system.

While many of today's managers are self trained at making the best links ad throughput in a system that is based upon separate modes, future managers will need new skills to optimize the use of purpose-built intermodal infrastructure. Both now and in the future, the tasks of these individuals were seen as “defining constraints and devising solutions to those constraints.” But, the nature of those constraints is very likely to shift from those internal to today’s transportation system (e.g., poor air-rail-transit connectivity in intercity passenger transport, or poor ship-rail-truck connectivity in freight) to external constraints in tomorrow’s systems (e.g., energy costs/availability, greenhouse gas limits, social equity constraints on “externalities”).

• Planning and Development

The effectiveness of future intermodal systems will depend upon the ways in which new participants become engaged in planning their design and operation.

If such engagement takes the form of partnership among stakeholders who share in the economic, environmental and social benefits generated by intermodalism, then IM systems will be poised to achieve their full potential. But, if future engagement takes the form of adversarial disputes over the degree and distribution of burdens and costs associated with intermodalism, then a formidable barrier will stand in the
• Future Skills Needs

*As intermodal transportation systems evolve, one must upgrade the level of intermodal skills, while attending to future skills needs. If this is not done, then the skills gap between APEC member economies will increase.*

The competencies required of the IM specialist are influenced to a significant degree by the nature of the economy and the pattern of development of intermodalism in a particular society. The workshops demonstrated the importance of developing individual programs to meet the specific needs of the member economies. At the same time, one must pay attention not only to the skills required to upgrade the level of intermodalism in those economies where basic skills are still inadequate, but also to their future needs. If this is not done, then the gap between the member economies will increase as intermodal transportation systems are evolving rapidly with new technologies and globalization. Therefore, it is essential not only to focus upon enhancing the knowledge and skills of important IM actors in particular economies, but also to train individuals for tomorrow's skill needs. It follows that policy makers and senior managers must have a keen awareness of the role that IM plays today and its future potential.

IV.B. **Development of Training Programs and Curricula to Meet Future Skill Needs.**

• Development of Training Programs

Training programs should be developed that possess the following characteristics: basic skills and technical competencies at entry level, intermodal planning and organizational skills at management level, strategic design and development skills to top level administrators and officials, and key interpersonal skills at all levels. The level of skills training must be carefully designed in order to meet specific needs, as
determined by the level of responsibility within an organization, the region of the world, and the level of development of the specific economy's transportation system.

• Educational Institutions

*Even in economies with the largest number of training opportunities, few programs provide students with the integrated and coherent experience needed to develop the skills required.*

Exiting educational programs meet some of the above needs to a greater or lesser degree in almost all economies. Yet, the number of programs that focus upon intermodalism is quite limited even in the most advanced economies. There, numerous programs in engineering, logistics, business and transportation provide the basic skills. Further, policy makers are sensitive to the opportunities of intermodalism and its future development. Remarkably, even in those economies, few programs provide students with the integrated and coherent experience needed to develop the skills required by what has been called the “new science of intermodalism.”

Many of the disconnected sources for skills acquisition that are in place across many of the APEC member economies cannot generally offer IM knowledge and develop IM insights for all positions in the workforce. In a few rare cases, programs exist that go beyond the level of imparting specific technical, administrative or planning skills, and enabling their students to appreciate how the pieces of the IM puzzle fit together. Additionally, there are many international governmental and non-governmental agencies, as well as private sector organizations, that now play an important role in specific skills training. At the same time, it is clear that the provision of more advanced and integrated skills will require the development of domestic educational capabilities that do not presently exist in many APEC economies.

• Curriculum Development

*It is necessary to integrate a general conceptual understanding of the various modes with a practical understanding of their capabilities, strengths and weaknesses.*

This involves a coherent stepwise skill development model that can be implemented through a range of educational activities, including short-term courses, workshops, work-study programs, practica and internship experiences, as well as traditional degree programs. To accomplish this, educational institutions will need to form partnerships with government and the transportation industry.
What is required is the development of a range of educational activities that include short-term courses, workshops and undergraduate and graduate programs, all incorporating practical application of the skills being transmitted. In addition to a sequential skill development program, there is also a need for a coherent skill development model, a template or master document endorsed by key groups. Therefore, it would seem appropriate that groups representing all the dimensions of intermodalism including logisticians, freight forwarders, marketing, operators, infrastructure providers, regulators, carrier, shippers and planners, be brought together with a group of academics, to discuss such a template. Such a meeting could be convened under AEC auspices.
Measuring Economic Benefits of Intermodal Transportation

Dr. Yuri V. Yevdokimov*

ABSTRACT

Usually benefits for transportation investments are analysed within a framework of cost-benefit analysis or its related techniques such as financial analysis, cost-effectiveness analysis, life-cycle costing, economic impact analysis, and others. While these tools are valid techniques in general, their application to intermodal transportation would underestimate the overall economic impact by missing important aspects of productivity enhancement.

Intermodal transportation is an example of the so-called general purpose technologies (GPTs) that are characterized by statistically significant spillover effects. Diffusion, secondary innovations, and increased demand for specific human capital are basic features of GPTs. Eventually these features affect major macroeconomic variables, especially productivity. Recent economic literature claims that in order to study GPTs, micro and macro evidence should be combined to establish a better understanding of the connecting mechanisms from the micro level to the overall performance of an economy or the macro level.

This study analyses these issues with respect to intermodal transpor-

* Dr. Yuri V. Yevdokimov, Assistant Professor of Economics and Civil Engineering, University of New Brunswick, Canada, Tel. (506) 447-3221, Fax (506) 453-4514, E-mail: yuri@unb.ca
Intermodal transportation. The goal is to understand the basic micro and macro mechanisms behind intermodal transportation in order to further develop a rigorous framework for evaluation of benefits from intermodal transportation. In doing so, lessons from computer simulation of the basic features of intermodal transportation are discussed and conclusions are made regarding an agenda for work in the field.

**INTRODUCTION**

Intermodal transportation can be thought of as a process for transporting freight and passengers by means of a system of interconnected networks, involving various combinations of modes of transportation, in which all of the components are seamlessly linked and efficiently combined.

Intermodal transportation is rapidly gaining acceptance as an integral component of the systems approach of conducting business in an increasingly competitive and interdependent global economy. For example, the United States Code with respect to transportation states:

> "It is the policy of the United States Government to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the United States to compete in the global economy and will move individuals and property in an energy efficient way. The National Intermodal Transportation System shall consist of all forms of transportation in a unified, interconnected manner, including the transportation systems of the future, to reduce energy consumption and air pollution while promoting economic development and supporting the United States' pre- eminent position in international commerce." (49 USC, Ch. 55, Sec. 5501, 1998)

David Collenette (1997), the Transport Minister of Canada, noted:

> "With population growth came development, and the relative advantages and disadvantages of the different modes changed as the transportation system became more advanced. ... Intermodalism today is about safe, efficient transportation by the most appropriate combination of modes." (The Summit on North American Intermodal Transportation, 1997)

These statements define intermodal transportation as a macroeconomic concept, because an effective transportation system is a vital factor in assuring the efficiency of an economic system as a whole. Moreover, intermodal transportation is an important socio-economic phenomenon which implies that the benefits of intermodal transportation have to be evaluated at the macroeconomic level, or at least at the regional level, involving all elements of the economic system that gain from having a more efficient transportation network in place.
DEFINING ECONOMIC BENEFITS OF INTERMODAL TRANSPORTATION

Traditionally, the benefits of a transportation investment have been primarily evaluated through reduced travel time and reduced vehicle maintenance and operation costs. However, according to Weisbrod and Treyz (1998), such methods underestimate the total benefits of transportation investment by "missing other important aspects of productivity enhancement." It is so because transportation does not have an intrinsic purpose in itself and is rather intended to enable other economic activities such as production, consumption, leisure, and dissemination of knowledge to take place. Hence, in order to measure total economic benefits of investing in intermodal transportation, it is necessary to understand their basic relationships with different economic activities.

Eventually, improvements in transportation reduce transportation costs. The immediate benefit of the reduction is the fall in total cost of production in an economic system under study which results in growth of the system's output. This conclusion has been known in economic development literature since Tinbergen's paper in 1957 (Tinbergen, 1957). However, the literature does not explicitly identify why transportation costs will fall. This issue is addressed in this discussion with respect to intermodal transportation.

Transportation is a multiple service to multiple users. It is produced in transportation networks that provide infrastructure for economic activities. It appears that transportation networks have economies of scale. As discussed below, intermodal transportation magnifies these scale effects resulting in increasing returns to scale (IRS) of a specific nature. It implies that there are positive externalities that arise because of the scale effects, externalities that can initiate cumulative economic growth at the regional level as well as at the national level (see, for example, Brathen and Hervick, 1997, and Hussain and Westin, 1997). The phenomenon is known as a spill-over effect. Previously the effect has been evaluated through the contribution of transportation infrastructure investment to economic growth. Since Auschauer's (1989) paper many economists have found evidence of such a contribution (see, for example, Bonaglia and Ferrara, 2000 and Khanam, 1996).

Intermodal transportation as it was defined at the very beginning is more than mere improvements in transportation infrastructure. From a theoretical standpoint, it possesses some characteristics of the general-purpose technologies (GPT), and it seems appropriate to regard it as an example of the GPT, which is discussed below. It appears reasonable to study intermodal transportation as a two-way improvement of an economic system's productivity. On the one hand, it improves current operational functions of the system. On the other hand, it expands those
functions. Both improvements are achieved by consolidating different transportation systems into a seamless transportation network that utilizes the comparative advantages of different transportation modes.

Improvements due to intermodal transportation are associated with the increased productivity of transportation services and a reduction in logistic costs. The former results in an increased volume of transportation per unit cost, while the latter directly reduces costs of commodity production.

Expansion of the intermodal transportation network is associated with economies of scale and better accessibility to input and output markets. The overall impact of intermodal transportation can be divided into four elements:

(i) an increase in the volume of transportation in an existing transportation network;
(ii) a reduction in logistic costs of current operations;
(iii) the economies of scale associated with transportation network expansion;
(iv) better accessibility to input and output markets.

These four elements are discussed below in a sequence.

**INCREASE IN VOLUME OF TRANSPORTATION IN THE EXISTING NETWORK**

An increase in volume of transportation can lead to economies of density - a specific scale effect. The economies of density exist if an increase in the volume of transportation in the network does not require a proportional increase in all inputs of the network. Usually the phenomenon is associated with an increase in the frequency of transportation (traffic) within the existing network (see Boyer, 1998 for a formal definition, Ciccone and Hall, 1996 for general discussion of economies of density, and Fujii, Im and Mak, 1992 for examples of economies of density in transportation).

In the case of intermodal transportation, economies of density are achieved through cargo containerization, cargo consolidation and computer-guiding systems at intermodal facilities. Cargo containerization and consolidation result in an increased load factor of transportation vehicles and higher capacity utilization of the transportation fixed facilities, while utilization of computer-guiding systems results in higher labour productivity.

For instance, in 1994 Burlington Northern Santa Fe Railway (BNSF) introduced the Alliance Intermodal Facility at Fort Worth, Texas, into its operations between Chicago and Los Angeles. According to OmniTRAX specialists, who operates the facility, BNSF has nearly doubled its volume
of throughput at the intermodal facility since 1994. First, containerization of commodities being transported plus hubbing or cargo consolidation at the intermodal facility resulted in longer trains with higher frequency. Second, all day-to-day operations at the intermodal facility are governed by the Optimization Alternatives Strategic Intermodal Scheduler (OASIS) computer system, which allowed BNSF to handle more operations with less labour.

**REDUCTION IN LOGISTIC COSTS**

Intermodal transportation is characterized by optimal frequency of service and modal choice and increased reliability. Combined, these two features define the just-in-time delivery — a major service produced by intermodal transportation. Furthermore, Blackburn (1991) argues that just-in-time delivery has become increasingly important factor in doing business globally.

It appears that just-in-time delivery reduces the burden of inventory holding costs. According to McCann (1993), total logistic costs include inventory holding costs. These costs account for a large share of the total production costs of businesses. Hence, reduction in the inventory holding costs directly improves the productivity of an economic system. The improved productivity comes from the notion that the same level of the economic system’s output can be now produced at a lower cost.

**TRANSPORTATION NETWORK EXPANSION AND ECONOMIES OF SIZE**

Transportation services are produced within transportation networks. In addition to traffic, a transportation network can be characterized by the total mileage between all service points in the network. Expansion of the network implies adding new service points or/and new services. Since intermodal transportation is a system of interconnected networks, it primarily increases size of the existing network by adding new service points. Expansion of the network in this way can lead to economies of size which are a transportation analog of economies of scale in standard production theory.

