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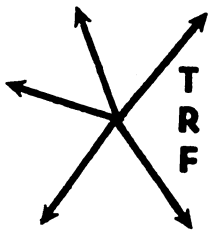

TRANSPORTATION RESEARCH FORUM

Economic Fundamentals in Freight Rates

*by Richard H. Steiner**

In speaking to you today about some new approaches to formulating railroad freight rates, I should emphasize that these comments are my personal observations and do not necessarily represent the views of the Penn Central Company. I would caution you also that I will be speaking to you in rather broad terms. Undoubtedly, you will find areas of detail susceptible to challenge. The important thing is to evaluate the argument being made.

We must start with the assumption that the rules and the standards we normally associate with a capitalistic economy, in terms of resource allocation, are criteria we accept for evaluating railroad performance. Basically, we should define a business (or a corporate entity or a railroad) in terms of use or employment of capital. This is how we should measure ourselves against other industries. But more importantly, we should evaluate railroad performance on the basis of the return generated on the employed capital. (This theory has led to the current vogue of using discounted cash flow for evaluating capital alternatives, etc.) A business by definition, whether it be a railroad or an airline, or a department store, involves a situation where owners have invested a certain amount of capital. The capital supplied by owners is employed for purchasing plant, labor, and material, and these, in turn, are blended to produce a product. That product is then sold in the marketplace; it is converted back to cash which can be recycled back through the enterprise. The stockholder is interested in how much his capital has expanded in a given period of time—his rate of return.

There are more than just a few economists in our country today who regard the railroad as a "dismal industry". Is this a fair and accurate evaluation? Look at the railroad industry today; look at the railroad industry ten years ago; look at the railroad industry thirty years ago. Has it really improved? There have been changes, yes, but has it really improved? Well, it depends on how you measure results. If you consider that the objective of the railroad as a corporate entity is to generate a return for our stockholders, and this is as good a rationale as any, we have not been very successful.

The railroad industry in 1966 had a rate of return of around 4%. The First National City Bank of New York publishes an annual listing of performance for major industrial groups in the United States. It ranks 73 major industries. The railroads in the best year they've had in a long time ranked 72nd in the parade. To put this in perspective, you can get a better rate of return in the railroad industry if you buy your own equipment trust certificates. Now, I use that as an illustration because it reflects the gravity of the problem we have in the railroad industry.

As an added sidelight on the rate of return problem in our business, I think it's significant that managements in many railroads today are not re-

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**General Manager Pricing, Penn Central.*

investing their capital in the railroad. The movement now is toward diversification. Does this mean that railroad management has decided that the rate of return potential of the railroad industry will always be dismal? That possibly capital could be better employed in pipeline or chemical company or some other type of investment? It's something to think about, especially for those of us who feel that there is tremendous economic potential in the railroad industry if it can be intelligently exploited.

Now that we have touched briefly on railroad corporate goals, let us examine the role of the pricing function in reaching our objective which is profit maximization or getting the best rate of return we can for our stockholders. The price that we charge for our services is a key element in the business equation. It represents the revenue per unit that we will generate in performing a service, assuming that we perform that service. (Of course, if your price isn't realistic you may not be given the opportunity to perform the service.) This equation is very simple: from the revenue generated, subtract the cost and the remainder is the profit. The price in this equation is obviously a very important part in relation to the revenue to be generated and the margin of profit above cost. More importantly, in the competitive marketplace the freight rate or the transportation price acts as a focal point for bringing together the evaluation of alternative modes of movement by our users. It's a little like the classic exercise of comparing "apples and oranges." For example, the shipper must compare a particular type of truck service with rail service. So he evaluates his alternatives in dollars and cents. He looks at the freight charges and then he looks at the other expenses in comparing the various alternatives. The freight rate is a primary element; it is the easiest to determine and it already has the common denominator of dollars and cents.

Have you ever noticed the absence of the use of the word "profit" in the statement of justification in rate proposals filed by railroads? Not many years ago, when I was relatively new in this industry, I was assigned by the Vice President to help write a justification for a rate change. It had been determined that the proposed action would increase our net profit substantially. When the justification document was edited by one of our senior pricing officers my use of the word profit was deleted. I asked why don't we specifically identify profit and was told that "we don't want our customers to think that we're making a lot of money on their business." The point that I am making here is that the direction from which we should approach the pricing problem (or really the marketing problem) should be to maximize our long run profitability. That's the only thing that really counts, maximizing the long run profitability of your particular company. If any other objective becomes paramount, you are bound to find yourself in long-term economic difficulty in a market economy such as ours. What this means, and it goes back to sophomore economics, is that pricing should be a function of demand. The price should be set at the level that will maximize long term profit which, of course, is determined by the margin of profit on each unit and the volume hauled. In a sense, demand pricing is charging "what the traffic will bear." In determining "what the traffic will bear" you must understand the characteristics of demand including all other competitive alternatives available to the customer. This must include an understanding of the economic factors which might lead him to forego a market altogether

if the transportation charge is too high, or decentralize his production to reduce transportation charges to a level at which he can compete. You may have different types of demand characteristics and different options depending on the service, on the equipment mix, and on the price. But the price-service mix that the carrier should select and should advocate is the one that maximizes its long term profit—its rate of return. Parenthetically I should point out that this may well result in sizeable reductions of many present rate levels when we look at the railroad's declining share of the transportation market.

How well do the railroads really relate to the marketplace? We do not do as well as I think we should. The railroad industry **reacts** to market situations or market pressures; we do not **act.** A majority of pricing proposals are initiated by our users. They do not begin with us as carriers but with our customers. That's analogous to my telling General Motors what I am going to pay for a Chevrolet. Sure I negotiate the price of a Chevrolet, but GM pretty much controls what price they are going to sell it for. Remember that I said generalizations can be dangerous; there are significant exceptions to this. But generally this is the situation you find.

The railroads, over a long period of time, are probably one of the most price competitive industries in this country. Since we are highly competitive, we tend to negotiate and put reliance on political objectives, rather than economic objectives in our pricing.

The reason for this heavy reliance on price competition is that management in the railroad industry has traditionally been production oriented. We are a production controlled industry and the traffic function has been given the responsibility for generating the volume of business. Generally, the service and equipment mix, the product that we sell, has traditionally been controlled in the operating end of the business. So, over a long period of time those responsible for volume generation have had only one tool given them by their management to generate traffic—and that has been price. Over an extended period of time this reliance on price competition has resulted in the forcing down of profit margins in basic rate structures. Since we are to an important degree oriented toward intra-industry competition we have tended to price down those areas of demand which the economist terms inelastic. The railroads have been price-competitive internally, which means that we have tended to depress rates where rail competition exists. At the same time we have neglected to properly evaluate many market areas where we have an intermodal competitive situation, where effective action would generate new business for the industry. I don't think you can criticize the individuals or the motivations of the traffic officers in the railroad industry. The situation in which they find themselves goes back to the traditional railroad management structure of domination by the production side of the business and isolation of those managers who are given responsibility for merchandising the product. Really, what a manager must have if he is going to be responsible for generation of business and marketability of the product is 1) breadth of control to consider all elements of the product; and 2) basic profit objectives to follow.

Of course, our competition has certain advantages. They tend to have either very low transportation costs which for certain markets give them a

lot of leverage or they may offer better service in terms of time and flexibility. Motor carriers are probably our biggest threat. I would also include private motor competition. They have certain advantages that we don't have. They have no economies of scale; they are very flexible.

In pricing truck services, motor carriers have not taken on the role of providing market rigidity for their users. Now what do I mean by market rigidity? Those of you who are familiar in some depth with pricing in the railroad industry are aware of the things that you run up against when you talk about changing rates. These are most often pressures from outside the railroad industry. For example, you cannot make a certain rate change according to an affected shipper "because you will change my market relationships." Another customer may tell you that "I won't know what my competitor's transportation cost is if you go to a continuous incentive basis of rates." Another might say, "Always put in point-to-point rates so I know what markets my competitor is going to." And of course, here's a real beauty from the grain people: "necessary for the orderly marketing of the commodity." As you are well aware, we don't get a dime for holding the umbrella, but in response to those shipper demands we perpetuate rate structures that may be completely uneconomic.

It is interesting to note that a spokesman for the grain industry recently stated that railroads should be allowed to change freight rates and not continue to provide "marketing expediency" at the expense of "distribution efficiency." This is especially interesting because four years ago that same spokesman was saying we must protect the Chicago Board of Trade and the terminal markets, and that disaster was surely in the offing if a change were made in the Eastern grain rates. Needless to say, the Chicago Board of Trade is still functioning; it didn't collapse when the railroads changed the grain rates in the Eastern part of the United States in 1964. The point is this: artificial rigidity, into which the railroads have trapped themselves, impedes our ability to be profitable and competitive in the marketplace. As railroads, we realistically should not have the responsibility, at least from an economic sense, to insure market relationships between commodities or producers. I even question whether, if the relationships are uneconomic, the railroad has any duty to maintain them in the long run under the Interstate Commerce Act. If a lower cost competitive option is open to the shipper he uses it and the railroads end up not handling the traffic. Conversely, the railroads may have been able to price it at a much higher level; a more profitable basis for railroads. Again, the objective of pricing should be to maximize railroad profitability.

