Perishables Transportation: A Fresh Look at Trailer on Flatcar and Container on Flatcar

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This paper summarizes research on the economic feasibility of using a dedicated intermodal (highway-rail-highway) service to move produce from the West Coast to the Midwest and the East. From government statistics and interviews with growers and food industry personnel, the study identifies a volume of traffic sufficient to conduct a pilot operation of a dedicated train from the West Coast to the Chicago area on a year-round basis. The dedicated train should originate from the San Joaquin Valley or Sacramento area during the late spring, summer, and fall and from the Yuma area during the remainder of the year, thus serving growers within 160 to 240 km (100 to 150 miles) of the origin rail terminal. Points as far east as New York and Boston could be served from the Chicago-area rail terminal. The cars and locomotives should be supplied by the railroads, but trailers and containers to perform the service should be supplied and controlled by a shippers' association formed to represent the users of the service. In most situations, the proposed service would be economically competitive, faster, and more reliable than existing truck movement in spite of an assumed 100 percent empty return of equipment. Additional cost-reducing opportunities for the proposed service are discussed in the paper, as are areas requiring further study.

Dependable transportation of fresh produce from the West Coast to eastern markets at reasonable cost is a difficult problem for the food industry. The current low-cost mode, the railroads, has problems with transit time, reliability, and car supply. The alternative to railroad transportation is most frequently the use of carriers that handle exempt commodities as a specialty or as a backhaul. This service is characterized by a severe fluctuation of price and by the lack of a reliable supply of trucks. Although less than completely satisfactory, trucking is increasingly being used when its transit time and reliability advantages offset the lower cost of rail.

Use of the present intermodal service alternative, trailer on flatcar (TOFC) and container on flatcar (COFC), is actually decreasing because of problems with rate structures, service reliability, and equipment supply. However, it appears that, if properly organized, TOFC-COFC could be a superior mode of transcontinental produce transportation in both service reliability and cost (or productivity) and that this potential could best be realized with a coordinated highway and rail service dedicated to transportation of fresh produce.

OBJECTIVES AND SCOPE OF STUDY

The primary objective of the study was to investigate the economic feasibility of a TOFC-COFC train dedicated to the transportation of produce from the West Coast to the Midwest and the East. A secondary objective was the identification of potential traffic volumes, organizational needs, and potential problem areas. In scope, the study was limited to a preliminary investigation of the potential market for and operating costs of the service. A complete report of the study, which was performed for the National Commission on Productivity (NCP), is available elsewhere (1).

TRAFFIC POTENTIAL

A minimum traffic volume of produce shipments from California of 80 to 90 trailers and containers is required to support a dedicated daily, weekday departure, TOFC-COFC service. Although a comprehensive source of origin-destination flow data for this traffic does not exist, data on the total traffic flow were not necessary for the study. Rather, it was necessary only to develop information that would show that traffic volume could exceed the minimum required to provide a sufficient market to support the service. Two independent data sources were used for the study: (a) the U.S. Department of Agriculture (USDA) annual compilation of fresh fruit and vegetable unloads at selected cities and (b) a survey of food distributors and retailers performed to estimate produce sales in the destination areas of the proposed service. An analysis of both data sources indicated that sufficient traffic does exist to support the service. In addition, the estimates of both sources are known to be understated; it is therefore certain that the total potential traffic available exceeds that developed in the study.

Nine commodities, representing about three-quarters of the produce shipped from California to 41 selected

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U.S. cities, were reviewed: cantaloupes, carrots, celery, grapes, lemons, lettuce, oranges, strawberries, and tomatoes. Potatoes and other less perishable commodities were excluded from the study because they do not demand the same transportation speed and level of service as do more perishable types of produce.

The trend of total USDA reported produce unloads (expressed in carlots, a standard measure of volume, or carlot-equivalents) from California by rail (including TOFC) and truck for the studied commodities for 1966 through 1974 reveals that, although total shipments have remained relatively constant, there has been a decided shift from rail to truck. In 1966, about 44 percent of the shipments were made by rail; in 1974, about 31 percent were made by rail. The decrease occurred despite the intensive capital program of the railroads to provide modern, mechanically refrigerated cars. There are many causes for such a shift, including

1. Generally superior service reliability of motor carriers,
2. Improved trucking efficiency,
3. Improved ability of motor carriers to balance produce traffic with westbound freight,
4. Changing economies of total distribution costs (rail versus truck), and
5. Railroad car supply problems.

