

AN EVALUATION OF MOTOR COMMON CARRIER
SERVICES

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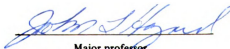
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Charles L. Hilton

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AN EVALUATION OF MOTOR COMMON CARRIER SERVICES

By

Charles L. Hilton

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ABSTRACT

AN EVALUATION OF MOTOR COMMON CARRIER SERVICES

By

Charles L. Hilton

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This thesis was an evaluation of services offered by motor common carriers. A service was broadly defined for the purposes of the study to include anything that a motor common carrier does for its customers, whether charged for or not, which helps customers perform procurement or distribution activities.

The evaluation consisted of an analysis of responses to two mailed questionnaires. One was sent to a sample of motor common carriers doing business in the midwest. The other questionnaire was sent to a sample of transport user firms in the same area. Responses of the motor common carriers were analyzed to identify the services mixes offered, to assess the perceived profitability of each service to the carriers, and to determine how the carriers view the usefulness of their service offerings in terms of transport users' procurement and distribution activities.

Major findings of the study included:

1. Motor common carriers have unique services mixes.

The typical motor carrier has approximately forty to sixty identifiable services available to transport users. The number of services varied only slightly with the size of carriers.

2. The composition of the services mix not only varied as between motor common carriers, but it also was subject to change during the ten year period under study. Carriers added new services in the area of coordinated transportation and specialized equipment. They discontinued services where they perceived profitability and usefulness was low. Changes in the composition of the services mix was apparently a strategy to improve profit performance.

3. The study found that small carriers that offered fewer services tended to have better operating ratios than those that offered more. On the other hand, medium size carriers with more services had the better operating ratios. For the remaining groups of carriers there was no statistical relationship between the number of services and the actual carrier profits.

4. Motor common carriers used "judgments" as the primary method of evaluating the profitability of services. This method was most important for the small carriers and less important for the larger ones. Responses from the larger carriers typically were from management specialists

who indicated the use of cost studies, forecasts, and break-even factors.

5. Some services were more difficult to evaluate than others. The direct revenue line-haul, pickup and delivery, and special equipment services were the most often evaluated while the terminal and advisory services were often omitted in the evaluations.

6. Motor common carriers that failed to evaluate a substantial proportion of services offered had poorer operating ratios than those that evaluated almost all of the services offered. This implies that knowledge about profitability may have been important to the carrier in controlling the performance of the services.

7. The overall perception of profitability of services was just above the breakeven level. This seemed to reflect the generally poor profit conditions present in the industry at the time. Some services were viewed as more profitable than others, e.g., line-haul and special equipment were rated much higher than pickup and delivery, terminal and advisory services. Other services were offered that the carriers perceived as definitely unprofitable to them.

8. Variation was found between each carrier's perception of profitability of services. It was found that profitability estimates were partially related to actual profits for small, medium large, and large carriers. Also

important, was the method or factor used to evaluate services and the title of the executive responding to the questionnaire.

9. Motor common carriers tended to over-estimate the usefulness of their services to transport users. While the ratings of usefulness were higher, line-haul, pickup and delivery, and terminal services were positively correlated with transport user ratings of the same services. Only the responses received from marketing or sales executives closely approximated the transport users' ratings.

10. The study revealed the need for motor common carriers to refine the process of evaluating both profitability and usefulness estimates of the services they perform. Already several carriers are experimenting with new services in a way that indicates they could take a previously rated unprofitable non-revenue service and convert it into a profitable one. More carriers need to examine carefully the importance of customer oriented services, e.g., the shipper information and advisory services, in developing loyal followings of customers which in turn can result in more traffic and higher profits. The opportunity for marketing differentiation exists in the area of services in the motor common carrier industry. Greatest differentiation is possible using a list of discretionary services which the study developed. Individual carriers can elect to offer specific services from this list which are compatible with

the carrier's operating authority, profit objectives, customer needs, and the competence of its management. The process of evaluation of present or prospective services should be continuous and should include the inputs of various other executives within the carrier's management. Profitability of services should include information from finance, accounting, traffic, and operations executives. Usefulness evaluations must recognize the contributions and insights of marketing and sales executives.

The findings of the study of motor common carrier services probably can be generalized to apply to motor carriers throughout the United States. However, subsequent studies could be undertaken using samples of carriers and transport users who do business essentially in other regions. In addition, the specific process employed to evaluate profitability and usefulness of services by each carrier should be examined in order to determine the relationship between each factor or method of evaluation and the most accurate assessment possible for specific services or types of services. The present study was macro in nature. The follow-up study should be a micro-study of a selected group of carriers.

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CHAPTER I

INTRODUCTION

Rationale for Study

The nation's transportation system is currently undergoing searching criticism and thorough examination. Debates are ranging from the halls of Congress, to the news media, to carrier and shipper meetings and conferences, to trade journals and magazines, and to the academic community.¹ A sampling of articles during the last several years shows a consistent theme: What needs to be done to permit the private common carrier system to survive?² The discussion varies, but usually centers on reasonableness of rates, adequacy of service, and carrier profitability of all common carriers whether rail, highway, air or water.

Shippers are complaining that they cannot obtain adequate service at reasonable charges. Carriers counter

¹Art Todd, "You heard it here--on these pages," Handling and Shipping, May, 1972, pp. 50-52.

²See: Gilbert Burck, "Transportation's Troubled Abundance," Fortune, July, 1971, pp. 59-62, 137-139; Lester K. Kloss, "Can Private Enterprise Continue to Provide Common Carriage?, Part I," Handling and Shipping, October, 1972, pp. 45-48; Byron Nupp, "Can Private Enterprise Continue to Provide Common Carriage, Part II," Handling and Shipping, November, 1971, pp. 47-50; W. K. Smith, "Can Private Enterprise Continue to Provide Common Carriage, Part III," Handling

that their operating costs have increased to the point that they can no longer serve some small towns or rural points nor handle small shipments without losing money.³ Government and regulatory officials are reacting to the fact that carriers sometimes violate their operating authorities by refusing to provide service to all their points or all industries. The economic conditions of some points or some industries are being adversely affected by poor or absent common carrier services.⁴

Common carriers are the only type of transportation firm obligated to perform service for the general public. This obligation was clearly outlined in a recent Interstate Commerce Commission report as arising from their status as "public institutions" and includes: (1) the duty to serve equally and fairly all who request their service, (2) the obligation to transport shipments in whatever volumes they may be tendered, and (3) to serve their authorized points without unjust discrimination.⁵ The I.C.C. went on to say

and Shipping, March, 1972, pp. 62-64; Lawrence M. Lesser, "Will Privately Owned Transport Survive?" Traffic Management, January, 1971, pp. 33-34.

³Terry P. Brown, "Many Small Truckers Go Out of Business; Costly Labor Pact and Recession Blamed," The Wall Street Journal, Wednesday, February 4, 1971, p. 28.

⁴"New I.C.C. Regulation Vitally Important to All Carriers," Trucking Business, May, 1970, p. 42.

⁵"Restrictions on Services by Motor Common Carriers; Ex Parte No. MC-77," February 18, 1970, as found in CCH Federal Carriers Cases, 1968-1970, Vol. 18, Commerce Clearing House, Inc., Chicago, Illinois, 1971.

that in the enjoyment of their benefits as common carriers "they may not exercise their rights to the end that they carry only that traffic which is particularly lucrative, while they refuse service for less desirable traffic."⁶

Yet, some common carriers are faced with financial conditions such that drastic cutbacks of service are necessary in order to avoid bankruptcy.

During the last two years several major railroads and a number of motor carriers, both large and small, have been forced to bankruptcy.⁷ Railroad financial problems are so serious that direct subsidy or government ownership are being considered as alternatives to keeping them a part of the transport system. Motor carriers probably do not face the prospect of government takeover; nevertheless, a continuance of the failure rate among motor carriers could lead to very serious curtailments or limitations of available motor common carrier service. One source puts the situation this way, "Common motor carriers face no less serious a challenge than the railroads."⁸ Another source also recognizes that the problem applies to motor common carriers as well:

⁶ Ibid.

⁷ Brown, p. 28.

⁸ Peter S. Douglas, "Logistics and Common Carrier Myopia," I.C.C. Practitioners' Journal, July-August, 1968, p. 725.

Although the decline in common carriers can largely be attributed to the decline in railroads, regulated motor carriers have also shown a decline in their position relative to private and exempt carriers.⁹

A plethora of recommendations has been made to solve railroad problems. Few are being advanced to deal with the motor common carrier. On their own, though, motor carriers have tried two ways to reverse the downward trend. They have sought higher rates or tried to restrict their service. Both methods, however, have the effect of causing diversion of traffic to specialized, private, or exempt carriage. One writer, commented on the effect of rate increases:

But rate increases have a limited future within the trucking industry especially--for the industry is particularly vulnerable to traffic diversion to 'do-it-yourself' private carriage operators. The past few years have seen a marked growth in private trucking to the point where it poses a serious challenge to the for-hire industry. Further diversion seems inevitable as rates continue to rise--and then the industry may be forced to jack up rates still further to make up for the traffic losses, in a vicious circle that could seriously harm the industry if it cannot stabilize the wage-price cycle soon.¹⁰

The loss of adequate common carrier service is particularly acute for some areas and shippers. One source referred to the situation as follows:

Other truckers have been cutting back operations, refusing to pick up small shipments and reducing or

⁹Ann F. Friedlaender, The Dilemma of Freight Transport Regulation, The Brookings Institution, Washington, D. C., 1969, p. 111.

¹⁰"The Economy: Review and Preview," Transportation and Distribution Management, January, 1971, p. 21.

eliminating service to small towns, even though they often are violating operating charters in doing so. Shippers in some out-of-the-way spots are finding themselves hard-pressed to get any service at all.¹¹

The practice of motor common carriers restricting points served, commodities handled, and refusing to accept interline traffic has been the subject of several I.C.C. investigations. In one instance, the I.C.C. ordered carriers to stop the restrictive practices or lose their authority altogether.¹² The order in this case ". . . resulted from many complaints--from shippers and carriers alike--that the growing trend in restrictions is increasing shipping cost and limiting service."¹³ In another I.C.C. decision, a carrier seeking to obtain new authority was opposed in the application by several carriers that had formerly handled the traffic but had recently restricted their service to the points. The I.C.C. granted the new authority and added:

. . . when the operating policies of existing carriers become so oppressive and limited as to prevent shippers from receiving a service suited to their reasonable transportation requirements, we cannot allow such practices (especially as to interline refusal and higher interline rates) to continue to the exclusion of all competition.¹⁴

The practice of limiting service also leads to private carriage. In explaining why his firm went into the private truck business, one source made the following comment:

¹¹Brown, p. 28.

¹²Ex Parte MC-77.

¹³"New I.C.C. Regulation . . . ," p. 42.

¹⁴Ryder Truck Lines, Inc.--Michigan and Short Routes, 114 MCC 852.

We presently have several substantial service gaps that must be filled. First we are using our long-haul private carriage to move, per week, approximately 60 to 80 loads that existing carriers cannot or will not handle. Approximately 60 per cent of our long haul private fleet loads are multiple pickup and delivery loads to all destination areas. Also, when we have equipment shortages to certain destination territories, we use our fleet to move our products to those areas. We operate this private fleet not because we want to, but because we have to (*italics are editor's*). It is uneconomical and it diverts company resources from our primary business. We therefore consider each load that must move in private carriage to be a failure of existing for-hire service.¹⁵

Along the same line of reasoning, another source concluded:

. . . that the fact that fifty-six per cent of the nation's shippers engaged in some form of private carriage (and presumably many, if not most, made this commitment after exhausting all for-hire possibilities) is indicative of the fact that even the most persistent efforts to improve for-hire service will not always succeed.¹⁶

An answer to the dilemma facing common carrier managements may be to increase productivity. But the carriers also feel that "they have done about all that is possible in this area under present operating conditions."¹⁷ Changes in the state highway weight and length laws could provide the needed increment in productivity, but these

¹⁵Starr H. Lloyd, "Food Distribution: A Study in Beef," Transportation and Distribution Management, September, 1972, p. 23.

¹⁶Colin Barrett, "The Elements of Private Carriage: Part III, "The Managerial Decision," Transportation and Distribution Management, September, 1970, p. 22.

¹⁷"The Economy: Review and Preview," p. 21.

changes are not immediately foreseen.¹⁸ The likelihood of getting relief in the form of regulatory changes is, similarly, remote.¹⁹ Nor is it possible that motor carrier management standing alone can stem the tide of rising wages and equipment costs. A very dismal future awaits the motor common carrier unless some way can be found to solve the dilemma.

A number of motor common carriers have operated very profitably contrary to the general decline among motor common carriers. Their managements have apparently found ways of retaining traffic and/or prospering from the traffic that they do get. What are these carriers doing differently? The answer may be found in the following statement: ". . . the mode whose special peculiarities enable it to offer the best cost/service package to the shippers gets the bulk of the traffic."²⁰ While this refers to "mode," it could equally apply to the carrier or carriers within a mode. "Cost/service" package suggests a combination of two very complex factors. Costs translate into rates. And rates must be approved through carrier rate bureaus and, also,

¹⁸"Technology and Highway Transportation," Handling and Shipping, January, 1971, p. 54.

¹⁹John P. Doyle, "General Doyle Comments on Highway Technology," Handling and Shipping, January, 1971, p. 55.

²⁰"To Eat and Keep Warm," Transportation and Distribution Management, March, 1971, p. 36.

the I.C.C. Shippers are traditionally opposed to rate changes which cause their freight costs to increase. So the remaining factor, "service," seems to offer the greatest opportunity for innovative action to solve the problem.

A study of services in the airline industry contained the following pertinent statement:

Due to the competitive nature of transportation, the quality aspect of a carrier's mix of customer services has also been brought in sharp focus. There has been a growing recognition that improvement in quality of carrier services is a key to achieving a differential advantage over competition leading to significant increases in patronage. Moreover, since government regulations frequently limit carrier pricing and routing flexibility, transportation firms are primarily restricted to competing for new traffic via the quality of their services. Thus providing the appropriate level of services in terms of customer preference and competitive activities has become a central area of concern to carrier management.²¹

Since airline managements have recognized services as an area for attaining differential advantage, do not motor common carriers have a similar opportunity? Is this perhaps what the successful motor common carriers are doing differently? One carrier representative suggests that this may very well be what happened.