From an economic point of view, changes in relationship in the markets of our users are not necessarily harmful. We are in a dynamic capitalistic economy where change does come about, relationships do change, industries change. There were industries flourishing 50 years ago that don't exist today. There are large industries today that were undreamed of 50 years ago. Locations of industries continually shift for logical economic reasons. So why is it the role of the railroads to protect everybody's market relationships? We have trapped ourselves into performing this role when it is frequently uneconomic for us. In fact, it may even be uneconomic for our

users. From an economic point of view, it is clearly not in the public interest to have railroads subsidize a market relationship.

The real problem of course, is to know demand; what you can charge for a particular service and what are the service alternatives to shippers. The railroads have not effectively demand priced in the past because it is difficult to do. To determine demand one must evaluate all of the options of the total distribution system. This is what modern marketing, which we have developing in its embryonic stage in the railroad industry, is all about. Its purpose is to measure demand characteristics. Demand characteristics involve more than price. They encompass time and equipment and distribution systems; in short, a total systems approach. Of course, demand pricing by definition should maximize our profitability if we assume intelligent reaction among the railroads themselves.

An expression frequently heard today in describing new freight rates is "cost-oriented." It's a "good" objective, you know. The economist tells us that we maximize our profits if we price at a level that approaches our costs. This is true, but the economist's definition of cost includes a profit increment that will satisfy the suppliers of capital. Additionally, the price is determined by the interrelationship of cost (supply) with demand. Cost-oriented pricing says that railroads are going to look at their cost characteristics and if their costs are very low they'll price very low. It is seldom that the railroads will increase their price because of the lack of profitability when compared to costs.

Demand pricing runs counter to cost-oriented pricing. The final results may not be always different, but the approaches are quite different. In a real sense demand pricing and cost-oriented pricing are attacking the same objective from opposite directions.

Costs function for the demand pricer in two roles. First, he uses cost to measure profit results. This is what I call a go-no-go gauge. A proposed price is tested against cost to determine the expected profit margin. It then must be decided whether or not the profit margin is adequate to meet the corporate profit objectives. Importantly, it is the profit margin and not the cost that is the determining factor in making the decision whether to offer the price or not. This is as it should be. The demand pricer has two problems to overcome. First, the cost information available is not always adequate for many of the cases involved. Secondly, railroad management has not been able to translate corporate profit objectives into consistent and useable standards. I should hasten to point out that these same problems of management measurement exist in many other industries and are equally difficult to solve.

The second role of cost for the demand pricer is in the evaluation of the structural characteristics of a pricing scheme. The structure of rates involves the relation between differing conditions, i.e., distance, routing patterns, equipment types, shipment sizes, geographic areas, etc. The structure must be compatible with the carrier cost characteristics. Additionally, the characteristics of costs may indicate other options that may increase the carrier profits and at the same time reduce the shipper charges.

So much for the discussion of basic philosophy. Let us now turn to some practical examples. Since the recent Eastern grain adjustment contains the elements necessary for my discussion, I will use it to illustrate some of the ideas and problems that I mentioned previously. This should also give you a better idea of what I mean by rate structure.

Before continuing, let's review some simple techniques of graphic analysis that could be very useful in looking at structural characteristics of rates. A graphic technique allows for the displaying of relationships visually, thus facilitating comprehension—the old Chinese adage, "A picture is worth a thousand words." Figure 1 shows the basic analytical charts that we use.

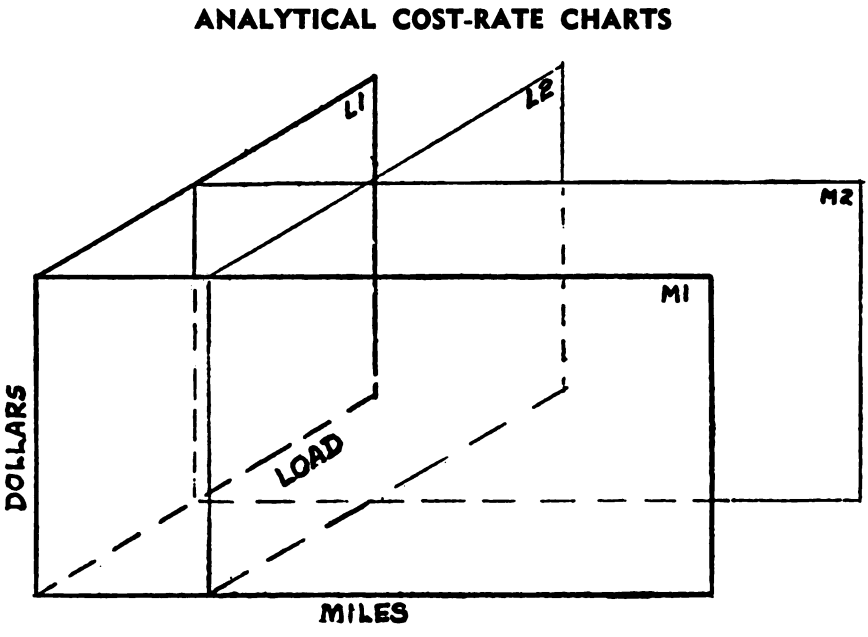


FIGURE 1

You will note that the vertical axis is in dollars. The two axes on the horizontal plane are miles and load. Hence, we can evaluate varying circumstances through relating them back to given payloads, given lengths of haul, and dollar unit relationships of cost or price. Obviously, the illustration in Figure 1 is not practical for normal analysis as people do not think well in the third dimension. The problem of trying to display characteristics in the third dimension with its inherent continuing variable characteristic becomes all but impossible. Therefore, to simplify the analysis we slice the plane through at a constant load factor thus displaying the effect of unit dollars on distance, or we slice a vertical plane at a given mileage thus displaying the effect of varying load on unit dollars. Examples of this we show in Figure 2. It is important that the analysis be done on the basis

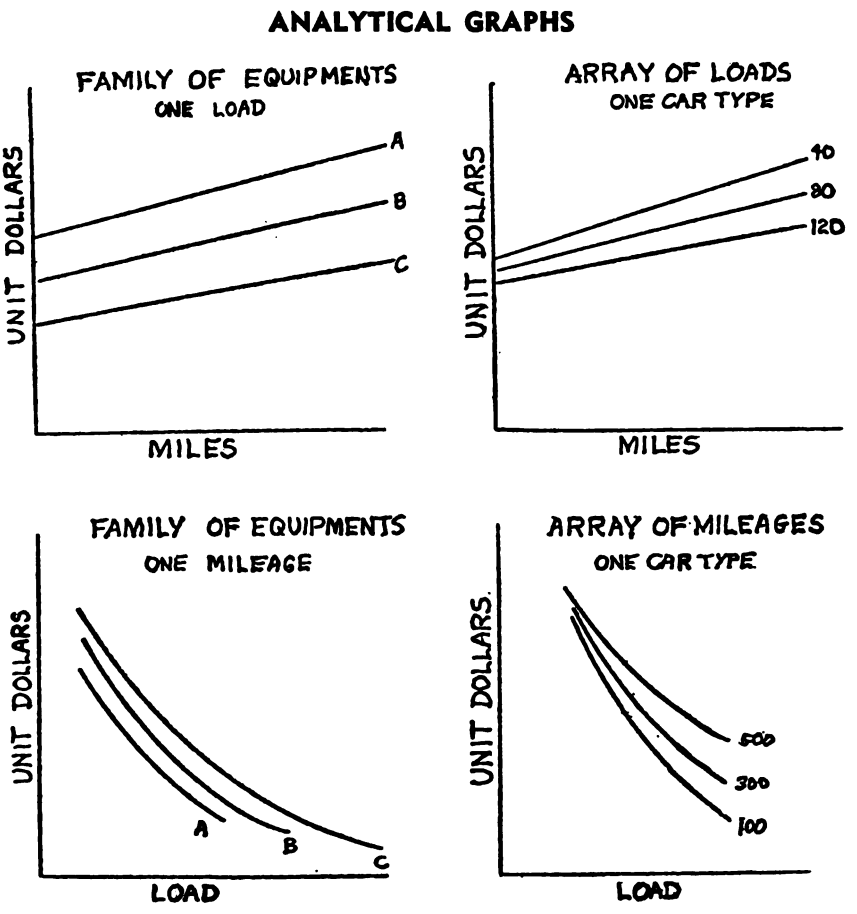


FIGURE 2

of a unit which best reflects the commodity concerned. Normally, a weight unit such as a per cwt. or per ton is used. Many commodities are purchased on a weight basis. However, it may be more meaningful for certain types of commodities to use other units such as barrels or crates or possibly cubic feet. In any case, it is the value of a specified unit of the commodity that is relevant for analysis and not the carload. The use of graphic analysis will become clear to you as we now look at some specific examples where rail rates and costs are displayed.

