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TRANSPORTATION RESEARCH FORUM

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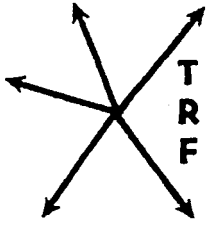

TRANSPORTATION RESEARCH FORUM

Overcoming Fundamental Problems in the Car Hire/Car Service System

*by Carl D. Martland**

1. A CONCEPTUAL FRAMEWORK

1.1 The Need for Car Hire, Car Service, and Interchange Rules

THE U.S. RAIL SYSTEM is comprised of numerous individual carriers who cooperate to move shipments from their origins to their destinations. However, because the process of transferring a shipment from one freight car to another is time-consuming and expensive, there is an overwhelming incentive to move each shipment directly to its destination in a single freight car. As a result, the rail industry has established minimum standards for freight cars to allow them to be interchanged among the individual railroads. These standards are designed to ensure safety and compatibility of equipment. A related set of rules determines how cars should be serviced and repaired when off their owner's lines.

More complicated are the rules that allow cars owned by a multitude of railroads to serve as a national fleet. For the system to function smoothly, railroads have evolved various rules and regulations to answer the following questions:

a. How is the owner reimbursed for the use of his car when it is used by another railroad?
b. What restrictions are there on the use of a foreign rail freight car (one that belongs to someone else)?
c. How does the user return a freight car to its owner?
d. How does the owner force other railroads to return his equipment?
e. Under what circumstances does a railroad have to accept foreign cars in interchange?

The "Code of Car Hire Rules"[1] address the first of these questions by establishing a system of rental payments by which a user reimburses the owner for the use of cars. The "Code of Car Service Rules"[2] addresses the issues raised in the next three questions, which concern the use of foreign equipment and the return of such equipment to its owner.

The issue of interchange appears at first to be straightforward. As long as the equipment meets the basic safety standards, and as long as it is covered by the Code of Car Hire and Car Service Rules (or a similar agreement), it can be used in interchange service. More complicated is the larger issue of sharing the revenue among the carriers involved in an interline shipment. The manner in which this is done can determine whether or not this shipment is profitable to each of the carriers involved. Although the division of the revenue could, in theory, reflect the equipment costs associated with the shipment, it generally does not.

The fact that millions of rail shipments are interlined annually provides a strong incentive for the railroads to develop easily administered rules for dealing with all these topics, especially since many decisions must be made by people in the field relying on limited information. This paper refers to all of these rules as the "Car Hire/Car Service System." The type of rule that can be easily administered depends to a large extent upon the information processing and communications capability of the railroad industry. Hence technology allows the industry to adopt more sophisticated rules for car hire, car service, and interchange. The new technology does not, however, eliminate the need for such rules, but simply offers opportunities for adopting better rules.

Before discussing the problems with the Car Hire/Car Service System, it is necessary to consider the major decisions and performance measures that they affect. In the long run, the rules governing the use and rental of freight cars will influence the average car cycle and therefore the acquisition and retirement of cars. In the short run, the rules will influence which cars are loaded and therefore such measures as empty miles and empty car days. The next two sections address these topics.

1.2 The Long Run Decision: How Many Cars to Obtain?

Any company owning a fleet of railroad cars must determine whether its

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fleet should be expanded, maintained at the same level, or contracted. To do this, the company needs information concerning the physical utilization of the cars, the financial performance of the railroad in using these cars, the age of the cars, and the projected demand for cars. The physical utilization would include measures such as the percentage of orders for empty cars that are satisfactorily filled as well as the average trips per car per year or its inverse, the average cycle time, which is the average number of days per loaded shipment. If the traffic moving in the cars is profitable, if there is no expected growth in traffic, if utilization of the fleet is deemed satisfactory, and if there are no unwarranted car shortages, then the existing fleet is adequate and should be maintained at the existing level. In this case, we have the simple relationship that the

$$\text{FLEET SIZE} = (\text{Loads/year})/(\text{Loads per car/year}) = \text{constant}$$

If either traffic volume or utilization changes, then the fleet size would have to be adjusted. If there are excessive shortages, then the fleet size would be increased to provide more reserve capacity, with the necessary side effect that utilization as measured by loads per car would also decline.

This is not the only possible situation, however, since the railroad may be dissatisfied with a fleet's financial performance. Exercising sound business judgment, the railroad would then seek to correct the financial problems by increasing the revenue/load, reducing the cost/load, or reducing the car-days/load, i.e., by improving car utilization. If efforts in these areas were unsuccessful, then the railroad would cease replacing equipment of this fleet, preferring to direct its resources into more profitable types of equipment.

The railroad may also have some highly profitable traffic from a customer who has other transportation options. The railroad would not only replace equipment and expand the fleet to keep pace with this customer's requirements, but would also maintain a reserve fleet to minimize the chance of a shortage.

