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# PROCEEDINGS —

## Nineteenth Annual Meeting

Theme:

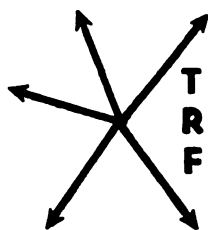
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**TRANSPORTATION RESEARCH FORUM**

# Railroad Profit Measurement and Organizational Structure

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## INTRODUCTION

**R**AILROAD COMPANIES are without significant exception organized so that, in effect, revenue responsibility lodges with a senior commercial officer and cost responsibility with a senior operating officer and profit responsibility with only the chief executive officer. Many students and practitioners of railroad management have long argued that railroad companies should be so organized as to push the profit responsibility down far below the level of the chief executive officer where it now lodges. Many have urged that railroad companies should adopt something like the decentralized form of terminal-area profit measurement and management responsibility which has come to be standard operating practice in the LTL trucking industry. In his recent book, *Railroad Management*, Professor D. D. Wyckoff of the Harvard Business School suggests that profit responsibility should ideally be decentralized, but he goes on to discuss the many practical difficulties this would entail.

If there is some agreement that improved organization for profit management is needed in our railroad companies, there is much disagreement on just how such an improved organization should look. It is the thesis of this paper that the resolution of this disagreement turns on a more careful identification of the controllable and uncontrollable dimensions of profit at various levels of railroad management and on a clearer delineation of the management information required by any logical decentralization for profit management.

It can be stated at the outset that the "terminal area" profit management system now in widespread and successful use by the LTL trucking industry would be unworkable in the railroad industry. The problem with such an approach is that railroad terminal area managements control too little of the profit calculus compared to their trucking counterparts. Local railroad sales personnel control too

little of the revenue generated in their territory; and local railroad operating personnel cannot be allowed to control all of their own costs (at least not for ordinary carload business.) This does not mean that profit management cannot be pushed down below the level of the chief executive officer, however, or that improved measurement systems cannot be developed for lower levels of railroad management.

## PRODUCT LINE COMMERCIAL MANAGEMENT

It is clear that one can logically break the commercial side of a railroad company (marketing, pricing, and sales) into profit groups, what some have called "product lines" and others would call "market areas." These product lines organize themselves naturally around commodity/shipping-industry groups: e.g., grain, chemicals, lumber, automobiles and automobile parts, coal. It is a simple matter to associate freight revenues uniquely with each such product line at whatever level of disaggregation may be desired. It is also possible to disaggregate terminal, line haul, and equipment costs along the same lines; though that job is by no means simple.

Thus, it is possible to measure profitability by product line. It is also possible to control profitability by product line, though only in part. Pricing, solicitation, equipment supply, and service are the principal factors which control the revenue dimension of the profit equation. All of those factors are subject to reasonably effective independent control by separate product line groups. The operations and maintenance activities which determine most of the cost dimension of the product line profit equation, on the other hand, are not subject to any such independent control. The intimate interactions between various parts of a railroad operation and the extensive joint cost characteristics of railroad technology simply make independent control of the operations involving traffic belonging to an individual product line impossible. (Single product lines that utilize TOFC/COFC and unit train operations are exceptions to this rule.)

It is important to recognize, however, that while these railroad operating and maintenance costs are not readily con-

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trollable on a product line basis, they also do not vary significantly for the service provided any given product line except over the long run. That is, a commercial product line management group is not likely to face operating and maintenance (except equipment maintenance) costs for its traffic that can be manipulated by the short-run actions of other management groups.

All things considered, then, a commercial product line management group can exercise effective control over the profitability of its traffic through its own decisions on pricing, solicitation, equipment supply, and service specifications. Such a group can largely control its revenue; it can largely control its equipment costs (to the extent such costs are at all controllable); and its other costs cannot be significantly altered by any other management group. (Of course, major policy decisions made at the level of the chief executive officer can affect the costs of all traffic moving on a system. The profit measurement system can easily clear commercial management groups of responsibility for the cost changes which thus result.)

This sort of product line management group could not function effectively as a profit center within the structure of a conventional railway organization. It would have to have direct control over its own pricing and solicitation, and it would have to have a means of acquiring equipment at essentially its own option rather than that of, say, the mechanical department. This requires very different reporting relationships than those now in place.