. . . If shippers and carriers would face up to their mutuality of interests and apply themselves to the study of potential and the necessary cooperative efforts to accomplish them, much could be accomplished for the benefits of all concerned.²²

²¹James C. Cotham, III, "Measuring the Quality of Transportation Services," Transportation Journal, Fall, 1969, p. 27.

²²C. D. Hardesty, Jr., "The Problem is Economics," Transportation and Distribution Management, June, 1970, pp. 42-43.

A shipper representative, in explaining a "last-resort" move to specialized common carriage instead of general common carriage, stated that their first step in solving service problems was always to work with existing carriers and try to get the services they needed.²³ Not all shippers make their needs known to motor common carriers, however.

. . . many firms, through habit or custom or simple inertia, are failing to make the best possible use of existing for-hire services; others might profit by the solicitation of new services to supplement or replace those currently available.²⁴

The reason for not working as closely as possible with common carriers to solve service problems is a traditional mutual antagonism that exists between shippers and carriers. Such feelings are deeply rooted and are extremely hard to overcome. Yet, one source claims:

The future of the common carrier depends on its ability to specialize its services, so that the shipper may realize operating economies as a result of better scheduling, integrated materials-handling systems, and better communications with its carrier-suppliers.

. . . In order to promote efficiency and eliminate duplication of effort, shippers and carriers must engage in cooperative systems where neither party can easily substitute for the services of the other.²⁵

²³"Common Carrier Capabilities: The View from Xerox," Transportation and Distribution Management, March, 1972, p. 35.

²⁴Barrett, p. 22.

²⁵Frederick J. Beier, "Carrier-Shipper Interface," Transportation and Distribution Management, July, 1970, p. 36.

Common carriers also need to be flexible, adaptive, and responsive to shipper needs. Another source contends:

Common carriers have thus far retained a prominent place in our economy by stressing increased flexibility in their reaction to the new logistics-oriented environment. This flexibility has most often taken the form of new vehicles designed to integrate the transportation function more closely with shippers' manufacturing and storage facilities.

. . . What many common carriers have learned, to their sorrow, is that if they are unable to provide the service modifications a shipper may require so that he may effect inventory or packaging cost reductions, the shipper will substitute contract carriage or even private carriage for the services of common carriers. Most galling to such common carriers is to see the shipper actually willing to increase his transportation expenditures but not for the services offered by common carriers.²⁶

A subtle danger to both common carriers and their shipper customers was brought out by the example of a manufacturing firm serving two major customers at distant points via common carrier trucking service:

One of the customers decided to enter private carriage, using his own trucks to pick up from the shipper's plant. The common carrier, having lost half of its traffic, may be forced to increase rates, which in turn may cause the remaining customer to seek another source of supply nearer home.²⁷

Thus, the motor common carrier lost business, but significantly, so did the manufacturer. The two traditional antagonists have a mutual interest in finding ways to

²⁶Douglas, p. 722.

²⁷Warren Blanding, "The Secret of Service: Entrepreneurship in Trucking," Handling and Shipping; Presidential Issue, Fall, 1969, p. 88.

improve the quality of transportation services. Yet the initial action to prevent diversion of traffic must be taken by the motor carriers. This depends on the carriers' freedom and willingness to act. One source discusses the freedom of action of motor common carriers as follows:

Carriers should be free within broad limits to work with shippers and consumers to develop methods and rates that will efficiently distribute the goods.

. . . Another freedom of action badly needed is for carriers to be allowed to respond quickly to opportunities as they arise. Fast action is a business necessity, but for transportation today speed in improvements in pricing and service is impossible because of regulatory and fraternal restraints.²⁸

There is already evidence that regulatory restraints have become a major concern of the I.C.C. and should not be as serious a deterrent to service improvement in the future as in the past. This, then, would leave only the fraternal restraints. The ability to overcome fraternal restraints would seem to depend on informed motor common carrier managements. They need to know which services are needed by shippers, which are profitable or unprofitable, and, just as importantly, which services not currently offered may be provided to better respond to shipper needs. To date, no one has indentified or enumerated all service possibilities, nor have services ever been evaluated in the context of a motor common carrier's total mix of services.

²⁸R. L. Bryant, "More Freedom of Action," Transportation and Distribution Management, January, 1972, p. 17.

The solution to the dilemma facing motor common carriers may be found in an evaluation of services offered to transport users. Thus, the need for the present study.

Statement of Objectives

This study will focus on motor common carriers. The basic objective is to identify services offered in terms of each carrier's services mix. Next, the study will seek to determine the relationship, if any, between the motor common carrier's perceived profitability and perceived usefulness of services and the carrier's actual success as measured by average operating ratios. Another basic objective of the study is to determine if there is competitive differentiation among motor common carriers based on services offered.

In order to accomplish these objectives, the study will analyze the responses to two mailed questionnaires, one to a sample of motor common carriers and another to a sample of transport users. Among the specific questions which the analysis will seek to answer are the following:

1. Is there an identifiable list of services for motor common carriers? How can these be classified for analysis purposes?
2. How many services do motor common carriers provide? Are there any services that all carriers offer?
3. Is there a relationship between the number of services offered and a carrier's actual success? Growth?

4. Is there evidence that motor common carriers respond to transport user needs in terms of offering new services?

5. How do motor common carriers evaluate the relative profitability of each identifiable service that they provide? What happens when a carrier does not have knowledge of its services' contribution to net revenues?

6. Is there a relationship between a carrier's overall average profitability ratings of services and its actual success as measured by average operating ratios?

7. How do motor common carriers perceive their services in terms of usefulness to transport users? Are these ratings close to the ratings given the same types of services by transport users.

8. How do transport users rate the usefulness of motor common carrier services?

9. Are there certain services that can be considered basic or essential to a motor common carrier's services' mix?

10. What opportunities exist for competitive differentiation in the services offered by motor common carriers?

The results of the analysis of motor common carrier services should have important implications for the problems currently facing many carrier managements.

CHAPTER II

SERVICES IN THE MOTOR COMMON CARRIER INDUSTRY

Importance of the Industry

Highway transportation has attained a remarkable record of growth since World War II.¹ One measure of growth is its share of total ton-miles of intercity freight traffic, which has increased from 9.1 per cent in 1946 to 22.3 per cent in 1971.² The nation's railroads, by comparison, suffered a decline during the same period from 66.6 per cent in 1946 to only 38.5 per cent in 1971. Freight revenues are another measure of relative importance, but unfortunately, accurate data for highway carriers are available only for the federally regulated segment of the industry. The regulated motor carriers increased their share of revenues from slightly over 20.5 per cent in 1946 to 53.1 per cent in 1971.³ Railroads dropped from 74.4 per cent to 38.8 per

¹C. M. Glenn, "Long Run Industry Trends Hint at Future of Trucking Industry," Trucking Business, January, 1971, pp. 8-10.

²American Trucking Trends 1972, American Trucking Associations, Inc., Washington, D. C., 1972, p. 7.

³Ibid., p. 16.

cent in the same time period. In fact, the regulated motor carriers have exceeded railroad revenues in every year since 1963. Omitted from the motor carrier revenues are any amounts for for-hire carriers that operate in intrastate, local, or exempt service, and the value of services generated by the rapidly increasing private carriage operators. If these were estimated and added in, one source suggests that the total value of all highway transportation service would approximately triple the federally regulated motor carriers revenues.⁴ According to T.A.A., highway transportation probably accounts for over 70.0 per cent of the nation's total expenditures for the movement of freight traffic. Regardless of the basis of measurement, then, highway transportation represents a vital part of the nation's transportation system.

The growth of the highway transportation industry has been credited to the truck's ability to improve the procurement and distribution activities of transport users.⁵ The highway vehicle is conceded to have an inherent advantage over competing modes of freight movement when performing door-to-door service, when the shipment moves over short to medium distances, and when prompt delivery is necessary. Highway carriers are both competitive with and complementary

⁴Transportation Facts & Trends, Transportation Association of America, 8th Edition, 1971.

⁵Glenn, p. 8.

to other modes. They are competitive when they strive to move the same commodities or provide similar services to meet transport user needs; they are complementary when they coordinate their facilities or services with other modes. The highway vehicle is particularly suited to assist the modern businessman in attaining a reduction of inventory costs yet avoiding the costs of stock-outs. Orders can be placed more frequently and in smaller quantities with reliance on the motor carrier to provide prompt delivery for replenishment of inventories. Many transport users are almost exclusively dependent on motor carriage for all transport needs, i.e., for inbound delivery of raw materials or supplies as well as the movement of finished products to customers. Highway transport has been an important factor in the market expansion of many businesses through its ability to reach and serve almost every city or hamlet in the country. It contributes, therefore, to the decentralization of population and industry, and is a major reason this country is a nation on wheels.

Types of Highway Carriers

The nation's transport system has a great stake in the continued existence and operating efficiency of motor common carriers. Only the common carrier holds itself out to serve the large or small shipper, the rural as well as the metropolitan area, and the regular or infrequent shipper.

Yet, the motor common carrier is not the only type of highway carrier. In addition to the common carrier, other specific types of carriers have been defined by the Interstate Commerce Commission to include contract carriers, private carriers, and exempt carriers.⁶ While these definitions are significant from a regulatory standpoint, a more detailed

⁶Part II of Interstate Commerce Act, Act of August, 1935 (Public No. 255, 74th Congress: 49 Stat. 543; U. S. Code, Title 49, Sec. 303).

Section 203 (a) (14). The term "common carrier by motor vehicle" means any person which holds itself out to the general public to engage in the transportation by motor vehicle in interstate or foreign commerce of passengers or property or any class or classes thereof for compensation, whether over regular routes or irregular routes. . . .

Section 203 (a) (15). The term "contract carrier by motor vehicle" means any person which engages in transportation by motor vehicle or passengers or property in interstate or foreign commerce, for compensation (other than transportation referred to in paragraph [14]), under continuing contracts with one person or a limited number of persons either (a) for the furnishing of motor vehicles for a continuing period of time to the exclusive use of each person served or (b) for the furnishing of transportation services designed to meet the distinct needs of each individual shipper.

Section 203 (a) (17). The term "private carrier of property by motor vehicle" means any person not included in the terms "common carrier by vehicle" or "contract carrier by motor vehicle," who or which transports in interstate or foreign commerce by motor vehicle property of which person is the owner, lessee, or bailee, when such transportation is for the purpose of sale, lease, rent or bailment, or in furtherance of any commercial enterprise.

Section 203 (b) contains the list of carriers exempted from the economic regulations of the Interstate Commerce Act. This list includes essentially the following: school vehicles, taxicabs, hotel vehicles, park vehicles, cooperative vehicles, vehicles transporting farm products, newspapers, or any transportation incidental to rail or air, within commercial zones, and vehicles used for occasional or reciprocal transportation.

typology of highway carriers is necessary for this study. Figure 1 on the following page uses eight operating characteristics to define differences among motor carriers.

The broadest differentiation in the typology occurs on the basis of for-hire or private carriage, as can be seen at the first nodal point. A further breakdown of the private carriage classification into intercity or local, interstate or intrastate, and long haul or short haul is possible but not necessary. Since private carriage must be incidental to another business activity, a private vehicle operation may become almost anything the owner desires it to be in fulfilling the transport needs of that business.

The second nodal point divides for-hire carriers between intercity and local operations. A local carrier limits its operations entirely to a city or the adjacent commercial area. On the other hand, an intercity carrier is primarily concerned with freight movements between cities.

The third nodal point distinguishes types of carriers on the basis of whether they are regulated or not. The regulations involved could be those of the I.C.C. or one of the state regulatory agencies. Most local carriage is not subject to economic regulation by either federal or state agencies.

The fourth nodal point separates interstate from intrastate operations. Interstate carriers handle shipments between states, while intrastate carriers transport shipments within a state.

The fifth division of carriers is made according to definitions contained in the Interstate Commerce Act for common and contract carriers. Since contract carriers tailor their operations to the specific needs of each shipper they serve, no additional classification of them is necessary.

Common carriers, though, can be further sub-divided several times on the basis of long-haul or short-haul operations, regular route or irregular route, and general purpose or specialized, as shown at all subsequent nodal points. The long-haul common carrier concentrates on movements of freight between a specified number of key points some distance apart. The short-haul common carrier handles shipments to or from many points in an area or along a route; shipments may have had prior or will have subsequent movement by a "long-haul" carrier.

The distinction between regular route and irregular route common carriers is made on the basis of specification of highways used or points served. Regular route carriers use named routes to reach specified points and typically provide service with known or advertised frequency. Irregular route common carriers operate to or from named points and surrounding areas, or between all points within a defined territory whenever sufficient volume of freight is available.

The general purpose common carrier looks to a broad base of customers for traffic and seeks to handle all freight tendered to it for movement. The specialized carrier,

however, handles only a limited type of freight or serves only those shippers desiring movement of a particular type of freight for which it had equipment and/or operating authority.

Most common carriers operate under several combinations of the above facts. For example, they may have applied for and received operating authority which fits them into more than one type, or they may have purchased another carrier which already possessed other types of authority and operations. The present study will use this typology to define precisely the type of motor common carrier to be examined. Carriers to be studied will be those highway carriers that are for-hire, intercity, regulated, interstate, common, and any combination of long-haul or short-haul, regular or irregular route, and general purpose or specialized carriage.

Motor Common Carrier Services

According to economists in the field, the basic service of a carrier is transportation and involves the creation of time and place utility by the movement of property or passengers.⁷ Essential to the present study

⁷See: G. Lloyd Wilson, Transportation and Communications, Appleton-Century-Crofts, Inc., New York, 1954, p. 5-7; Frank H. Mossman and Newton Morton, Principles of Transportation, The Ronald Press Company, New York, 1957, p. 3; Dudley Pegrum, Transportation Economics and Public Policy, Richard D. Irwin, Inc., Homewood, Illinois, 1963, p. 4; Marvin Fair and Ernest W. Williams, Jr., Economics of Transportation, Revised Edition, Harper & Brothers Publishers, New York, 1959, p. 3.

is the fundamental question, "What does a motor common carrier do?" Other considerations pertinent to the fundamental question might be: Are there variations on the basic service of transportation which are identifiable as such? Does a motor carrier have just one thing to offer, i.e., transportation service? If the latter question is answered affirmatively, then there would be little need for this study.