In our company we initiated our research in grain marketing because the rail market share was dwindling. Additionally, after a little analysis we found out we were losing money on the total of our grain and grain product traffic. It was obvious that we had a serious problem. Traditionally, when you have a problem with a declining market you react by reducing the price. Conversely, when you have a situation where you're losing money

on what you handle you raise the price. If you raise the price your market declines more, and if you lower it you increase your loss. So what do you do? You have to approach the problem differently because a simple unsophisticated adjustment of the rate level will not solve the problem. You have to look at the structural aspects of the difficulty.

The basic grain rate structure is found in Tariff CTR-245 and is commonly referred to as the McGraham formula grain rates. This is not technically correct terminology. John McGraham was a rate clerk on the Union Lines

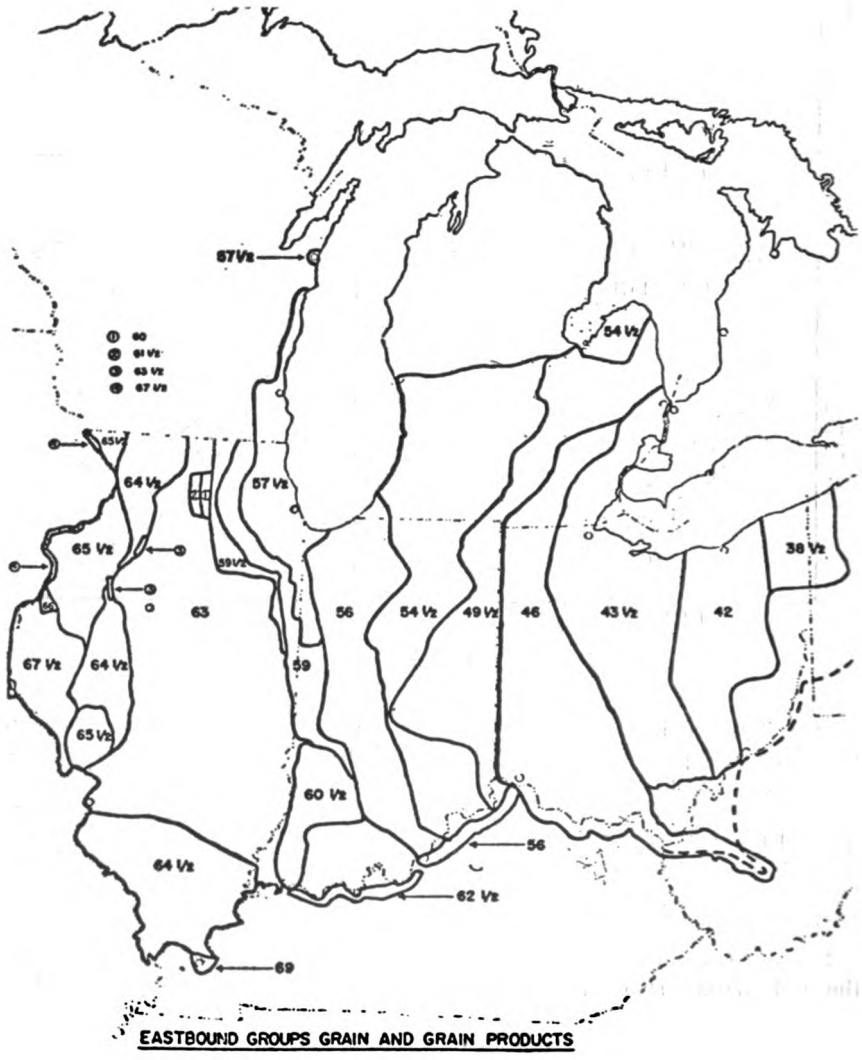
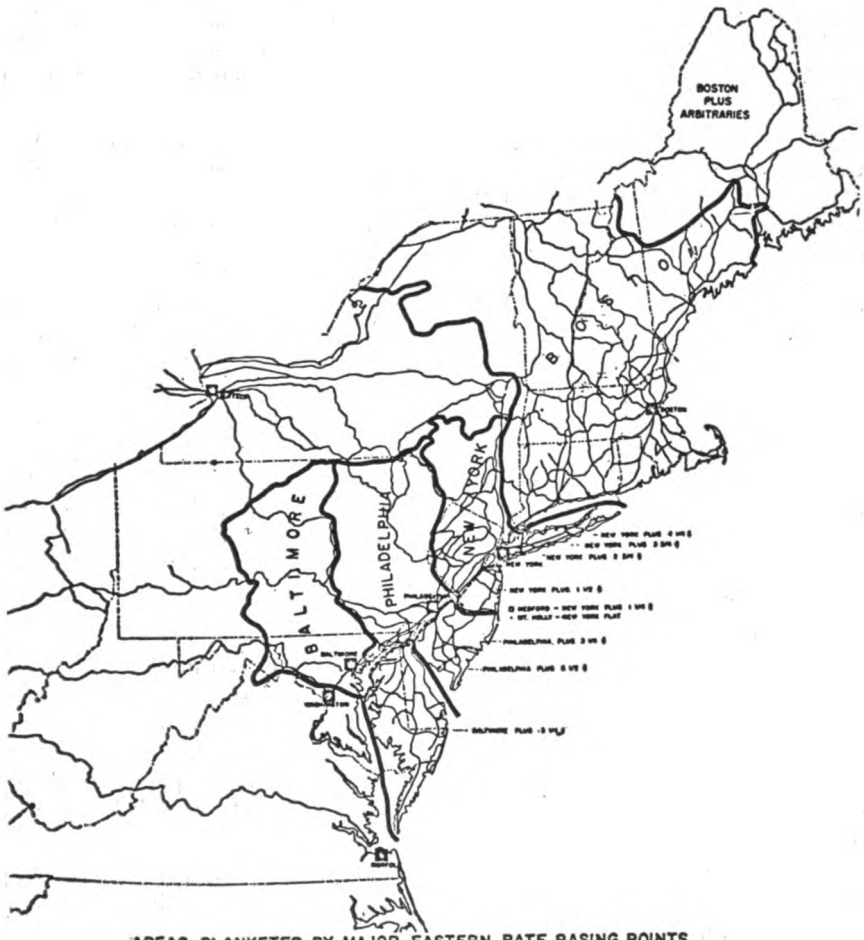


FIGURE 3

of the old Pennsylvania Railroad in 1871. He devised a basis of relationships for rates between New York, Chicago and intermediate points, not from West to East but from East to West. This formula has been used for years in railroad rate making. One might suspect that conditions might have changed a bit since 1871. Nevertheless, we have rate structures that we maintain today that are predicated on this basis. The origin rate groups are shown in Figure 3. The map contains the states of Illinois, Indiana, Ohio, and Michigan. In each of the rate groups the rate on traffic originating in that group going to the East is the same to any given destination. At the other end of the line there are destination rate groups. These are shown in Figure 4. For example, we had the Boston rate group which runs from



AREAS BLANKETED BY MAJOR EASTERN RATE BASING POINTS
ON TRAFFIC FROM CENTRAL TERRITORY ORIGINS

FIGURE 4

Ogdensburg, N.Y. to Augusta, Me. to Westchester County, just outside of New York City. Hence, there was a constant rate from any origin in a given origin rate group to any destination in the destination rate group.

Parenthetically, it might be of interest to note that the difference between the rate from any one of the origin groups to different destination groups is always constant. The Boston group always takes a rate 2¢ higher than New York City. The reason for this 2¢ difference is that in about 1896 there was a rate case in which the Commission said the rates should be 10% higher to Boston than to New York because the mileage from Chicago was approximately 10% greater. The base rate to New York at that time was 20¢. Ever since then we have maintained the 2¢ relationship. Since the railroads maintain a constant rate relationship between all destination groups, it is easy and convenient for grain traders to quote grain prices on a New York basis. The price at Boston is always 2¢ higher no matter where the origin of the grain. It is 2¢ less at Philadelphia or wherever, depending on the customer's location.

We made intensive use of graphic techniques as we analyzed the McGraham formula rates. As noted the structure deals with the relationship between origins and destinations so we plotted the rate against mileage. The results are shown in Figure 5. Rates and short line miles from all of the possible origins to all of the possible destinations were plotted. We then outlined the boundaries of our scattergram or graph. It showed, for example, rates at 65¢ could be applied for distances 400 miles to over 1,000 miles; or a 700 mile haul may move for 51¢ to 85¢ per cwt. Obviously, the rates did not reflect the mileage nature of truck costs and charges. The truck had not yet been invented when this rate structure was established.

The inherent rigidity and irrational variance in this type of structure does not lend itself to the competitive environment of unregulated trucking. For example, even if the rates were appropriate (competitive and profitable) between the centers of two groups, competition could undercut and secure the shorter hauls, and the rails would be left with the less profitable longer hauls. This is only an example of where the railroads have maintained a rate structure that disregards both the competition and our own economics.