## EQUIPMENT MANAGEMENT

Thanks to monetary inflation, the capital cost of freight equipment has begun to dominate the balance sheets of our railroad companies and to have a dramatic influence on their financial futures. These same costs have also become the largest single factor affecting the profitability of railroad traffic. Thus, control of profits requires control of decisions on equipment purchases, disposition, and utilization. Not all of those decisions are strictly commercial decisions; but they are not all operating or maintenance decisions, either. All things considered, equipment management lies in a middle ground between the commercial, financial, transportation, and mechanical department functions in a railroad company.

Because commercial decisions probably have the greatest effect on car fleet size, design, and use, some have suggested that the equipment management func-

tion should be integrated with other commercial functions such as pricing and solicitation. Certainly, pricing drives the need for new freight equipment more than any other controllable factor. (Effectively, the prices on the least profitable traffic using a particular car type generate a requirement for new cars to handle any new business.) Certainly, solicitation practices affect empty backhauls, and empty backhauls have a major impact upon the cost of getting cars to where they are needed for loading.

At the same time, most cars are used, or could potentially be used, to serve more than one type of traffic. Thus, equipment fleets do not always break themselves down neatly among "product line" groups of traffic. Furthermore, a substantial share of the cost of freight equipment is affected by its design and maintenance and by the way the cars are handled in the transportation function.

All of this suggests that equipment management does not fit neatly into either the revenue-oriented commercial department or the cost-oriented operating department. Somehow, the equipment management function must bridge an organizational gap without losing sight of either the revenue or the cost implications of equipment management decisions. That is simply to say that it, too, should be profit-oriented.

Setting up equipment management groups on a profit-measured basis can meet that requirement. Such groups could logically be responsible for all of the costs associated with purchase and ownership of cars; that is, the capital costs. They could also be considered responsible for the maintenance costs, though clearly they would have to "buy" this work from their mechanical department (or, in some cases, outside contractors.) Like their product line management counterparts in the commercial department, they would have to "buy" transportation for their equipment from the operating department. Finally, they would "earn" revenue on their equipment by making it available to the product line managers.

Thus, such equipment management groups would have essentially complete control over their capital costs (they control the buy and sell decisions), some control over maintenance and transportation costs (to the extent anyone has such control), and a shared interest with product line commercial groups in their revenues. In this last respect it is important to note that neither the product line nor the equipment management groups could live without each other. What was good for one would usually be good for the other, at least in the long

run. The relationship would thus be self-regulating and would not require common top-management control.

Some who support the general concept of profit-measured product line management of railroad commercial functions have suggested that each product line group should also include its own equipment management group, or that the two sets of groups should at least report to common upper-level commercial management. As suggested above, that seems unnecessary where each of these groups is measured on a profit basis. Beyond that, such common management seems undesirable because of the different skills required and the different communications links with which the two sets of groups will work. Product line management is essentially a commercial function which faces and interacts principally with customers. Equipment management is essentially a production and asset management function which faces and interacts with financial and production people internal to the railroad (and the railroad industry) on the one hand and with commercial product line management groups on the other.

Top manager responsibilities in both areas will not be so extensively involved with goal-setting or conflict resolution. Profit measurement of each group will largely take care of that. The top managers will be responsible, rather, for personnel selection and skill development. Since the backgrounds and skills for the two areas are different in many ways, the top managers to whom they report will have somewhat different jobs on their hands. Top management reporting relationships should reflect those differences.

#### PROFIT MANAGEMENT IN ITS LARGER SETTING

The two sets of profit management groups described above would still operate at fairly high levels in the organization structure. While they would assume most of the responsibilities of the existing commercial (traffic) departments and some part of those (having to do with certain equipment functions) of other departments, most of the company would still not be under any direct profit measurement system.

Some additional profit measurement capability can be created, however, both to assist these two sets of profit management groups and to instill some level of profit appreciation in other commercial and operating personnel. The most important of these additional profit measurements would be developed for (1) operating/sales "areas" and (2) "traffic lanes." The first is a rough equiv-

alent to the terminal area profit measurements used by LTL trucking companies. Traffic lane measurement is also used by trucking companies, not to measure the performance of management units but, rather, to assist various management units in identifying opportunities to improve their profit performance.

In the railroad case these two sets of profit measurements can assist both product line and equipment management groups in identifying additional profit opportunities, as well as special profit problems, the most important of which are those related to present and prospective empty backhauls. The failure of present railroad profit and performance measurement systems to identify empty backhaul problems is, in fact, one of their major deficiencies. It is just this deficiency which writers such as Reebie and Wyckoff have keyed on coming as they do out of the trucking industry which properly accords this problem great importance. While it is an important problem in the railroad industry, too, it is one that must be viewed in its proper perspective. In particular, one should not assume that just because operating/sales area and traffic lane profit measurement can assist in profit improvement, such measurement systems should be made the basis for management reorganization.