A recent study by Oi and Hurter contends that there is only one service and variations that exist are only attributes of its quality:

The concept of 'service' simply refers to the quality of transportation. Under the mantle of 'service' are included such features as speed, damage to goods, night deliveries, flexibility of schedules, and split deliveries. These features, or attributes, are related to, but are not an essential part of, the spatial movement of goods. Taken together, they constitute the quality of the transportation activity.⁸

In a footnote the authors go on to explain further their concept of "service."

This treatment of service is analogous to that of quality for physical goods. An automobile thus is basically a four-wheeled vehicle with an internal combustion engine. The addition of such features as greater horsepower, cushioned seats, and automatic transmissions contributes to the quality of an auto but does not alter the basic product. In the case at hand, the only intrinsic difference is that transportation is itself a service and not a tangible good.⁹

⁸Walter Y. Oi and Arthur P. Hurter, Jr., Economics of Private Truck Transportation, Wm. C. Brown Company Publishers, Dubuque, Iowa, 1965, p. 49.

⁹Ibid.

They seem to reject the existence of an assortment of services performed by motor common carriers, at least in the context of the quality of service. This is, however, where they differ with other authorities.

A leading motor common carrier's president recently commented on the subject by saying, "Motor carriers have only one product line--service--and each unit of service must make a profit contribution."¹⁰ While he used the term "one product line" he does refer to "each unit of service," which suggests that there may exist more than one service within a motor carrier's service line.

Ample support for the argument that motor common carriers offer more than just one service can be found in a survey of transportation literature.

A textbook on motor transportation by Charles A. Taff, Commercial Motor Transportation, contains the following references to services:

The primary duty of the sales department is to sell the services provided by the operating department of the company. . . . He (the salesman) must know the services which can be rendered by each department of the company when it appears desirable or necessary.¹¹

Stopping-in-transit . . . is an extra transportation service for which the carrier is entitled to receive additional compensation.¹²

¹⁰W. D. Baker, "Motor Carrier Management Strategy," Transportation Journal, Fall, 1968, p. 48.

¹¹Charles A. Taff, Commercial Motor Transportation, Richard D. Irwin, Inc., Homewood, Illinois, 1969, p. 365.

¹²Ibid., p. 337.

Diversion or reconsignment is an accessorial service.¹³

Consolidated pickup and delivery service . . .¹⁴

In-bond shipments also are treated somewhat differently from ordinary shipments.¹⁵

Leased equipment operating in interchange service can be scheduled for return to the originating carrier.¹⁶

Seven types of trailer-on-flat car (piggyback) service have been developed.¹⁷

Regular route scheduled service may be performed . . .¹⁸

There are some motor carriers which operate certain scheduled hours of departure for over-the-road runs. Others may have only one scheduled departure at a specific time, which is referred to as a 'hot-shot' run. A number of carriers which have made use of the hot-shot run have found that too many shippers desire all their freight to go on that particular run. Hence, many carriers which had instituted this service have discontinued the operation.¹⁹

Before shipments are accepted from a shipper or a connecting carrier, all pieces of each LTL shipment should be tagged or marked showing the consignee's name and destination. It is the shipper's responsibility to mark and tag each piece of freight, but if he fails to do this the carrier's representative receiving the freight must mark and tag it.²⁰

Distribution service . . .²¹

There are many additional services for which charges²² are made, but the ones discussed are representative.

There are often times when a transportation salesman will make suggestions that will improve packing methods or aid in solving problems in the shipping department.²³

¹³Ibid., p. 345.

¹⁴Ibid., p. 270.

¹⁵Ibid., p. 264.

¹⁶Ibid., p. 221.

¹⁷Ibid., p. 130.

¹⁸Ibid., p. 415.

¹⁹Ibid., p. 268

²⁰Ibid., p. 264.

²¹Ibid., p. 336

²²Ibid., p. 346.

²³Ibid. p. 367.

Another authority, Fritz R. Kahn, in his book entitled, Principles of Motor Carrier Regulation, also supports the idea of many services:

Services which a carrier is not required to perform are known as accessorial services, and the charges therefore, should in themselves be compensatory.²⁴

Unloading freight from rail pool cars and segregating the several shipments prior to loading them on the carrier's line-haul vehicles is an accessorial service that differs from the usual pickup of traffic at a shipper's warehouse platform and is not embraced in the functions of receiving and preparing freight for transportation.²⁵

Partial deliveries or stops to partially unload in transit have been distinguished as separate services from split deliveries at destination . . .²⁶

Express service is marked by undertakings to provide services superior to that normally required and furnished for ordinary freight.²⁷

The collection and remittance of C.O.D. charges is an extra service which is of value to the shipper and consignee . . .²⁸

Refrigeration is another ancillary service for which a charge separate from the transportation charge should ordinarily be maintained.²⁹

Loading and unloading are transportation services normally performed by a motor carrier and are included within his line-haul charges. Transit service, however, is of a special nature.³⁰

The performance of pickup and delivery service at the basement or floors not directly accessible to the highway vehicle would be an extra service . . .³¹

²⁴Fritz R. Kahn, Principles of Motor Carrier Regulation, Wm. C. Brown Company Publishers, Dubuque, Iowa, 1958, p. 197.

²⁵Ibid. ²⁶Ibid. ²⁶Ibid. ²⁷Ibid., p. 198.

²⁸Ibid. ²⁹Ibid. ³⁰Ibid. ³¹Ibid., p. 199.

When viewed from the transport user's side, the same support for a number of services is found. Taff, in his new book entitled, Management of Physical Distribution and Transportation had the following comments.

Carriers offer many special services that have been designed to accommodate the physical distribution manager and influence his selection of carriers. . . . There are many others, the titles of which are explanatory, such as exclusive use of vehicles, inside delivery, Saturday and Sunday collection and delivery, segregation of shipments, redelivery, and articles requiring special handling.³²

A most important special service, and one which possesses many technical aspects, is the transit privilege.³³

Storage is a service in connection with transportation and is an actual part of transportation service only to the extent of normal and necessary holding of property during the movement and for the period normally required to make delivery. . . . Storage generally is thought of as only applying to less-than-carload (LTL) shipments warehoused by carriers before transportation service has begun or after it has been completed.³⁴

Colton and Ward in their book entitled, Practical Handbook of Industrial Traffic Management, add to the evidence of an assortment of services in the following comments on service:

³²Charles A. Taff, Management of Physical Distribution and Transportation, Richard D. Irwin, Inc., Homewood, Illinois, 1972, p. 411.

³³Ibid.

³⁴Ibid., p. 417.

Wherever possible, it is advisable to choose a carrier that offers single line service from origin to destination.³⁵

Some motor carriers do place on their trailers pallets that may be interchanged with an equal number of pallets either at origin or destination.³⁶

Expediting is making arrangements for the transport of goods prior to shipment so as to get them to their destination quicker than they would arrive without assistance. Tracing is following the shipment to get a record of its movement. Both are services normally provided many times every day . . .³⁷

Warren Blanding, in his article for the 1969 Presidential Issue of Handling & Shipping magazine entitled, "The Secret of Service: Entrepreneurship in Trucking," uses the concept of a "service complex" primarily in connection with a carrier's routes and commodities. He does, however, discuss what might be classed as a consultative service being provided by Mason & Dixon Lines through "marketing coordinators:"

These men are assigned to single industries or groups of closely related industries and are specially trained in the transportation requirements and distribution economies of those industries. They are, in effect, a type of consultant, both to their shippers and to their employers: to their shippers in the most efficient use of transportation services, based on considerations of procurement, production, distribution, inventory, marketing practices and trade customs as well as competitive situations and product requirements; and

³⁵ Richard C. Colton and Edmund S. Ward, Practical Handbook of Industrial Traffic Management, The Traffic Service Corporation, Washington, D. C., 1965, p. 124.

³⁶ Ibid., p. 186.

³⁷ Ibid., p. 317.

to their employers in terms of the types of services that can be developed to best serve customers and at the same time provide a fair rate of return.³⁸

In an article entitled, "Common Carrier Capabilities," Transportation and Distribution Management, George Gecowets describes another type of consulting service performed by Consolidated Freightways. This carrier has an information center containing 3500 tariffs and guides. They staff the center with eight trained researchers who can provide detailed answers to shipper's problems:

A shipper of aluminum products had volume commodity rates established to specific points. He also had shipments to various other points. What he needed was a detailed guide that indicated routings over which the LTL points could be served and at the same time be held intermediate to the key volume points. This would let him consolidate the LTL shipments into truckloads and benefit through the savings by stopping in transit for partial unloading at the various LTL points.

He called in the information center. Center researchers contacted numerous carriers to verify many of the routings, especially with intermediate applications involved.

The guide they prepared proved to be so successful that he periodically returns it to the center for updating.³⁹

Frederick J. Beier, writing in the Transportation Journal, in an article, "The Role of the Common Carrier in the Channel of Distribution," describes other advisory or consultative activities:

³⁸Blanding, p. 88.

³⁹George Gecowets, "Common Carrier Capabilities," Transportation and Distribution Management, May, 1968, p. 49.

Further, carriers may be able to provide information concerning means of reducing transportation costs either through strategic locations or technical assistance in the area of packaging and materials handling. Thus, the carrier is able to provide input information concerning market research and operational problems of the shipper. When these activities are clearly lacking within a firm, the carrier should be willing to assume them to the extent of his ability and act as a staff consultant to the shipper.

Another function which can be performed by the carrier is to act as a clearing house of information and a coordinator of action by channel participants. For example, the carrier can gather information as to the transportation and materials handling requirements of those firms in the channel with whom it deals. After the data are digested and analyzed the carrier may be in a position to suggest compatible handling systems and techniques to all relevant channel participants. Such a process is often necessary, for example, in order for succeeding members of a channel to adopt compatible materials handling systems. Where many carriers participate in the channel movement they may further pool their information so that needs of all channel members can be made known to all carriers. In this case, a single carrier can act as a middleman between the shipping firm and the rest of the transportation industry. This is presently done in regard to rate making and routing procedures--there appears to be no reason why it cannot be done in terms of an information exchange. The individual carrier's responsibility is to turn such data into meaningful programs for the shipping firm.⁴⁰

An examination of motor common carrier advertisements also reveals many instances of unique services carriers provided. One example found in a carrier's house organ will illustrate what a new service can mean to the carrier:

ATL's new 'Protect' program for special shipments is exceptional service, says George C. Powell, manager of cargo claims and customer service.

⁴⁰Frederick J. Beier, "The Role of the Common Carrier in the Channel of Distribution," Transportation Journal, Winter, 1969, pp. 17-18.

It costs more money, and it doesn't bring in any additional revenue itself. But it's the kind of program that makes for satisfied customers, for repeat customers, for new customers.

Each shipment is specially marked and specially handled all the way through the ATL system.

It cost more to 'Protect' a shipment, sure, but it pays off in customers who are pleased and gratified to know that something they want delivered in a hurry can be delivered in a hurry.

It is working--and it means more business every day for ATL.⁴¹

Many variations on the basic transportation service, therefore, can be identified and are commonly used by carriers and the bulk of writers on the subject.⁴²

Definition of Service

The word "service" will be defined for the purpose of this study to mean anything that a motor common carrier does for its customers, whether charged for or not, which helps customers perform procurement and distribution activities. This broad definition also allows the examination of any indirect non-transportation services the carrier provides, recognizing that the latter group of services may contribute indirectly to carrier profitability by developing more satisfied or loyal customers. Some services may be required

⁴¹"New 'Protect' Program Pays Dividends," ATL Dispatcher, September, 1972, p. 4.

⁴²Gayton E. Germane, Nicholas A. Glaskowsky, Jr., and J. L. Heskett, Highway Transportation Management, McGraw-Hill Book Company, New York, 1963, p. 123.

by either regulatory authority or by competitive pressures from other carriers. However, discretionary managerial action could be used to elect to provide other services, thus attaining a degree of differentiation.

Two broad classifications of services, based on the degree of competitive differentiation possible, can be identified. The first, an essential group, would include services that almost all carriers provide. The second, a discretionary group, would include those services that some, but not all, carriers provide.

The combination of services in the first essential group with some of those from the second discretionary group, provides each carrier with the opportunity to have a unique offering of services and represents an individual carrier's "services mix." Specifically, a "services mix" is defined as that assortment of services which, from its operating authority, managerial interest or competence, and response to competitive and customer pressures, the carrier offers to its perceived market. The "services mix" provided by a carrier may be its only opportunity to become differentiated in a highly competitive industry.

Typology of Services

A list of sixty-eight specific and four "other" services can be developed using the sources mentioned in the foregoing discussion as found in the available literature,

from motor common carrier advertisements, tariffs, and routing guides, and from interviews with carrier managements. The seventy-two unique and identifiable services fall naturally into five functional groupings.

Group I. Line-Haul Services

Group II. Pickup or Delivery Services

Group III. Services Requiring Special Equipment

Group IV. Terminal Services

Group V. Advisory Services

There are twenty-three Group I services, seven Group II, fourteen Group III, eighteen Group IV, and ten Group V. A complete listing of each service is shown in Table 1 and also in the Sample Questionnaires included as Appendix I.

Group I. Line-Haul Services

Services in this group are related directly to the basic line-haul transportation in the movement of freight between the origin and destination. These are services that are offered by most carriers. Yet some discretion and selectivity would be possible for the individual carrier. For example, all carriers offer LTL and TL services, but not all necessarily operate with published dispatch schedules, nor would all have a small package express service.

Group II. Pickup or Delivery Services

This group includes pickup and delivery services in addition to the ordinary pickup and delivery activities

TABLE 1.--Identifiable Motor Common Carrier Customer Services.

Service Number	Description of Service
<u>Group I. Line-Haul Services</u>	
1	Less-than-truckload
2	Truckload
3	Volume
4	Direct or single line
5	Interline
6	Trailer interchange
7	Air/Truck connections
8	Rail/Truck connections
9	T.O.F.C.
10	Water/Truck connections
11	Published dispatch schedules
12	Special handling for emergency shipments
13	Expedited shipments
14	Exclusive use of vehicle
15	Loading/Unloading service
16	Reconsignment/Diversion
17	Consolidation/Distribution
18	Stop-offs in transit for partial loading or unloading
19	Other In-transit privileges
20	Bonded or Customs shipments
21	Small package express
22	Return of empty pallets, bins, racks, cages, etc.
23	Other Line-Haul services
<u>Group II. Pickup or Delivery Services</u>	
24	Scheduled pickup or delivery
25	Intra-plant split P & D
26	P & D at private residences
27	P & D at off-hours
28	P & D at positions not immediately adjacent to vehicle
29	Redelivery
30	Other pickup or delivery services
<u>Group III. Services Requiring Special Equipment</u>	
31	Refrigerated or humidity controlled trailers
32	Heated or insulated trailers
33	Tank or bulk liquid trailers
34	Hopper or dry bulk trailers
35	Open-top trailers
36	Flat-bed or low-boy trailers
37	Converter-vans
38	Hi-cube vans
39	Air-ride trailers

TABLE 1.--Continued.