This discussion has so far avoided the complexities introduced by the interchange of equipment. In the absence of equipment interchange, a railroad would use its own cars on its own tracks to service its own customers. The fleet size would vary for each equipment type depending upon the profitability of the traffic, the growth or decline of such traffic, the actual and desired levels of physical utilization, and, of course, the cost of new equipment. The capacity of the car fleet, however, would be but one aspect of capacity. The railroad would also make adjustments as required in locomotives, line capacity, and terminal capacity, using appropriate economic analysis to determine the best way to adjust capacity to the expected traffic conditions.

At the opposite extreme, we can envision a car supply company that owned freight cars, but provided no transportation service at all. Its revenues would come entirely from renting cars to railroads or shippers and its expenses derive entirely from owning, maintaining, and managing a fleet of freight cars. Such a company has no immediate concern for the profitability of rail traffic to the carriers, but has an eminent concern for the exact nature of the car hire and car service rules that determine how much and under what circumstances it is paid for the use of its cars.

A car supply company faces the same basic decision as the railroad: should it expand, maintain, or contract its fleet? If the annual rentals exceed the costs of ownership, maintenance, and administration, then the car supply company would consider expanding its fleet. Unlike the railroads that estimate customers' demand for freight service, however, the car supply company estimates the railroads' demand for the company's cars. If this demand is constant or growing, then the car supply company would expand its fleet. In fact, the car supply company will expand its fleet until the expected revenue exceeds the expected costs for the last car acquired:

$$(\text{Average Daily Rent})\ (\text{Days Utilized}) \geqslant \text{Annual Cost/Car}$$

If the average daily rent is very low, then annual revenues will fail to cover costs even if the car is highly utilized, causing the car supply company to forego investment in such cars. If the average daily rent is very high, then the car supply company would be willing to invest even if the car was utilized only a small portion of the year.

Because of the interchange of equipment, most railroads find themselves between the two extreme positions. They need to use freight cars in order to earn money by providing rail service to their customers, yet they are also in the position of renting cars to and from other railroads and car supply companies. Some railroads will be a net renter of freight cars, while others will not. In general, a net renter of cars desires lower rates and a net supplier of cars desires higher rates.

It is also necessary to consider the railroads in terms of the type of traffic that they handle. To originate traffic, a railroad needs access to cars and must move an empty car to a shipper's dock for loading. A terminating carrier, on the other hand, need not supply cars, but must do something with the empty car once it is unloaded. An intermediate carrier has no problems with the load, which he simply moves from one interchange to another, but he may also have to move the empty back to the originating carrier. The originating carrier needs to know where he can obtain empty cars that can be used to handle specific shipments. The terminating carrier needs to know how to dispose of empty cars, and all of the carriers are concerned with the costs of transporting empty cars.

1.3 The Short Run Decision: Whose Car to Load?

Each day, railroad officials make thousands of individual decisions that result in the placement of empty freight cars for loading at shippers' sidings. In the aggregate, these decisions determine the performance of the national fleet as seen in such measures as empty miles per loaded car-mile, empty car-days/load handled, cars stored empty, and car shortages. To understand the importance of car hire and car service rules, it is essential to understand the economic decision involved in placing a car for loading.

If all cars were commonly owned, then the decision could be based upon a straightforward set of procedures designed to minimize the transportation expense of the system. This would normally result in loading the empty car that could be most easily positioned for loading. In practice, however, a car distributor may have both a system car and a foreign car that are suitable for use by a particular customer. Which car will he load? To make this decision, he must weigh the time required to move the empty into position, the transportation cost incurred in so doing, the car hire paid to others, the car hire received from others, the disposition of the car that is not loaded, and the disposition of the car that is loaded when it is eventually unloaded.

The selection of a system or a foreign car must also consider a number of other factors:

a. What restrictions are there in loading the foreign car? Can it be loaded to this destination?
b. What restrictions are there to loading the system car? Can it be loaded to this destination?
c. If the foreign car is not loaded, how much will it cost in terms of car hire and transportation cost to move it off-line?
d. Are there any additional costs associated with the return of the foreign car to its owner?
e. Are there any special costs for loading the foreign car (such as a loading charge)?
f. Are there any special benefits from loading the foreign car (such as reclaim for some or all of the car hire)?
g. If the system car is returned empty, how much will it cost to reposition it at least as favorably as it is now positioned?
h. How much car hire will the system car earn off-line?
i. How much will it cost to have the system car returned by other carriers?

These questions can only be answered by reference to a specific set of car hire and car service rules. Suffice it to say that it is clearly in the interest of the originating carrier to understand the answers to these questions before deciding which car to load.

In the standard situation, it makes more sense to load the system car because the owner is assured of car hire revenue while the car is off line and the owner has to pay added car hire to use the foreign car. In surplus conditions, a railroad would rarely reload foreign cars, because system cars sent off line can earn car hire at rates of $30/day or more. All of this car hire is foregone if the foreign car is reloaded. There is therefore a clear incentive to load system cars despite the negative impact on other railroads, who also have a surplus of equipment. During surpluses, originating carriers thus cause cross hauls by making rational decisions to load their own cars to off-line points.