Again, management sub-units cannot be effectively measured by the performance of factors over which they have limited control. Local railroad operating and sales personnel have limited control over the level of revenues generated by traffic entering and leaving their area, and they have much less than total control over the costs associated with the movement of that traffic, even when it is within their geographic area of management responsibility.

#### THE INTERFACE BETWEEN PRODUCT LINE AND EQUIPMENT MANAGEMENT

In the profit management organizational approach proposed here, the product line management groups would collectively be responsible for the total freight transportation profit of the railroad corporation. The equipment management groups would also be collectively responsible for the total freight transportation profit of the corporation, plus off-line car hire revenues and some surplus equipment costs not effectively under the control of the product line management groups. That is, these two sets of groups would have all-inclusive and largely overlapping profit responsibilities. The matrix in Figure 1 shows these relationships.

PROFIT MEASUREMENT MATRIX

Product Line  
Mgt. Groups ( $P_i$ )

| Equipment Mgt. Groups ( $E_i$ ) | Product Line Mgt. Groups ( $P_i$ ) |       |     | Total Total NRC | Off-line Sys. Car Hire | Surplus Equip. Cost | Total Adj. NRC |
|---------------------------------|------------------------------------|-------|-----|-----------------|------------------------|---------------------|----------------|
|                                 | $P_1$                              | $P_2$ | --- |                 |                        |                     |                |
| $E_1$                           | (1)                                | (1)   | (1) | (1)             | (2)                    | (3)                 | (4)            |
| $E_2$                           |                                    |       |     |                 |                        |                     | (4)            |
| $E_3$                           |                                    |       |     |                 |                        |                     | (4)            |
| ⋮                               |                                    |       |     |                 |                        |                     | (4)            |
| Totals                          | (5)                                | (5)   | (5) |                 |                        |                     |                |

FIGURE 1

- (1) Columns show "net revenue contribution" (NRC) with equipment charged out on opportunity cost basis.
  - (2) Off-Line system car hire credited to equipment management groups. (All foreign line car hire distributed to product line costs).
  - (3) Undistributed costs of both surplus equipment and of equipment charged to product lines at less than full costs (i.e., at opportunity cost).
  - (4) Net revenue contribution after all equipment opportunity costs charged out. ("Bottom line" for equipment management groups.)
- Note: Actual management reports would display additional measures; such as, percent contribution and changes in each cell from preceding periods.
- (5) "Bottom line" for product line management groups.

Figure 2 shows the principal channels of communication that must set themselves up in this organization scheme. As would be expected, the equipment management groups become the major link between the commercial product line

management on the one hand and transportation, mechanical, and financial management on the other. In playing this role, however, they have the same motivation as their various product line management counterparts; namely, prof-

CHANNELS OF COMMUNICATION

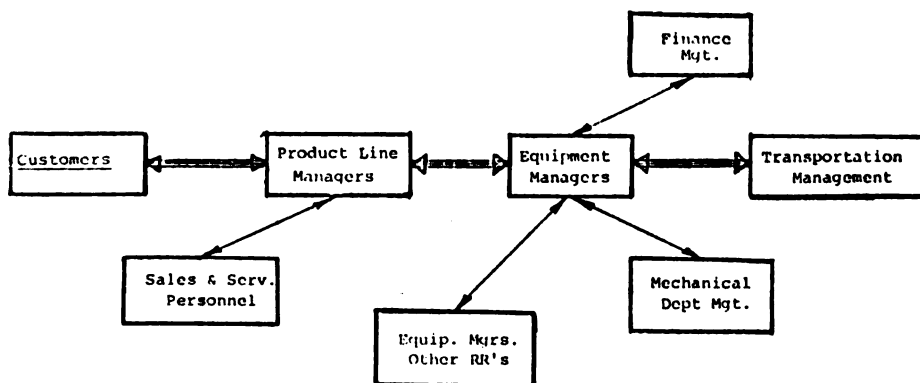


FIGURE 2

it. That is, when they request new equipment to supplement what they already have on hand, it will be because they perceive an opportunity to increase total profit. When they request heavy repair programs, it will be because they perceive an opportunity to increase total profit. And, when they request improved handling of certain traffic (remember, they "pay" the transportation costs for this), it will be because they perceive an opportunity to increase total profit.