Empirical research in support of existence of economies of size in the transportation networks goes back to 1960s (see, for example, Healy, 1961). The empirical evidence shows that in general, freight transportation costs are increasing at a constant or increasing rate with increase in tonnage per trip, but are increasing at a decreasing rate with increase in mileage. Since expansion of the network due to intermodal transportation is associated with an increase in the overall mileage, it eventually leads to a decreasing average total cost of transportation by pushing the volume of transportation toward an efficient scale. This phenomenon
arises because of initial excess capacity of transportation vehicles and fixed facilities which is due to technical requirements.

**Better Accessibility to Input and Output Markets**

Expansion of a transportation network, as a result of intermodal transportation, brings in better accessibility to input and output markets. Brathen (1999) calls this backward and forward linkages to markets for supplies, inputs and final goods. Weisbrod and Treyz (1998) note that: "Highway projects have an important spatial location characteristic... They can serve to expand the market reach of businesses, allowing businesses an opportunity to realize economies of scale by serving broader markets more economically. In addition, highway system improvements can provide businesses with access to a greater variety of specialized labour skills and specialized input products, helping them to become more productive."

This statement defines three effects of intermodal transportation: (a) decreased production costs due to economies of scale (to serve markets more economically); (b) better accessibility to output markets (to serve broader markets); and (c) better accessibility to input markets (access to a greater variety of specialized labour skills and specialized input products).

Since the economies of size have already been discussed, we will focus on better accessibility to input and output markets. Weisbrod and Treyz (1998) present an interesting framework for evaluating the productivity gain from better accessibility to input markets based on the elasticity of substitution between different inputs. In doing so, the crucial element is estimation of a production function in the form of constant elasticity of substitution (CES) with different inputs such as capital, labour, transportation, and natural resources. Econometric estimation of the CES function, a well-explored area in microeconomics, therefore provides a direct assessment of accessibility to input markets through higher substitutability of inputs.

Economic benefits from better accessibility to output markets can be defined as follows: businesses accumulate inventories over time which is defined as a stock of unsold goods. Since sale opportunities improve as a result of expanding the transportation network, via intermodal transportation businesses can sell their inventories earlier which increases their sales revenue. Hence, extra revenue from the sale of inventories is a legitimate economic benefit associated with intermodal transportation.

**Setting a Framework for Empirical Analysis**

In recent years new literature on economic growth has developed concerning the general purpose technologies (GPTs) (see, for example,
Helpman, 1998). The term GPT is related to revolutionary technologies with significant macroeconomic spillover effects. The adjective revolutionary implies a technological breakthrough that is not just a simple continuous improvement, but rather a one-time large positive technological development with persistent consequences. It is said that as a GPT gradually diffuses, it affects the development of the entire economy (Barro and Sala-I-Martin, 1997). Enhanced productivity which increases the economy's long-run output, and demand for specific human capital in terms of higher skills are among the distinguishing features of the GPT.

Intermodal transportation is a good example of a GPT since it results in higher productivity and it requires special skills. With regard to the latter, new educational programs dedicated to training of specialists in intermodal transportation have appeared. For example, the U.S. Department of Transportation (USDOT) established the University Transportation Centers Program in 1981. Ten years later, USDOT added four Centers with respect to intermodal transportation under the Intermodal Surface Transportation Efficiency Act. The Denver Intermodal Transportation Institute recognized the increasing need for these specialists and hence introduced a Master’s Program in intermodal transportation in September 1999.

So far, different aspects of intermodal transportation have been discussed in isolation. However, it was stated by Koulovatianos (1999) regarding GPT that a better explanation of connecting mechanics at the micro level with the overall impact on an economy is required. Applied to intermodal transportation it implies that microeconomic aspects discussed previously should be combined with macroeconomic analysis to study its contribution to economic growth. Such a framework can produce a global measure of benefits from intermodal transportation. There are three classes of models that might help us to accomplish this goal.

Computable general equilibrium models derive transportation flows from internal and foreign trade flows. For instance, a multi-regional version of this model can include the costs of delivering goods and services from producers to consumers. A change in these costs affects both the location and the levels of production and consumption, generating long term consequences for the entire economy (see Roson and Vianelli, 1993 for example of such a model for Italy).

Spatial input-output models derive transportation flows from the detailed spatial characteristics of existing transportation networks. Transportation network is regarded as a set of service points (nodes) and the links between them. In turn, a node is characterised by a set of socioeconomic characteristics. Compared to the computable general equilibrium models, the distinguishing features of spatial input-output models
are explicit transportation sector as a transportation network and dynamic changes in transportation flows. Examples are in Rohr and Williams (1994), and Williams and Lindberg (1989).

Macroeconomic models with transportation incorporate transportation flows as given through the existing level of national transportation investment, the level of congestion, traffic speed, cost of the use of transportation facilities, and others. The models are expressed in a form of relationships between macroeconomic variables, usually involving time lags, which are established by statistical analysis of empirical data. Examples are Minford, Stoney, Riley and Webb (1994) and CEBR (1994).

At the present it seems appropriate to design computable general equilibrium models with an explicit transportation sector in order to study the benefits associated with intermodal transportation. Spatial input-output models are very time-consuming because they require a large amount of spatial data. In Northern America spatial input-output models can only be applied at regional levels. Macroeconomic models with transportation cannot be applied to intermodal transportation because transportation in this class of models is represented by a set of exogenous variables.

At this stage, it is possible to formulate some basic principles underlying the design of the computable general equilibrium model with explicit transportation sector:

30546. A macroeconomic system is a multilevel structure with complex production and consumption patterns; as such, it is subject to a multilevel analysis in which transportation appears as a microeconomic element.
30547. Transportation is an input in the general production process, because manufactured commodities are not only produced using capital and labour, but are also delivered to the consumer.
30548. Transportation is a part of household consumption.
30549. Transportation services are produced within transportation networks.
30550. The production of transportation services in transportation networks requires capital (infrastructure and vehicles) and labour (operators of transportation vehicles).

Computer Simulation as a Demonstration Exercise

To demonstrate some theoretical finding of the above discussion, a set of computer simulation exercises were performed. As already stated,
intermodal transportation results in an increase in the volume of transport and a decrease in unit cost of transportation. The effect was simulated at the microeconomic and macroeconomic levels.

**MICROECONOMIC SIMULATION**

In an microeconomic sense, an increase in the volume of freight transportation due to intermodalism results in a one-time increase in the production of an aggregate manufactured commodity being transported. According to Batten and Karlsson (1996) the potential output for the manufactured industry in a region can be presented by the following production function:

\[ Y = A(T_r)f(K_r, L_r) \]

where \( A \) is the factor productivity, \( T_r \) is a vector of variables characterising transportation network in region \( r \), \( K_r \) and \( L_r \) represent the capital and labour in the region. Obviously, since the factor productivity is a function of transportation, an increase in the volume of transportation will result in a shift of the aggregate production function. Brathen and Hervik (1997) argue that the shift effect proves to be significant when new fixed links replace old scheduled services in a transportation network, thus allowing for 24-hour operations and just-in-time deliveries which is the case with intermodal transportation.

The consequences of the increased transportation due to intermodalism were traced in the short and long run. For the short run simulation the following assumptions were applied:

1. A fixed transportation network: one production area and one consumption area for the aggregate manufactured good.
2. One transportation carrier serves the producer of the manufactured good only, and therefore, partial equilibrium analysis is assumed.
3. The initial volume of transportation is given exogenously.
4. The manufactured good production function captures the idea that productivity increases with increases in volume of freight transportation at decreasing rate — an important feature of intermodal transportation.
5. Price of the aggregate manufactured good adjusts according to a linear downward-sloping demand curve which captures the assumption of monopolistic competition\(^1\).
6. Amount of manufacturing capital is fixed.

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1. For instance, Paul Krugman (1997) emphasises that imperfect competition is a vehicle for economic growth, and transportation costs are important for generating such a growth.
7. Price of transportation or the freight rate adjusts according to a linear downward-sloping demand for transportation.
8. Total costs of production of the aggregate manufactured good include transportation costs.
9. The producer of the aggregate manufactured good maximizes profit.

When optimal value of manufacturing labour was chosen, values of the following economic variables were calculated: (i) total output of the aggregate manufactured good; (ii) price of the good; (iii) total sales revenue; (iv) total production costs; (v) profit; (vi) overall productivity. Volume of transportation was then increased, and the optimization problem was repeated. Then the entire exercise was repeated for the long run simulation with variable manufacturing capital and labour.

**Macroeconomic simulation**

The production function of the transportation network was introduced as

\[ T_t = g(K^F_t, K^V_t, L_t^T) \]

where \( K^F_t \) is the transportation fixed capital (transportation facilities), \( K^V_t \) is capital cost of vehicles, \( L_t^T \) is transportation labour, \( t \) is time. The production function represents the transportation network.

Then the system of five equations underlying the economy's dynamics was derived on the basis of the general equilibrium framework. Combined with basic macroeconomic relationships, the production function of the transportation network allowed us to trace the consequences of intermodal transportation for the economy as a whole. A literature search, as well as an analysis of the Canadian Database, suggested specific parameter values for the model.

The derived model was calibrated with respect to the so-called “cake eating case” that describes an economy in a stationary state with the following basic property: what is produced in the economy is then re-invested to make up for capital depreciation; the rest is consumed. This implies zero economic growth. Then, fundamental macroeconomic properties of intermodal transportation — increase in frequency of transportation and expansion of the transportation network — were imposed on the calibrated model in a form of a one-time, ten percent increase in traffic, transportation network’s capital, labour and size. The conse-

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2. Overall productivity was defined as the ratio of output per unit of factor cost.
3. The derivation of the economy's general equilibrium model is not presented here because it would be too space consuming.
quences of the increase were traced over time to analyze their dynamic properties.

**Major findings**

The microeconomic simulation exercise showed that an increase in the volume of transportation within the existing transportation network has an impact on the overall productivity in both the short-run and long-run. More specifically, a 50 percent increase in the volume of transportation resulted in a 21 percent increase in productivity in the short-run, and 26.3 percent increase in the long-run. It is also worth mentioning that eventually all microeconomic indicators, such as total production of the aggregate manufactured good, total sales revenue, total costs and profit improved in both runs. More efficient transportation allowed the producer of the aggregate manufactured good to increase output and reduce labour input in the short-run, and slightly expand operations in the long-run.

In terms of welfare economics, total surplus increased as well. It increased by 1.3 percent in the short-run and by 1.5 percent in the long-run. The increase includes a 3.1 percent increase in consumer surplus in the short-run and a 3.6 percent increase in the long-run as well as a 0.4 percent increase in producer surplus in the short-run and a 0.52 percent increase in the long-run. This means that eventually consumers benefit more than producers from having an effective intermodal transportation in place.

These results show that benefits from intermodal transportation can be measured through improvements in the overall productivity of an economic system. However, the above discussed simulation captures only a fraction of total benefits, the fraction that is associated with improvement of current operations in a partial equilibrium framework.

The macroeconomic simulation showed that a one-time 10 percent increase in all basic characteristics of the transportation network due to intermodal transportation resulted in a permanent increase of the economy's growth rate. The growth rate was steadily increasing over the first 15 periods, reaching its maximum at value of 3.0 percent, then it decreased with passage of time and settled down at 0.4 percent. This is a long-run contribution of intermodal transportation to economic growth.

In order to give a sense of the size of these benefits, they were calculated for the first 50 periods (years). The value of the Canadian GDP of $718 billion in 1998 was used for this purpose. It was found that total cumulative benefits from a simultaneous 10 percent increase in frequency of transportation and the transportation network expansion, as a result of intermodal transportation, generated $682 billion over 50 years (approxi-
mately $13.64 billion per year). The impact of intermodal transportation appeared to be permanent and, therefore, the value presented above is an underestimation of the total economic benefits.

**Concluding Remarks**

First of all, the results of the computer simulation are in accord with other studies:

(a) The simulation supports the conclusion of Scottish experts (SACTRA, 2000) that, in general, the contribution of transportation to economic growth, while modest, is not economically insignificant. The obtained results also support Brathen (1999) and Hussain and Westin (1997) argument that innovations in transportation under increasing returns to scale can initiate cumulative economic growth.

(b) A frequently cited statement in the literature that total benefits from transportation should be measured through productivity enhancement of an economic system is confirmed by statistically significant values of consequences of intermodal transportation. In addition, the results of the computer simulation support Roson's (1995) thesis about higher efficiency of a system's optimum versus user's optimum in transportation networks.

(c) To some extent, the computer simulation supports conclusions by Kruger (1997), Hussain and Westin (1997) and Scottish experts (SACTRA, 2000) that if economic markets are not perfectly competitive, then conventional benefit-cost analysis underestimates total benefits from transportation improvements.