In ordinary conditions, system cars will be less plentiful, so more foreign cars will be reloaded. In shortages, any available foreign car will be reloaded unless the terminating carrier is forced to send it home by a directive. In shortages, owners cause empty cross hauls by restricting the rights of terminating carriers to reload cars.

Changes in the car hire and car service rules can easily be designated to promote greater loading of either the system or the foreign car in any of these situations. For example, a car service rule could provide a $1,000 fine for loading a system car off-line when suitable foreign cars were available, according to some precise definition of

available. If enforced, this would promote the use of foreign cars. Likewise, a car service rule could allow foreign cars to be loaded only to the owning road, which would greatly increase the use of the system car for loading.

1.4 The Reason for Periodic Surpluses and Shortages of Freight Cars

Reducing the situation to basic terms, periodic surpluses and shortages occur because the rail fleet is fairly fixed in size while demand is variable. Freight cars are expensive and durable, lasting up to 50 years. Hence each year, only a small portion of the fleet is due for retirement, severely limiting the downward flexibility in the size of the fleet. Likewise, the capacity for building freight cars is limited. In fact, as car shortages increase, signalling the need for additional equipment, suppliers quickly develop backlogs of a year or more in supplying newly ordered equipment. In short, the fleet for next year will be constrained to include almost all of the cars that are now in the fleet, and can only be increased slightly because of capacity limitations in the car supply industry.

Why is demand variable? The major problem for the railroads is that general economic conditions can easily cause rail traffic volume to vary 10% above or below expectations. In 1975 and again in 1980, severe recessions caused nationwide surpluses of equipment in most car types, despite the fact that in the peak periods immediately preceding these recessions, there were severe shortages of some types of equipment. In addition to fluctuating with the business cycle, rail traffic can be highly seasonal. Hence, some car types will be very highly utilized and in short supply during portions of the year, yet underutilized the rest of the year.

1.5 The Impact of Shortages and Surpluses on the Car Cycle

Since the fleet of rail cars adjusts slowly to changes in traffic volume, the utilization of the fleet is forced to adjust very quickly. This becomes obvious if we treat the fleet for a particular car type as fixed for a certain time period. This means that the number of car-days available of that car type is fixed for that period, so that the average cycle time will vary inversely with the number of loads:

$$\text{Average Cycle Time} = \frac{\text{(Total Car Days)}}{\text{(Number of Loads)}} = \frac{\text{(Constant)}}{\text{(Number of Loads)}}$$

It is illuminating to consider how this occurs. The average cycle time is composed of four major components: the average time to load a car, the average loaded trip time, the average time to unload a car, and the average total time spent empty. Since the first three of these components are unlikely to vary much during different times of the year, the average cycle time varies primarily over the short run because of variations in the total empty time. Quite simply, the fewer the cars that are loaded, the longer the average empty car has to wait to be loaded.

But how does the empty time fluctuate? The empty time is different from the three other major components of the average cycle time. In most cases, there is not a destination clearly defined for an empty car that has just been unloaded, and, if there is one, it is unclear how important it is that it reach that destination quickly. If there is a surplus of cars, then there could be more time spent in any of the empty statuses: moving empty, awaiting distribution, stored serviceable, awaiting repairs or cleaning, or constructively placed for loading.

From the national perspective, and from the perspective of the shipping community, it would make the most sense for the additional empty time to be spent in a way that incurs little additional cost. For instance, it is probably cheaper to store some cars than to move them from yard to yard incurring fuel, maintenance, and crew expense. Furthermore, it would seem to be rational to store cars in a clearly defined manner; for example, it might make sense to store the oldest cars or the dirtiest cars.

From the car owner's perspective, however, the rational decision is quite clear. To the extent possible, store someone else's cars so that yours can continue to earn car hire and so you won't have to pay car hire! If this decision is made by everyone, then the additional empty time will unfortunately show up as additional empty movement time.

The car hire and car service rules play an important part in determining where the extra empty time will be spent during a surplus, because they set the rules and define many of the costs for determining whose car to load to which destination. Since the empty time is fixed, the real issue is whose cars get used and whose do not.

During a shortage, the average cycle time will decline if more loads can be handled with the same fleet of cars.

Once again, the change in the cycle will to a great extent come from a change in the average empty time. Cars will come out of storage, they will be repaired more quickly, and they will be moved more quickly to loading points. If the shortage persists, however, then it will become important to determine whose customers receive cars to load. Several possibilities exist: priority could be given to customers of the road that owns a car, to customers of a road that unloaded the car, to customers of a road that is willing to pay the most for a car, to customers willing to pay the most for the car, or to customers who receive an order from the commission requiring that they be given cars for loading. Once again, the system of car hire, car service, and interchange rules, including the ability of the ICC and the AAR to issue orders and directives, influences whose customers get to load cars.