Because of the equalizing of all grain storage and processing locations, the rate structure also equalized the charges for grain and the products of grain. Grain products move on a rate 1/2¢ per cwt. higher than the whole grain. This arrangement obviously disregards the difference in the cost characteristics to carriers resulting from the lighter shipments of low density grain products which frequently require more expensive rail equipment. Additionally, products generally give the carriers a higher claims risk because of the value added in manufacturing.

Figure 6 illustrates the character of the rail costs as they are affected by the shipment size. Obviously, if the carriers evaluate their costs predicated on the heavier loading characteristics of whole grain, the profit margin on such products would be very low or result in a loss. Conversely, if the rate level were predicated on the cost characteristics of the lightest loading product, then the resulting price may be too high to be competitive with

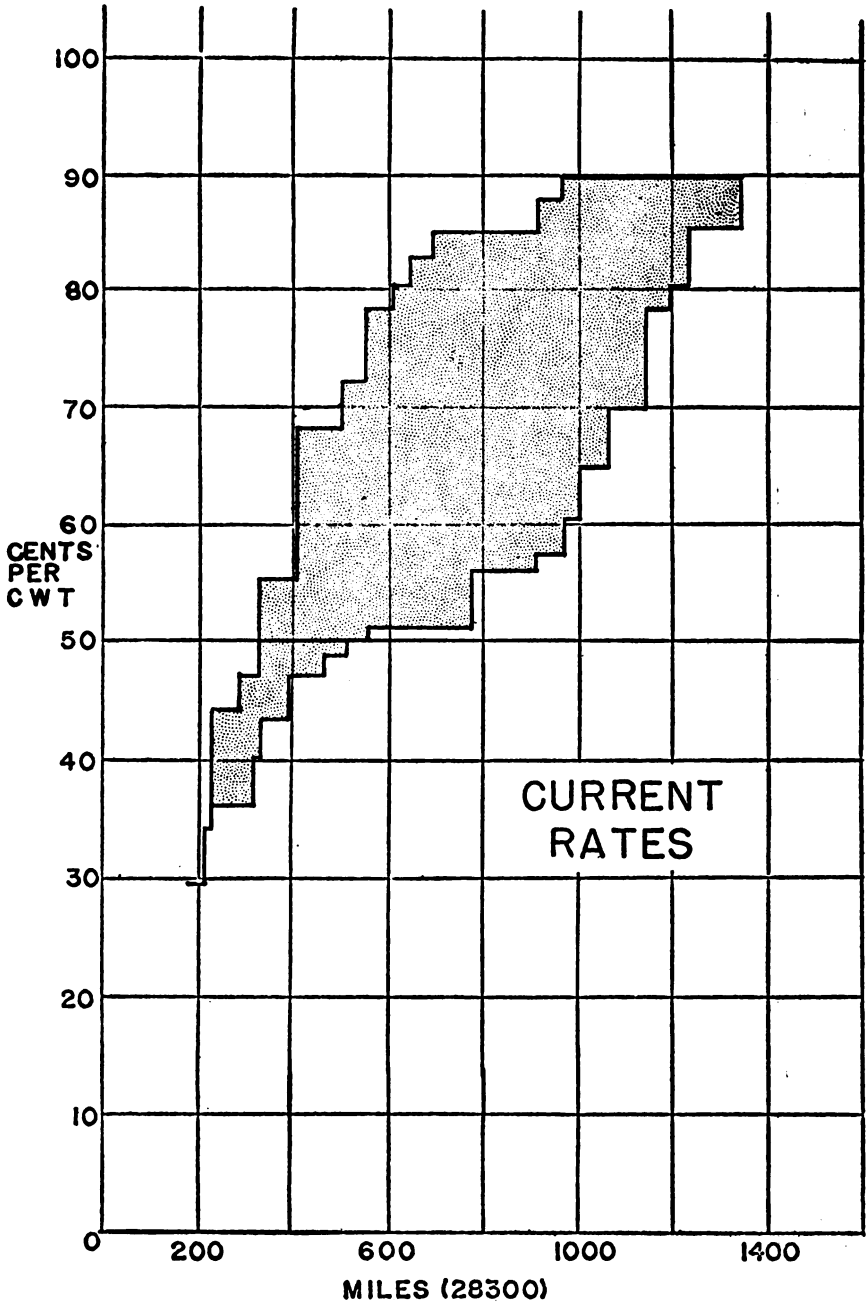


FIGURE 5

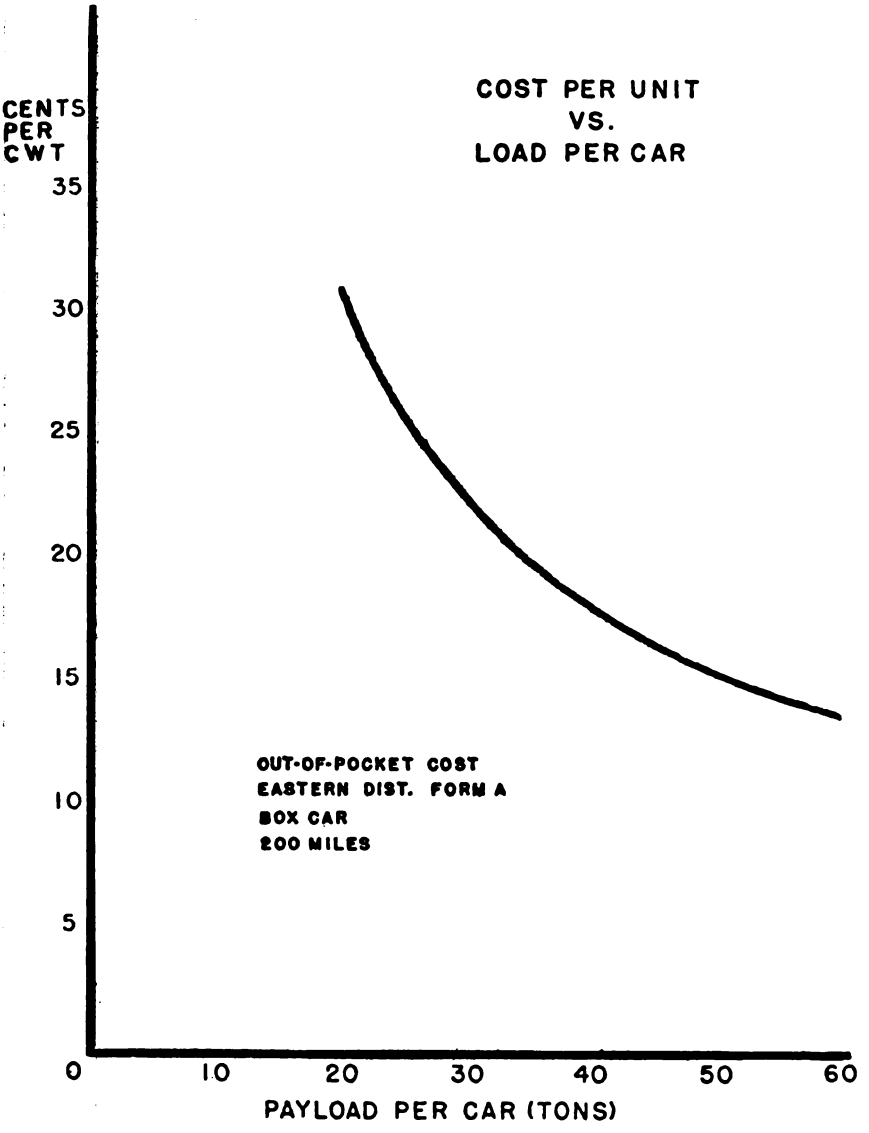


FIGURE 6

other modes of transportation. Again, the rigidity of the rate structure disregards the competitive realities and the cost characteristics of the rail carrier.

These several illustrations of the structure problems that were inherent in the traditional grain rate relationships brought home to us the necessity of evaluating not only the level of rates but their structure as well. The grain examples also vividly point out how a rate structure which may have been

rational at the turn of the century no longer fits the economic realities of 1968. It is, therefore, clear that the railroads cannot afford the luxury of maintaining rigidity in rate structures as an end to itself when doing so drives away our traffic and our profit opportunities.

Figure 7 summarizes the situation we faced and our approach to meeting it. Thus carriers who wished to maintain the traditional rate structure advocated a reduction in the level while we in 1964 proposed a new scale of mileage rates. Figure 7 also shows the nature of the truck competition confronting the rails. A scale of mileage rates was adopted in 1964 by the Eastern carriers and has proved highly successful for both the carriers and the public as a whole.

An additional problem that was inherent in grain transportation was the performance of accessorial services at no charge or at a charge far less than cost. The most important of these accessorial services, and the one we will discuss here, is transit. What is transit? "Transit" has a specific meaning in terms of distribution of a commodity. "Transit" also has a specific meaning in rail rate terminology. The literal definition of transit is the stopping of a commodity in the distribution cycle between origin and final destination for some economic function. The stopping can take place for the purpose of storage, combining with other commodities, changing of form, mixing loads, etc. By this definition virtually all flows of goods in our economy receive or are involved in transit of some kind.