Service Number	Description of Service
40	Containers (any size)
41	Bins, cages, racks, or pallets provided by carrier
42	Tie-down & special stowage devices
43	Double-floors, stabilizers or compartments
44	Other special equipment
<u>Group IV. Terminal Services</u>	
45	C.O.D. shipments
46	Order/Notify shipments
47	Export documentation
48	Sorting or segregating shipments
49	Marking or tagging freight
50	Storage or warehousing
51	Packing or crating (including re-packing or re-crating)
52	Armed guard and/or escort vehicle
53	Furnishing extra driver
54	Furnishing helper labor
55	Direct advertising on carriers vehicle
56	Rate quotations
57	Route selections
58	Shipment tracing
59	Proof of delivery
60	Advanced notification of arrival to consignee
61	Pre-arrival confirmation to shipper
62	Over, short, or damage location
<u>Group V. Advisory Services to Customers</u>	
63	Distribution cost studies or audits
64	Loss & damage claims prevention programs
65	Advice on packaging materials, packing methods and loading techniques
66	Advice on order size or shipment quantities
67	Assistance in shipment documentation
68	Advice on materials handling or shipment preparation techniques
69	Advice on inventory control systems
70	Warehouse or plant site location studies
71	Advice on shipping and receiving facilities
72	Other advisory services

contemplated in regular LTL or TL freight movements. The opportunity to meet particular customer needs would seem to exist in the carrier electing to provide one or more of these.

Group III. Services Requiring Special Equipment

Among these services are those things a carrier can do for a shipper which are related to the acquisition and use of special equipment. Prime examples are Service No. 40 (Containers), Service No. 41 (Bins, cages, racks, or pallets provided by carrier), and Service No. 43 (Double-floors, stabilizers or compartments).⁴³ While several services may seem to be linked to special operating authorities (and many are), e.g., tank or bulk liquids, hopper or dry bulk, or refrigerated or humidity controlled trailers, most motor common carriers have an opportunity to respond to a variety of shipper demands for Group III services requiring special equipment and therefore can differentiate their service offerings from other carriers.

Group IV. Terminal Services

Included in this group are all activities of a motor common carrier normally performed within freight terminals and functionally related to freight movements. Among them are information services such as rate quotations,

⁴³All service numbers refer to Table 1, pages 33 and 34.

route selections, shipment tracing, proof of delivery, advanced notification of arrival to consignee, or pre-arrival confirmation to the shipper.

Group V. Advisory Services

This last group includes the non-transportation and non-revenue activities of a motor carrier. They usually are performed by the sales or customer relations department and are not functionally related to the freight movement as such. The consulting activities referred to earlier⁴⁴ would be included in this group. The extent to which a carrier offers advisory services is probably a true measure of its total responsiveness to the physical distribution environment that has evolved among transport users during the decade of the 1960's.

Individual services included in the total of the seventy-two listed are in each instance different ; yet, they are not mutually exclusive but are inter-related. The aggregate of a carrier's services represents the quality of service a carrier seeks to provide for its customers, and this "services mix" will be the subject of investigation in this study.

⁴⁴Blanding, p. 88.

CHAPTER III

THE SURVEY OF MOTOR COMMON CARRIERS AND TRANSPORT USERS

Selection of Samples

The data for the study was obtained from two mailed questionnaires. One was sent to motor common carriers. The other was sent to transport users. Responses to the questionnaires were analyzed to find answers to the questions concerning the number of services offered, the motor common carrier ratings of profitability and usefulness, transport user ratings of usefulness and the inter-relationships of these ratings with motor carriers' actual profitability. Transport user responses were used primarily as a check of the actual usefulness of services offered by motor common carriers.

Motor common carriers in the survey were those that had operations in the area defined by the I.C.C. as the Central Region, which includes the four states, Ohio, Indiana, Michigan, and Illinois. The transport users were those industrial and retail firms that had plants and/or warehouses in the same four states.

Three technical criteria were used in selecting the specific motor common carriers for the survey:

1. Carriers had to be domiciled or had to have operations and terminals in the Central Region. (This permitted the inclusion of a number of carriers that had home offices outside the Central Region but nevertheless had substantial competitive impact within the region.)

2. A carrier's operating characteristics included for-hire, intercity, regulated, interstate, common carrier, and any combination of long-haul or short-haul carrier, regular or irregular route, and operating under general purpose or specialized authority.

3. Operating statistics were available from the carrier's annual reports to the I.C.C. for the period 1960-1971. (This would mean that the carrier had been in existence and had survived as an entity during the period.)

A total of 178 motor common carriers were selected using the above criteria. In 1969 these carriers represented slightly over 5 per cent of the total number of motor common carriers in the nation, but they accounted for over \$4 billion in revenues, or over 30 per cent of the total freight revenues for regulated motor common carriers. Operating statistics were obtained from a publication entitled Carrier Reports.¹

¹Carrier Reports: Financial Reports on the Nation's Leading Carrier, Carrier Reports, Old Saybrook, Connecticut, Annual issues, 1960-1971.

A total of 150 transport users were chosen from the Official Directory of Commercial Traffic Executives,² a publication which lists names of traffic officials for approximately 7000 firms. Approximately 1500 of these firms had facilities in the four Central Region states. A systematic 10 per cent sample of 150 firms was selected by picking at random a number between one and ten and taking every tenth firm thereafter. The 150 firms chosen in the sample represented a cross-section of business activities, including heavy steel, fabrication, assembly, food products, manufacturing, rubber, plastics, and retailing. They had plants and/or warehouses in large cities as well as small towns.

The Motor Common Carrier Questionnaire

The questionnaire mailed to the sample carriers is included as Appendix I. Three questions in Part II of the questionnaire were used to evaluate services of motor common carriers. Question # 1 determined approximately when each service was first offered. Every motor common carrier's assortment of services could be identified, therefore, within each of the three time periods, 1960 or before, 1961-1965, and 1966-1970. Any change in services offered

²The Official Directory of Industrial and Commercial Traffic Executives, The Traffic Service Corporation, Washington, D. C., 1971.

could be determined by the additions or deletions from the carrier's mix during each period.

Question # 2 sought the carrier's estimate of the contribution by each identifiable service to the carrier's net revenues, either directly or indirectly. The specific method used by the carrier to evaluate services was requested in Part I, (4), of the questionnaire.

Question # 3 sought the carrier's estimate of usefulness to a transport user for each identifiable service. This would be a measure of the motor carrier's perception of contribution to a transport user's procurement or distribution activities.

In each instance, the questionnaire was directed to the carrier's president or top executive officer for completion. A stamped self-addressed envelope was included, and an offer to send a summary of survey results was made in order to facilitate response.

The Transport User Questionnaire

This questionnaire is included as Appendix II. It was directed to the traffic executive in the transport user firm and was designed to obtain information about exactly the same services that the motor carriers were asked to evaluate. Specifically, the traffic executive was asked to indicate the usefulness of motor common carrier services in the effective performance of procurement or distribution activities within his firm. Responses would give an

indication of the services actually used by the transport users as well as the usefulness of the service.

No attempt was made to match up individual transport user needs with any specific carrier's services mixes. The survey sample did not permit this type of comparison. Both motor common carriers and transport users are identified by coded numbers only in order to maintain anonymity of responses. Services are identified by a consecutive numbering system running from one through seventy-two, with one exception. When comparisons are made between motor common carrier questionnaire services and transport user questionnaire service, Service # 23 is omitted. This service, "Other Line-Haul Services," was inadvertently omitted from the transport user questionnaire, and no transport user responses were received. Since only three motor carriers listed this service, the omission is not viewed as seriously affecting the services mix analysis.

Characteristics of Responding Motor Common Carriers

Location

A total of seventy-eight motor common carriers responded to the survey.³ This represented a 43.8 per cent response rate. Almost half of the seventy-eight responding

³A complete listing of the responding motor common carriers is included in Appendix III.

carriers, thirty-eight or 48.7 per cent, were domiciled in the Central Region. The remaining 51.3 per cent were based all over the United States, with five each in Wisconsin, Pennsylvania, and Iowa, four in North Carolina, three each in Minnesota and Missouri, two each in Florida, Arkansas, and California, and one each in Kentucky, Nebraska, New Jersey, Colorado, Maryland, Alabama, Tennessee, Georgia, and Utah. Table 2 contains a breakdown by state within the Central Region and other states. All of the responding motor common carriers offered transportation services to transport users in the Central Region and competed with each other for a share of the total traffic available.

TABLE 2.--Respondent Motor Carriers by State of Domicile.

State	Number of Motor Carriers	Per Cent
Indiana	12	15.4
Ohio	11	14.1
Michigan	11	14.1
Illinois	4	5.1
Other States	40	51.3
Total	78	100.0

Long-Haul and Short-Haul

The classification of responding carriers into either short-haul or long-haul reveals that thirty-one, or 39.7 per cent, were short-haul while forty-seven, or 60.3 per cent were long-haul. The criteria for classifying

a carrier as a short-haul were: (a) no two major points in its operating authority were more than 500 direct miles apart, (b) most points served were within 300 miles of point of domicile, or (c) all operating authority was within a maximum of two states. Carriers not fitting these criteria were classed as long-haul. The distribution of carriers between short-haul and long-haul for the Central Region and other states is shown in Table 3. Proportionately more short haul carriers would be expected in the respondent group from the Central Region. In fact, 57.9 per cent of the carriers in the four states were short-haul, while only 22.5 per cent were short-haul from all other states. Similarly, 71.0 per cent of all short-haul carriers were from the Central Region. Only 34.0 per cent of the long-haul carriers were from the region.

TABLE 3.--Distribution of Carriers: Short-Haul and Long-Haul By State of Domicile.

Domicile Point	No.	<u>Short-Haul</u>		No.	<u>Long-Haul</u>		Total
		Per Cent of S-H	Per Cent from Area		Per Cent of L-H	Per Cent from Area	
Central Region	22	71.0	57.9	16	34.0	42.1	38
Other States	9	29.0	22.5	31	66.0	77.5	40
Total	31	100.0		47	100.0		78

Revenue

The responding sample carriers tended to follow the trend for all the motor carrier industry in terms of revenues. A few very large carriers accounted for the largest share of revenue dollars while a large number of small carriers received only a small share of the market.⁴ Table 4 contains the distribution of motor carriers by revenue sizes for the year 1971. Specifically, the table shows that 66.7 per cent of the carriers accounted for only 21.1 per cent of the total revenues. At the other extreme, 20.5 per cent of the carriers received a total of 61.9 per cent of the revenue. In fact, it can be seen that only 7.7 per cent of the motor carriers had 36.7 per cent of the revenue dollars in 1971. This is a pattern of concentration of business in a few large firms that Patton refers to as characteristic of the entire industry.

Operating Ratios and Growth Indices

The performance of the surveyed carriers can be compared to the industry on the basis of two factors: operating ratios and growth. This is shown in Table 5. The average operating ratio for the period 1960-1971 was 95.72.⁵ This compares closely to the average of 95.48 for

⁴Edwin P. Patton, "Implications of Motor Carrier Growth and Size," Transportation Journal, Fall, 1970, p. 47.

⁵Operating Ratio = $\frac{\text{Operating Expenses}}{\text{Operating Revenues}}$

TABLE 4.--Distribution of Motor Carriers by Revenue Size: 1971.

Revenue Size Of Carrier	Number of Carriers	Per Cent of Total	Cumulative Percentage	Revenue (000)	Per Cent of Total	Cumulative Percentage
<u>Small</u> Less than \$5,000,000	15	19.2		\$ 60,622	2.3	
<u>Medium Small</u> \$5,000,000 but less than \$10,000,000	13	16.7	35.9	114,267	4.4	6.7
<u>Medium</u> \$10,000,000 but less than \$25,000,000	24	30.8	66.7	377,649	14.4	21.1
<u>Medium Large</u> \$25,000,000 but less than \$50,000,000	10	12.8	79.5	443,424	16.9	38.0
<u>Large</u> \$50,000,000 or more	16	20.5	100.0	1,620,247	61.9	100.0
Total	78	100.0		\$2,616,208	100.0	

Source: Computed from Carrier Reports: Financial Reports on the Nation's Leading Carriers, Carrier Reports, Old Saybrook, Connecticut, 1971.

TABLE 5.--Average Operating Ratios and Average Growth Index for Surveyed Carriers by Short-Haul and Long-Haul and Revenue Size.

Revenue Size Of Carrier	Short-Haul			Long-Haul			Total	
	Number Of Carriers	Average Oper- ating Ratio	Average Growth Index	Number Of Carriers	Average Oper- ating Ratio	Average Growth Index	Number Of Carriers	Average Oper- ating Ratio
Small	12	97.31	207.4	3	95.51	220.2	15	96.95
Medium Small	10	96.28	338.2	3	95.42	242.9	13	96.08
Medium	6	95.65	336.70	18	96.32	281.8	24	96.16
Medium Large	3	92.99	350.72	7	92.67	405.3	10	92.77
Large	-	-	-	16	95.48	320.4	16	95.48
Total	31	96.24	288.5	47	95.38	311.0	78	95.72

Source: Computed from Carriers Reports, 1960-1971.

the Class I and II motor carriers of general freight for the same period.⁶ Growth is measured in terms of increases in revenues, which is acceptable as an actual indicator of growth in output even though it may be affected by rate increases.⁷ A growth index was computed for each of the seventy-eight responding carriers using their 1960 revenues as a base. The average growth index for all responding carriers in 1971 was 299.5. The comparable growth index for Class I and II motor carriers of general freight was 236.7.⁸ Though the surveyed carriers apparently had a growth index higher than the industry average, it must be recognized that this index represented a composite for all carriers and does not reflect the effect of mergers or acquisitions. A merger or acquisition by one of the surveyed carriers would have been reflected immediately in the growth index of the surviving carrier. Since the surveyed carriers did acquire others during the period, their true growth indices may tend to be overstated in comparison to industry figures. Increases in revenues by other than acquisition for the sample carriers were not differentiable, hence no real direct comparison was possible.