2. SOME PROBLEMS RELATED TO CAR HIRE, CAR SERVICE, AND INTERCHANGE

As noted at the outset, freight cars move freely throughout the U.S. rail system subject to the rules and regulations of the Association of American Railroads and the Interstate Commerce Commission. The extensive history of these rules has been reviewed by the Commission and others.[3] This paper, in an attempt to avoid duplicating these historical efforts, focuses on a number of specific, fundamental problems in the current Car Hire/Car Service System. These problems arise because the rules were developed and modified with inadequate consideration of their impact on the fleet sizing and car distribution decisions described in the previous section. As a result, the rules exacerbate rather than ameliorate the impacts of demand variability and add to the complexity of inter-railroad coordination. The identification of these fundamental problems was accomplished during a more comprehensive study of the institutional and organizational barriers to improving car distribution performance, which concluded that

> ". . . The problems of car distribution performance exist, in part, because of the lack of incentives for improving performance, coupled with the complexity of and weaknesses in the car hire-car service system. If this is true, the industry should consider fundamental changes in the management of freight cars. The rules, regulations, and institutional environment surrounding car distribution should promote, not hinder, effective car distribution performance."[4]

The fundamental problems can be summarized as follows:

a. Railroads are nearly always required to accept loaded cars in interchange service even if the shipment is not believed to be profitable.
b. The interests of the owner outweigh the interests of the user.
c. There is not a national fleet of freight cars managed in the best interests of all users.
d. The rules do not take into consideration the high costs of moving empty cars.
e. The rules emphasize car ownership costs, not the demand for cars, in the establishment of car hire rates.

Each of these problems is discussed below in more detail.

2.1 The Problems With Compulsory Interchange

Railroads are required to maintain joint rates for shipments over two or more railroads and to allow such shipments to be made in a single freight car. This prevents the need to transload the shipment into a series of freight cars owned by the various railroads participating in this route, thereby promoting efficiency and lower rates. This doctrine was developed during a period with much simpler car hire rates. In fact, all cars earned the same car hire when off-line. Without variations in car hire, a shipment would not be profitable if loaded in an "expensive" car. The owner might object to sending new cars off-line without adequate reimbursement for his ownership costs, while the receiver might object to paying too much for the use of an old car, but the division of revenue and the total revenue presumably reflected the actual car hire rate.

In 1982, when the top daily rate for a new car is well over $30, the compulsory interchange of equipment causes new problems. At such high rates, the car hire can even exceed the revenue that a carrier might receive from a shipment. If a carrier requires ten days to terminate a load, wait for the customer to unload it, and return it empty to interchange, then a $6/day car contributes $300 more net revenue to the terminating railroad than a $36/day car. If there is no link between car hire and divisions, there is a chance for carriers other than the originating carrier to lose money because of the excessive car hire that must be paid. The originating

carrier may at least have the option of refusing to use the $36/day car, but other carriers are required to accept the expensive car in interchange and cannot prevent financial loss. Notice that this has nothing to do at all with the initial goal of compulsory interchange, which was directed at the provision of efficient inter-line service without requiring the transloading of a shipment.

A second problem with compulsory interchange occurs during car surpluses. As the car service rules now stand, an originating carrier faces no restrictions on his ability to load a system car to any destination. Hence, the originator can load a system car offline, knowing that the expense of returning the car empty will be borne by the terminating and other carriers. Furthermore, he is assured of receiving car hire not only for the time that the car is moving loaded and being unloaded, but for the empty return as well. In other words, the originating carrier has little incentive to store cars during surpluses because he can load them offline and receive car hire for a minimum of about 10 days, and have the (surplus) empty returned at no cost to himself. Is there any wonder that railroads do this so often, even if it results in the cross haul of empties?

2.2 Over Emphasis on the Interests of the Owner

The bulk of the freight cars in the national fleet move about the country according to rules designed to protect the owner's interest in their cars. Car hire rates are designed to ensure adequate coverage of ownership costs including a return to capital, not to promote effective utilization. When car shortages are reported, additional mechanisms come into play to speed the return of cars to their owners. A road can request car assistance directives that require their cars to be loaded only to or via their systems; in more extreme conditions, the owning road can obtain an order requiring cars to be returned home either loaded or empty; in the most extreme conditions, the owner can require cars to be returned empty.

The Freight Car Utilization Program has shown that these rules, orders, and directives are successful at the expense of increasing average cycle times for the nation.[5] That is, the owner indeed receives more of his own cars for loading, but other railroads are restricted in loading the cars in question and incur a greater number of empty miles and empty car days than they would otherwise require. The additional empty days increase the cycle time nationwide and reduce the number of cars that can be loaded in that particular type of equipment during the shortage. Nevertheless, the owner is still justified in seeking such assistance, because it is the only way for him under the existing car service situation to protect his on-line loadings.