The equipment management groups will have an incentive, moreover, to buy, lease, borrow, or steal(?) equipment wherever they can get the most revenue-generating capability for the least money. They will also scratch to fill their empty backhauls, because they will have to pay for them in any case. (And, if they cannot figure that out, their product line management counterparts will soon enough educate them when they see what they have to pay for equipment set in for loading at the end of a 2,000-mile empty backhaul.)

In short, this organizational format creates two sets of entrepreneurial groups which will conspire with each other to move the key corporate decisions (e.g., pricing, equipment acquisition, maintenance programs, transportation service policies) in just those directions that only the chief executive now can be responsible for. Figure 3 shows the organization structure that would emerge.

**PROVIDING PROFIT MEASUREMENT INFORMATION**

None of this can work unless these two sets of profit management groups have adequate profit measurement information for their existing traffic and an analytical capability to assess the profit implications of their pending decisions.

The complexity of railroad operations and the extensive joint cost problems associated with those operations make determining the cost dimension of the profit equation difficult. But it is not impossible. The essential requirement is a capability to follow the movement of individual carloads and to associate line-haul, terminal, and equipment-related costs with each such movement. That is, competent profit-measurement systems require a car-for-car costing capability. The job of measuring profit by disaggregate "product line" (commodity/territory/shipper) and disaggregate equipment type is otherwise unmanageable. Unmanageable, that is, except at such a crude level of discrimination as to produce cost and profit measurements that have no credibility with the management groups being measured, let alone with the operating department groups who are being importuned to change service patterns, maintenance policies, etc.

It is important that these car-for-car costing systems also provide a capability to answer "what if" questions for move-

**THE REVISED ORGANIZATION**

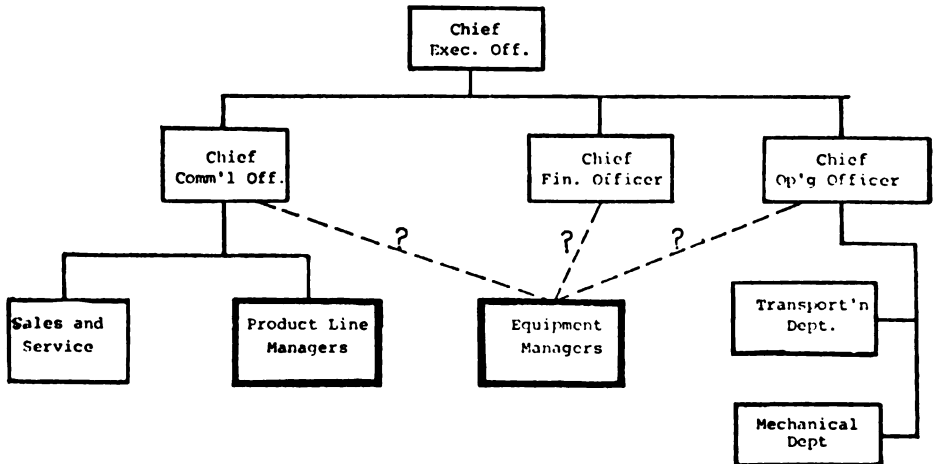


FIGURE 3

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ments not yet made. That is, the procedure for estimating future profitability must be consistent with the procedure used to measure past performance. Indeed, the two procedures should be developed as part of a common system.

There are railroad companies that already have car-for-car costing systems in operation that are competent to support the organizational arrangement outlined above.

### **OTHER RAILROAD PERFORMANCE MEASUREMENT PROBLEMS**

Many of those who have speculated on how best to improve railroad organization and management procedures have tended to confuse the need for better (more disaggregate) cost and profit measurement with the need for better measurement of service quality and of the other revenue implications of operating performance. In particular, the case for terminal area profit measurement has been grounded partly on the argument that local operating management would thus be made more aware of the contribution effects of poor service quality.

It is clear that better information on

service quality is needed. It is also clear that the availability of sales/operating area profit measurement information will enhance the ability of local managements to synthesize service quality information with more disaggregate cost information when they get it. But profit measurement information is not a substitute for cost and service quality measurement at the local level, because the local level management cannot control profit. They can, within limits, control cost and service quality; and local sales personnel can use profit measurement information to solicit higher quality traffic from those accounts not controlled by headquarters sales officers.

In this connection, it should be noted that those who suggest traffic lane profit measurement is the key element in an improved management information capability are confused. Car-for-car costing is the key. Car-for-car costing makes possible the product line, shipper, and equipment-specific profit measurements which are essential to effective profit management. Car-for-car costing also makes possible sales/operating area and traffic lane profit measurement; but those measurements are of only secondary importance to the decentralization of profit responsibility.