Nineteen of the USDA's selected 41 U.S. cities are in the Midwest and East and account for approximately 44 percent of the 41 cities' produce unloads (including citrus) originating in California. Shipments from California to New York and Chicago are very heavily oriented to rail (both carload and TOFC). Midwestern and eastern cities are more heavily oriented to rail than are the 41 cities as a whole because the remaining 22 cities are closer to the West Coast, where trucking is more competitive.

Survey of Food Distributors and Retailers

The volume of West Coast produce purchased by food distributors and retailers varies by season and by marketing practices. Because of variations in harvest location, commodity shelf life, and customer requirements, food retailers cannot level their requirements for produce. A review of monthly receipts from various parts of California suggests that a minimum basic requirement of 1 trailer-container load of California produce/day for every $200 million in total annual sales is a reasonable, conservative estimate for projecting produce traffic requirements of midwestern and eastern cities on a daily (250 days/year) basis. Full truckload requirements by major cities for produce from the West Coast are estimated to be almost 200 loads/day. This estimate includes only traffic for those facilities (the potential initial participants in the proposed dedicated TOFC-COFC train concept) having the capability of receiving at least 1 truckload/day. A substantial additional volume of produce is transported from the West Coast to facilities that cannot receive at least 1 truckload/day.

Concept Acceptability

The industry is not wedded to fixed distribution practices. Interviews emphatically confirmed that if the proposed dedicated service were economical and reliable it would be considered attractive. Supermarket chains were particularly concerned about the fact that, when a shipment (especially of lettuce) does not arrive on schedule, they may have to buy replacements at a premium of $300 to $1000/carlot-equivalent to keep grocery shelves stocked. This extra cost, the usually poor quality of the merchandise, the managerial inconveniences of covering shortages attributable to delayed shipments, and markdowns of excess stock after arrival of the late shipment are responsible for decisions by many distributors and retailers to use truck services, which, although higher in cost, are more reliable. In general, the responses indicated that

1. The idea of a dedicated TOFC-COFC service for perishables was appealing because of the potential for improved service reliability and increased control over individual shipments;
2. Many distributors and retailers would be willing to try the dedicated TOFC-COFC service if costs of the proposed service are competitive with those of the service currently used; and
3. The proposed service can help stabilize some of food distributors' and retailers' transportation costs, especially during harvest periods when unregulated transportation costs escalate in response to increased demand for trucking services.

OPERATIONAL CONCEPT

The proposed dedicated intermodal service would operate in the following manner:

1. Produce would be loaded into trailers and containers at the growing area;
2. Trailers and containers would be pulled by highway tractor to an appropriate central railhead or terminal in California;
3. Trailers and containers would be placed daily (5 days/week) on a dedicated train (of 40 to 45 flatcars) and moved by rail as a single unit to a central terminal in the Chicago-Peoria area;
4. Trailers and containers would then be pulled by highway tractor to distributing points and facilities in the Midwest and the East;
5. Empty trailers and containers would be returned to the railroad terminal, placed on the dedicated-train flatcars, and returned as a single unit to the West Coast railhead or terminal;
6. From the West Coast railhead or terminal, the empty trailers and containers would be pulled by highway tractor to a growing area; and
7. Backhaul traffic would be moved as permitted by economic, operational, market, and legal constraints.

It is assumed that the service will pick up fresh fruits and vegetables on the West Coast 5 days/week, 52 weeks/year, not including approximately 10 holidays. This means that the service will originate in California 250 days/year. Current service operates somewhat more frequently, but emerging contract patterns among the field laborers in California make Saturday and Sunday operation increasingly prohibitive.

Demonstration Project

The key factors in establishing a demonstration service are the participation of food distributors and retailers, selection of origin and destination terminals, and development of an operating schedule. A reasonable test case for this service would be to involve a number of distributors and retailers with facilities within 640 km (400 miles) of the selected destination terminal. The number of required participants would depend on the total volume of traffic that each could route by dedicated service.

This test would involve

1. Commitment by each participant for a specific number of trailer and container shipments each operating day,
2. Commitment of sufficient refrigerated trailers and containers to conduct the project, and
3. Assignment of staff to coordinate and control trailer and container movements.

The most promising route for the service is from central California to either the Chicago or New York area. Because of its greater distance (which makes the economies of rail more attractive) and potential volume, New York City (or the Philadelphia area) might appear to be the best destination point for a test operation. However, NCP-fostered improvements, such as the "fresh-from-the-West" service, which is a special produce train service operated on a fast, coordinated schedule from western growing areas to Chicago, New York, Boston, and other eastern points, have alleviated some of the service problems for traffic to the East Coast. Interviews indicated that a smaller midwestern city with few regular truck backhauls and unreliable train service has a more immediate need for improved service.