The term "transit" for rail rate purposes means the equalization of transportation charges between origin and final destination of commodity irrespective of the physical operations performed by the carrier. The classic illustration is found in the flow of grain and grain products involving:

1. movement of whole grain from a country elevator to a terminal elevator for storage;
2. movement from the terminal elevator to a primary grain processor who converts the grain into a grain product;
3. movement of that grain product to a feed mixing plant for the manufacture of feed; and
4. movement from the feed plant to a final distribution or retail outlet for direct delivery to the consuming livestock or poultry grower.

Under grain rate transit, the basic transportation charge for the movement from the origin country elevator to the final feed distribution point is the same or approximately the same whether the material moves directly or through the three intermediate operations. The justification for such a system is that the equalization of transportation charges irrespective of geographic location stabilizes the market relationship for merchandising the commodity and neutralizes possible competitive advantage between rail carriers for plant locations. In other words, the traditional transit tariff for rate purposes says the physical operations and srevices really do not happen. It is interesting that none of our barge, motor truck, or air freight competitors perform such a service. It is important that we properly evaluate the economics of transit both in terms of operation in the marketplace of the commodity and also

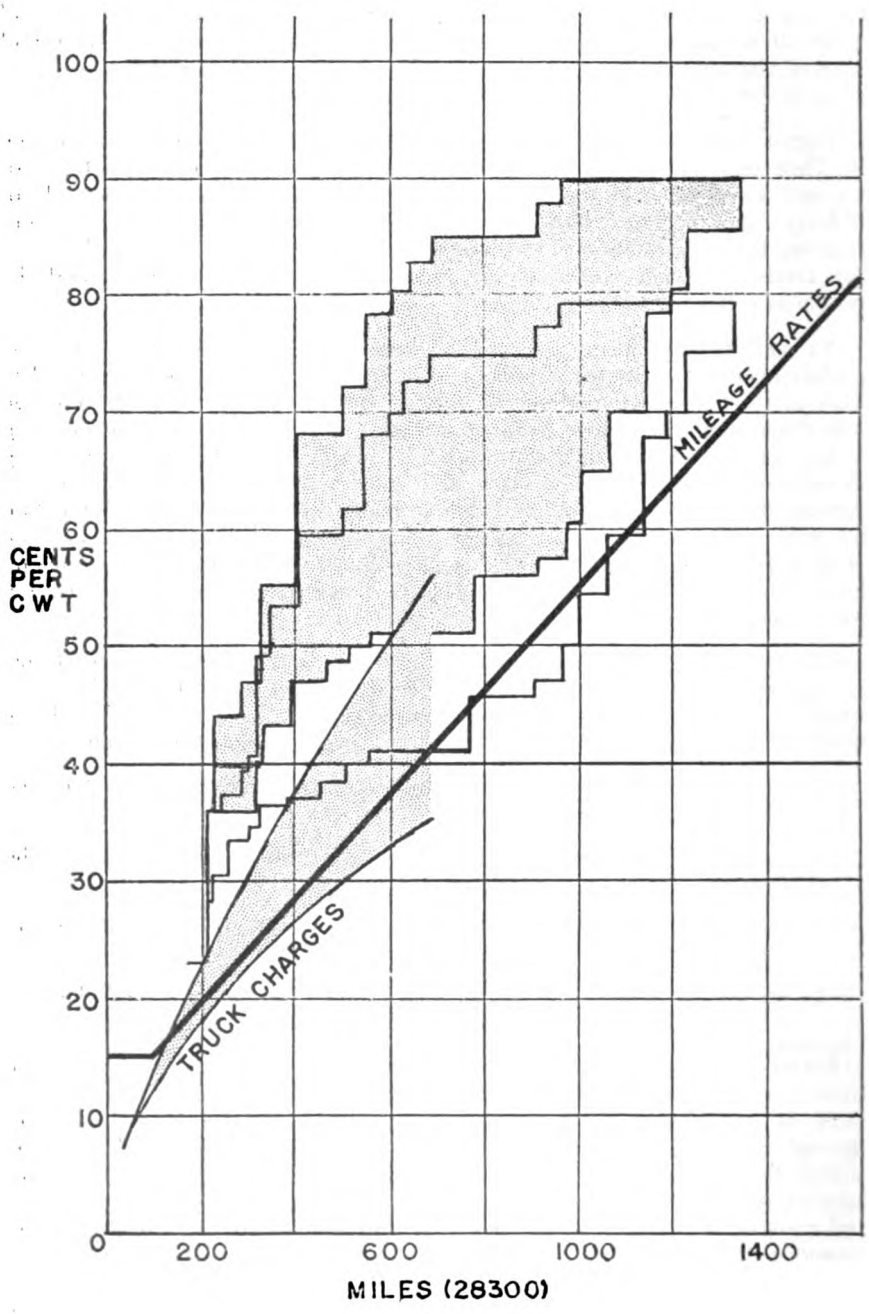


FIGURE 7

in terms of railroad economics. There may be strong justification for rate transit for certain commodities.

To make an adequate judgment in the matter, we should evaluate the cost characteristics of transit services incurred by the carriers over the years. To illustrate the impact of transit cost, please note Figure 8 on which rail per unit costs have been plotted against distance in a boxcar loaded to 110,000 pounds. You will note that the cost characteristics of a through movement are indicated by the bottom line which slopes upward and to the right as the railroad incurs additional expense for distance. The intercept on the Y axis reflects the terminal cost elements, therefore, these elements will be reincurred at any additional transit points. As the graph makes clear, with each additional transit the level of cost moves vertically corresponding to the added terminal cost factors. This illustration disregards any circuitous mileage which may be incurred because of the transit operation.

Figure 9 presents the same type of analysis. However, the payload has been reduced thus showing the impact of lighter loading in both the increasing of terminal factor and the increase in the slope of the linehaul costs. This, of course, is significant because in the grain area we have equalized the through rate irrespective of the load that is produced by the commodities. Figure 10 illustrates what might be a typical grain and grain product transit operation, assuming transit at certain intermediate points and varying payloads. You will note that superimposed over the cost lines is the diagram of the rate structure. This points out very vividly why the carriers have had an earnings problem under this type of pricing scheme.

Transit is performed on many other commodities besides grain, and usually the transit charges are higher. It is argued that as long as the transit charge covers the carrier's direct cost of performing the service, the railroad does not lose. However, this argument leaves out one important element in the measurement of the economics of transit and this is its effect on carrier investment. As mentioned earlier, rate of return on incremental segments of our capital must be a primary concern to the railroads, since obviously the total return of the industry is made up of the sum of its parts. The incremental investment that is readily identifiable with a flow of traffic is the cost of equipment. Therefore, we must look at the effect of transit on the amount of equipment investment the carriers must make and its effect on the rate of return. The nature of railroad operations is such that the turnaround time on a car is more a function of the trip than of the distance. By that I mean the turnaround time for an 800 mile haul may not be different from that of a 400 mile haul. This is because of the large proportion of time required for terminal operations and getting cars into and out of trains. We should look briefly at the simple diagram of the equipment operations that the railroads face—Figure 11. Diagram I shows one flow pattern of equipment that could exist in an operation for a commodity moving between points A and C being transited at point B. One set of equipment could be recycled between points A and B on the inbound leg. A second set of equipment could be recycled between points B and C. This type of operation requires virtually double the amount of equipment capacity necessary for a direct movement from A to C. (This assumes, of course, that no seasonality is resulting from the transit operation in B.)