2.3 The Lack of a National Fleet

The car hire and car service rules are designed to promote effective administration of the use of cars controlled by railroads or shippers to serve the needs of shippers. The rules are not, in general, designed to create a national fleet of cars, but are designed to allow cars of diverse ownership to be used nationwide. The distinction is important because a national fleet can be managed more effectively than a conglomeration of individual fleets. In managing a national fleet, administrators can focus on such issues as equitable distribution of cars during shortages, efficient storage of cars during surpluses, a proper balance between ownership and transportation costs at all times, and appropriate mechanisms for attracting capital to the railroad industry.

2.4 The Lack of Concern for the Transportation Cost of Empty Movement

A fourth major problem with the existing system of car hire, car service, and interchange policies is the lack of concern with the cost of empty car distribution. A car owner can load a car to another railroad, secure in the knowledge that the car will not only earn car hire for the entire time that it is off-line, but will also be returned to him at no extra charge for the empty movement. This single factor is one of the major structural reasons for the excessive number of empty miles incurred each year in the rail industry. The intricacy of the Codes of Car Hire and Car Service Rules obscures the fundamental fact that one railroad can with impunity cause other railroads to pay for crews, locomotives, fuel, and other resources in order to move empty cars around. One of the most flagrant examples of this occurs during shortages when a railroad is directed to return a foreign car directly to its owner. Despite the fact that the terminating railroad has either no chance or a severely restricted opportunity to reload that car, he is forced to pay to move it to interchange. To add insult to injury, he is required to pay car hire for the privilege of handling the car. During a surplus, a different prob-

lem emerges; the owner can load his cars off-line and return foreign cars empty, even though he knows that this increases the empty miles that will be incurred by other railroads. If the owner had to pay for the net increase in empty miles at .20 - .40 per mile, would he be so anxious to send that system car off-line, especially if it also earned little or no car hire for the empty return?

The originating carrier at least has some incentive to load a foreign car, because he can balance the various transportation and car hire factors and store system cars where appropriate given the existing rules. The intermediate carrier, however, has no choice, and may well be paying additional car hire for the privilege of cross-hauling empties owned by two railroads who were unable to establish more efficient procedures.

2.5 The Unwarranted Link Between Car Hire Rates and Car Ownership Costs

The history of car hire rates records a series of changes designed to provide a more equitable sharing of the costs of ownership. But the rules do not relate car hire rates to the value of cars to users. As a result, when cars are in short supply, there is no way for owners to increase car hire rates; there is not even a legal way for railroads to use the available cars for the most profitable traffic. During surpluses, when the marginal car simply clogs up the transportation system, its value to the user is zero or less; yet he must pay at a rate prescribed by the car hire rules. In 1980-81, downward flexibility allowed little relief from the maximum car hire rates, despite severe surpluses, in large part because of the absence of market freedom that would allow users to refuse to pay for overpriced cars and to charge for empty movement cars.

3. ATTEMPTS BY THE INDUSTRY TO OVERCOME THESE PROBLEMS

The industry is well aware of the problems enumerated in the previous section. In 1974, in response to severe pressure from the federal government to reduce car shortages, the AAR set up the Freight Utilization Research/Demonstration Program, (FCUP). An effort involving industry, supplier, government, and shipper representatives on its steering committee and numerous task forces, the FCUP has documented car utilization problems, expanded our understanding of the potential approaches to solving these problems, has participated in a number of demonstration projects that have shown how to improve car utilization, and in general has been a positive force for improvement in car hire, car service, and interchange issues.[6] Furthermore, the AAR Car Service Division has developed special rules for the handling of unusual types of equipment, for managing assigned fleets, and for improving the administration of the car hire and car service rules. Finally, the industry has, through Trailer Train, provided free-running general service equipment for use at car hire rates substantially below those established in the Code of Car Hire Rules.

The industry has successfully addressed fundamental problems of car supply through a variety of well-conceived studies, demonstrations, and innovations that modified the car service environment:

a. Clearinghouse[7]—a number of railroads have voluntarily agreed to use each other's general service box cars as if they were home cars, thereby freeing the restrictions on loading foreign cars encoded in Car Service Rules 1 and 2. Second, these railroads agreed to manage their box cars as a common fleet, using a computer program to distribute empty cars so as to protect loadings in an equitable manner and also control empty transportation cost.

b. Gondola pool[8]—this is similar to the Clearinghouse, but involves a different car type.

c. Assigned cars[9]—unlike general service cars, the loaded and empty movements of assigned cars are managed by the railroads who provide the equipment to a particular customer. The car service rules provide mechanisms for storing cars at the loading or unloading points without incurring car hire costs, which in effect is a way to share the surplus in a well-defined manner. Owners generally provide cars to the fleet in proportion to their share of the revenue, and the revenue is based upon a cost analysis that takes into account the actual empty miles, which are often equal to the number of loaded miles. In most cases, the shipper has the option of providing his own equipment in return for a slightly different rate.