A midwestern location in or near Chicago could generate a minimum of 80 trailer-container loads/day within a 640-km (400-mile) radius. A midwestern destination would also involve participation of fewer railroads to initiate the service. Discussions with food distributors and retailers and railroads, as well as an examination of potential midwestern traffic, suggest that Chicago, Joliet, or Peoria would be among the most likely candidates for a midwestern terminal. If the first test service is successful, it would set a precedent for a similar service to the eastern seaboard.

A review of growing seasons and traffic patterns suggests two different patterns of shipment to the east from California. During the late spring, summer, and early fall, the bulk of the traffic is from the Salinas area and the San Joaquin Valley. Although these areas ship all year, volumes decline substantially during the winter. The Imperial Valley of California and the area around Yuma, Arizona, originate substantial volumes of produce during the winter months. An example of origination of a dedicated TOFC-COFC train might be from the San Joaquin Valley or Sacramento area in the late spring, summer, and early fall and from the Yuma area during the rest of the year.

If departures of 5 days/week are assumed, 6 to 7-day turnaround time for the railroad cars and 8-day turnaround time for trailers and containers [plus approximately 1 day for every additional 640 to 800 km (400 to 500 miles) from the rail terminal] could be scheduled. These times assume that 12 h are needed for loading or unloading at the field and warehouse, that trailers and containers returning to the origin on one day are used for loading on the next working day, that rail movement time does not exceed 56 h, and that trailer loading cutoff times at origin and trailer availability at destination are 1 h each.

Organization Concept

Because food distributors and retailers have the greatest interest in reliable transportation of perishable goods, the operation should be controlled by an independent shipper association organized by participants in the detailed TOFC-COFC service. Because the association may not want to become directly involved in day-to-day operations, it could contract with or establish a separate operating organization. That organization would set up the system for scheduling, coordinating, and operating the transportation system and would control all trailer-container movements. It would carry on day-to-day relations with growers, receivers, and carriers, and it could be delegated to negotiate tariffs and handle other carrier-related matters subject to approval of the association's membership or board.

The operating organization would develop and manage an information system (manual or computer) to maintain trailer-container control at all times, schedule operations for optimum equipment use, and maintain space control for the train. In accordance with policies established by the association, space on the train would be committed to specific member receivers who could trade space among themselves (through the operating company) when they needed additional space or had excess capacity. The operating organization's responsibility would also include securing backhauls when economically and legally feasible. Backhaul traffic, which could materially reduce the shipper association's cost of service to its members, is available and can conform to scheduled operating requirements.

ECONOMIC EVALUATION

Highway costs used in this study are based on customer interviews and do not represent engineering estimates of what actual costs should be. They are the most appropriate costs for this study because they represent costs that are perceived by potential users of a dedicated TOFC-COFC service and that would probably be used in evaluating the proposed service.

Long-Haul Truck

Most of the truck traffic from California to the Midwest and East is handled by owner-operators, contract trucking firms, or carriers dealing only in exempt commodities. Some private fleet operators in the East and Midwest who are interested primarily in westbound traffic use refrigerated trailers to secure return loads of exempt agricultural commodities. Although truck operators generally attempt to secure loads in both directions, they are not always successful. Long-term empty return costs are reflected in a distributor's and retailer's average cost per truckload. During the peak harvest seasons, when trucks are in great demand, negotiated per-trip costs can be double those charged during slow times of the year. During peak seasons, when truck demand is at its greatest, some operators find the price distributors and retailers are willing to pay so attractive that they return empty to handle more profitable eastbound produce traffic. Thus trip costs paid by a distributor or retailer are very difficult to quantify because they are negotiated rates (what the traffic will bear) and are influenced by many factors including distance, weight, shipment value, transportation demand, equipment availability, return traffic availability and proximity, and competitive transportation services and costs (principally rail). Fortunately for the consumer, produce prices paid by distributors and retailers are usually at their lowest when transportation costs are at their highest.

Based on an analysis of the interview results, a long-distance highway cost range of $0.40 to $0.53/truck-km ($0.65 to $0.85/truck-mile) to the Chicago area has been used for this study, reflecting a higher return load factor. To all other cities, a range of $0.47 to $0.59/truck-km ($0.75 to $0.95/truck-mile) has been used, reflecting a lower return load factor.