Second, the computable general equilibrium approach seems to be appropriate for North America at the present. However, the proposed approach should eventually evolve into spatial input-output models with comprehensive transportation database.

Third, our macroeconomic simulation supports the proposition that intermodal transportation is an example of GPT. The macroeconomic simulation showed that the impacts from intermodal transportation were permanent which is a basic feature of the GPT.

For future work in the field, complementarity of transportation to capital and labour as inputs in the overall production process and technological indivisibilities of transportation capital have to be explicitly incorporated into the general equilibrium model. Preliminary analysis shows that these features can only magnify the resulting total benefits. As well, human capital has to be included as an important factor of production.

It is also worthwhile mentioning that some benefits from intermodal
transportation, for example, savings of leisure time, improvements in road safety and positive environmental effects, are not directly related to conventional measures of economic growth. However, they have to be incorporated in future models. As an example, leisure can be explicitly included in consumers’ utility functions.

With regard to simulation, future computer models should include a set of relationships and constraints based on engineering specifications of intermodal systems combined with economic characteristics of the systems. The latter should be used for specification of objective functions given engineering relationships as constraints. Coupled with an intermodal database, the models could provide a deeper understanding of the gains from intermodal transportation at different levels - single independent projects, regional and national economies. These considerations define the agenda for future economic research in the area of intermodal transportation.

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New York Regional Intermodal Freight Transportation Planning: Institutional Challenges

José Holguín-Veras, Ph.D., P.E.
Assistant Professor, Department of Civil Engineering

Robert E. Paaswell, Ph.D., P.E.
Distinguished Professor and Director of the
University Transportation Research Center
City College of New York

Preface

The main objective of this paper is to review the institutional structure of the transportation agencies in the New York City region, with particular emphasis on their ability to conduct intermodal freight transportation planning. The paper is comprised of three major sections and an Introduction. In Institutional Structure, a brief description of the concerned agencies and their formal and informal interactions is provided. At the end of this section, the adequacy of the current institutional structure is examined. The New Paradigms section attempts to provide an idea about new governance structures that may enhance the efficiency and effectiveness of intermodal freight transportation in the New York region. Conclusions summarizes the major findings of this research.

Introduction

The New York City metropolitan region is a region of superlatives. That is both good and bad news. The good news is that the population and its workforce create a world-class economic engine. The bad news is
that—as a consequence of this economic activity—the costs of doing business in a world capital, that is congested and growing more so, are substantial.

This metropolitan region is home to close to 20 million residents, more than 600,000 business establishments, more than 1.3 million registered trucks, and more than 8.8 million employees. The region is one of the largest and densest in the world with an average of 17,600 persons per square mile. Every year, more than 67 million trucks cross the toll facilities administered by the various transportation agencies (NYMTC, 1999a). One-third of the nation's transit commuters are in this metropolis; one-tenth of all national vehicle miles traveled on expressways are within this metropolis (Paaswell and Zupan, 1998). The complexity of moving goods and passengers is compounded by the severe congestion, the existence of significant physical constraints and the fact that the area is home to the largest concentration of transportation facilities in the world, including three airports, dozens of container terminals, intermodal yards and more than 11,000 miles of highways.

As anticipated in a metropolitan region that must simultaneously serve itself, while serving as a major international gateway, enormous quantities (and types) of freight are transported to and from the region. The cargoes with origin or destination in the New York City region amounted to 170 million tons in 1996 (Holguín-Veras and Thorson, 2000). The majority of these goods arrive, or depart from, terminals in New Jersey, and then are transported to New York by trucks that move 79% of the region's goods, while the national average is 44% (Holguín-Veras and Thorson, 2000). If through movements are taken into account, the total tonnage moved to, through or out of the region is 475 million tons (NYC EDC, 1998). Although air cargo represents only 0.26% of the regional goods movement, it is very important to the economy because these cargoes are time-sensitive cargoes with high opportunity costs that require efficient trucking connections at both ends of the trip.

There are several sources that provide estimates of the high costs involved in moving goods in New York City. Federal Express claims that it costs 30% more to deliver in New York City than in other comparable locations (NYMTC, 1998b). Urban goods movement focus groups indicated that because of: theft/vandalism, physical constraints, lack of equitable law enforcement for parking/standing, and high facility costs near the urban core, shipments to New York City pay a surcharge of $150 on average (NYMTC, 1999b). Another focus group of business representatives reported that moving a shipment from the container terminals in New Jersey to Manhattan, a straight-line distance of 1.5 miles, cost as much as sending a shipment from Connecticut to Ohio, that is a difference of 500 miles (NYC EDC 1998).
The complex nature of the freight transportation system, the congestion that hampers it, and the physical challenges faced by the system, also extend to the institutional structure intended to govern the freight transportation system. First, firms, shippers and carriers are almost exclusively private sector. Yet the institutional structure that plans, regulates and funds the transportation system and its infrastructure is defined by a complex set of mega-agencies (each of them among the largest of its kind in the world). These agencies include, from New York State: the Metropolitan Transportation Authority (MTA), the New York State Department of Transportation (NYSDOT), and the Port Authority of New York and New Jersey (PANYNJ); and a number of smaller, though still large agencies, most notably, the New York City Department of Transportation (NYCDOT), the New York Metropolitan Transportation Council (NYMTC) the regional Metropolitan Planning Organization, and the New York City Economic Development Corporation (NYC EDC). From New Jersey, the most relevant agencies are the North Jersey Transportation Planning Authority (NJTPA), which is the MPO for Northern New Jersey, New Jersey Transit (NJT), and the New Jersey Department of Transportation (NJDOT).

The complexity of this institutional structure originates from the legislation and purposes for establishing the each agency. Needless to say, these agencies did not arise from a master plan identifying goods movement as a high priority.

• A number of special purpose governments, some of them created at the beginning of the 20th Century, have played a prominent role in the economic development and in building the region's transportation system. The Port Authority of New York and New Jersey (founded in 1921 as the Port of New York Authority), the Triborough Bridge Authority (founded in 1933 and later merged as part of the Metropolitan Transportation Authority), the Metropolitan Transit Authority (created in 1968) and the New York State Thruway Authority, and the New Jersey Turnpike Authority are examples of special governments that are given powers to design, build and operate transportation facilities, as well as (important) special powers to collect tolls and fees, and issue debt. It is the latter that makes them independent and unique operators of regional infrastructure.

• The State DOTs, most of them reorganized as such in the mid 1960s (although their predecessors date back from the 18th Century), originated from federal legislation requiring states to establish highway departments to receive and utilize federal funds. The purpose of these funds was, initially, to build roads for a rapidly
expanding (in terms of mobility) country. State DOTs still plan, build and maintain roads.

- Federal Law also requires the establishment of Metropolitan Planning Organizations (since 1975). Their purpose is to coordinate all regional transportation planning and programming and to establish an annual program of projects for the region. They also have the responsibility of long range planning. It is the MPOs who would develop regional freight plans. But note that while the MPOs plan the expenditure of funds; the other agencies (most frequently DOTs) are the recipients of funds and also have an influence on their expenditures.

Each mega-agency controls a different facet of the system and maintains some independence from the others. While many of the agencies have the power to be multi modal, and modally integrated, the history and institutional framework have led them to concentrate on single modes. And, in fact, while the special purpose authorities provide service (operate transit systems, ports, bridges and tunnels, expressways) the State DOTs plan, build and maintain highway infrastructure, but operate no transit systems or expressways. However, the infrastructure they build must serve the needs of passengers and freight; simultaneously, these people and goods also move over the portions of the transportation network controlled by the special purpose authorities.

However successful this structure may have been in the past, in this era of systems integration and multi-modalism, it is not particularly well prepared to address the challenges facing the freight transportation system. This is the result of a combination of factors. The advent of new paradigms of transportation operations, based on the use of real time information and technology, the shift toward integrated transportation system encompassing different transportation modes (multimodal transportation systems), and the sheer volume of the cargoes to be transported will all require enhanced interagency coordination and planning. Both passengers and shippers have numerous choices concerning how to move themselves, their customers and their goods. In the new era of Just-In-Time manufacturing and E-commerce, these choices depend upon knowledge of these alternatives and what the overall choices among the systems available have to offer, and, most importantly, how much they cost to use. Institutions must address their role in the system, and begin to understand the implications of real time information on how the parts of the system they control impact user behavior. This is the major shift in institutional responsibility from the last quarter of the 20th Century to the first decade of the 21st Century.

The complexity of planning for improved goods movements under
such a fragmented institutional structure is compounded by the significant role of the private industry. The New York City region, following the breakup of Conrail, is being served by two railroads; multiple railroads already serve the intermodal terminals in Northern New Jersey; float barges carrying rail cars serve some of New York City’s needs; while thousands of trucking companies take care of both long haul and local deliveries in the area. The fiercely competitive nature of the freight industry, among modes and among companies, necessitates the implementation of a planning process that is responsive to industry needs, while taking societal impacts into account.

In today’s context of just-in-time production systems and heightened international competitiveness, efficient goods movement is absolutely necessary. For that reason, and given the fact that demand is expected to grow and that adding transportation capacity is quickly becoming increasingly difficult and expensive, there is an urgent need to determine the course of action to be taken in order to guarantee increased efficiency in freight transportation movements. Effective policy making is not possible without an efficient institutional structure. However, policy making must begin, not with institutional capability, but with fundamental questions addressing economic and quality of life issues. Integrated, inter and multimodal transport policy must become more integrative in addressing current regional objectives, including:

- Reducing the costs of moving goods.
- Stimulating regional business location decisions.
- Assisting economic development and job creation.
- Reducing regional congestion.
- Improving air quality.

Only by embracing the above objectives as their guiding principles, the transportation agencies can begin the process of reshaping agendas and reviewing cooperative steps to achieve policy goals. However, it should be remembered that historical precedents in the region show how arduous and perilous the process of institutional change could be.

**Institutional Structure**

This section provides an overview of the different agencies that are related to the freight transportation system. This overview attempts to cover, to the extent permitted by the length of this paper, the agencies’ history, purpose, responsibilities, geographic domain, as well as providing an indication of the agency’s size and regional influence. Some of the information provided in this section comes from the web pages maintained by the different agencies which contain the most up to date information about the agencies considered here.
METROPOLITAN PLANNING ORGANIZATIONS IN THE REGION

In the strictest sense, there is no consensus on what is to be defined as the New York City metropolitan region. The Regional Plan Association, a civic group founded at the beginning of this century to foster regional planning, traditionally has defined the New York City region as having thirty-one counties, including counties in New York, New Jersey and three counties in Connecticut (Danielson and Doig, 1982, pp. 36-37). In this huge area, with more than 12,700 square miles, the combined jurisdictions of two Metropolitan Planning Organizations (MPOs) cover a great portion of the region. These MPOs, the New York Metropolitan Transportation Council (NYMTC) and the North Jersey Transportation Planning Authority (NJTPA), play a major role in regional transportation planning.1 These regions are shown in Figure 1.

FIGURE 1: NYMCT AND NJTPA'S REGIONS

Although the situation of a metropolitan region with multiple MPOs is hardly a new event (see examples in Dempsey et al., 2000, Vol. I, Sec. II pp. 27-30), the New York City case is unique because of the size of the transportation agencies involved, of the MPOs, and the complexity of

1. Note that there are two MPOs that define the greater New York City and Northern New Jersey region – one based in each State. This is in great contrast to the MPO in the St. Louis region, where the metropolitan area also crosses two states, Missouri and Illinois and there is only one MPO. By having one MPO - East West Gateway - the St. Louis Region attempts to address local, and intra regional conflicts at one table.
their institutional relationships. Regardless of which definition of the New York City metropolitan region is used, NYMTC's and NJTPA's regions cover a major portion of what could be considered the metropolitan region of New York, if defined in terms of the economic interactions of its different geographic areas.

NEW YORK METROPOLITAN TRANSPORTATION COUNCIL (NYMTC)

The New York Metropolitan Transportation Council (NYMTC) is an association of local governments and transportation agencies that serves as the federally mandated Metropolitan Planning Organization (MPO) for New York City, Long Island and the Lower Hudson Valley (NYMTC, 1999). As shown in Figure 1, the NYMTC region is comprised of Manhattan, Brooklyn, Bronx, Queens, Staten Island (Richmond) plus the adjacent counties of Nassau (Long Island), Suffolk (Long Island), Westchester, Putnam, and Rockland.