d. Private cars[10]—are under the exclusive control of their owners or lessees. These cars also move at rates that include an adequate provision for both car cost and empty mileage. Car supply companies lease

cars to shippers under a wide variety of terms.

e. Railroad owned tank cars, Mechanical Designation LRC cars, and Class R refrigerator cars (Car Hire Rule 1(d)(1))—these cars can be put on a mileage basis for car hire if so desired. The owner must do so for all cars in a particular designation and must keep this in effect for at least one year. By exempting such cars from time payments, the owners can encourage other roads to hold the cars until they can be reloaded, thereby minimizing unnecessary empty mileage. The time limit is interesting in that it suggests a precedent for a minimum period for placing any equipment type in a special car hire or car service status.

f. Heavy duty flat cars (Car Hire Rule 21 and Car Service Division Circular CSD 439)—These are special duty flats including depressed center flats (mechanical designation FD and FDS), flats with a hole for achieving lower clearances (FW and FWS), and the ordinary non-piggyback general service flats (FM). These lightly utilized cars are subject to a loading charge of $300 (for FD or FSDO or $100, which is prorated among all roads sharing in the loaded movement on the same basis as the division of revenues. These cars are managed as a national fleet by the AAR for the stated purpose of ensuring "the best possible distribution of the limited ownership of these special flat cars."

g. Exemption of Cars from Car Service Rules 1 and 2—prior to 1981, these rules allowed cars to be reloaded only in the general direction of the owner's road, unless the car was exempted from these rules. Exemptions were commonly granted during surpluses, but they were also granted by what are above termed the car supply railroads to encourage loading of their equipment at all times. (Note that this was not the same as releasing these cars to a nationally managed pool.) In 1981, these restrictions were eliminated on all general purpose cars in an attempt to promote more reloading of foreign equipment.

h. Railbox, Railgon, and Trailer Train —These companies are jointly owned by a number of individual railroads. They were created for the purpose of providing general purpose equipment at the lowest reasonable cost for use by the nation's railroads. Trailer Train provides the bulk of the nation's fleet of piggyback flat cars, which are used by railroads according to rules established by Trailer Train, i.e., by the owning railroads. Railbox and Railgon provide general service box cars and gondolas that supplement the cars owned by individual railroads. Each of these car supply companies has provisions for maintaining its equipment, for establishing an appropriate fleet size, and for declaring equipment surplus. The car hire rates are flexible upward and downward and are established according to well-defined procedures designed to enable the companies to continue to finance equipment acquisitions. Railbox created a free running, inexpensive national fleet that united the railroads by giving them common access to cars that could be stored at no expense to the users during times of surplus.

i. Special rules for short lines of less that 100 miles (Car Hire Rules, Appendix B, Rule 6)—If car hire costs are excessive relative to their share of the revenue, these short lines can appeal to the Car Service Division for partial relief of car hire. This is an example, albeit a limited one, that the notion of compulsory interchange must be tempered by financial common sense.

j. Short-routing of empty cars (Car Service Rule 5)—empty cars can be short routed (i.e., returned home or to a specific destination in a manner not covered or allowed by the other rules) at a rate of $.28 per mile plus switching changes, with a minimum of 100 miles for each road handling the car. The road requesting the service pays the charges and car hire or mileage allowance costs. This is an example of the principle that the railroad causing the empty movement will, under some circumstance, be obliged to pay for the costs of that movement and also forego the right to receive any car hire.

k. Multi-level Demonstration[11] — This FCUP initiated project has established a management group to distribute the multilevel cars that were previously in a number of individual assigned fleets. By managing the cars, the railroads and the participating automobile companies are able to reduce the number of empty miles, to reduce the fleet required to protect a given level of loading, and to adjust rapidly to a new mix of origins and destinations. The success of the demonstration with

General Motors and Ford may lead to a standardization of equipment to allow management of a fleet to serve all automobile companies. In some instances General Motors and individual railroads have established a base ratio of empty to total miles and have agreed to pay each other for the transportation cost of empty miles above or below the standard level. For example, General Motors would pay the railroad for an excessible number of empty miles, and the railroad would pay General Motors for achieving empty miles less than the standards. This is a situation that fosters an explicit trade-off between car ownership and transportation costs.

1. Containers—Some railroads have established tariffs requiring users to pay for excessive costs for transporting containers. This is another example of forcing consideration of the costs of empty return.

The similarities and differences among these fleets are summarized in Exhibits 1 and 2. As can be seen in Exhibit 1,

— the owner cannot always (or does not always) choose to restrict the loading of his equipment.
— the owner is not always entitled to the return of his equipment and may have to pay transport charges.
— the owner does not always receive car hire when the equipment is off-line empty.