Short-Haul Truck

Short-haul truck costs are based on interview data relating to food industry private fleet operations. Such costs vary considerably because of substantial variations in labor and fuel costs. For privately operated fleets used primarily in short hauls of up to 400 km (250 miles), some distributors and retailers indicated that their full distributed costs per kilometer ranged as high as $0.45/km loaded ($0.72/mile loaded), including operation of the refrigerated unit. The median costs reported by the distributors and retailers were about $0.42/km ($0.68/mile). For the purposes of this study, an average cost of $0.43/loaded or empty trailer-km ($0.70/trailer-mile) was used because in specific situations, this cost may vary as much as 25 percent.

On short hauls, trailers and containers are usually returned empty. In conjunction with the dedicated train, trailers and containers are also assumed to be returned empty. These costs would be reduced to the extent that backhauls are available. Thus highway costs may be roughly approximated as $0.87/one-way km ($1.40/one-way mile) between destination rail terminal and customer warehouse and between a field loading point and origin railhead.

Rail Costs

Costs for the rail portion of the dedicated TOFC-COFC service were calculated by using the Interstate Commerce Commission (ICC) rail form A formula. The treatment of constant costs in this study differs from the ICC's form A approach. In the form A procedure, constant costs are uniformly distributed over all traffic on the basis of tons and ton-miles, thereby discriminating against or in favor of a given traffic depending on its weight and distance relative to the average weight and distance of all railroad traffic. For this study, use of a flat percentage increase over variable costs to cover overhead was considered more appropriate. Because the "average" constant cost determined by the ICC is about 30 percent of variable cost, a 30 percent markup on variable costs was used. The resultant fully allocated costs were then increased by an incremental profit margin of 10 percent over fully allocated costs as a minimum rate base attractive enough for the railroads to experiment with the proposed operation.

Cost Comparison

For purposes of comparison, highway and rail costs have been converted to trailer-container equivalents. A comparison of costs for typical origin-destination combinations is given in Table 1. The data given in the table show that the dedicated TOFC-COFC service concept is competitive with long-distance trucking even with the assumption of empty backhaul. It would appear from the table that conventional, single-shipment TOFC-COFC service is even more economical. This can be misleading, however, because of the potential for reducing the net cost of the dedicated service and the significantly better control of service and reliability.

Table 2 compares the costs per trailer of shipping from the San Joaquin Valley to midwestern and eastern cities by dedicated TOFC-COFC train and by truck. When one considers the Midwest as a whole, the economics of a dedicated TOFC-COFC service appear attractive, especially in view of a reliable, dependable service with stable and predictable costs. Minimum projected savings are in the range of 10 to 20 percent of current truck costs. To smaller midwestern cities, the intermodal dedicated service can be very attractive because service can be greatly improved at a cost lower than that now paid to the truckers.

Because of the long empty-truck backhaul, serving Boston and New York from the Chicago area appears to be economically less attractive than from a more eastern terminal, yielding projected savings of only about 1 to 5 percent. But, even with the high cost of highway operation, economically competitive service can be provided to the East. In this market, the economic advantage of the dedicated TOFC-COFC service could be significantly enhanced by the potential for trip leasing for backhauls from the New York and New England area to the Midwest.

Several areas of potential cost reduction exist for the dedicated TOFC-COFC service. They include possible reduction in train crew size, reduced trailer ownership costs, and reduced origin terminal costs.

Investment Requirements

Three major categories of capital investment are required for a dedicated TOFC-COFC train service: trailers and containers, terminal facilities, and railroad flatcars and locomotives. The requirement for investment in trailers and terminal facilities will be discussed in this section. It is assumed that flatcars and locomotives would be provided by the railroads because flatcars can be obtained readily from the trailer train fleet and locomotive requirements can probably be met from existing locomotive pools.

It is important to note that investment costs discussed here are included as part of the costs of ownership of equipment and facilities shown in the dedicated train cost calculations. Actual costs spread over appropriate service units [per trailer-container, per trailer-container-km (per trailer-container-mile), and so forth] may be more or less than the average costs used in study calculations.

Trailers and Containers

The primary investment by food distributors and retailers will be refrigerated trailers and containers. Shipper-furnished trailers and containers would relieve the railroads of problems associated with trailer-container control and equipment financing. In addition, the furnishing of trailers and containers by shippers would demonstrate shipper commitment to the success of the operation. It would also give the proposed shipper association and operating organization positive control over the trailer-container fleet.