More information about the surveyed carriers can be obtained by grouping them according to revenue size, as

⁶American Trucking Trends, 1970-1971.

⁷Patton, p. 35.

⁸American Trucking Trends, 1972, p. 17.

well as short-haul and long-haul. Table 5 contains this grouping together with average operating ratios and average growth indices for each group. There were only six surveyed carriers with revenues under \$10 million that were long-haul and twenty-two that were short-haul. On the other hand, only nine short-haul carriers had revenues over \$10 million and the rest were long-haul. No short-haul carriers had revenues over \$50 million. The average operating ratio for the thirty-one short-haul carriers was 96.24 and for the forty-seven long-haul carriers, 95.38. Neither was statistically different from the other, nor from the industry average. In terms of operating ratios, the only conclusion that can be drawn from the averages is that the short-haul carriers probably did no worse than the long-haul carriers during the twelve year period.

The average growth index for the surveyed short-haul carriers was 288.5, while for the long-haul carriers it was 311.0. Both were relatively close to the average of the surveyed carriers and no statistical difference was found between the two means. Thus, while it would appear that the long-haul carriers had increased revenues more than the short-haul and also had better operating ratios, such conclusions cannot be substantiated statistically.

The groupings of surveyed carriers by revenue size does reveal some differences in average operating ratios and growth indices, however. The greatest differences are

found between the small carriers and the medium large carriers. The fifteen small carriers had an average operating ratio of 96.95 and an average growth index of 209.9. The ten medium large carriers, on the other hand, had an average operating ratio of only 92.77 with a growth index of 338.9. The small carriers had the lowest growth index while also having the highest operating ratios. The medium large carriers had the greatest increase in revenues, and also attained the lowest operating ratios.

The forementioned differences in the two revenue sizes suggest a relationship between a carrier's growth rate and its profitability as measured by the operating ratio. Simple correlation coefficients were calculated to compare individual carrier operating ratios and growth indices for each revenue size. The coefficients for each revenue size are shown in Table 6. The correlation coefficient for small carriers, as expected was relatively low at $-.234$.

TABLE 6.--Correlation Coefficients for Average Operating Ratio vs. Growth Index for Individual Motor Carriers by Revenue Size.

Revenue Size	Correlation Coefficients (r's)
Small carriers	$-.234$
Medium small carriers	$-.604$
Medium carriers	$-.116$
Medium large carriers	$-.681$
Large carriers	$-.613$
All carriers	$-.471$

The negative coefficient is explained by the fact that the two sets of data would normally move in opposite directions from each other for the better level of performance, i.e., as the operating ratio improves it would go down, while greater growth would be reflected in a higher growth index. With a coefficient of $-.234$, there is only a slight relationship between operating ratios and growth for these carriers. The low coefficient suggests that growth had a lesser impact on improving these carrier's profits than possibly might be expected.

The coefficient for the medium small carriers was fairly high at $-.604$. At least for this group of carriers increases in revenues were reflected generally in lower operating ratios.

The medium size carriers had the least relationship between operating ratios and growth. Their coefficient was only $-.116$. Apparently for many of these carriers increases in revenues resulted in higher rather than lower operating ratios.

The highest coefficient was found for the medium large carriers, $-.681$. For these carriers an increase in revenues was accompanied by lower operating ratios.⁹

⁹ An interesting example of what can happen to operating ratios following an acquisition is found for a carrier in this group. Two carriers of approximately the same size were combined in 1967. The operating ratios and growth indices by years from 1960 for the two carriers are shown as follows:

The large carriers had a correlation coefficient of $-.613$. For this group of carriers there was also apparently a fairly good relationship between growth and profitability.

The experience of the carrier illustrated in footnote 9 suggests a tempering of any conclusion regarding the relationship of growth and profitability; growth attained by acquisition is usually followed by a period of approximately

Year	Carrier A		Carrier B	
	Operating Ratio	Growth Index	Operating Ratio	Growth Index
1960	94.27	100.0	95.4	100.0
1961	87.70	110.5	95.9	100.3
1962	85.11	126.9	95.8	115.4
1963	84.85	139.9	95.3	124.2
1964	81.94	156.6	95.4	126.8
1965	79.80	180.8	92.5	143.7
1966	79.82	198.4	94.6	159.6
1967	81.61	204.7	97.9	145.3
1968	92.46	453.6	-	-
1969	97.07	585.5	-	-
1970	102.14	577.2	-	-
1971	95.46	703.5	-	-

The combination involved a carrier that had an exceptional operating ratio record and average growth with another carrier which was attaining only average operating ratios and average growth. The result was that the surviving carrier's operating ratio went up almost immediately and by 1970 was over 100.0. Revenues also had dropped slightly in 1970 probably as a result of the intervention of exogenous factors affecting the entire industry such as a prolonged strike and an economic slow-down. Thus, a very profitable medium size carrier had suddenly become an unprofitable medium large carrier. To the credit of the management and the removal of the exogenous factors, in 1971 the carrier had apparently solved many of its problems and was again attaining a respectable 95.46 operating ratio. The experience of this carrier is not isolated in the motor carrier industry and may be found in the record of such carriers as Consolidated Freightways and Spector Freight System.

three to four years of higher operating ratios. During this period assimilation of the acquired carrier's authority, facilities, and personnel must be accomplished. Once this has been done, the combined operations take on the characteristics of the previous acquiring carrier.

Characteristics of Responding Transport Users

One hundred and fifty transport users were mailed questionnaires and eighty-nine useable responses were received.¹⁰ This was a response rate of 59.3 per cent. Three other responses were received from firms which indicated that they did not use motor common carriers but relied exclusively either on water, rail, or private carriage. Their responses were not included in the analysis.

Location

Over two-thirds of the responding transport users were located in the states of Ohio and Illinois, with the remainder spread over Michigan and Indiana. Five cities accounted for 54.0 per cent of the total transport users' responses. These cities were Chicago, Cleveland, Detroit, Cincinnati, and Indianapolis. The responding motor common carriers had terminals located in these same cities from

¹⁰A complete listing of the responding transport users is included as Appendix IV.

TABLE 7.--Transport Users by State of Major Facility Location.

State	Number	Per Cent
Ohio	38	42.7
Illinois	22	24.7
Michigan	16	18.0
Indiana	13	14.6
Total	89	100.0

TABLE 8.--Transport Users by Major City.

Major City	Number	Per Cent of Total Responses
Chicago	18	20.2
Cleveland	10	11.2
Detroit	7	7.9
Cincinnati	7	7.9
Indianapolis	6	6.7
Total	48	54.0

which they could provide service. The rest of the transport users were scattered throughout the four states in smaller cities and towns.

Sales

The greatest number of transport users, thirty-four had annual sales between \$10 million and \$50 million. Eighteen large firms had sales over \$100 million. The complete distribution according to sales is shown in Table 9.

TABLE 9.--Distribution of Annual Sales of Transport Users.

Sales	Number	Per Cent
Less than \$5 million	13	14.6
\$5 million but less than \$10 million	12	13.5
\$10 million but less than \$50 million	34	38.2
\$50 million but less than \$100 million	12	13.5
\$100 million or more	18	20.2
Total	89	100.0

Plant and Warehouse Location

The number and location of plants and warehouses for responding transport users is shown in Table 10. The total for the Central Region does not total eighty-nine because several firms did not indicate the number of establishments. Most responding transport users had less than five plants or warehouses in the Central region, but 11.2 per cent had ten or more. The national and international character of the responding transport users was suggested by the number that have facilities throughout the United States and abroad.

Annual Freight Bill

The approximate annual freight bill for responding transport users is shown in Table 11. The largest percentage, 38.2 per cent, purchased transportation of over \$1 million while only 14.6 per cent had freight bills of less than \$100,000 annually. These expenditures represented

TABLE 10.--Number and Location of Establishments of Responding Transport Users.

Number of Establishments	Central Region		Rest of United States		Abroad	
	Number of Transport Users	Per Cent	Number of Transport Users	Per Cent	Number of Transport Users	Per Cent
Less than 5	66	74.2	32	36.0	10	11.2
5 but less than 10	9	10.1	11	12.4	6	6.7
10 or more	10	11.2	13	14.6	4	4.5

TABLE 11.--Distribution of Approximate Annual Freight Bill for Responding Transport Users.

Freight Bill	Number	Per Cent
Less than \$100,000	13	14.6
\$100,000 but less than \$500,000	28	31.5
\$500,000 but less than \$1,000,000	14	15.7
\$1,000,000 or more	34	38.2
Total	89	100.0

purchases of transportation conservatively estimated at over \$50 million annually, for which the surveyed motor common carriers would be competing for a share.¹¹

Primary Products

The responding transport users manufactured or sold a mixture of industrial and consumer products. Fifty-nine, or 66.3 per cent handled industrial products; forty-two, or 47.2 per cent were concerned with consumers. Many handled both industrial and consumer products. Only seven firms, or 7.8 per cent, felt that their primary market area was only within the Central Region while thirty-three, or 37.1 per cent, had both national and international markets for their goods.

¹¹This was calculated by taking the mid-point of each range and multiplying it times the number of firms, except in the case of the highest annual freight bill, \$1 million was used.

Use of Transportation

In terms of their usage of various modes of transportation, over two-thirds indicated they used railroads for either procurement or distribution. While all used motor carriers, some transport users indicated motor common carriers were utilized for procurement only or distribution only. Contract carriage was used by 46.1 per cent and private carriage, 52.8 per cent. Many transport users were utilizing some combination of common or contract, common or private, or common, contract and private carriage.

The characteristics of the transport users responding to the survey suggests that they were sufficiently representative of the need for motor common carrier services to be used as a check on the motor carriers evaluation of its own services rendered. Evidence to support this assumption is found in the variety of sizes, locations, and types of operations involved.

In summary, responses to both questionnaires represented acceptable cross-sections of the respective industries. The responding motor common carriers were found to include a number of short-haul and long-haul carriers, a variety of carriers of different sizes, and a range of carriers with different operating ratios and growth rates. The responding transport users were found to represent many different sizes of firms and locations, with varied products, markets, and usage rates of motor

common carriage. The ratings of services contained in these responses will be analyzed in the next chapter.

CHAPTER IV

ANALYSIS OF MOTOR COMMON CARRIER SERVICES

Responses to the survey questionnaires will be analyzed in order to find answers to the questions raised earlier. The first part deals with the number of services offered by each carrier and the number of carriers offering each service. Changes during each time period will also be examined. The second part examines carriers' estimates of profitability of services and their perceptions of usefulness to transport users. The third part deals with the transport users' responses to the questionnaires. The last section will link motor common carrier ratings of profitability and usefulness to the transport users' responses in an analysis to determine the relationship between how well carriers estimated these factors and how they related to carriers' actual profitability.

Number of Services

A summary of services offered by the seventy-eight responding motor common carriers is shown in Table 12 by major time periods--1960 or before, 1961-1965, and 1966-1970. In 1960, the average number of services offered by all carriers was 40.3. Major groupings of carriers were found in the thirty to fifty services brackets. With the addition

TABLE 12.--Number of Services Offered by Motor Carriers.

Number of Services	1960 or Before		1961-1965		1966-1970	
	Number of Carriers	Per Cent	Number of Carriers	Per Cent	Number of Carriers	Per Cent
Less than 20	2	2.6	2	2.6	1	1.3
20 but less than 30	7	9.0	4	5.1	4	5.1
30 but less than 40	28	35.9	25	32.1	19	24.4
40 but less than 50	27	34.6	25	32.1	25	32.1
50 but less than 60	14	17.9	21	26.9	27	34.6
60 or more	-	-	1	1.3	2	2.6
Total	78	100.0	78	100.0	78	100.0
Average Per Carrier	40.3		42.4		44.0	

of services in the period 1961-1965, the average for all carriers increased to 42.4. Most carriers were still grouped in the thirty to fifty brackets, but it can be seen that the carriers offering more than fifty services now accounted for 28.2 per cent of the total. During the years 1966-1970, the highest number of carriers were offering more than fifty services, 37.2 per cent, and the average number had increased to 44.0 services. There was an increase of approximately two services per carrier in each of the five year time periods.

The number of carriers offering each service varied during the time periods, also. Table 13 contains the distribution of carriers offering each service. In 1960, seventeen services had less than twenty carriers; at the other extreme, nineteen services were provided by more than seventy carriers. During 1966-1970 only thirteen services were offered by fewer than twenty carriers. At the same time, twenty services were offered by more than seventy carriers.

The average number of carriers offering each service by functional groupings of services is shown in Table 14. The highest averages are found in Group I and Group II services and the lowest in Group III and Group V.¹ Overall

¹References to services by functional groupings or by service number are referring to the list of services contained in Table 1 pages 33 and 34 or in the Questionnaires found in Appendix I or Appendix II.

TABLE 13.--Number of Motor Carriers Offering Each Service.

Number of Carriers	1960 or Before		1961-1965		1966-1970	
	Number of Services	Per Cent	Number of Services	Per Cent	Number of Services	Per Cent
Less than 20	17	23.6	16	22.1	13	18.1
20 but less than 30	10	13.9	7	9.7	7	9.7
30 but less than 40	5	6.9	4	5.6	6	8.3
40 but less than 50	7	9.7	11	15.3	10	13.9
50 but less than 60	7	9.7	5	6.9	6	8.3
60 but less than 70	7	9.7	10	13.9	10	13.9
70 or more	19	26.5	19	26.5	20	27.8
Total	72	100.0	72	100.0	72	100.0

TABLE 14.--Average Number of Carriers Offering Each Service
By Functional Groupings.

Functional Groupings	1960 or Before	1961-1965	1966-1970
Group I	53.0	55.9	58.3
Group II	58.4	49.4	60.0
Group III	27.7	31.6	35.1
Group IV	47.1	47.8	48.1
Group V	28.3	30.5	31.8
Overall Average	43.7	46.0	47.7

averages for each time period increased by approximately two carriers per year.

Table 15 shows the number of services by carrier according to revenue sizes. The small carriers offered fewer services than did the larger carriers. In fact, the number of services appears to increase with the size of the carrier. If a difference of means statistical test is used to compare the average of 39.9 for the small carriers and 47.0 for the large carriers, a "z" value of -1.742 is found. This value for z is too low to show any significant difference between the means at the $\alpha = .05$ level. Nor was there any difference between the average number of services for short-haul and long-haul carriers. The variance within each set of data, i.e., every group of carriers had a wide range in number of services, accounts for the lack of statistical significance in the comparison of means or averages.