In short, the owner's rights to the use of cars have been foregone or restricted in numerous instances. Exhibit 2 shows a similar variability in the rules and regulations by which owners are reimbursed for the use of their cars. The

CHARACTERISTICS OF RIGHTS OF USERS AND OWNERS OF VARIOUS FLEETS OF EQUIPMENT

FLEET	Right to: Load Offline Anywhere (User)	Free Empty Return (Owner)	Car Hire When Empty (Owner)
1. Typical System Car	Yes	Yes	Yes
2. Typical Foreign Car	Various Restrictions	Yes	Yes
3. Clearinghouse and Gondola Pool Cars	Yes	No	Yes
4. Cars Exempted from Car Service Rules 1 & 2	Yes	No	Yes
5. Railbox	Yes	N.A.	User can store
6. Tank and other Cars (Car Hire Rule 1(d) (1))	Various Restrictions	Yes	Mileage only
7. Multilevel Cars (demonstration)	Destinations Assigned by A.A.R.	No	Yes
8. Heavy Duty Flats (CSD 439)	Destinations Assigned by A.A.R.	No	Yes
9. Xtra, Realco Trailers (Free runners)	Yes	N.A.	User can store
10. Assigned cars	To pool points Only	No	Various reclaim restrictions
11. Short line (Car Hire Rule B6)	Various Restrictions	N.A.	Reclaim under Certain Conditions
12. Containers	Various Restrictions	May be Transport Charge	Yes

EXHIBIT 1

CHARACTERISTICS OF CAR HIGH AND EMPTY USAGE CHARGES FOR VARIOUS FLEETS OF EQUIPMENT

FLEET	Car Hire Rates	Flexibility in Rates	Loading Charge	Loading Incentive	Cost of Car Hire or Empty Move in Tarrif
1. Typical System Car	Time/Mileage based on age	Downward	No	N.A.	No
2. Typical Foreign Car	Time/Mileage based on age	Downward	No	Some have offered reclaim	No
3. Clearinghouse and Gondola Pool Cars	Time/Mileage	Downward	No	Some have offered reclaim	No
4. Cars Exempted from Car Service Rules 1 & 2	In some case, owners give originator free use of cars if loaded off-line	Downward	No	Some have offered reclaim	No
5. Railbox	Flat rates for Time/Mileage	Upward/Downward	No	No	No
6. Tank and Other Cars (Car Hire Rule 1(d)(1)	Mileage	Downward	No	No	No
7. Multilevel Cars (demonstration)	Time/Mileage based on age	Downward	No	No	Yes (various contracts)
8. Heavy Duty Flats	Mileage	Downward	Yes	No	Yes
9. Xtra, Realco Trailers (Free runners)	Flat Rates	Upward/Downward	No	No	No
10. Assigned Cars	Time/Mileage based on age	Downward	No	No	Yes
11. Short Line (Car Hire Rule B6)	Time/Mileage based on age	Downward	No	No	No (can reclaim if excessive)
12. Containers	N.A.	N.A.	N.A.	No	Yes (empty mileage allowance)

EXHIBIT 2

Car Hire and Car Service Rules do not apply uniformly to all types of equipment, while some equipment is not even subject to these rules.

4. CHANGING THE CAR HIRE/ CAR SERVICE SYSTEM

4.1 The Process from the Industry's Perspective

The rail industry has at least three major forums for discussion of freight car management. The first consists of the various committees of the AAR, who frequently consider changes in the Codes of Car Service and Car Hire Rules. The Committee or Car Service and the Operating-Transportation General Committee do not quickly recommend changes, but require consideration of all the intricacies of any proposal and stand ready to modify rules to correct abuses. While individual roads may question the the decisions reached by these committees, it is difficult to argue that they do not provide well-established procedures for changing car utilization rules and policies. Final decisions must be made on a letter ballot of the AAR's membership based on the principal of "one car, one vote."

The Freight Car Utilization Program offers a second major forum for discussion. This group has played active roles in the Clearinghouse, the Multilevel demonstration, the studies of hourly car hire,[12] and, more recently, in the development of comprehensive proposals for improved car management systems.[13] Originally established as an organization distinct from, but administered by the AAR, the program is now a part of the AAR's Research and Test Department. It was supported in part by funds from the Federal Railroad Administration, at least through 1981.

The third major forum is provided in the board meetings of Trailer Train and its subsidiaries. Trailer Train, Railbox, and Railgon are major industry initiatives that were undertaken outside of the general framework of car hire and car service rules. Trailer Train personnel have the competence to develop and evaluate proposals for more effective fleet management, and they certainly have an effective review process to minimize the risks to both Trailer Train and the industry of any major new equipment venture.