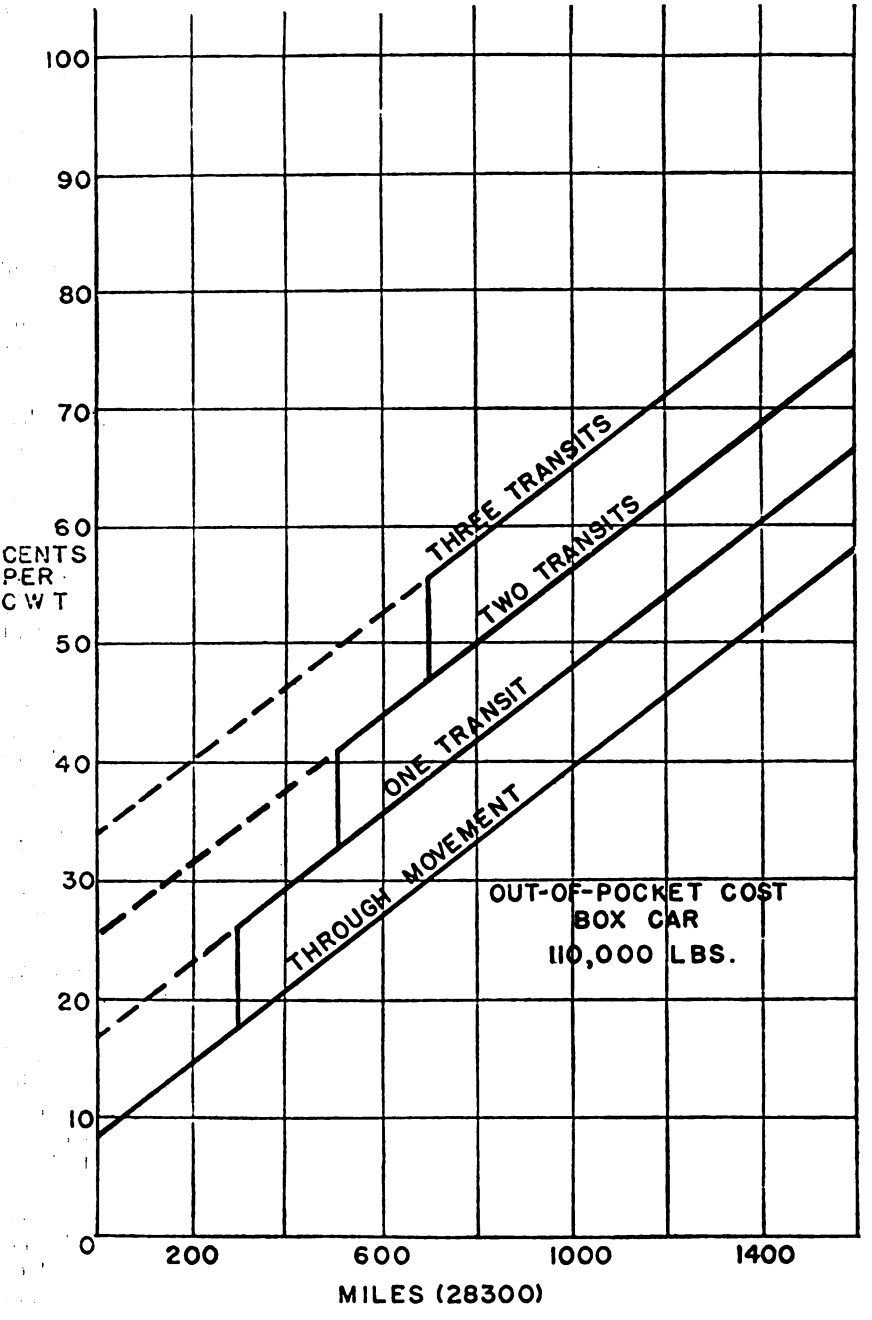


FIGURE 8

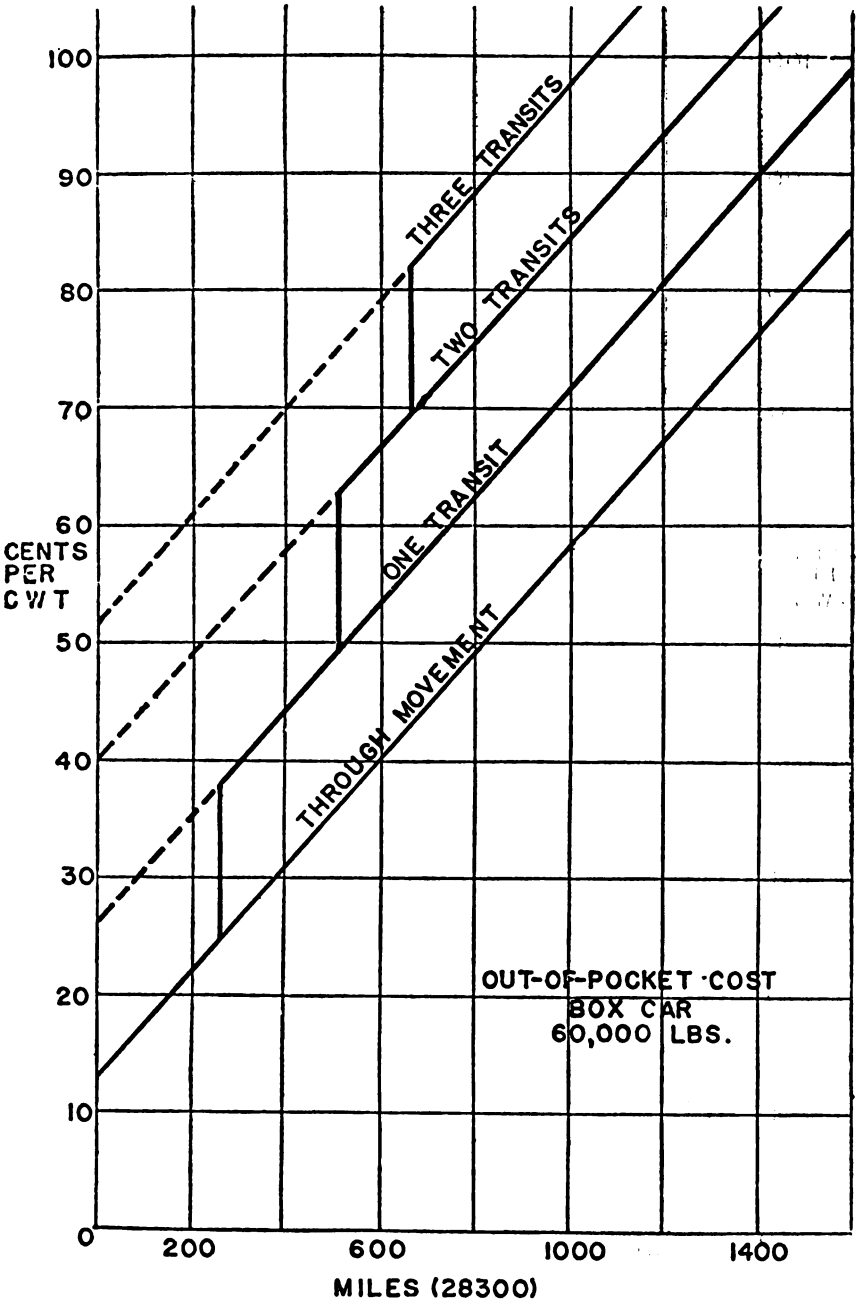


FIGURE 9

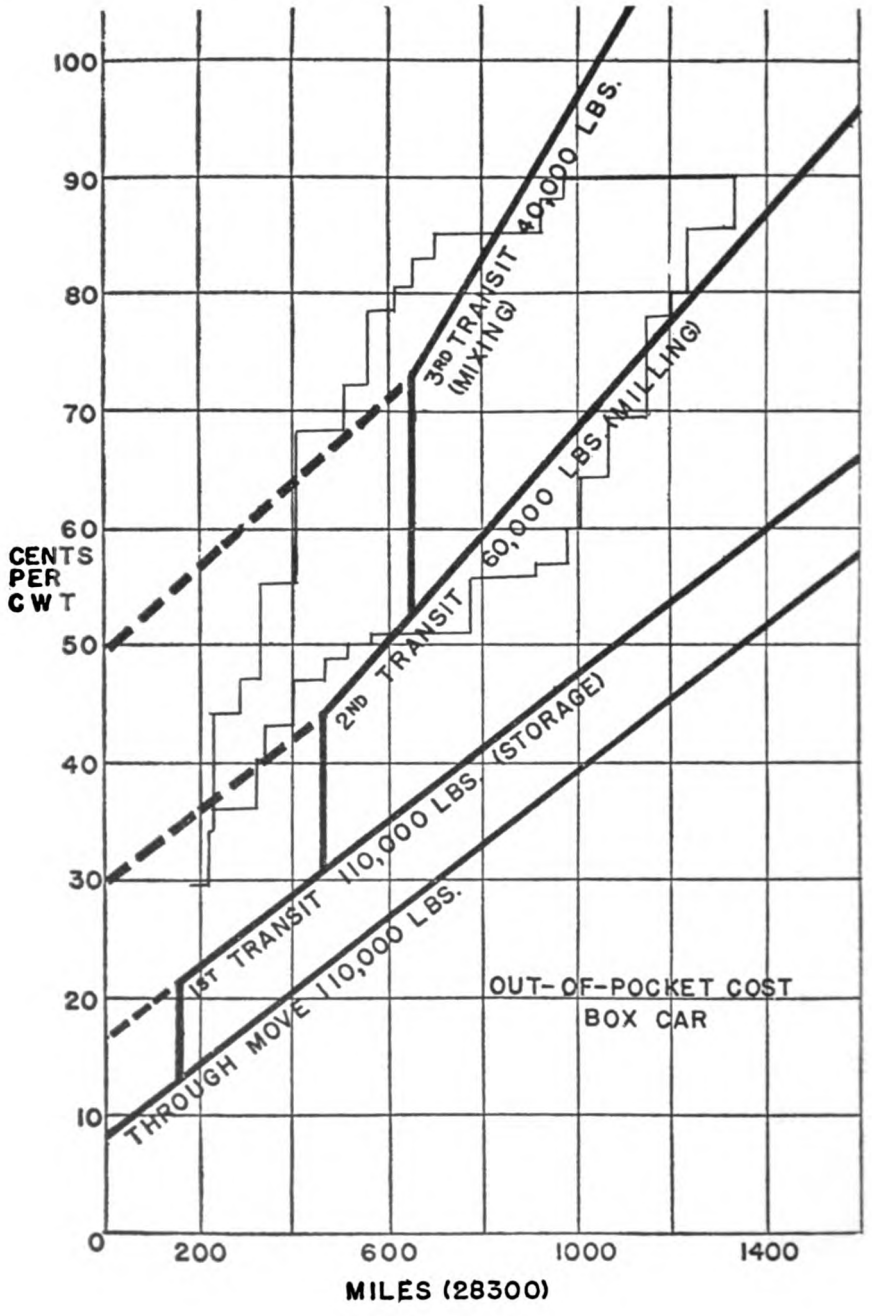


FIGURE 10

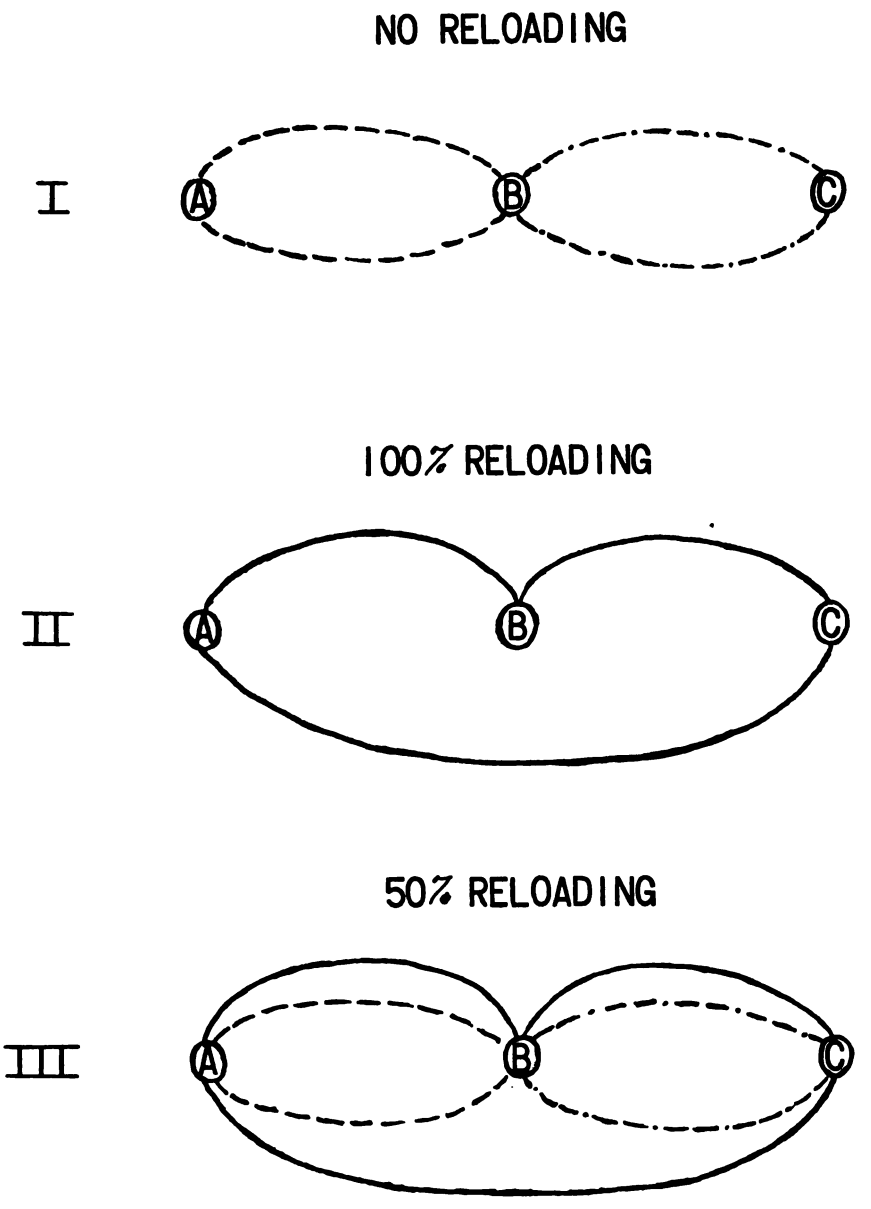


FIGURE 11

Diagram II shows a flow pattern between the same points but with reloading of the inbound car taking place at point B and the empty returning from C to A for recycling. This type of operation requires approximately 25% to 30% more equipment than the direct move A to C. This is because,

as mentioned before, the primary element of time involved is in the terminal operation intermediate in the linehaul. A third flow pattern, Diagram III, and the one that we have encountered frequently in actual practice involves an average recycling and reloading of about 50%. Therefore, the flow pattern would be as follows: the broken line would represent that part of the traffic which is handled with two sets of equipment; the solid line would represent that equipment which is reloaded at transit point B. The analysis we made on transit times on the former New York Central indicates that the additional equipment capacity required for a 50% reload factor would be approximately 64%. Therefore, if the added revenue from the transit charge only covers the direct hauling, switching, and paperwork costs we might generate some net profit from the through move. But the added capital investment cost involved in providing 64% more freight car equipment to do the job can drastically affect our rate of return on investment.

There may be cases, however, as mentioned before, where the nature of a particular commodity and the competitive situation is such that the carrier may decide to perform the service because without it no traffic would move between points A and C. Therefore, the relevant comparison is not the effect on profitability between transit and nontransit but the profitability between the transit operation and not handling the business. But again, that decision must be made after fully evaluating all alternatives.

Within the past decade or so the railroads have been using a technique called incentive rate making. The philosophy of incentive rates is to give the shipper a lower unit price in exchange for acceptance of a change in the method of doing business that reduces rail costs. The most common type of incentives are given for increasing volume per shipment, loyalty incentives for a given market share, and incentives for increased utilization of railroad equipment. This type of rate making may or may not be compatible with demand pricing. It does, in certain cases, give a reduction in price where demand conditions do not justify it, especially if the pricer is not closely attuned to his market.