NYMTC's board is comprised of both voting and non-voting members that represent the different constituencies. The voting members are: New York State Department of Transportation Commissioner (as a Permanent Co-Chairperson), Nassau County Executive (Rotating Co-Chairperson), New York City Planning Commission Chairperson, New York City Department of Transportation Commissioner, Metropolitan Transportation Authority Chairperson, Westchester County Executive, Putnam County Executive, Rockland County Executive, and Suffolk County Executive. Non-voting members are: Federal Highway Administration Division Administrator, Federal Transit Administration Regional Administrator, New Jersey Transit Executive Director, US Environmental Protection Agency Regional Administrator, Port Authority of New York & New Jersey Executive Director, New York State Department of Environmental Conservation Commissioner, North Jersey Transportation Planning Authority Executive Director, New York State Department of Transportation Region 11 Regional Director (Council Secretary). As seen, two of the voting board members are appointed by the Governor of New York, two are appointed by the New York City Mayor, while five are elected local officials.

NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY (NJTPA)

NJTPA is the federally mandated MPO for Northern New Jersey. Its geographic domain consists of thirteen counties and two major cities, Newark and Jersey City. It is governed by a Board of Trustees comprised of one elected official of each county and the two major cities, for a total of fifteen members. The Board also includes a Governor's representative, the Commissioner of the New Jersey Department of Transportation
NYSDOT is one of the oldest transportation agencies in the United States. It is a descendent of the Office of Surveyor-General established in 1777, that has undergone a number of transformations over two centuries. In 1846 it was replaced by the Office of State Engineer and Surveyor, that, in turn, was replaced by the Department of Public Works in 1846 it was replaced by the Office of State Engineer and Surveyor, that, in turn, was replaced by the Department of Public Works.
1878. The Public Service Commission, established in 1907, took charge of the regulation of private transportation, railroad, bus safety inspections, and rail-highway crossings. In 1909, the Highway Act created the New York State Department of Highways. An unified Department of Public Works emerged in 1923 (NYSDOT, 2000). The modern NYSDOT was created in 1967 as part of an overall reorganization of the institutional structure of the state agencies in New York under Governor Nelson Rockefeller.

The top executive of NYSDOT is the Commissioner of Transportation, who is appointed by the Governor and must be ratified by the State Legislature. NYSDOT is organized in eleven regional offices each having a Regional Director that is appointed by the Commissioner. Three different NYSDOT regions are located in parts of the New York City metropolitan region. Region 8 consists of the Hudson Valley, Region 10 represents Long Island, and Region 11 consists of New York City. Each of these regions enjoy relative independence, though key policy decisions are usually taken in consultation with NYSDOT headquarters in Albany. NYSDOT has an operating budget of $4.8 billion (1998) and 11,000 employees.

**STATE OF NEW JERSEY DEPARTMENT OF TRANSPORTATION (NJDOT)**

The NJDOT is the preeminent state transportation agency in New Jersey. NJDOT's main functions are related to statewide planning, maintenance and rehabilitation of transportation infrastructure. With more than 5,000 employees and an annual budget of $2.17 billion, NJDOT is one of the largest and most influential agencies in New Jersey. This situation, together with access to State funds, enables NJDOT to undertake major transportation enhancement projects in an environment of relative independence. Some of these projects, e.g., Portway, are expected to improve the intermodal access to the New Jersey marine terminals along the Hudson River, thus enhancing New Jersey's role as a major national and international intermodal freight transportation hub. As with NYSDOT, it is organized in different regions (i.e., North, Central and South). Regions North and Central are the most relevant to the purposes of this paper because they represent the New Jersey counterpart of the New York City metropolitan region (see Figure 2).

**NEW YORK CITY DEPARTMENT OF TRANSPORTATION (NYCDOT)**

In addition to the state DOTs, the New York City Department of Transportation (NYCDOT) is in charge of local streets and arterials, supervises the city's franchise agreements with private bus companies, and oversees private ferry operators in city owned piers. NYCDOT is in
FIGURE 2: STATE DEPARTMENTS OF TRANSPORTATION:
NYSDOT AND NJDOT

charge of defining local truck routes, of issuing commercial vehicle permits, and of promulgating traffic regulations that affect local deliveries of urban goods movements. NYCDOT also is in charge of deployment of Intelligent Transportation Systems in its facilities, and, through its alternative fuels program, of promoting the use of alternative fuels in the area, including truck fleets. NYCDOT jurisdiction encompasses the five boroughs shown in Figure 3.

NYCDOT is headed by a Commissioner who is appointed the New York City Mayor and must be ratified by the City Council. NYCDOT, in its capacity as the arm of the New York City Mayor in transportation, is in position to influence transportation policy and projects in the New York City area. This power, significantly more than what the financial capabilities and size of NYCDOT may suggest, is derived from the fact that the New York City Mayors are influential politicians in their own right. This, in turn, enable both the Mayors and the Commissioners of Transportation to play a powerful role in shaping transportation decisions.

NYCDOT network includes a number of key bridges (e.g., Brooklyn Bridge, Williamsburg Bridge, Manhattan Bridge and the Queensboro Bridge) that are of primary importance to urban goods movements. The NYCDOT transportation network is, for the most part, complementary to the transportation network of NYSDOT Region 11.
The Port of New York Authority (PNYA) was created in 1921, with broad responsibility to solve regional transportation problems, as a bi-state agency in charge of “Port District” a bi-state area of approximately 1,500 square miles centered on the Statue of Liberty (Danielson and Doig, 1982; pp. 155). A schematic of the Port District is shown in Figure 4. Interestingly enough, the main motivation for its creation was the widespread desire to improve rail freight’s efficiency (Danielson and Doig, 1982; pp. 187). In 1972, its name was changed to the Port Authority of New York and New Jersey (PANYNJ), to make it reflects its bi-state nature.

Although originally in charge of port related activities, the PNYA filled a vacuum in the transportation sector. In 1923, after it negotiations with the railroads on improving rail access to the region foundered, the PNYA turned its attention to vehicular traffic. The same year, both states agreed that future bridges and tunnels should be “constructed and financed by the Port Authority,” (Danielson and Doig, 1982; pp. 187) though the formal agreement was signed in 1930. With the transfer of the Holland tunnel to PNYA in 1930 an era of involvement with vehicular traffic began. In the following years the PNYA would play a primary role in building the George Washington Bridge (1931), the Lincoln Tunnel
(1937); and later on, the second deck at the George Washington Bridge, the first containerports at Newark, the Port Authority Bus Terminal, and the World Trade Center (PANYNJ, 2000). The economic development impact of these investments has been significant. The cumulative investment in all facilities amounts to $30 billion in 1999 dollars (PANYNJ, 2000).

Since its modest beginnings, the PANYNJ has transformed itself into an agency of considerable size and influence with 7,200 employees, and a total budget of $3.6 billion (1999). Of similar importance is the amount of users of its facilities: 121.4 million vehicles used the interstate crossings in 1998; 3,075 ships arrived at its facilities in 1998; 86.40 million passengers used PANYNJ airports; and 65 million riders used the agency’s interstate transit system (PANYNJ, 2000).

The PANYNJ is a self supporting public agency that relies almost entirely on revenues generated by facility users, tolls, fees and rents. It does not receive tax revenues from any local or state jurisdictions, and has no power to tax (PANYNJ, 2000). In terms of governance, the Governors of the States of New York and New Jersey each appoints six members to the Board of Commissioners who subject to state approval. The commissioners serve for overlapping six year terms, and the Governors retain the right to veto the actions of the commissioners of his or her own state. The Board of Commissioners appoints an Executive Director to carry out day to day operations.
The Metropolitan Transportation Authority (MTA) was created in 1968 with broad powers to operate, design and plan the transit system in the New York metropolitan region. The MTA is comprised of a number of different organizations that collectively handle commuter rail lines, subways, buses and the bridges and tunnels that were built by the Triborough Bridge Authority (currently MTA Bridges and Tunnels) under Robert Moses.

Two of the agencies comprising the MTA are of most interest for the purposes of this paper. The first one is Long Island Railroad (LIRR), which moves freight along its commuter lines, and MTA Bridges and Tunnels, which is in control of some of the most important bridges in the New York City area (i.e., Triborough Bridge, Throgs Neck Bridge, Verrazano Narrows Bridge, Bronx-Whitestone Bridge, Henry Hudson Bridge, Marine Parkway Gil Hodges Memorial Bridge, Cross Bay Veterans Memorial Bridge, Brooklyn Battery Tunnel and Queens Midtown Tunnel). Proposals have also been made to handle freight traffic along the rail lines of Metro North, another commuter rail agency part of MTA. These facilities are shown in Figure 5.

**Figure 5: MTA Bridges and Tunnels**

The MTA is governed by a seventeen member Board. Members are recommended by the Governor (six), New York City's Mayor (four), and the county executives of the outlying New York State counties served by
the MTA (seven members with a total of four votes, because the members from the counties of Dutchess, Orange, Putnam, and Rockland cast one collective vote). In addition to voting members, the MTA Board includes non-voting members representing transit worker unions (three) and various civic groups (three). The MTA operating budget in 1998 was $6.4 billion with 58,000 employees.

**THE NEW YORK CITY ECONOMIC DEVELOPMENT CORPORATION (NYC EDC)**

The New York City Economic Development Corporation is a quasi-governmental agency which contracts with the city to promote long-term economic growth. The agency provides services to New York City businesses to make them more competitive, productive, and profitable (NYC EDC, 2000). NYC EDC has played an increasingly important role in trying to define freight transportation policy in the region.

The agency’s President and a Chairman of the Board are both appointed by the New York City Mayor. The agency has been active in the effort to redevelop the Port of New York, and has produced a number of planning documents on intermodal freight transportation and urban goods movements. The NYC EDC also manages the Brooklyn Army Terminal in Sunset Park, Brooklyn and is overseeing renovations to the facility.

**CHALLENGES AND OPPORTUNITIES IN CURRENT INSTITUTIONAL STRUCTURE**

As it should be evident by now, the institutional structure of the transportation sector in the New York City metropolitan region is characterized by a high degree of fragmentation, both functionally and geographically. This fragmentation, which is the product of the nature and character of the historical evolution of the agencies in the region, prevents the region’s transportation agencies from taking advantage of the tradeoffs that frequently occur in such complex systems.

From the functional standpoint, a number of different agencies control and operate key components of the region’s transportation network, each acting somewhat independent of the others (see Table 1). Bridges and tunnels are operated and maintained by five different agencies (Port Authority of New York and New Jersey, New York City Department of Transportation, New York State Department of Transportation, New Jersey Department of Transportation, and Metropolitan Transportation Authority). The complexity is exacerbated, not only by operating concerns, but also by regulatory and financial concerns. For example, State DOTs must follow regulations set by the U.S. Department of Transporta-
tion in planning and operating infrastructure. Their budgets are complex combinations of federal funding, and State general and dedicated funds (in New York and New Jersey, State DOTs do not operate toll roads, and do not issue debt). The special purpose authorities discussed here (i.e., Port Authority of New York and New Jersey, Metropolitan Transportation Authority) do operate toll facilities and, as noted, issue debt. A summary of the key features of the key agencies is shown in Table 1.

**Table 1: Main features of agencies in New York metropolitan region**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Geographic domain</th>
<th>Modes</th>
<th>Type of agency</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York Metropolitan Transportation Council</td>
<td>New York City + 5 counties in NY</td>
<td>MPO</td>
<td>Plan, coordinate</td>
<td></td>
</tr>
<tr>
<td>North Jersey Transportation Planning Authority</td>
<td>13 counties in NJ</td>
<td>MPO</td>
<td>Plan, coordinate</td>
<td></td>
</tr>
<tr>
<td>New York State Department of Transportation</td>
<td>New York State State highways, traffic control systems</td>
<td>DOT</td>
<td>Plan, build</td>
<td></td>
</tr>
<tr>
<td>New Jersey Department of Transportation</td>
<td>State of New Jersey State highways, traffic control systems</td>
<td>DOT</td>
<td>Plan, build</td>
<td></td>
</tr>
<tr>
<td>New York City Department of Transportation</td>
<td>New York City Local streets, arterials, traffic control systems</td>
<td>DOT</td>
<td>Plan, build</td>
<td></td>
</tr>
<tr>
<td>Port Authority of New York and New Jersey</td>
<td>Port District in NJ and NY Marine terminals, bridges, tunnels, airports, transit</td>
<td>Special purpose</td>
<td>Plan, build, operate, issue debt, toll</td>
<td></td>
</tr>
<tr>
<td>Metropolitan Transportation Authority</td>
<td>New York City + 7 counties in NY Buses, subways, commuter lines, bridges, tunnels</td>
<td>Special purpose</td>
<td>Plan, build, operate, issue debt, toll</td>
<td></td>
</tr>
<tr>
<td>New York City Economic Development Corporation</td>
<td>New York City Marine terminals</td>
<td>Special purpose</td>
<td>Plan, operate</td>
<td></td>
</tr>
<tr>
<td>Federal Agencies: USDOT, FHWA, FTA</td>
<td>US</td>
<td></td>
<td>Oversight, regulate</td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 1, geographically, no two agencies in the New York City metropolitan region have similar jurisdictions. This situation translates into the agencies having different definitions about their role and the relative importance of their constituents. The geographic jurisdiction also determines the area of responsibility of the agency and consequently the way in which the resources are allocated.
Almost all of the major transportation agencies in the region, in one way or the other, perform functions that overlap with other agencies. This overlapping is most evident between special purpose authorities and the Department(s) of Transportation. The Port Authority of New York and New Jersey (PANYNJ) has traditionally had a highly capable planning staff that performs technical work similar to that performed by the MPO; its jurisdiction overlaps with both the New Jersey DOT and New York State DOT; and, although originally focused on port development, over the decades, PANYNJ’s role has changed to include the operation of the regional airports, an interstate transit system and the World Trade Center. The Metropolitan Transportation Authority, in addition to operating one the largest transit system in the world, operates a number of important toll bridges and commuter lines that play and important role in the freight system. At the same time, both New Jersey and New York DOT control a significant portion of the intermodal freight system, while the remainder is controlled by private intermodal companies.