4.2 Some Changes that Would Address Fundamental Problems

Any of these three forums could be used to develop or implement changes in the car hire/car service system that would address the fundamental problems outlined in Section 2. In many cases, important changes could be based on the experiments and special situations described in Section 3, which have provided a great deal of data concerning the results of changes in the car hire/car service system. The essential concept is that the car hire/car service system should promote better short and long-run decisions by railroads, car supply companies, and shippers, as discussed in Section 1. Some strategies that could be followed are:

a. Under certain circumstances, allow a railroad to charge the owner for the return of empty equipment. This would reduce the burden on intermediate and terminating carriers, who are forced to accept equipment with high car hire rates in interchange, who have little incentive to reload such equipment, and who must even pay car hire while returning it empty to the owner.
b. Under certain circumstances, allow a railroad to declare certain car types surplus. This would, perhaps, allow the railroad to store foreign empties without paying the time portion of car hire and after some time even charging the owner with a storage charge. This would not restrict an originating carrier's desire to load his cars off-line, but it would eliminate the guarantee that he would receive car hire for the entire time that the car was off-line. This would cause a major change in the existing economics of reloading foreign equipment and would be a major inducement to reduce empty mileage.
c. A combination of loading, unloading, and usage charges that protect the originating, terminating, and intermediate carriers. Any carrier that imposed a loading charge would accept a rule allowing the terminating and intermediate carriers to return the car empty at a reduced car hire rate plus a transportation charge. Provisions could be established to give the intermediate and terminating carriers more freedom in providing cars for loading, which is today the prerogative and responsibility of the originating carrier.
d. The elimination of the time portion of car hire during declared surpluses coupled with an increase in the mileage portion or car hire. This would eliminate the car hire cost of holding an empty car for reloading and at the same time increase the mileage cost of sending the car home. This would at least put the financial incentives where they belong and thereby reduce the unnecessary movement of cars during a shortage.
e. An increase in the time portion of car hire coupled with a decrease in the mileage portion during a declared shortage. This would encourage the rapid movement of cars when they are most needed. A limit to the time portion might be the base rate plus the average daily mileage multiplied by the average mileage rate.
f. Elimination of the current system of car assistance directives in favor of a fleet management concept such as recommended by the Freight Car Utilization Program.[14] Movement directives plus penalties for failure to comply would replace the need to direct cars back to the owning roads.
g. Establish non-railroad-owned fleets to provide a reserve fleet that would supplement the individual railroad fleets. The car hire on such cars could be flexible, rising during shortages and falling during surpluses. Users could be protected by the ability to store such equipment, to charge for some portion of the empty movements, and to negotiate appropriate rules for dealing with surpluses and shortages.

Implementation of such changes in the car hire/car service system could go a long way toward increasing the incentive for improving car utilization and would promote better decisions in both fleet sizing and in car distribution.

FOOTNOTES

1 See the "Code of Car Service Rules/Code of Car Hire Rules," A.A.R. Circular No. OT-10, published quarterly in **The Official Railway Equipment Register**, National Railway Publication Company, New York, NY.

2 Idem.

3 For a recent review, see John Richard Felton, **The Economics of Freight Car Supply**, University of Nebraska Press, Lincoln, Nebraska, 1978.

4 Martland, Meyer, Sloss, Bray, and McCord, **Improving Freight Car Distribution Performance: Overcoming Institutional and Organizational Barriers to Change**, MIT Studies in Railroad Operations and Economics, Volume 36, 1982.

5 Task Force II — **Analysis of Car Service Rules, Orders, and Directives — The Impact of Car Service Rules on Car Utilization**, Freight Car Utilization Research/Demonstration Program, A.A.R. Report No. R-369, 1979.

6 Freight Car Utilization Program, **Catalog of Projects and Publications**, A.A.R. Report No. R-453, 1980.

7 A. D. Dingle, **Freight Car Clearinghouse Experiment: Evaluation of the Expanded Clearing-**

house, Freight Car Utilization Research/Demonstration Program, A.A.R. Report No. R-293, 1978.

8 Idem.

9 For a discussion of the applicable rules and regulations, see Martland, Meyer, Sloss, Bray, and McCord, op. cit., pp. 38-40.

10 Shippers must obtain permission from the originating carrier to use private cars, a controversial process governed by A.A.R. Circular OT-5-E, "Rules Governing the Assignment of Reporting Marks and Mechanical Designations," which is included in the Official Railway Equipment Register.

11 The best description of the history of the multilevel projects is included in the "Application of Certain Common Carriers by Railroad Under 49 U.S.C. Paragraph 11342 for Approval of an Agreement for the Pooling of Car Service." See also Martland, Meyer, Sloss, Bray, and McCord, op. cit., pp. 33-38.

12 The Operating Transportation General Committee, after failing to reach a concensus on this issue, referred it to the Freight Car Utilization Program for further study. The analysis by Task Force I-6 and MIT was reviewed by the O-T Committee and eventually led to the adoption of hourly car hire. See C. D. Martland, Incremental Per Diem, MIT Studies in Railroad Operations and Economics, Volume 19, 1977.

13 Task Force II-1, Alternatives for Improving Freight Car Management, Freight Car Utilization Research/Demonstration Program, A.A.R. Report No. R-426.

14 Task Force II-4, Proposal for Change in the Railroad Industry-Wide Car Management System, Freight Car Utilization Research/Demonstration Program, A.A.R. Report No. R-379.