For purposes of this discussion, let us assume that incentive pricing is an acceptable pricing philosophy for the rail carrier. An acceptable incentive rate, in other words, is one that meets the carrier's objectives of increasing the margin of profit and the rate of return on investment.

The incentive approach is predicated upon a sharing of cost savings. I wish to focus your attention upon the questions involving cost. What is the relevant cost to be used in this type of decision making? The costs available today within the rail industry are primarily a result of the prescribed accounting procedures of the ICC Form A. (The concept of cost for the economist, on the other hand, may be different than the concept of cost of an accountant.) Form A, as we know it today, became an adopted procedure about 1939. Therefore, it is almost 30 years old. The Form A costing method normally allows us to develop two types of costs. The first is out-of-pocket or a long-term average variable cost. This, by prescribed definition, assumes that 80% of total cost is variable. The second cost that can be developed by applying Form A is a fully distributed cost which also includes those items that were excluded by the 80% variable cost formula.

The economist talks in terms of the marginal or incremental costs associated with a particular management decision. An incremental cost is that change in cost that results from taking a particular course of action. This is normally below the level of a long-run average cost. It is not my intention to advocate the use of marginal costing for making all pricing decisions but to illustrate what the economic consequences can be when the inappropriate cost is applied in making a pricing decision.

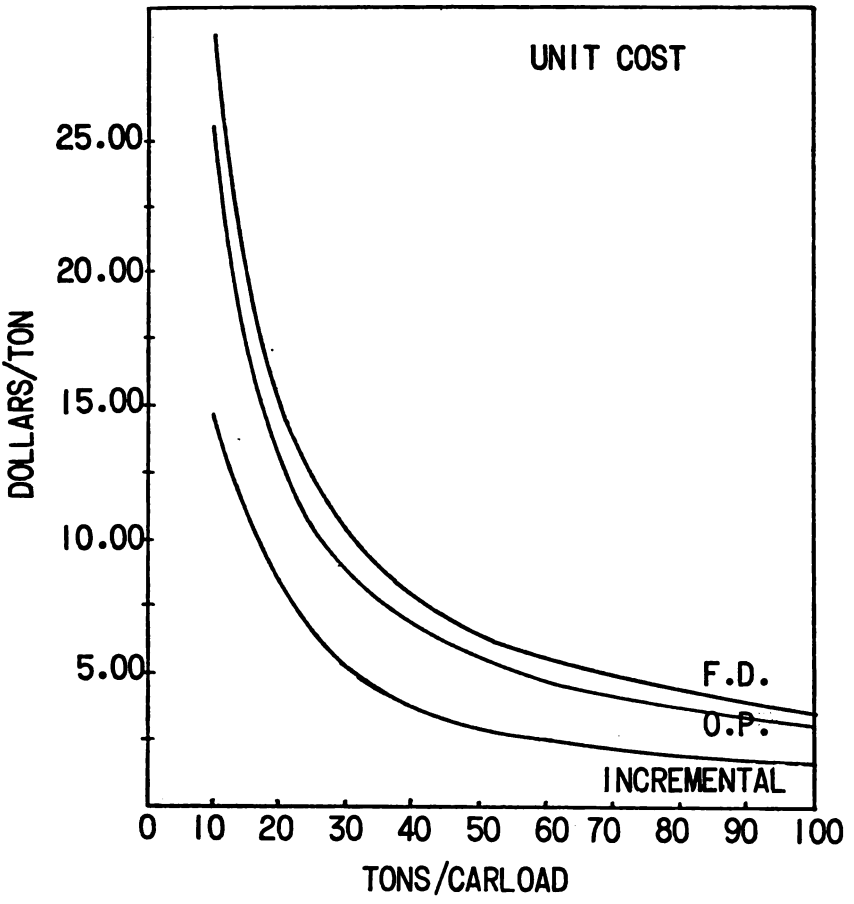


FIGURE 12

To illustrate this point Figure 12 displays three cost curves relating cost change to increased payloads. The upper curve shows the level and slope of a Form A fully distributed cost. The second curve shows a Form A out-of-pocket cost. The third curve shows a hypothetical incremental cost. Many individuals concerned with improving railroad profitability advocate the use of fully distributed costs in making management decisions. Normally, in the

evaluation of rate adjustments, the rail industry uses the out-of-pocket cost line.