The complexity of this institutional structure is magnified by the power relationships among the agencies. Contrary to the case of simpler metropolitan regions in which a single agency—frequently a DOT—is able to marshal the power to play a dominant role in its region; in the New York City metropolitan region no single agency enjoy a situation of dominance. Assuming that the operating budget is an indication of the agency’s strength, it is interesting to note that four of the agencies have operating budgets—of the same order of magnitude—exceeding $2 billion per year (MTA, $6.4 billion; NYSDOT, $4.8 billion; PANYNJ, $3.6 billion; and NJDOT, $2.17 billion). This situation makes systematic transportation planning much more difficult to achieve because there are many more players (with conflicting views about investment priorities) to take into account when doing transportation policy and programming. Furthermore, since two of these agencies issue debt the interest of bondholders need also to be taken into account.

In spite of the centripetal forces leading each agency toward a potentially different direction, there is no doubt that all the agencies must play, ultimately, a positive role in the region they are located. When addressing the objectives noted in the introduction, all agencies, local jurisdiction and special government must recognize two significant factors necessary to solve goods movement problems. These are:

- the rapid integration of high technology (Intelligent Transportation Systems, ITS) into infrastructure; and,
- the need to bring innovative and modern techniques of financing to support infrastructure renewal and growth.

The first, ITS, is changing the way infrastructure systems will be op-
erated (Paaswell, 2000). Infrastructure systems will go from static control to centralized, real-time dynamic control. This will add not only capacity, but more choices for system users. Ultimately, ITS should drive real system use costs down. The second addresses the need to get away from issuance of debt as the primary way to build new infrastructure. In Europe and Asia, innovative finance incorporates road pricing, land value arbitrage and a number of other approaches to raising capital and operating funds for modern infrastructure.

The complexity of today's local transportation governments mitigates against quick changes to these new models. First, each agency is supported by a particular local or State government and reflects—to some extent—the wishes of the voters. Second, each has a long institutional history of managing its slice of the pie. However, because these agencies have for the most part interlocking Board of Directors, that are appointed by Governors, Mayors, and Legislatures—these obstacles to institutional change can be overcome. Atlanta, Maryland, Seattle and Vancouver have just gone through regional government transformations that began with setting new regional objectives, such as those noted above (for a meaningful summary of the Seattle case see Dempsey et al., 2000, Vol. I, Sec. II pp. 10-12).

**NEW PARADIGMS OF GOVERNANCE**

It seems evident that the institutional structure discussed above, which has been the result of an unique set of historical circumstances, needs to evolve to be able to deal with the new set of challenges posed by the 21st Century. The need to design and implement highly complex Intelligent Transportation Systems, to take into account the broad range of constituents, to do effective multimodal planning, to build the highly expensive and challenging infrastructure projects the region needs, necessitates a different kind of institutional structure based on new paradigms of governance.

It is not entirely clear at this point in time what these new paradigms would be. In all likelihood any new governance structures in the New York City metropolitan region are going to be the result of complex political negotiations. As with any other complex system, the result is likely to be determined by both the pressures for change and the political feasibility of the proposed solution. Importantly, it should be understood that the rationale for change begins with a strategic action: defining the objectives to improve intermodal and freight transportation. These must be added, or used to modify the broader set of transportation goals existing in the region.

In any case, regardless of the actual institutional and governance
structures that will be implemented in the future, the path to change will encompass three distinct set of options. The first set of options consist of modifying, in some cases redefining, broadening and in others narrowing, the agenda and mandates of different agencies. The second set consists of defining inter-agency cooperation agreements, (i.e., compacts, memoranda of understanding and other agreements), aimed at ensuring that the resulting institutional and governance structure is able to effectively respond to the development challenges outlined here. The third set is comprised of a set of actions intended to change the agencies themselves, including the creation of new agencies, if needed.

The structure of the region's MPOs may also need to change to include a broader set of constituents and stakeholders. In their present form, the region’s special purpose agencies— that have been engines of economic development— are not fully represented as voting members, though the Port Authority of New York and New Jersey is member of NJTPA and the Metropolitan Transportation Authority is member of NYMTC. Many of the special purpose governments have been created to address complex issues of regional funding. However, in the past, most of these agencies, with the exception of the Port Authority of New York and New Jersey, have had narrowly focused agendas. The inclusion of the special purpose agencies as part of the MPOs would significantly enhance the planning process, bringing to the planning table considerable expertise in innovative financing and programming, and would undoubtedly smooth the implementation of projects and programs.

Other proposals that deserve consideration and that certainly have the potential to enhance interagency coordination are: a) to put the Commissioner of the New York State Department of Transportation in the Boards of the Port Authority of New York and New Jersey and the Metropolitan Transportation Authority; and, b) to create a Transportation Cabinet, comprised of the Executives of the transportation agencies in New York City. Though incremental such steps could improve coordination and pave the way for more formal interagency interactions.

The region’s leaders must also try to achieve an institutional structure for the transportation sector that is able to deal with the frequently differing perspectives of Mayors and Governors, while still providing effective transportation planning. Outside pressure, from both civic groups and the Federal Government, may play a key role in aligning the priorities of Mayors and Governors toward institutional change. The Federal Government should play the same type of proactive role it played during the construction of the interstate highway system. Environmental legislation may be the catalyst for an increased Federal role in the region. Civic groups must play a proactive role in pushing transportation up in the busy agendas of Mayors and Governors, so that the region's leaders appreciate...
the need to undertake the institutional changes the region needs. Such outside pressure may also play a role in mitigating other dynamics such as: City vs. Suburbs, Highway vs. Transit, State Agencies vs. Local Governments, that add significant complexity to the political equation.

Agencies in New York City metropolitan region have a history of change. The challenge of integrating goods movement priorities into the region’s transportation agenda comes from understanding that the transportation components are highly multi modal, and that the private sector is the primary player. Global competitiveness mandates that the region reexamine how it moves and transfers goods entering, leaving and being redistributed to and from the rest of the world. This is part of an economic development agenda that must also help shape the transportation agenda.

The political realities at the New York City metropolitan region, in which a set of powerful, tradition-rich, agencies have dominated the institutional scene for decades, seems to indicate that the path to change will be one more of gradual evolution than one of institutional revolution. The existing agencies are characterized for having, for the most part, highly competent executives in the art of politics that are likely to defeat abrupt changes in the agency’s role, and of its position in the institutional totem pole.

CONCLUSIONS

The institutional system governing the New York City metropolitan area is as complex and varied as the transportation system itself. It is comprised of a number of agencies of great influence and power that, for the most part, operate in an environment of functional and geographic fragmentation.

This situation is the result of a unique set of historical circumstances. However successful in the past, this institutional structure needs to transform itself into another more responsive to the economic development objectives of one of the largest, and more complex, metropolitan regions in the world. This challenge is compounded by the sheer size of the regional transportation system, both of passengers and freight; and by the integrative pressures of the tidal wave of Intelligent Transportation Systems—that are effectively pushing the agencies down the path of inter-agency coordination.

However high the pressure for institutional change may be, it will not take place in a vacuum. It will take place in a highly contested political arena, with players well versed in the political arts that, most likely, will defeat any proposal that may significantly reduce or alter the perceived power of the agency. This situation seems to indicate that the path
of institutional change will be one more of gradual evolution than of revolu-
tionary institutional transformations. Outside pressure, from both
civic groups and the Federal Government, is a *sine qua non* condition for
the regions' leader to develop a common agenda of institutional change.

This paper identifies three main avenues of change: redefining the
agencies' mandates and roles; implementing inter-agency compacts or
memoranda of understanding that lay out the foundation for effective in-
ter-agency cooperation; and transforming the institutional structure in-
cluding the consolidation and creation of new agencies, if deemed
necessary. In any case, the existence of powerful political players at all of
the agencies involved, each having its own set of constituents and de-
mands, points out to a long and arduous process of institutional change. It
is the authors' hope that at the end of this process the New York City
metropolitan region be able to have the regional and multimodal trans-
portation agencies that have been the unfulfilled dream of long gone gen-
erations of planners and civic leaders.

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Progress in Intermodal Passenger Transportation: Private Sector Initiatives

Andrew R. Goetz
Timothy M. Vowles
Department of Geography and Intermodal Transportation Institute
University of Denver

INTRODUCTION

Any casual observer of the passenger transportation system today in the United States is aware that problems abound. Whether one is driving or riding on highways, boarding long-distance rail, local transit, or flying on the nation's airlines, problems with congestion, delays, poor on-time performance and customer service, high costs, and an overall poorer quality of travel experience seem to be endemic to the system. Of course, there are exceptions with travel in some locations having improved as a result of new infrastructure, technology, service innovations, or other factors. But with increasing numbers of passengers pressuring existing systems that are unable to cope with the increased demand, the growing and disturbing trend is toward diminution of the quality of passenger travel.

Our increasingly globalized economy is being driven to a large extent by new technologies and innovations in communications and the information sector. An increased amount of business and personal interaction among people and organizations around the world has been facilitated by these innovations. To some extent, communication technologies can serve as a substitute for travel, especially for telecommuting purposes and basic information exchange. But research has also shown that improved
communication technology can also increase the need for travel as new opportunities for direct interaction arise because of the improved technologies. The world is smaller today because of dramatically improved information flow, despite the fact that physical distances remain the same.

Overcoming the friction of distance is still an obstacle to direct face-to-face communication, and even though transportation technology has improved dramatically over the last two centuries, the pace of improvement has slowed over the last thirty years. There have been very few significant technological breakthroughs and widespread adoptions that have dramatically increased speeds or reduced travel times for passenger transportation systems. Instead, it appears that travel times are increasing, rather than decreasing. According to Coyle, Bardi, and Novack¹, it took 12 days to travel by pack horse between Philadelphia and Pittsburgh in 1800. By 1840, a canal and railroad system reduced the trip to seven days. In the 1850s, a direct rail line reduced it further to two days, and by 1910, improvements in rail technology cut the trip to just eight hours, representing a 97% reduction in travel time in one century. With the innovation of air transport and subsequent technological improvements, the trip was reduced to 50 minutes by the 1960s, representing a travel time reduction of another 90% in 60 years. Since the 1960s, however, travel times have not gone down significantly, and in a surprising number of cases, have actually been increasing. Airline travel times in the year 2000 between Philadelphia and Pittsburgh are listed at over an hour, longer than it took in the 1960s.

Not all of the blame should be targeted at the lack of technological breakthroughs. The supersonic Concorde could cover the Philadelphia-Pittsburgh trip in about half the present time, but this aircraft has encountered numerous implementation obstacles, especially concerns with noise, cost of operation, and the recent Air France Concorde crash and grounding of all Concordes casts a large question over the future of commercial supersonic air transport. Very high-speed rail (over 300 mph) systems, including Maglev, are other alternatives that could significantly reduce transport times in selected corridors, but widespread adoption and implementation has been slowed due to capital cost and safety concerns. Rather than lack of technological breakthroughs, it has been operational difficulties, lagging infrastructure development, and lack of coordination among transportation modes that are largely to blame for the lack of progress in transportation performance. The speeds and performance of the line-haul portion of intercity travel have generally been maintained or

have experienced some improvement within the last thirty years. It is at the terminals or stations and the intracity portion of the travel where the problems are concentrated.