TABLE 15.--Average Number of Services Offered: By Revenue Size and By Short-Haul and Long-Haul.

Revenue Size of Carrier	Short-Haul Average Number	Long-Haul Average Number	Total Average Number
Small	39.3	42.0	39.9
Medium Small	42.4	41.3	42.2
Medium	42.3	46.2	45.2
Medium Large	48.0	44.0	45.2
Large	-	47.0	47.0
Total	41.7	45.5	44.0

Changes in Number of Services

All of the surveyed motor common carriers except five had as many or more services in 1970 as they did in 1960. Fourteen had no changes in services, thirty-two increased by at least ten per cent, eighteen increased between ten and twenty per cent, and ten had more than twenty per cent. The greatest difference was found for Carrier # 70 which reported an increase in services of eighty-two per cent between 1960 and 1970.

Changes in number of services was generally associated with those motor carriers that had a considerable variation in operating ratios year to year in the time period 1960-1971. Among the carriers increasing their services more than ten per cent there were some that had a trend toward lower operating ratios; others in the group were experiencing higher ratios. Almost every carrier which added only a

few services had virtually no variation in the level of their operating ratios, i.e., if operating ratios were low, they stayed low and, if operating ratios were high, they remained high. An increase in number of services was probably a strategy to improve profits for some carriers and was an attempt to reverse a trend toward lower profits for others. It was likely that a few carriers actually made their profit situation worse as they added or dropped services. The precise relationship between changes in number of services and profitability was not clear, therefore.

Services that were dropped by motor common carriers during the time period, 1961-1970, were perceived as unprofitable by the carriers which discontinued offering them. One carrier listed a total of eight services discontinued. Seven different carriers dropped Service # 31 (refrigerated trailers), four others stopped offering Service # 20 (bonded or customs shipments) and Service # 37 (converter-vans), three discontinued service # 17 (consolidation/distribution), Service # 39 (air-ride trailers), Service # 41 (bins, cages, racks, etc.), and Service # 46 (order/notify shipments). Ratings of usefulness to transport users by these carriers were lower than for other services. A few carriers, though, chose to drop services with low perceived profitability even though these same services were given a reasonable level of transport user need.

There were services in each functional group that had an increase in the number of carriers offering them.

Group III special equipment services increased the most at over twenty-five per cent. Group I, line-haul services, and Group V, advisory services, went up by about ten per cent, while Group II, pickup and delivery services, and Group IV, terminal services, remained almost the same. The specific service having the greatest increases are listed in Table 16.

TABLE 16.--Services With Greatest Increase in Motor Carriers By Time Period.

Service Number	1960 or Before Number of Carriers	1961-1965		1966-1970	
		Number of Carriers	Index of Increase (1960)	Number of Carriers	Index of Increase (1960)
Service # 7	31	42	135.5	48	154.8
Service # 8	27	40	148.1	47	174.1
Service # 9	26	42	161.5	57	219.2
Service #10	23	27	117.4	35	152.2
Service #11	16	17	106.3	21	131.3
Service #19	28	32	114.3	33	117.3
Service #22	52	58	111.5	64	123.1
Service #37	24	27	112.5	30	125.0
Service #38	50	60	120.0	70	140.0
Service #40	8	18	225.0	27	337.5
Service #41	16	25	156.3	30	187.5
Service #42	29	35	120.7	36	124.1
Service #43	9	17	188.9	29	322.2
Service #48	38	43	113.2	46	121.1
Service #63	20	26	130.0	29	145.0
Service #64	38	42	110.5	47	123.7

Services involving coordination with other modes of transportation had particularly significant increases during the ten years. These services included:

Service # 7	Air/Truck connections
Service # 8	Rail/Truck connections
Service # 9	T.O.F.C.
Service #10	Water/Truck connections

The development of inter-modal containers, as well as an improved atmosphere and general acceptance by the transportation industry, contributed to the increase of motor common carriers offering these services. In every instance, motor carriers perceived these services as both profitable and useful. They may have been perceiving an opportunity to respond to a growing transport user demand for coordinated transportation, also.

Increases in Service # 11 (published dispatch schedules) and Service # 19 (other in-transit privileges) represented an attempt by carriers to attract and hold new customers by offering regular and dependable service. Published dispatch schedules could be advertised and stressed as a sales appeal. Other transit privileges include all privileges, other than those included in Service # 18 (stop-offs in-transit for partial loading or unloading), which allowed the shipper to stop a shipment for fabrication, processing, sorting, storage, etc., yet permitting a through rate to apply on any subsequent movement of the freight. This service gave the motor carriers flexibility in competing with railroads for traffic.

Service # 22 (return of empty pallets, bins, racks, cages, etc.) would be linked to the special equipment services provided in Group III and could be expected to increase along with them.

All of Group III services, except Service # 31, (refrigerated or humidity controlled trailers), Service # 32 (heated or insulated trailers), and Service # 36 (flatbed or low-boy trailers), increased in the number of carriers offering them. Technological improvements in design of highway equipment were made during the 1960's, and many have found their way into the motor common carrier service offerings.

Only one of the Group IV terminal services increased during the ten year period. Service # 48 (sorting or segregating shipments) was a service which enabled motor common carriers to meet the small shipment needs of transport users. This service usually took one of two possible forms. The first was the unloading and segregating of pool car shipments with a subsequent line-haul movement by the motor carrier. The second possibility occurred when a carrier accepted a number of small shipments loaded and tendered to it by the shipper at a truckload rate. The motor carrier broke down the shipment at a point near the destinations and then distributed each small shipment to its specific consignee. Unlike other services which were added, the motor common carriers adding Service # 48 perceived its

profitability to them consistently below the breakeven point. Ratings of usefulness to transport users were also below that which were given other services these carriers offered. The offering of a sorting or segregating service was probably influenced by the carriers' desire to meet a definite shipper need and could have been inspired by the "small shipment problem" discussions.

Two services in Group V were offered by more carriers in 1970 than in earlier periods. Service # 63 (distribution cost studies or audits) and Service # 64 (loss & damage claims prevention programs) were evidence that motor common carriers were trying to become more customer oriented. Distribution cost studies or audits and advice on inventory control systems are services which might give a carrier an inside track with some customers.

In general, the increases in specific services during the two five-year periods does suggest that motor common carriers may have been responding to customer needs. Technological developments seemed to have contributed significantly to the increase in number of carriers offering specific services, also.

Number of Services and Motor Carrier Operating Ratios

A possible relationship between the number of services offered by a motor carrier and its profitability is suggested by comparing the average operating ratios and

the average number of services for carriers grouped by revenue size.² The less profitable small carriers had fewer services than the more profitable medium large and large carriers. A simple correlation coefficient was calculated using each carrier's operating ratio and its number of services. The overall coefficient obtained was .015. The coefficient was so low as to indicate almost no relationship existed between the two factors. What little that did exist can be interpreted to mean that higher operating ratios were associated with a lower number of services and vice versa.

Correlation coefficients were next calculated for each revenue class and are shown in Table 17.

TABLE 17.--Correlation Coefficients: Operating Ratio and Number of Services.

Revenue Size of Carrier	Correlation Coefficients "r's"
Small	.484
Medium Small	.120
Medium	-.298
Medium Large	.084
Large	.021
All Carriers	.015

The best relationship was found between operating ratios and number of services for the small carrier group.

²Refer to Table 5 for average operating ratios and Table 15 for average number of services by size of carrier.

The correlation coefficient was .484. This positive coefficient indicated that at least for small carriers lower operating ratios were found with carriers having fewer services, and higher operating ratios were associated with carriers having higher number of services. In fact none of the small carriers having more than forty services earned an operating ratio below 96.0, and on the other hand, four carriers with fewer than forty services each had average operating ratios of 95.0 or less.

A negative correlation coefficient of $-.298$ was found for the medium carriers group. While the relationship is fairly weak, the medium carriers with higher operating ratios were also the ones typically with fewer services, and carriers with lower ratios had the greatest number of services. For this group of carriers, then, greater diversity in the services mix was somewhat associated with carriers having better operating ratios. Other than with the small and medium carrier groups, the coefficients for groupings of carriers were so low as to preclude the conclusion of a relationship between each carrier's profitability and its services.

Motor Carrier Ratings of Services

Evaluation of Services

The responding motor common carriers were asked to rank the factors used in determining each service's

contribution to net revenues. A summary of the rankings is shown in Table 18. Factor "a" (judgments) was used by all except five carriers and received a first ranking by forty-three carriers. Factor "b" (breakeven factors for customers, shipments, vehicles, routes, loads, terminals, etc.) was used by all except sixteen carriers and seventeen ranked it as first. Factor "c" and Factor "e" (periodic and continuing cost studies) were next in importance.

The carriers were grouped by revenue size and by the number ranking each factor of evaluation as first in importance. This is shown in Table 19. Size of the carrier made a difference in the factors used. The small carriers used judgments almost exclusively to determine profitability, while the larger carriers used other more sophisticated methods. This finding tends to agree with a recent study of management styles of different size motor carriers.³ In it the author found that small carriers relied on informal controls and used the "eye-ball" method of managing. The large carriers were found to use a more formal style of management and more specialized control tools. Middle-sizes of carriers tended to use a combination of styles because they were sometimes too large for one-man control but too small to support a more conventional management organization or use specialized controls.

³Daryl Wyckoff, "Must Success Spoil the Small Motor Carrier?" Transportation and Distribution Management, October, 1972, p. 51.

TABLE 18.--Factors Used by Motor Carriers to Determine A Service's Contribution to Net Revenues.

Ranking of Use	Factor "a" (Judgments)	Factor "b" (Breakeven factors)	Factor "c" (Forecasts)	Factor "d" (Periodic cost studies)	Factor "e" (Continuing cost studies)	Factor "f" (Other methods)
<u>Number of Carriers Indicating Use of Factor</u>						
1	43	17	10	2	9	2
2	11	16	13	12	14	1
3	7	13	8	16	17	0
4	4	10	13	13	8	0
5	7	6	11	12	8	1
6	1	0	0	0	0	3
Not Used	5	16	23	23	22	71

TABLE 19.--Number of Carriers Using Each Evaluation Factor by Revenue Size.

Revenue Size	Factor "a"		Factor "b"		Factor "c"	
	Number Of Carriers	Per Cent Of Factor "a"	Number Of Carriers	Per Cent Of Factor "b"	Number Of Carriers	Per Cent Of Factor "c"
Small Carriers Per Cent of Small Carriers	13 86.7	30.2	2 13.3	11.8	-	-
Medium Small Carriers Per Cent of Medium Small Carriers	8 61.5	18.7	2 15.4	11.8	2 15.4	25.0 62.5
Medium Carriers Per Cent of Medium Carriers	13 54.2	30.2	4 16.7	23.5	5 20.8	
Medium Large Carriers Per Cent of Medium Large Carriers	5 50.0	11.6	2 20.0	11.8	1 10.0	12.5
Large Carriers Per Cent of Large Carriers	4 25.0	9.3	7 43.8	41.1	-	-
Total	43	100.0	17	100.0	8	100.0
Per Cent of Carriers	55.1		21.8		10.3	

TABLE 19.--Continued.

Revenue Size	Factors "d,e,f"*		Totals
	Number of Carriers	Per Cent of Factors "d,e,f"	
Small Carriers Per Cent of Small Carriers	-	-	5 100.0
Medium Small Carriers Per Cent Medium Small Carriers	1 7.7	10.8	13 100.0
Medium Carriers Per Cent of Medium Carriers	2 8.3	20.0	24 100.0
Medium Large Carriers Per Cent of Medium Large Carriers	2 20.0	20.0	10 100.0
Large Carriers Per Cent of Large Carriers	5 31.2	50.0	16 100.0
Total	10	100.0	78
Per Cent of Carriers	12.8		100.0

* Note: When more than one factor was ranked number one, the first one listed was used as primary. Also there was only one carrier each for Factors "d" and "f"; these were grouped with Factor "e" in this table.

Method of Weighting Service Ratings

In Part II of the motor common carrier questionnaire, the carrier was asked to rate the profitability of each service on the basis of one of the following criteria:

- a. Information Not Available
- b. Net Loss
- c. Breaks Even
- d. Average Net Revenue
- e. High Net Revenue

Numerical weights were necessary for each criteria in order to facilitate evaluation and inter-service and inter-carrier comparisons in the subsequent analysis. The weights used were as follows:

	Weights
a. Information Not Available	"0"
b. Net Loss	"1"
c. Breaks Even	"2"
d. Average Net Revenue	"3"
e. High Net Revenue	"4"

The weights for each service then could be added and an average rating determined. For example an average rating of profitability for Service #1 was as follows:

	No. of Carriers	Weights
a. Information Not Available	11	11 x 0
b. Net Loss	6	6 x 1 = 6
c. Breaks Even	5	5 x 2 = 10

d. Average New Revenue	36	$36 \times 3 = 108$
e. High Net Revenue	<u>20</u>	$20 \times 4 = 80$
Total carriers rating	67	
Average rating = $204 \div 67 = 3.044$		

The eleven carriers that rated Service #1 (less-than-truckload) as Information Not Available may not have offered the service, may have just not wanted to rate it, or may have not known its rating of profitability. These were not used, therefore, in calculating the average. The use of similar weights will permit the analysis of the ratings of usefulness of service. Interpretation of ratings then will be in terms of an average of numerical weights rather than qualitative criteria.

Services Evaluated to Services Offered

Many services were not evaluated by carriers that offered them. The percentage of services evaluated in the questionnaire to those offered by the carriers is shown in Table 20 by functional groupings of services. Overall, 82.8 per cent were evaluated on a profitability basis and 88.4 per cent were rated on the basis of usefulness to transport users. Within each functional grouping there were differences in percentages. Group III services had the highest percentage of evaluations under both questions while Group V had the lowest. Specific services with the highest percentage of evaluations included:

Service # 1	Less-than-truckload
Service # 2	Truckload
Service # 3	Volume

TABLE 20.--Services Evaluated to Services Offered by Functional Groupings.