If an average train size of 43 cars carrying 86 trailers, a nominal 8-day turnaround (about 6 sets of equipment because equipment would not be loaded on Saturdays and Sundays in the West or unloaded on Sunday in the Midwest and East), and 10 percent reserve are assumed, approximately 568 trailers would be needed for the service. Prices of refrigerated trailers have recently been quoted at $22 500 to $27 000, depending on the amount of insulation and other options. If an average cost of $25 000/trailer is assumed, new trailers needed to provide the proposed service would cost approximately $14 million. Recent quotes of equipment manufacturers indicated that refrigerated containers would cost about $17 000. Because about half the fleet is in transit (empty or loaded) at any given time, only about 284 chassis would be required. Net investment in containers and chassis, if purchased new, could amount to approximately $12 million.

If an 8-year life and a 10 percent salvage are assumed, nondiscounted cash-flow equipment costs would amount to approximately $6.30/day for a container plus half of a chassis versus $7.70/day for a trailer. If we add an

Table 1. Selected cost comparisons.

Destination	Cost From Origin ($)			
	Salinas[a]	San Joaquin[b]	Desert[c]	Southwest[d]
Chicago				
Truck	1350 to 1420	1440 to 1990	1380 to 1810	1310 to 1710
Rail carload[e]	1390	1330	1230	1170
Conventional TOFC-COFC	1440	1390	1320	1270
Dedicated TOFC-COFC	1440	1410	1420	1250
Detroit				
Truck	1830 to 2320	1860 to 2360	1790 to 2270	1690 to 2150
Rail carload[e]	1520	1460	1370	1310
Conventional TOFC-COFC	1530	1480	1410	1360
Dedicated TOFC-COFC	1740	1710	1720	1570
Columbus				
Truck	1840 to 2330	1870 to 2370	1740 to 2210	1620 to 2060
Rail carload[e]	1540	1480	1350	1290
Conventional TOFC-COFC	1550	1500	1390	1340
Dedicated TOFC-COFC	1800	1770	1780	1630
Buffalo				
Truck	2030 to 2570	2060 to 2610	2090 to 2640	1860 to 2360
Rail carload[e]	1650	1580	1500	1430
Conventional TOFC-COFC	1630	1580	1510	1460
Dedicated TOFC-COFC	2100	2070	2080	1930
Boston				
Truck	2370 to 3000	2400 to 3040	2320 to 2940	2200 to 2790
Rail carload[e]	1900	1840	1790	1730
Conventional TOFC-COFC	1840	1790	1750	1700
Dedicated TOFC-COFC	2720	2680	2700	2550
New York				
Truck	2260 to 2860	2290 to 2900	2160 to 2740	2040 to 2580
Rail carload[e]	1850	1780	1670	1620
Conventional TOFC-COFC	1800	1740	1650	1610
Dedicated TOFC-COFC	2490	2460	2480	2320

Note: Data in this table are based on approximate highway kilometers for trucks, rail carload kilometers (converted from mileage given in Rand McNally Railroad Atlas) for main-line routes and two interchanges, and carload kilometers with local cartage added for conventional TOFC-COFC. Total trailer-container ownership costs and cost of two interchanges are included in all TOFC-COFC cost calculations.

[a]For dedicated TOFC-COFC: Salinas-Chicago railheads.
[b]For dedicated TOFC-COFC: Sacramento-Chicago railheads.
[c]For dedicated TOFC-COFC: Barstow-Chicago railheads.
[d]For dedicated TOFC-COFC: Yuma-Chicago railheads.
[e]Cost per equivalent trailer-container load [13 600 kg (300 cwt)/trailer-container and 20 400 kg (450 cwt)/carload].

Table 2. Dedicated TOFC-COFC train and truck costs per trailer of traffic originating in San Joaquin Valley.

Destination	Dedicated TOFC-COFC Train Costs ($)	Average Truck Costs ($)	% Savings With Dedicated Service
Chicago	1410	1715	18
Detroit	1710	2115	19
Columbus	1770	2125	17
Buffalo	2070	2335	11
New York	2470	2595	5
Boston	2680	2720	1

annual maintenance cost per trailer or container of $1000/year (including tires) and if we assume that equipment is in service 90 percent of the time, costs for trailers and containers would average roughly $10 and $11/serviceable day respectively. This compares favorably to the $15/day ownership cost used in the dedicated service cost calculations.