Both freight and passenger systems suffer from the same affliction of congestion and delays at terminals and in intracity travel. Advantages gained in improving line-haul speeds and travel times can be wiped out with hours or even days of delays into and out of terminal locations. Operational difficulties occur with increasing regularity as a result of adjusting to new mergers and acquisitions, labor disputes, capacity mismatches, as well as the ever-expanding volume of demand. Basic infrastructure development, such as new or improved terminals, stations, airports, roadways, rail lines, and other necessary systems to enhance efficiency and safety have not kept pace with demand. Finally, better coordination among the modes through a stronger commitment to intermodalism would result in better performance.

Much of the progress that has been made toward the development of an intermodal transportation system in the United States has been on the freight side, led largely by private sector initiatives. Conversely, progress toward developing an intermodal system on the passenger side in the United States has lagged, especially in comparison with systems in Europe. Much of this difference is due to the large role that the public sector plays in passenger transportation, particularly at the intracity scale, and the uneven development of passenger transportation systems in the United States, aside from the private automobile/public highway system. The lack of intermodal systemwide planning has limited the benefits that could be achieved through coordinating and connecting existing passenger systems. Private passenger transportation companies are starting to become interested in intermodalism, and are beginning to develop more innovative programs and plans to tap into the benefits of such an approach.

In order to help promote an improved intermodal passenger system in the U.S., a greater awareness and understanding of the benefits of intermodalism need to be realized. Collecting and organizing data on current intermodal policies, plans, programs, and projects initiated by both public and private sector organizations is critical. As a first step toward this goal, this paper will identify and assess private sector initiatives among intercity passenger operators, with the purpose of identifying innovative practices. This research will also yield insights from a private sector perspective concerning current progress, barriers, and opportunities of passenger intermodalism. There is wide variation among organizations concerning the degree to which the intermodal concept has been embraced. This research will highlight those companies that are more
progressive in spearheading development of an intermodal passenger transportation system in the U.S.

The paper will begin with some background on the major passenger transportation modes in the United States, followed by a discussion of the intermodal concept in passenger transportation. The focus of the paper is on private sector initiatives from the major intercity bus, rail, and air transportation companies in the development of an intermodal passenger transportation system.

**Passenger Transportation in the U.S.**

Serious students of transportation history understand that modern forms of transportation owe their origins to technological developments largely within the last two centuries. Prior to the 1800s, water transportation via the sailing ship on oceans and other navigable waterways was the primary mode of long distance transport, while land transportation was limited to horse-drawn wagons or carriages traveling on very poor roadways. The building of inland canals helped to bring the advantages of water transport to interior locations, most notably in the opening of the Erie Canal in 1825. But it was the innovation of the steam engine and its application to steamships and railroads that represented a major technological breakthrough, significantly increasing carrying capacity, speeds, reliability, and geographical reach. In particular, the railroad became the workhorse of long-distance passenger transportation in the U.S., holding a position of unquestioned dominance from the mid-1800s to the 1920s. The application of rail technology to intra-urban transportation occurred through the use of commuter railroads and later through the innovations of the electric streetcar, subway, and elevated rapid transit lines.

The 1900s brought additional technological breakthroughs, particularly the application of the internal combustion engine to the automobile, bus, and truck. The development of the motor vehicle industry revolutionized transportation as well as the national economy. Henry Ford's assembly line and innovative management practices propelled the automobile into becoming the transportation mode of choice and spearheaded long waves of economic development now referred to as the Fordist mode of production. The success of the motor vehicle industry was tied to the inherent advantages of speed, convenience, and reliability that these private forms of transportation conveyed. But a very necessary accompaniment to the success of the private motor vehicle was the public road and highway system. The early public roads and highways of the 1920s and 1930s began to establish motor vehicles as serious competitors

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to the railroads. The massive road-building and highway programs of the early postwar period (1945-1970), especially the inauguration of the Interstate Highway System in 1956, catapulted the automobile to a position of overwhelming dominance in U.S. passenger transportation at both the intercity and intracity scales. This position of automobile dominance has not eroded, and in fact has strengthened, throughout the latter decades of the twentieth century. By 1995, the private automobile accounted for over 80% of U.S. domestic intercity passenger-miles (See Table 1) and over 90% of U.S. intracity passenger-miles.

Another major technological breakthrough of the twentieth century was the invention of the airplane and subsequent developments in aviation. Air transportation represented a great leap forward in domestic intercity and overseas travel through its sheer speed in overcoming the friction of distance. Though starting slowly in the early half of the 20th century, air passenger transportation became a major passenger mode by the 1950s, eclipsing rail in 1957 based on intercity passenger miles. The rate of growth in air transport has exceeded all other passenger modes over the last 40 years, and now accounts for a sizeable portion of both intercity passenger miles and numbers of passengers carried by for-hire modes of transport (See Table 2).

Table 1
U.S. Domestic Intercity Passenger-Miles, 1995
(Billions of Passenger-Miles)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Passengers-Miles</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Automobile</td>
<td>1,898</td>
<td>80.6%</td>
</tr>
<tr>
<td>Airlines</td>
<td>403</td>
<td>17.1%</td>
</tr>
<tr>
<td>Bus</td>
<td>28</td>
<td>1.2%</td>
</tr>
<tr>
<td>Rail</td>
<td>14</td>
<td>0.6%</td>
</tr>
<tr>
<td>Private Aviation</td>
<td>11</td>
<td>0.5%</td>
</tr>
</tbody>
</table>


The U.S. airline industry has grown and developed under two different regulatory phases. From 1938 to 1978, the Civil Aeronautics Board regulated the industry with respect to market entry and exit, pricing, mergers and acquisitions, and subsidies. Airlines were required to receive CAB approval for any changes they wished to make in routes, fares, fares.

or company structure. The industry developed within this regulatory framework so that airlines became established as either trunk (major) carriers, local service (regional) carriers, intrastate, charter, or air taxi (commuter) carriers. Airlines including American, Braniff, Continental, Delta, Eastern, Northwest, United, and Western were among the trunk airlines, serving the major transcontinental routes. By 1978, the trunk airlines accounted for 87% of domestic revenue passenger miles (RPMs) within the airline industry.

Deregulation of the airline industry in 1978 heralded the beginning of the second major phase in the evolution of the industry. The CAB was phased out, while airlines were allowed to serve any route at any fare, while they were also allowed to merge with and acquire other airlines. During the first five years of deregulation, former regional airlines (e.g., USAir, Texas International), intrastate (e.g., Southwest), and new “upstart” carriers (e.g., People Express, New York Air) began to challenge the majors and reduced their domestic RPMs to 75% by 1983. What followed from 1983 to 1993 was a wave of mergers, acquisitions, and bankruptcies that resulted in a much fewer number of major carriers emerging as the dominant players in the industry. By 1993, eight major carriers (United, American, Delta, Northwest, Continental, US Airways, TWA, and Southwest) controlled 93% of domestic RPMs. Since 1993, another wave of new entrant carriers (e.g., Valujet/AirTran, Kiwi, Spirit, Frontier, Vanguard, Western Pacific) have tried to become established service providers, with mixed success. Today, the airline industry is still dominated by a small number of major carriers, and the possibility of another round of merger activity exists as evidenced by United Airlines’ recent announcement of its intention to merge with USAirways and the code share agreement between Northwest and Continental.

The intercity bus industry in the United States has faced a more difficult road in its quest to serve the traveling public. After a period of early rapid growth in the 1930s and 1940s, the intercity bus industry has main-

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**Table 2**

**U.S. Domestic Intercity Passengers Carried by For-hire Modes, 1995**

(Millions of Passengers)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Millions</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>499</td>
<td>40.5%</td>
</tr>
<tr>
<td>Bus</td>
<td>359</td>
<td>29.2%</td>
</tr>
<tr>
<td>Rail, Commuter</td>
<td>351</td>
<td>28.6%</td>
</tr>
<tr>
<td>Rail, Amtrak</td>
<td>20</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

tained about the same number of passenger-miles since 1945. Combined with the dramatic increases in automobile and air traffic, the bus industry has seen its share of intercity passenger-miles decrease over time to 1.2% by 1997. Still, the bus industry accounted for 359 million intercity passengers in 1997, second only to air among the for-hire modes, representing nearly 30% of intercity passengers (See Table 2). According to the American Bus Association, buses serve 4,274 towns in the U.S., considerably more than air and rail. Many small towns rely solely on bus service as the only non-automobile passenger transportation alternative.

There are approximately 3,600 bus companies operating in the U.S. today. The largest bus company is Greyhound Lines, accounting for approximately 20% of RPMs in the intercity bus industry. Greyhound is the only nationwide provider of scheduled intercity bus transportation services in the U.S, serving more than 2,500 destinations. Greyhound recently merged with Laidlaw, Inc. of Canada, which also owns Greyhound Lines of Canada and certain Grey Line franchisees. Most other bus companies operate contract charter and special service, offering non-scheduled specialized service to and from specific points for groups of passengers. Some local service bus companies offer intercity service in and around major metropolitan centers, usually for longer distance commuting trips.

From the mid-1800s to the 1920s, intercity passenger transportation in the U.S. was dominated by the private railroads. From 1945 to 1970, the private rail passenger industry experienced a period of precipitous decline attributable largely to competition from the automobile/highway system and the airlines. By 1970, intercity rail travel shrunk to 10% of levels attained during the early 1940s, and practically all the private railroads were losing money on their passenger services. This dire situation led directly to governmental intervention to try to salvage passenger railroad service through the creation of the National Railroad Passenger Corporation, a quasi-governmental corporation, otherwise known as Amtrak. Amtrak relieved private railroads of their passenger obligations

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5. American Bus Association webpage.
through establishment of a basic nationwide network of rail passenger service initially using private railroad rolling stock and rights of way.

Since 1970, Amtrak has tried to stabilize and reinvigorate the passenger rail industry in the U.S. Although revenue passenger-miles have increased somewhat since 1970, intercity rail continues to fall farther behind private automobiles and the airlines. Amtrak has had a difficult time financially during this period, never having turned a profit. The percentage of revenues covering costs has ranged from 37% to 80%. The most successful part of Amtrak's operation has been the Northeast Corridor service between Boston, New York, and Washington. In this congested high-density corridor, frequent and relatively high-speed trains have been effective competitors to the highways and airlines. Outside of the Northeast Corridor and a few other higher-density corridors, the rest of Amtrak's system is characterized by less frequent, slower-moving trains over longer distances serving lower density markets. It is in these markets where Amtrak currently cannot compete with its competitors, although the type of service Amtrak provides here is geared to a more specialized tourist market, rather than business.

A relatively large number of rail passengers use commuter rail services provided by various private companies and public authorities in and around major metropolitan centers. Commuter rail operations such as New York's Long Island Railroad, the commuter rail "T" lines in Boston, MARC in the Washington, DC/Baltimore area, the Chicago and Northwestern in Chicago, Tri-Rail in Southeast Florida, and the Bay Area commuter rail lines in San Francisco are good examples. In some ways, these commuter lines should really be categorized as intracity rail, as commuting trips tend to be much shorter than standard intercity trips, and usually occur within the travelshed of the extended metropolitan area. These commuter rail operations have grown significantly in recent years, and will probably continue to grow as exurban highways and roadways become more congested with commuter activity.

In sum, intercity passenger transportation in the U.S. today is dominated by the private automobile/highway system and the air transportation system. But as was noted earlier, these systems are suffering from increased congestion and delays, and the pace of progress in improving speed and reliability has slowed significantly. These problems must be addressed in numerous ways, including the development of a truly intermodal passenger transportation system, where the strengths of each mode can be utilized to greater effect within an integrated system. It is to this topic that we now turn.

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Precisely defining intermodal transportation is a tricky endeavor. There are numerous definitions of the term, each with their own nuances that may be applicable in particular contexts. A basic definition would be "being or involving transportation by more than one form of carrier during a single journey." A fuller definition would be "the concept of transporting passengers and freight on two or more different modes in such a way that all parts of the transportation process, including the exchange of information, are efficiently connected and coordinated." This second definition is more descriptive of the larger meaning associated with intermodalism, particularly regarding the efficiencies that accrue as a result of connected and coordinated services. Strictly speaking, intermodal transportation has been in existence throughout human history, such as when the first sailing ships were loaded with cargo taken from horse-drawn carts. But these simple transfers of freight or passengers from one mode of transport to another have come to be viewed largely as separate activities from the perspective of the individual modes of transportation. An intermodal approach sees the whole process of moving people or goods as a connected intermodal system working together as opposed to separate modal systems working independently.