My purpose here is to show how the use of cost can vary in making incentive rate reductions even, for example, when a carrier wishes to share the cost savings with the shipper. The relevant comparison of costs is not the level but the rate of change. Figure 13 displays the same three cost

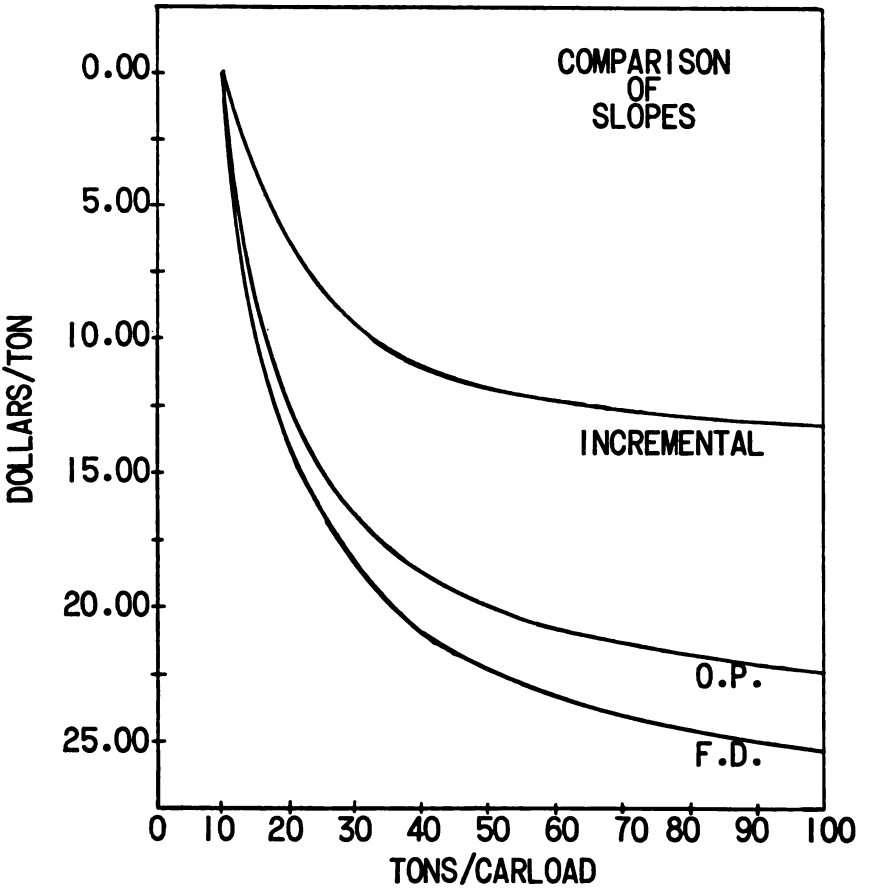


FIGURE 13

curves plotted to depart from a constant O point. Obviously, the use of fully distributed costs would result in the largest rate reduction—the opposite result derived by those who argue the theory that fully distributed costs should be used to protect carrier earnings. Likewise, the incremental cost savings is much less than the other two, therefore, it would result in a smaller rate reduction. As noted, incremental costs are those which are directly affected by a particular management decision. They reflect the true

economics of a course of action. It is my opinion, that this failure to understand our true cost characteristics and to apply proper economic analysis has resulted in many incentive rate schemes that do not provide a significant profit improvement for the carrier.

Indiscriminate use of incentive pricing can and has impaired carrier earnings. It has forced carriers to supply new equipment that frequently is not actually needed. In certain areas this situation has resulted in rates being made on the basis of an alleged cost saving when the railroad pricing officer did not understand the loading characteristics and the materials handling requirements of the commodity. The actual result was to generate from the shipper a demand for new, sophisticated and costly freight equipment having sufficient capacity to permit his taking full advantage of the rate reduction.

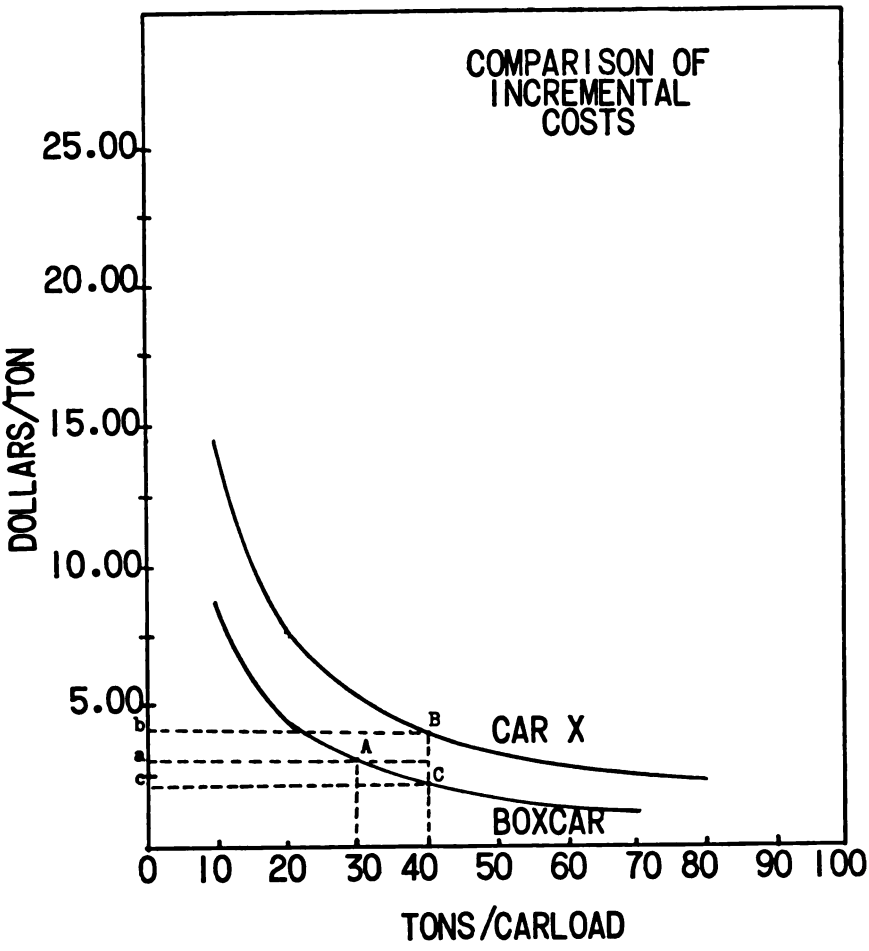


FIGURE 14

The economic effect of this is illustrated in Figure 14. The illustration shows incremental cost curves, but the result is the same no matter what costs are used. The illustration shows that if the railroad were now moving a 30 ton payload, it would be incurring a unit cost of from O to a. If the minimum weight were increased to 40 tons in a boxcar, then the cost would fall to O to c. However, if due to the nature of the commodity, to reach a 40 ton payload the carrier must now supply high cube car "X", then the carrier's per unit cost would be O to b, or an increased per unit cost of from a to b. The increased capital commitment for the new car will almost always cause a vertical shift in the cost line and unless very sizeable payload increases can be obtained, the per unit cost will be increased. The profit impact of this type of pricing result is compounded when the new equipment requires additional capital investment. The result can be a drastic reduction in the rate of return on investment. This serves to illustrate the necessity that we fully understand all of the aspects of the marketplace in our pricing activities and not operate in a vacuum relying on pat formulas.

I have attempted to cover a broad range of topics to illustrate some of the problems that exist in rate making. I have also tried to point out some possible solutions. There are three major points underlying this presentation; they are:

1. It is essential that the railroads fully implement the philosophy of demand pricing and this requires railroads to develop expertise in measuring demand. That objective can be reached only through a broad application of modern marketing concepts.

2. Railroads must set profit objectives and standards for their management. It is essential that all decisions within the industry be made to maximize long-term profitability and performance must be measured against those profit objectives.

3. The railroad industry must have better cost information. The proper cost is essential if we are to evaluate the true profit effect of any management decision. Reliable cost data will provide a sound basis on which to select alternatives that maximize profits.