It should be emphasized that a $12 to $14 million capital expense is not required for the initial test operation. Existing equipment owned by distributors and retailers may be suitable; some equipment may be leased on a short-term basis from lessors; and the railroads may be willing and able to provide some equipment to the association for an experiment. Thus no commitment for a sizable capital expense need be considered until the test operation has proven the viability of the concept.

Terminal Facilities

TOFC-COFC terminal facilities are normally owned by the railroads. The existence of numerous large-volume facilities in the Chicago area makes it preferable to use one of the existing facilities at the destination of the dedicated train. At the origin, however, new or additional facilities may have to be constructed or at least expanded. Total facility costs, excluding land, could be approximately $500 000 to $600 000 (including 2 side loaders at $215 000 each). The trailer-container side loaders are semiportable and could be moved if the train origin shifts during the year.

CONCLUSIONS AND IMPLEMENTATION STUDY REQUIREMENTS

Even without a backhaul, a dedicated TOFC-COFC service for perishables operated between California and the Chicago area on a year-round basis by a shipper association is economically feasible as an alternative to highway trucking. It can offer shippers a reliability that can come only from a service that is under their control, eliminating the vagaries of truck operators and the unreliability of current railroad service. Because the energy efficiency of TOFC-COFC line-haul is greater than that of most competitive highway movements, energy savings can be realized. This, combined with increased economic productivity, makes the service attractive from a national policy point of view. Although these findings affirm the feasibility of the concept, further study in the following areas is required to support a management commitment to proceed with implementation:

1. Refined cost analysis,
2. Railroad impact,
3. Backhaul potential,
4. Legal and regulatory status, and

5. Implementation planning.

The information resulting from these investigations should provide sufficient background for a management decision regarding a test of the concept.

Refined Cost Analysis

Several areas of cost research offer potential for better defining the most cost-effective means of operating the service including

1. Detailed costs of a specific train service between one origin and one destination (including a more refined estimate of investment requirements),
2. Cost trade-offs between COFC and TOFC modes of operation, and
3. Cost trade-offs between the 56-h schedule and a shorter schedule with high-speed operation.

Railroad Impact

Railroads might be concerned with the establishment of rate precedents that could affect other shippers or commodities. They might also be concerned that the proposed train could divert existing perishable carload traffic and leave mechanical refrigerator cars idle. Availability of rail terminal facilities and equipment to load and unload the train in a short time on a regular schedule may require difficult negotiations especially if the origin point shifts one or two times during the year.

Backhaul Potential

A qualitative description of potential backhauls is needed. The following, beginning with those that appear to have minimal legal obstacles, should be investigated:

1. Movement to west coast warehouses of goods owned by members of the shipper association,
2. Trip-leasing of trailers for return hauls by highway from destination areas to the Chicago area dedicated train terminal, and
3. Coordination with shipper associations (or freight forwarders) engaged primarily in westbound traffic.

Legal and Regulatory Status

The Interstate Commerce Act defines and governs the freedom of shipper associations and the construction of railroad tariffs. Previous ICC and court proceedings have inhibited the establishment of contract rates that would be desirable in the proposed concept. There is, however, increasing pressure for relaxation of regulatory constraints with regard to such contracts. A rate structure and form that could be approved by the ICC must be designed carefully. Investigating the legal status of various potential backhauls is also important.

Although the precedent of shipper associations is firmly established, the activities of these associations are not defined clearly and precisely in the Interstate Commerce Act. Although shipper associations do not violate antitrust provisions per se, all implications or potential problem areas should be reviewed. The use of association-furnished equipment for backhaul loads may or may not infringe on carrier rights, interests, or the Interstate Commerce Act itself. Regulatory approval is another item that should be studied because an attempt to implement the concept without considering the nature of protests that might arise could cause lengthy delays.

Implementation Planning

Efficient management, scheduling, and control of trailers throughout the year will require full cooperation of the growers, receivers, and carriers. Establishment of authority, communication links, and levels of participation will have to be carefully worked out. In addition, the contractual relationships among the parties and with the railroads must be carefully considered. In implementation, the following steps should be considered:

1. Determine parties interested in participating;
2. Develop structure and detailed roles of the shipper association and operating company;
3. Develop a detailed operating plan that includes coordination with railroads, establishment of trucking operation to loading points, and determination of methods of trailer movement from rail terminals to destination; and
4. Construct a proposed rate structure and contract form for negotiations with the railroads.

REFERENCE

1. Perishables Transportation: A Fresh Look at TOFC/COFC. Peat, Marwick, Mitchell and Co., Sept. 1975.