This intermodal approach to transportation is becoming more widely recognized by private sector providers of transportation, governmental agencies, and the larger transportation community. The private sector has led the way in the adoption of intermodal technologies within the freight transportation arena, most notably the pioneering efforts of Malcolm McLean and Sea-Land Services in the 1950s in spearheading the container revolution, as well as the development of piggyback services (trailer on flat car [TOFC] or container on flat car [COFC]) by the freight railroad and trucking industries starting in the 1950s. Today, intermodal operations are part and parcel of the shipping, railroad, trucking, and air cargo businesses, and have resulted in a much more integrated and efficient freight transportation system. An intermodal approach has resulted in increased profitability, better utilization of existing infrastructure, reduction in need of additional capacity, lower prices, and better customer service.

Over 40 years of intermodal development on the freight side have shown that an intermodal approach is more efficient. Unfortunately, a

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similarly successful track record on the passenger side does not exist because the passenger system has lagged behind. Nevertheless, it is expected that similar efficiencies can be gained when applying intermodal concepts and practices to the passenger arena. Theoretically, improvements in physical connectivity and information coordination should result in substantial efficiencies that will benefit all passenger modes so engaged. As more passenger operators engage in intermodal linkages, there will develop a track record that can be analyzed to determine precise benefits achieved through the adoption of specific intermodal operations.

The U.S. Department of Transportation and other governmental entities have reacted to the intermodal revolution in freight transportation by adopting and promoting it as official policy in both freight and passenger transportation. The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) was the first major piece of federal transportation legislation that did not contain the word "highway". It signaled a shift in thinking about transportation away from individual modal perspectives to a more integrated intermodal approach. Since government is responsible for providing much of the infrastructure used in both freight and passenger transportation in the U.S., government recognition of intermodalism is an important step in the development of the larger system, particularly for the passenger sector.

It is increasingly being recognized that the benefits of an intermodal approach already realized in the freight transportation industry can be extended into the passenger transportation arena. Whether or not passenger services are provided by the private sector or by government, thinking in terms of providing seamless, door-to-door service through a combination of integrated modes must be a part of present and future planning activities. Passenger transportation has lagged behind freight transportation in the US in the adoption of intermodalism. Furthermore, other countries around the world, especially in Europe, have developed better intermodal passenger systems. The bad news is that the U.S. is behind in passenger intermodalism; the good news is that there are good examples of how it can be done based on both US freight intermodalism and European passenger intermodalism.

Over 40 years of intermodal development on the freight side in the U.S. have shown that an intermodal approach is more efficient. Unfortunately, a similarly successful track record on the passenger side in the U.S. does not exist because the passenger system has lagged behind. Nevertheless, it is expected that similar efficiencies can be gained when applying intermodal concepts and practices to the passenger arena. Theoretically, improvements in physical connectivity and information coordination should result in substantial efficiencies that will benefit all
passenger modes so engaged. As more U.S. passenger operators engage in intermodal linkages, there will develop a track record that can be analyzed to determine precise benefits achieved through the adoption of specific intermodal operations.

**Vision of an Intermodal Passenger Transportation System**

Imagine a future whereby an individual takes a trip from Meridian, Mississippi to Vouray, France using a combination of modes including local transit, intercity bus, intercity high speed rail, and international air in which only one through-ticket has been purchased and baggage is picked up at the origin and delivered to the final destination. This vision, elaborated by Gil Carmichael, describes the essence of what intermodal passenger transportation is all about: seamless, efficient, environmentally sound, and safe transportation for travelers moving from point-to-point throughout the world.

When Federal Express or UPS delivers a package from Haverhill, Massachusetts to Columbus, Indiana, several modes of transportation are involved but the customer calls one company and the delivery occurs with a guaranteed time of arrival. But if a non-driving passenger wishes to make the same trip, that person would have to contact at least four separate transportation providers to schedule the trip at a relatively high cost with no assurances of actual time of arrival. This example illustrates important differences between the freight and passenger transportation sectors in the U.S. To be fair, it should be recognized that it is easier in most cases to ship packages rather than people. Packages do not talk back, and don't mind being stacked up in warehouses or on trucks. Still, given the importance of transporting people, one would think that performance can improve to at least approximate the efficiencies already achieved in the freight sector.

The vision of a seamless, integrated passenger system in the US can be made more focused by considering actual practices in more intermodally advanced places such as Europe. The infrastructure of European passenger operations is much better as the individual systems of intercity rail, bus, and local transit are themselves better developed. But the Europeans have made important strides in linking these systems together so that connections are much more convenient to the traveler. The classic example is the intercity rail stations in the lower levels of major European airports, including Charles de Gaulle in Paris, Gatwick and

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Heathrow in London, Frankfurt, Amsterdam, and Zurich. With the development of the Trans-European High Speed Rail Network, an international flight to any of these major airports provides convenient access to the numerous cities and towns throughout Europe. Once reaching the desired city, the more ubiquitous local rail transit or bus systems can take travelers close to their final destinations. The European intermodal system is not perfect but it is a distinct improvement over what is available in the U.S.

**Intermodal Passenger Transportation in the US**

The successful application of intermodal principles to transportation relies on three critical factors: infrastructure, information technology, and cooperation. In freight transportation, most of the intermodal innovations in infrastructure, information technology, and cooperation were developed by the private sector, as individual companies within modes worked with other companies from other modes to create a better, combined service for the customer. In the passenger arena, the public sector plays a much larger role as both provider of infrastructure and services, especially at the intracity scale. But the private sector is a major passenger service provider at the intercity scale, most notably in the form of the airlines, bus companies, and intercity passenger rail. If the evolution of a passenger intermodal system in the US takes a path similar to that of freight, it will be the private sector that will be the driving force for the changes necessary to create an integrated, seamless system.

The challenges to achieving such an intermodal system in the US are great. Even if the private sector passenger companies are willing to make intermodalism a reality, many of the changes must rely on an infrastructure that is largely the domain of the public sector. The cooperation between private companies will require cooperation with public sector authorities responsible for turning the airports, rail stations, and bus stations into fully integrated intermodal terminals. Public sector progress is a critical element in the ultimate success of passenger intermodalism, and is the subject of further research on the efforts of the US DOT, state DOTs, metropolitan planning organizations, regional transportation authorities, transit agencies, and individual counties, cities, and towns to implement intermodal initiatives. The purpose of the remainder of this paper, however, is to focus on the progress made thus far by leading private sector passenger transportation companies in helping to achieve the vision of an intermodal passenger transportation system in the US.

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The three major modes of commercial intercity passenger transportation in the United States have different goals and objectives concerning intermodal partnerships with each other. This section's focus is on existing programs that are already in place for bus, rail, and air intermodal transportation.

a. Bus

The major intercity bus carrier in the United States is Greyhound Lines, Inc. based in Dallas, Texas. As the most flexible of the three modes, Greyhound is able to adjust its schedules and routes to meet the requirements of its rail and air partners. The largest alliance is with Amtrak, called “Amtrak Thruway Connections”. Thirty-four of Greyhound’s routes are sold as part of the Amtrak connection and allow travelers in such locations as Phoenix, Duluth, Boise, and Columbus a linkage to Amtrak’s nationwide rail system. Appendix A and Figure 1 show the Amtrak connecting stations and the routes served by Greyhound or a subsidiary of Greyhound. The intermodal service offered by the two companies allows for travelers to purchase a single ticket good for travel on both modes. Along with the service alliance that Greyhound and Amtrak have, the carriers are also co-located at 36 intermodal transfer stations across the country.

Greyhound’s linkage with air service providers is not as strong as its alliance with Amtrak. The only true alliance that Greyhound has with an airline is through its Peoria-Rockford subsidiary with United Airlines at Chicago O'Hare. With this alliance, passengers wanting to travel to/from Rockford, Illinois can purchase tickets to their destination on United Airlines. Passengers are transported to/from Chicago O'Hare on bus service provided by the Peoria-Rockford Bus Company and from there United takes passengers to their final destination. The service is marketed by United as Groundlink and by Greyhound as Flightlink. Benefits of this service include one ticket and one reservation convenience, a discount when purchasing the tickets together instead of separately, and frequent flier mileage for the ground travel. Greyhound offers its Flightlink services at 16 other airports but none of the routes are tied to specific carriers at the airports Greyhound serves, and none of the service is quoted in any airline CRS (See Appendix B).

These are not the first attempts by Greyhound to link up with air carriers in the United States. During the 1980s the company had an agreement with America West to connect Scottsdale, Arizona to America West flights at Phoenix Sky Harbor Airport. During this same period
Greyhound also had an agreement with the now defunct PEOPLExpress. As late as 1997-1998 Greyhound and Airtran Airways had a code share agreement between Airtran’s hub at Atlanta Hartsfield and Macon, GA and Chattanooga, TN. This agreement like the previous ones in the 1980s ended. Greyhound’s agreement with United should prove to be a better agreement because of the volume of traffic that the airline carries.

Greyhound is taking the initiative in passenger intermodal service. The carrier already participates in 87 intermodal facilities across the nation and is involved in the planning and development in over 100 others. Not all of the facilities involve a connection between major transportation companies but instead may involve a shift from Greyhound to a local or regional transit system including intercity buses, transit buses, and light rail systems.

b. Rail

Amtrak, the National Railroad Passenger Corporation, created by the federal government to take over the nation’s intercity passenger rail services, commenced operations in May 1971. The carrier’s largest intermodal passenger alliance with Greyhound is discussed in the previous section. Amtrak also has alliances with two air carriers in the United States, Alaska Air and United.

The alliance with Alaska Air allows Alaska Airlines Mileage Plan members to earn miles when they travel on Amtrak’s Coast Starlight, Cascades, Capitols, San Joaquin’s, or San Diegans rail service. The alliance does not include any service agreements between the two participants.

The alliance between Amtrak and United is a service agreement but is still not a true intermodal agreement. The Air Rail program allows a passenger to fly one direction on United and Amtrak provides transportation in the other direction. Air Rail allows the passenger to make up to three stopovers along the Amtrak portion of the journey and is priced cheaper than if each of the components were purchased separately.

Slow progress is being made in linking Amtrak stations to airports to facilitate connections to airline services. The Amtrak station at Baltimore-Washington International Airport is located several miles away from the airport terminal, and passengers must be bused between the two locations. Connections between Amtrak stations and airports in Newark, New Jersey and Providence, Rhode Island are currently being developed, though in neither case will the rail line connect directly into the terminal. Disappointingly, there are no existing or planned intercity rail stations in the US located directly underneath an airport terminal building, such as is found in many European airports. Until physical connectivity between
intercity rail stations and airports improves dramatically, tremendous opportunities for passenger intermodal development will be lost.

Amtrak promotes auto/rail passenger intermodal travel through its AutoTrain product. With this service, passengers and their cars are transported together between Washington D.C. and Orlando, Florida. The train departs suburban Washington D.C. at four in the afternoon and arrives in suburban Orlando at 8:30 the following morning. This type of passenger intermodal travel allows the passengers to use their own vehicles at both ends of the trip.

Amtrak is also developing greater connectivity with some local transit systems, particularly along the Northeast Corridor. The construction of intermodal passenger terminals, such as Washington, DC’s Union Station, facilitates convenient connections between Amtrak and the local transit system. Amtrak’s EZPass program will allow the use of the same debit card on the Amtrak system as well as the participating local transit operations.

c. Air

A survey of the websites and schedules for the largest US airlines shows that only two, United and Frontier, promote their passenger intermodal service domestically. United’s intermodal service is marketed as Groundlink and is bus or van service from selected United destinations to other metropolitan cities that are more efficiently served by ground transportation than by air. Appendix C and Figure 2 show the airports and the destinations offered by this service. In the case of Rockford-Chicago O’Hare, the service opens up slots at O’Hare for United and allows the carrier to offer more frequency than it would be able to with an aircraft. Similar arguments can be used for the Groundlink service out of Denver. United is also looking into creating an alliance with the Chicago Transit Authority, which operates the train to downtown Chicago from Chicago O’Hare. The airline would offer through ticketing adding an additional small fee to cover the train portion of the journey.

Frontier Airlines, based at Denver International Airport, offers a similar product to United’s Groundlink called the Freeway Flyer. The Freeway Flyer is motor coach service from Boulder to Denver six times a day. The unique aspects that make this product different than the other products previously mentioned is that the service is free. The other carriers add the cost of the service into the overall price of the ticket whereas Frontier does not charge for the service. The carrier also checks the passengers’ bags to or from the Boulder stop all the way through to the final destination. With United’s Groundlink, passengers have to collect their baggage at mode switch and transport them to the other mode.
Internationally, two carriers, United and American, have codeshare agreements with European train companies to provide service between Charles de Gaulle airport in Paris, France and selected destinations in France and Belgium. Both of the carriers have agreements with SNCF on its high-speed passenger train for a number of destinations in France. The destinations included in the codeshare agreements are shown in Table Three.