Service Group	Profitability Percentage Evaluated/Offered	Usefulness Percentage Evaluated/Offered
Group I. Line-Haul Services	84.6	90.3
Group II. Pickup and Delivery Services	86.5	83.3
Group III. Services Requiring Special Equipment	91.1	92.5
Group IV. Terminal Services	79.2	89.6
Group V. Advisory Services	67.5	77.4
Total	82.8	88.4

Service # 4 Direct or single line
 Service # 5 Interline
 Service #26 P & D at private residences
 Service #29 Redelivery
 Service #31 Refrigerated or humidity controlled
 trailers
 Service #32 Heated or insulated trailers
 Service #40 Containers
 Service #41 Bins, cages, racks, or pallets provided
 by carrier
 Service #43 Double-floors, stabilizers or
 compartments
 Service #52 Armed guard and/or escort vehicle
 Service #53 Furnishing extra driver

In each case the service was related to individual freight shipments and required the commitment of labor or equipment in the movement of the shipment. Costs were readily linked to the performance of the service and to the revenue derived from it.

The services having the lowest percentage of evaluations included:

Service #11	Published dispatch schedules
Service #56	Rate quotations
Service #57	Route selections
Service #58	Shipment tracing
Service #59	Proof of delivery
Service #60	Advanced notification of arrival to consignee
Service #61	Pre-arrival confirmation to shipper
Service #62	Over, short, or damage location
Service #64	Loss & damage claims prevention programs
Service #65	Advice on packaging materials, packing methods, & loading techniques
Service #66	Advice on order size or shipment quantities
Service #67	Assistance in shipment documentation
Service #68	Advice on materials handling or shipment preparation techniques
Service #69	Advice on inventory control systems
Service #70	Warehouse or plant site location studies
Service #71	Advice on shipping and receiving facility design for plants or warehouses

These services were more nebulous in nature and were more difficult to associate with specific freight movements and to revenue. In general, these services were non-revenue in character and required the person responding to the questionnaire to exercise judgment in terms of the indirect profit contribution to be obtained from the performance of them.

One of the factors causing some carriers not to rate some of the services offered was probably the difficulty in assessing the contribution made by customer loyalty. Another factor may have been a company policy preventing the disclosure of information which might aid competition. Six responding carriers did not rate the profitableness of any

services and four failed to rate the usefulness of services to transport users. A last possible reason for not rating a service may have been the inability of the person who evaluated the service to arrive at a rating.

Variation of percentages was found for motor carriers. A distribution of percentages for profitability and usefulness of services by motor carrier are found in Table 21. In rating usefulness to transport users the responding carriers evidently had less difficulty or had no company policy preventing them in rating usefulness. In fact a number of carriers rated more services' usefulness than they were actually offering.

TABLE 21.--Distribution of Services Evaluated to Services Offered By Motor Carrier.

Percentages	Profitability		Usefulness	
	Number of Carriers	Per Cent	Number of Carriers	Per Cent
Less than 60.0	19	24.4	10	12.8
60.0 but less than 80.0	9	11.5	9	11.5
80.0 but less than 100.0	27	34.6	20	25.7
100.0 or more	23	29.5	39	50.0
Total	78	100.0	78	100.0

The relationship between the percentage of services evaluated on the basis of profitability and each carrier's average operating ratio was tested by comparing the average

operating ratios of two groups of motor carriers--one group of nineteen carriers which had forty per cent or more of services not evaluated against another group of twenty-three carriers which had evaluated all of their services. The average operating ratio for the first group was 96.3, and for the second the average was 94.7. While there was some variation within each group of carriers the average operating ratios were statistically different. This fact seems intuitively correct because carriers with knowledge of their services' profitability should have the ability to control more carefully those that are unprofitable and to exploit those services that are profitable. If the carrier had no knowledge of its services' profitability, no effective control could be exercised over them.

Motor Carriers' Profitability Ratings

Average Ratings by Service.--Motor common carriers felt that very few services they provided should be rated at average net revenue contribution or higher. A summary of the distribution of ratings by service is included in Table 22. Only nine services received an average rating of over 3.000 and twenty received average ratings less than 2.000. The average for all services was 2.351.

Average ratings for services by functional groups are shown in Table 23. Line-haul and special equipment services groups received the highest ratings, while pickup

TABLE 22.--Distribution of Motor Carrier Profitability Ratings of Services.

Average Ratings	Number of Services	Per Cent
Less than 2.000	20	27.8
2.000 but less than 2.500	24	33.3
2.500 but less than 3.000	19	26.4
3.000 but less than 3.500	7	9.7
3.500 or more	2	2.8
Total	72	100.0
Average of all services	2.351	
Standard deviation	.963	

and delivery and terminal services received the lowest. In fact, the terminal services as a group were rated at an average of only 1.884.

TABLE 23.--Profitability Ratings by Service Groups.

Groups	Average Ratings	Standard Deviations of Average Ratings
Group I. Line-haul	2.603	.941
Group II. Pickup and delivery	2.021	.902
Group III. Services requiring special equipment	2.700	.792
Group IV. Terminal services	1.884	.889
Group V. Advisory services	2.345	.968
Total	2.351	.981

Services with the highest perceived average profitability ratings included:

Service # 1	Less-than-truckload
Service # 2	Truckload
Service # 3	Volume
Service # 4	Direct or single line
Service #14	Exclusive use of vehicle
Service #24	Scheduled pickup or delivery
Service #33	Tank or Liquid bulk trailers
Service #34	Hopper or dry bulk trailers
Service #38	Hi-cube vans

The first four were basic line haul transportation services from which the carrier obviously would derive the greatest revenues for freight movements and, also, would be able to associate these revenues with costs of performance.

Service # 14 (exclusive use of vehicles) received the highest average rating of all services, 3.677, and when performed, it has historically proven to be a valuable source of net revenue contributions for most motor common carriers. Higher productivity resulting from the use of Service # 24 (scheduled pickup or delivery), similarly, was rated at the average revenue contribution level. Service # 33 (tank or bulk liquid trailers) and Service # 34 (hopper or dry bulk trailers) were rated by only four and five carriers respectively, but were given ratings of 3.00 by each. They apparently felt these specialized trailers were justified in serving certain transport users. Increased carrying capacity doubtlessly contributed to the higher rating for Service # 38 (hi-cube vans).

Specific services with average profitability ratings less than the breakeven level (average < 2.000) included:

Service #12	Special handling for emergency shipments
Service #21	Small package express
Service #22	Return of empty pallets, bins, racks, cages, etc.
Service #26	P & D at private residences
Service #27	P & D at off-hours
Service #28	P & D at positions not immediately adjacent to vehicle
Service #29	Redelivery
Service #45	C.O.D. shipments
Service #46	Order/Notify shipments
Service #48	Sorting or segregating shipments
Service #49	Marking or tagging shipments
Service #51	Packing or crating
Service #53	Furnishing extra driver
Service #54	Furnishing helper labor
Service #58	Shipment tracing
Service #59	Proof of delivery
Service #61	Pre-arrival confirmation to shipper
Service #62	Over, short, or damage location
Service #69	Advice on inventory control systems

Service # 12 (special handling for emergency shipments) was probably rated at less than breakeven because it usually necessitates extra attention and effort on the part of the carrier, without any additional revenue for the shipment. Service # 21 (small package express) presents handling and cost problems for many carriers and faces strong resistance to higher charges on the part of shippers. Service # 22 (return of empty pallets, bins, cages, racks, etc.) would cause the carrier to incur costs but receive little or no revenue from the effort. The four pickup and delivery services, Services # 26-# 29, are all necessary but very costly services for carriers to perform, usually requiring

considerable effort and time to complete. Service # 45 (C.O.D. shipments) and Service # 46 (order/notify shipments) require additional time on the part of all carrier personnel handling the paper work involved with the shipment. Apparently the carriers felt that charges for these services were not sufficient to cover their costs. Service # 48 (sorting or segregating shipments) and Service # 49 (marking or tagging shipments) involve additional handling of the freight in terminals, as would be true also for Service # 51 (packing or crating). Service # 53 (furnishing extra driver) and Service # 54 (furnishing helper labor) probably result in higher total labor costs to the carrier than the revenue collected for them. Shipment information services, which include Service # 58 (shipment tracing), Service # 59 (proof of delivery), Service # 61 (pre-arrival confirmation to shipper), and Service # 62 (over, short, or damage location) require manpower in the terminals without any direct revenue generation. Service # 69 (advice on inventory control system) was an advisory service for which no revenue could be directly identified.

Individual carriers typically rated each service as it contributed to net revenues for that carrier. Closeness of agreement in ratings by carriers of each service can be measured by the standard deviation of the ratings. For example, if all carriers rated the service exactly the same, the standard deviation would be zero. If some rated it high

net revenue while others rated it net loss, the standard deviation would be greater than 1.000. Table 23 shows the standard deviation for all services was .981. The lowest standard deviation was for Group III at .792 and implies that there was less disagreement among carriers in evaluating these services than was true with other functional groups.

Table 24 contains a distribution of standard deviations for all services. There were only six services where the carriers' ratings were generally in agreement.

These included the following:

Service # 2 Truckload
 Service # 4 Direct or single line
 Service #33 Tank or bulk liquid trailers
 Service #34 Hopper or dry bulk trailers
 Service #38 Hi-cube vans
 Service #39 Air-ride trailers

TABLE 24.--Distribution of Standard Deviations for Profitability Ratings by Service.

Range of Standard Deviations	Number of Services	Per Cent
Less than .500	6	8.3
.500 but less than .750	19	26.4
.750 but less than 1.000	47	65.3
1.000 or more	5	7.0
Total	72	100.0

All of the above services, except Service # 39, were perceived as having greater than average profitability (> 3.000).

The greatest disagreement occurred in the services with standard deviations of the average profitability ratings above 1.000. Two services in this group from the "other" categories were not considered. The remaining three included Service # 12 (special handling for emergency shipments), Service # 61 (pre-arrival confirmation to shipper), and Service # 63 (distribution cost studies or audits). Some carriers felt that special handling for shipments could be profitable even though the majority did not. The same was also true for Service # 61 (pre-arrival confirmation to shipper). The average rating for the advisory service, Service # 63 (distribution cost studies or audits), was barely above the breakeven level ($\bar{X} = 2.095$), but considerable dispersion of profitability ratings by carriers was evident.

Further evidence of a wide range of opinion about the profitability of services can be seen in the fact that 25.0 per cent of the ratings were at the net loss level, 24.8 per cent were at breakeven, 40.2 per cent were at average net revenue, and 10.0 per cent were at high net revenue.

Average Ratings by Motor Carrier.--The average profitability of each carrier's unique service offering was also determined. Table 25 contains the distribution of carriers' average ratings. Fourteen carriers rated their services at less than the breakeven level while four

TABLE 25.--Distribution of Average Profitability Ratings
For Each Motor Carrier's Services Mix.

Average Ratings	Number of Carriers	Per Cent
Less than 2.000	14	18.0
2.000 but less than 2.500	39	50.0
2.500 but less than 3.000	21	26.9
3.000 or more	4	5.1
Total	78	100.0

carriers had average ratings greater than 3.000. An examination of the average operating ratios reveals that the fourteen had higher, hence poorer, actual profitability performances than did the four carriers. Specifically, the average operating ratios were 96.63 as compared to 91.78. This suggests that the fourteen carriers knew they were losing money on many of the services they were performing and, at the same time, the four knew they were making money. It also suggests that there may be a relationship between a carrier's average rating and its operating ratio.

A correlation coefficient was calculated using the two factors profitability ratings and operating ratios for each carrier. The result was a coefficient of $-.174$ which reflected only a weak relationship for carriers as a whole. When they were grouped according to revenue sizes, however, a somewhat stronger relationship was found for at least two groupings of carriers: the small carrier and the large

carrier groups. Table 26 contains a summary of average ratings, average operating ratios, and correlation coefficients for each group.

TABLE 26.--Average Ratings of Profitability, Average Operating Ratios, and Correlation Coefficients By Revenue Size.

Revenue Size of Carrier	Average Profitability Ratings	Average Operating Ratios	Correlation Coefficients
Small	2.538	96.95	-.456
Medium Small	2.288	96.08	.111
Medium	2.364	96.16	.038
Medium Large	2.424	92.77	-.130
Large	2.366	95.48	-.383
Total	2.393	95.57	-.174

carrier groups. Table 26 contains a summary of average ratings, average operating ratios, and correlation coefficients for each group.

Within the small carrier group the higher average ratings were associated with lower operating ratios while lower ratings were found with carriers having higher operating ratios. The same situation was found generally within the large carrier group. Medium small and medium size groups of carriers showed the reverse; lower ratings were found with carriers also having the lower operating ratios. Only the small and large carriers had average ratings which closely reflected their actual profitability.

Carriers tended to have wide ranges of ratings within their services mixes, as indicated by the distribution of standard deviations by carrier shown in Table 27. Eleven had standard deviations of less than .500; one in fact rated all of its services at the average revenue level. Twenty, however, had standard deviations of 1.000 or larger. Some carriers appeared, then, to have rather substantial proportions of their services rated at net loss. A comparison of operating ratios for carriers that had as high as forty to fifty per cent of their services rated net loss to carriers that had no services rated net loss failed to show a statistically significant difference between averages, although the former had slightly poorer average operating ratios.

TABLE 27.--Standard Deviations of Profitability Ratings by Carrier.

Standard Deviations	Number of Carriers	Per Cent
Less than .500	11	14.1
.500 but less than .750	9	11.5
.750 but less than 1.000	38	48.8
1.000 or more	20	25.6
Totals	78	100.0

Only the small and large motor carriers seemed to perceive the average profitableness of their services at levels which reflected their average operating ratios. For

whatever reasons, the other carriers' ratings did not approximate actual profit performances. Among the small and large carriers were some that had a number of unprofitably rated services that they continued to offer even though operating ratios were poor. A possible explanation for offering low rated services may be found in the motor carriers' perception of usefulness to transport users of its services. This is discussed in the following section.

Motor Carrier Ratings of Services' Usefulness to Transport Users

Usefulness Ratings by Services.--Motor common carriers did have ideas concerning the usefulness of their services to transport users. One carrier, for example, replied that all of the services it provided were useful and that it would not offer any service that was not needed. The process of rating usefulness required the carrier to assess carefully the need for and the benefits derived from each of its services by the transport user in the performance of procurement and/or distribution activities.