<table>
<thead>
<tr>
<th>Destination</th>
<th>US Airline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angers</td>
<td>United</td>
</tr>
<tr>
<td>Bordeaux</td>
<td>United</td>
</tr>
<tr>
<td>Le Mans</td>
<td>United</td>
</tr>
<tr>
<td>Lille</td>
<td>United/American</td>
</tr>
<tr>
<td>Lyon</td>
<td>United/American</td>
</tr>
<tr>
<td>Nantes</td>
<td>United/American</td>
</tr>
<tr>
<td>Poitiers</td>
<td>United</td>
</tr>
<tr>
<td>Rennes</td>
<td>United</td>
</tr>
<tr>
<td>Tours</td>
<td>United</td>
</tr>
</tbody>
</table>

In addition to its codeshare alliance with SNCF, American also has a code share agreement with Thalys, a joint train venture between Belgian, French, British, and German railways, for service between Paris Charles de Gaulle and Brussels. Both of the agreements still make passengers shift their own luggage between modes.

**Hurdles to Passenger Intermodal Travel**

The Vice President of Southwest Airlines, Pete McGlade, points out that airlines may not be the best entity to provide “seamless” travel. McGlade believes that his company is so successful because they focus on one thing, carrying air passengers and a foray into other modes would deviate resources away from this success. This does not mean that the carrier is against intermodal services. The carrier believes in intermodal linkages if another transportation company can tap into the strength of the carrier and provide a service that benefits both of them. McGlade points to the success of the Betty Bus, a bus that carries Memphis travelers to Little Rock where they can fly on Southwest to their final destination for less than they could from Memphis, as an example of the type of indirect relationship in which the carrier participates.20

The Chief Executive Officer of Greyhound, Craig Lentzsch, points out two different reasons why intermodal services are facing difficulties in the United States. The lack of intermodal facilities is the first hurdle.

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faced by companies that want to provide intermodal services. While bus and rail services are linked at a number of terminals across the nation, the linkages at airports are fewer and farther between. Without dedicated terminals, intermodal services will continue to be difficult to achieve in the United States.  

Airports, in particular, have become major obstacles to improving intermodal connections. There are currently no policies or common guidelines to accommodate ground transportation at airports, as each airport has its own decisional authority regarding the extent to which it will accommodate ground transportation service providers. This applies to local transit systems, taxis, shuttle services, as well as to intercity carriers. Some recognition of this problem has appeared in recent FAA reauthorization bills that mention the accommodation of surface transportation needs at airports, but how individual airports actually respond varies dramatically.

The second hurdle facing alliances between modes is the dissemination of information to the public and travel professionals concerning the linkages that are available to them. Lentzsch believes that affordable listings in computer reservation systems and the creation of a system, possibly web based, that the public can access for information on fares and schedules, is paramount to passenger intermodal success in the United States.

Yet another possible barrier to passenger intermodal travel in the United States may be the codeshare agreements that air carriers have with smaller commuter air carriers. Examples of this include United/United Express and American/American Eagle. In these agreements the smaller carrier uses smaller aircraft (in terms of seats) to serve thinner routes from hub airports than could be economically served by the larger carrier. These agreements may prevent the larger carriers from entering into agreements with other modes; this also may be the case internationally.

**Next Steps**

Overcoming barriers to passenger intermodalism in the U.S. involves three major categories of next steps: continued development of physical infrastructure (especially terminals), improved information systems, and expanded policies and programs that facilitate intermodal cooperation. The physical infrastructure of passenger transportation systems must con-

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tinue to be improved if passenger intermodalism is to develop. This is particularly important for the intermodal terminals that serve as the linchpins connecting the system. Without effective physical connectors, smooth and seamless services are impossible. Efforts to build these intermodal facilities should be expanded so that every city and town in the U.S. has a passenger intermodal facility that serves as a focal point for the intercity and intracity transportation systems serving that place.

Information systems that include all major modes of passenger transportation would greatly facilitate intermodal connections. These systems are a necessary prerequisite to achieving the vision of one-stop, seamless, door-to-door passenger service that has became the industry standard for package delivery. Significant advances are being made in the development of inclusive computer reservations systems within the airline industry. Similar advances need to be made including all passenger modes.

Cooperation within and between the private and public sectors remains the key ingredient in making intermodalism a reality. Private sector progress will occur only so far as the industry can create profitable services. As more passenger intermodal initiatives are implemented over time, a longer track record of performance can be assessed to determine the successfulness of these innovations, which should result in an expansion of intermodal services. Mutually beneficial cooperation between private sector companies will make this happen. But cooperation must also include the public sector in the provision of physical infrastructure, information systems, and the policies that will facilitate implementing intermodal initiatives.

CONCLUSION

In comparison to intermodal freight transportation in the US or intermodal passenger transportation in Europe, the development of an intermodal passenger transportation system in the US continues to lag behind. An assessment of recent private sector initiatives toward the goal of providing intermodal passenger services indicates that some progress is being made. Both Greyhound Bus Lines and Amtrak realize that the current and future success of intercity bus and rail is directly linked to the intermodal connectivity that can be established to each other, the airlines, and local transit systems. The airlines, with the possible exceptions of United, Frontier, and American, have not embraced the intermodal concept to the same degree. In many ways, the airlines regard themselves as a separate mode providing only air transportation, not a part of a seamless intermodal system. Yet, United Airlines, through its Groundlink services and its Air Rail program, is at least starting to develop an intermodal consciousness. The financial success of these and other pro-
grams will obviously be critical to the continuation and expansion of intermodal initiatives among the airlines, Greyhound, and Amtrak.

The success of private sector initiatives also depends greatly on the progress of the public sector in helping to provide the infrastructure and services necessary to make the vision of passenger intermodalism possible. The most important endeavor in this area is the construction and expansion of intermodal terminals that bring air, rail, bus, local transit, and the private automobile together so that the advantages of each mode can be maximized within an integrated system. Nowhere is this need greater than at the nation's major airports, where direct physical connections to Amtrak and Greyhound in particular are woefully inadequate. There are currently no Amtrak stations located directly at a major airport in the US, and Greyhound has encountered difficulties in getting direct curb access to some of the nation's major airports. Turning airports into intermodal centers should be a top priority of the US Department of Transportation.

Passenger transportation in the US will benefit from intermodal initiatives taken by both the private and public sectors. In conjunction with other strategies to develop new technologies, enhance capacity, and improve operational efficiency, an intermodal approach will help solve many of the problems that currently plague the US passenger transportation system.
## Appendix A

<table>
<thead>
<tr>
<th>Amtrak Connecting Station</th>
<th>Route</th>
<th>Daily Round Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington</td>
<td>Washington-Charlottesville</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Washington-Pittsburgh</td>
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</tr>
<tr>
<td>St. Albans, VT</td>
<td>St. Albans-Montreal</td>
<td>1</td>
</tr>
<tr>
<td>Rocky Mount</td>
<td>Rocky Mount-Wilmington</td>
<td>2</td>
</tr>
<tr>
<td>Atlanta</td>
<td>Atlanta-Macon</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Atlanta-Columbus</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Atlanta-Chattanooga-Nashville</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Atlanta-Mobile</td>
<td>1</td>
</tr>
<tr>
<td>Miami</td>
<td>Miami-Key West</td>
<td>1</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>Pittsburgh-Columbus</td>
<td>2</td>
</tr>
<tr>
<td>Cleveland</td>
<td>Cleveland-Columbus-Cincinnati</td>
<td>2</td>
</tr>
<tr>
<td>Chicago</td>
<td>Chicago-Indianapolis-Cincinnati</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Chicago-Indianapolis-Louisville</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Chicago-Marquette</td>
<td>1</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>Minneapolis-Duluth</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Minneapolis-Eau Claire</td>
<td>1</td>
</tr>
<tr>
<td>New Orleans</td>
<td>New Orleans-Mobile</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>New Orleans-Baton Rouge</td>
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</tr>
<tr>
<td>Houston</td>
<td>Houston-Dallas</td>
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</tr>
<tr>
<td>Dallas</td>
<td>Dallas-Abilene-Odessa</td>
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</tr>
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<td>San Antonio</td>
<td>San Antonio-Laredo</td>
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</tr>
<tr>
<td></td>
<td>San Antonio-Brownsville</td>
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</tr>
<tr>
<td>Denver</td>
<td>Denver-Vail-Eagle</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Denver-Colorado Springs-Pueblo</td>
<td>2</td>
</tr>
<tr>
<td>Glenwood Springs</td>
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</tr>
<tr>
<td>Raton</td>
<td>Denver-Raton</td>
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<td>Albuquerque</td>
<td>Albuquerque-El Paso</td>
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<tr>
<td>Salt Lake City</td>
<td>Salt Lake City-Pocatello-Idaho Falls</td>
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<td>Flagstaff-Phoenix</td>
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<tr>
<td>Los Angeles</td>
<td>Los Angeles-Las Vegas</td>
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<tr>
<td>Bakersfield</td>
<td>Bakersfield-Las Vegas</td>
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<tr>
<td>Portland</td>
<td>Portland-Pendleton-Boise</td>
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</tr>
<tr>
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<td>Portland-Medford-Ashland</td>
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<tr>
<td></td>
<td>Portland-Bend</td>
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</tr>
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## Appendix B

<table>
<thead>
<tr>
<th>Airport Served</th>
<th>Key Cities Served</th>
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<tbody>
<tr>
<td>Albuquerque</td>
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<tr>
<td>Atlanta</td>
<td>Columbus, Montgomery</td>
</tr>
<tr>
<td>Chicago</td>
<td>Rockford</td>
</tr>
<tr>
<td>Denver</td>
<td>Vail, Eagle, Glenwood Springs, Grand Junction</td>
</tr>
<tr>
<td>Key West</td>
<td>Greyhound's bus station at the airport</td>
</tr>
<tr>
<td>Louisville</td>
<td>Fort Knox</td>
</tr>
<tr>
<td>Manchester, NH</td>
<td>Boston, Burlington, White River Junction</td>
</tr>
<tr>
<td>Melbourne</td>
<td>Greyhound's bus station at the airport</td>
</tr>
<tr>
<td>Miami</td>
<td>Key West</td>
</tr>
<tr>
<td>Milwaukee</td>
<td>Green Bay, Oshkosh, Appleton, Sheboygan, Fond du Lac</td>
</tr>
<tr>
<td>Moline</td>
<td>Greyhound's bus station at the airport</td>
</tr>
<tr>
<td>Nashville</td>
<td>Knoxville, Memphis, Jackson, Paducahn</td>
</tr>
<tr>
<td>New Orleans</td>
<td>Mobile, Baton Rouge, Lafayette</td>
</tr>
<tr>
<td>Phoenix</td>
<td>Flagstaff, Tucson, Yuma</td>
</tr>
<tr>
<td>San Francisco</td>
<td>San Jose, Santa Cruz, Salinas</td>
</tr>
<tr>
<td>South Bend</td>
<td>Greyhound's bus station at the airport</td>
</tr>
<tr>
<td>St. Louis</td>
<td>Columbia, Springfield, Ft. Leonard Wood</td>
</tr>
<tr>
<td>Syracuse</td>
<td>Watertown, Potsdam, Massena</td>
</tr>
<tr>
<td>Washington Dulles</td>
<td>Charlottesville, Winchester, Staunton, Lynchburg, Roanoke</td>
</tr>
</tbody>
</table>
## APPENDIX C

<table>
<thead>
<tr>
<th>Airport</th>
<th>Destination</th>
<th>Operator</th>
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<tbody>
<tr>
<td>Denver</td>
<td>Breckenridge</td>
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</tr>
<tr>
<td></td>
<td>Copper Mountain</td>
<td>Resort Express</td>
</tr>
<tr>
<td></td>
<td>Keystone</td>
<td>Resort Express</td>
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<td>Fort Collins</td>
<td>Airport Express</td>
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<td>Loveland</td>
<td>Airport Express</td>
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<td>Niwot/ Longmont</td>
<td>Airport Express</td>
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<tr>
<td></td>
<td>Vail</td>
<td>Colorado Mountain Express</td>
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<tr>
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<td>Beaver Creek</td>
<td>Colorado Mountain Express</td>
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<td>Portland</td>
<td>Corvallis/Albany</td>
<td>Anthony's Airporter</td>
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<td>Salem</td>
<td>Hut Airport Shuttle</td>
</tr>
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<td>Chicago O'Hare</td>
<td>Rockford</td>
<td>Peoria-Rockford Bus Company</td>
</tr>
<tr>
<td>San Francisco</td>
<td>San Jose</td>
<td>The South Bay Flyer</td>
</tr>
</tbody>
</table>

**FIGURE 2**

**United Groundlink Destinations**