The distribution of average usefulness ratings by services are contained in Table 28. The overall average for usefulness was 3.284, considerably higher than the average for profitableness ratings by the carriers. Also, no services were given an average rating by motor carriers of not useful. Motor carriers felt that each service on the list of seventy-two was at least marginally useful to

TABLE 28.--Distribution of Motor Carrier Usefulness Ratings By Service.

Average Usefulness Ratings	Number of Services	Per Cent
Less than 2.000	0	-
2.000 but less than 2.500	2	2.8
2.500 but less than 3.000	17	23.6
3.000 but less than 3.500	33	45.8
3.500 or more	20	27.8
Total	72	100.0
Average Rating	3.284	
Standard Deviation	.875	

transport users. In fact, almost three-fourths of the average ratings were close to the highly useful level.

Highest average ratings by functional group were given Group I and Group III services. The lowest average ratings were for those services in Group II and Group IV. Average ratings for each functional grouping are shown in Table 29.

All services in the line-haul group were rated at more than average usefulness, except four. These four included Service # 9 (T.O.F.C.), Service # 11 (published dispatch schedules), Service # 19 (other transit privileges), and Service # 21 (small package express). On the other hand, only three of the seven pickup and delivery services received average usefulness ratings above the 3.000 level, Service # 24 (Scheduled pickup and delivery), Service #25

TABLE 29.--Average Usefulness Ratings by Functional Groups of Services.

Service Groups	Average Ratings	Standard Deviations
Group I. Line-Haul services	3.408	.821
Group II. Pickup & delivery services	3.086	.925
Group III. Services requiring special equipment	3.368	.796
Group IV. Terminal services	3.152	.936
Group V. Advisory services	3.220	.875
Total	3.284	.875

(Intra-plant split P & D), and Service # 27 (P & D at off-hours). The rest were rated at less than average usefulness. All of the special equipment services except Service # 41 (Bins, cages, racks, or pallets) received average ratings above 3.000. In the terminal services, nine services were rated at less than average usefulness. These services included:

Service #46	Order/Notify shipments
Service #48	Sorting or segregating shipments
Service #49	Marking or tagging freight
Service #50	Storage or warehousing
Service #51	Packing or crating
Service #52	Armed guard and/or escort vehicle
Service #53	Furnishing extra driver
Service #54	Furnishing helper labor
Service #55	Direct advertising on carrier's vehicle

On the other hand, the terminal services which involve providing shipment information to transport users were perceived at well above the moderately useful level. The specific services included:

Service #56 Rate quotations
 Service #57 Route selections
 Service #58 Shipment tracing
 Service #59 Proof of delivery
 Service #60 Advanced notification of arrival to
 consignee
 Service #61 Pre-arrival confirmation to shipper
 Service #62 Over, short, or damage location

These same services had been found unprofitable to the carrier in the profitability analysis in the previous section. Among the Group V advisory services all were found to be more than average in usefulness.

Motor carriers tended to agree on the ratings of usefulness to about the same extent as they did on profitability. The range of standard deviations by service is shown in Table 30.

TABLE 30.--Distribution of Standard Deviations for Usefulness Ratings by Service.

Range of Standard Deviations	Number of Services	Per Cent
Less than .500	6	8.3
.500 but less than .750	16	22.2
.750 but less than 1.000	40	55.6
1.000 or more	10	13.9
Total	72	100.0

Substantial agreement on the perception of usefulness was found for only six services:

Service # 1 Less-than-truckload
 Service # 2 Truckload
 Service # 3 Volume

Service # 4 Direct or single line
 Service #34 Hopper or dry bulk trailers
 Service #72 Other advisory services

The first four were basic line-haul services and were rated high on the profitability scale as well as high usefulness by most motor common carriers. Service # 34 (hopper or dry bulk trailers) was rated by only seven carriers but was given highly useful ratings in each instance. Service # 72 was an "other" advisory service.

Disagreement among the carriers on the perception of usefulness was evident for the following services:

Service # 9 T.O.F.C.
 Service #11 Published dispatch schedules
 Service #21 Small package express
 Service #49 Marking or tagging freight
 Service #50 Storage or warehousing
 Service #51 Packing or crating
 Service #52 Armed guard and/or escort vehicle
 Service #53 Furnishing extra driver
 Service #69 Advice on inventory control systems

All except Service # 69 were among the lowest rated services on the perceived usefulness scale by motor common carriers.

Over half of the ratings given for individual services were at the highly useful level, while approximately a fourth were at the average usefulness level, and the remainder were below. Only 2.9 per cent of the ratings were recorded at the not useful level.

Usefulness Ratings by Motor Carrier.--The average usefulness of each carrier's services mix was calculated, and a range of these averages by carrier is found in Table 31. Four carriers did not evaluate any of their

TABLE 31.--Distribution of Average Usefulness Ratings for Each Motor Carrier's Services Mix.

Average Ratings	Number of Carriers	Per Cent
Less than 2.000	5	6.4
2.000 but less than 2.500	2	2.6
2.500 but less than 3.000	11	14.1
3.000 but less than 3.500	33	42.3
3.500 or more	27	34.6
Total	78	100.0

services on the usefulness scale, but among those that evaluated a substantial proportion, there was a range from a low of 1.919 to a high of 4.000. Carrier # 5 had evaluated over three-fourths of its services and rated them at an average of less than marginally useful. On the other hand, Carrier # 31 rated all of its forty-two services at the highly useful level. Sixty carriers had average ratings for usefulness at the 3.000 level or higher.

Motor carriers also had a range of ratings of usefulness as indicated by the standard deviations of their ratings in Table 32. A comparison of Table 32 with Table 27 shows that the carriers had less variety of ratings for usefulness than they did for profitability. Only 14.1 per cent of carriers had standard deviations of less than .500 when rating profitableness, while 23.1 per cent was found in rating usefulness. Similarly, over 25.6 per cent of the

TABLE 32.--Standard Deviations of Usefulness Ratings by Carrier.

Standard Deviations	Number of Carriers	Per Cent
Less than .500	18	23.1
.500 but less than .750	23	29.5
.750 but less than 1.000	29	37.2
1.000 or more	8	10.2
Total	78	100.0

carriers had standard deviations over 1.000 for profitableness but only 10.2 for usefulness. This fact suggests the need to examine the relationship between the two factors as rated by each carrier.

Relationship of Profitability Ratings and Usefulness Ratings

The qualitative rating factors for usefulness and profitableness may be viewed as approximately equal at each level. The rating of "Not Useful" is essentially equivalent to a rating of "Not Profitable"; a rating of "Marginally Useful" is the same as "Breakeven"; "Moderately Useful" equals "Average Net Revenue"; and "Highly Useful" is equated to "High Net Revenue." This assumption seems reasonable since a "Not Useful" service probably would be unprofitable also to the transport user, and conversely, a "Highly Useful" service would be very profitable. A direct numeric comparison of the two different evaluations

can be made for the responding carriers' ratings of profitability and usefulness of services, therefore.

Correlation coefficients for each functional group of services were calculated using each service's average rating of profitability and its rating of usefulness. Table 33 contains these coefficients. The overall coefficient of .512 indicates a small amount of association of lower profitability ratings with the lower usefulness ratings and higher profitability ratings with higher user ratings. The greatest relationship existed for Group II services. A small but negative relationship was found for Group IV services. This negative coefficient was the result of low

TABLE 33.--Correlation Coefficients: Profitability Ratings vs. Usefulness Ratings by Service Group.

Service Group	Correlation Coefficients
Group I. Line-Haul services	.538
Group II. Pickup and delivery services	.935
Group III. Services requiring special equipment	.306
Group IV. Terminal services	-.154
Group V. Advisory services	.392
Total	.512

profitability ratings for a group of shipment information services, e.g., Services # 58-# 62, while at the same time the carriers were rating them very high on the usefulness scale.

Ratios of the usefulness ratings to profitability ratings for each service and each carrier were also calculated. The distribution of the ratios by service is shown in Table 34. The average ratio between the two evaluations was 1.426 which indicated that the responding motor carriers were rating usefulness considerably above profitability for each service. Only two services were rated lower on the usefulness scale than on the profitability while ten were given ratings that were seventy-five per cent or more

TABLE 34.--Distribution of Ratios: Usefulness/Profitability Ratings by Service.

Range of Ratios	Number of Services	Per Cent
Less than 1.000	2	2.8
1.000 but less than 1.250	20	27.8
1.250 but less than 1.500	23	31.9
1.500 but less than 1.750	17	23.6
1.750 or more	10	13.9
Total	72	100.0
Average ratio	1.426	

higher. The two that received lower usefulness than profitability ratings were Service # 14 (exclusive use of vehicle) and Service # 55 (direct advertising on carrier's vehicle). Among services that had the highest ratios were Service # 12 (special handling for emergency shipments), Service # 21 (small package express), Service # 22 (return of empty

pallets, bins, etc.), Service # 26 (P & D at positions not immediately adjacent to vehicle), Service # 48 (sorting and segregating shipments), Service # 56 (rate quotations), Service # 58 (shipment tracing), Service # 59 (proof of delivery), and Service # 62 (over, short, and damage location).

Similar ratios were calculated for usefulness and profitability ratings of the services offered by each carrier. The distribution of ratios by carrier is contained in Table 35. The range of ratios was very similar to that found for services in Table 34. Clearly, the majority of motor carriers were rating usefulness much higher than profitability.

TABLE 35.--Distribution of Ratios: Usefulness/Profitability Ratings by Carrier.

Range of Ratios	Number of Carriers	Per Cent
Less than 1.000	3	4.2
1.000 but less than 1.250	15	21.1
1.250 but less than 1.500	30	42.3
1.500 but less than 1.750	13	18.3
1.750 or more	10	14.1
Total	71	100.0

Both ratings of profitability and usefulness of services by motor carriers would need to be related to similar ratings by transport users of the same services

in order to have any real value. Comparisons, therefore, of motor carrier and transport user ratings were made in a later section.

Transport User Ratings of Services'
Usefulness

A measure of each service's actual usefulness can be obtained from the responses of the sample of transport users. Eighty-nine midwestern industrial and retail firms, all of which used motor common carriers, rated the same list of services with an average rating of 2.672. This in qualitative terms is an average rating below the moderately useful level. There was a considerable range of ratings, however, as shown by Table 36. Thirteen services, or 18.3 per cent, were rated at less than marginally useful.

TABLE 36.--Distribution of Transport User Average Ratings of Usefulness.

Range of Ratings	Number of Services	Per Cent
Less than 2.000	13	18.3
2.000 but less than 2.500	27	38.0
2.500 but less than 3.000	15	21.1
3.000 but less than 3.500	8	11.3
3.500 or more	8	11.3
Total	71*	100.0
Average rating	2.659	

* Note: One service, # 23 (other line-haul services), was inadvertently left off of the Transport User Questionnaire and was not evaluated.

Sixteen or 22.6 per cent, were given average ratings at or above the moderately useful level.

When the ratings by transport users are broken down by functional groups of services as shown in Table 37, Group I is found to have received the highest average rating, 2.954. The advisory services in Group V were the lowest with an average rating barely above the marginally useful level.

TABLE 37.--Transport Users' Ratings of Usefulness by Functional Groups of Services.

Service Groups	Average Ratings	Standard Deviations
Group I. Line-Haul services	2.954	1.067
Group II. Pickup and delivery services	2.691	1.090
Group III. Services requiring special equipment	2.413	1.199
Group IV. Terminal services	2.630	1.182
Group V. Advisory services	2.152	1.130
Total	2.672	1.149

Substantial disagreement among transport users was also apparent from the standard deviations of the average ratings. All groups had standard deviations above 1.000 with Group III having the highest at 1.199. High standard deviations reflected the fact that while some transport users may have rated a service low or not useful others were at the same time finding it highly useful.

The distribution of standard deviations for each service in Table 38 shows the disagreement among transport users over the perceived usefulness of the motor common carrier services. There were only eight, or 11.3 per cent, with standard deviations of less than .750. On the other hand, there were forty-three, or 60.5 per cent, with standard

TABLE 38.--Distribution of Standard Deviations for Transport Users' Ratings of Usefulness.

Standard Deviations	Number of Services	Per Cent
Less than .500	2	2.8
.500 but less than .750	6	8.5
.750 but less than 1.000	20	28.2
1.000 or more	43	60.5
Total	71	100.0

deviations of 1.000 or more, reflecting a wide degree of disagreement. Among the services where little disagreement was evident are the following:

Service # 1 Less-than-truckload
 Service # 2 Truckload
 Service # 4 Direct or single line
 Service #13 Expedited shipments
 Service #52 Armed guard and/or escort vehicle
 Service #58 Shipment tracing
 Service #59 Proof of delivery

All were perceived as having high usefulness except Service # 52. It was rated by twenty-eight of thirty-one transport users at the not useful level. Six special equipment

services reflected considerable disagreement and had standard deviations above the 1.200 level. They were as follows:

Service #31	Refrigerated or humidity controlled trailers
Service #32	Heated or insulated trailers
Service #33	Tank or bulk liquid trailers
Service #34	Hopper or dry bulk trailers
Service #42	Tie-down & special stowage devices
Service #43	Double-floors, stabilizers or compartments

Comparison of Motor Carrier and Transport User Ratings

A summary of all ratings of services by motor carriers and transport users is shown in Table 39. The data were taken from Tables 23, 29, and 37. Also included in the table are correlation coefficients for services by functional groups to determine the relationship between motor carrier ratings of usefulness. The following sections will examine each functional grouping of services by comparing motor carrier to transport user ratings.

Line-Haul Services

Both profitability and usefulness average ratings by motor carriers differed from the transport user ratings of Group I services. Motor carrier average profitability ratings were below and their estimates of usefulness were above the similar ratings by transport users. Almost no relationship existed between the motor carrier profitability and transport user ratings while their estimates of usefulness

TABLE 39.--Comparison of Motor Carrier Ratings With Transport User Ratings.

Service Groups	Motor Carrier Ratings		Transport User Usefulness (3)	Correlation Coefficients	
	Profitability (1)	Usefulness (2)		(1)to(3)	(2)to(3)
Group I. Line-Haul services	2.603	3.408	2.954	.176	.750
Group II. Pickup and delivery services	2.021	3.086	2.691	.928	.882
Group III. Services requiring special equipment	2.700	3.368	2.413	.601	.375
Group IV. Terminal services	1.884	3.152	2.630	-.386	.908
Group V. Advisory services	2.345	3.220	2.152	.767	.071
Total	2.351	3.284	2.672	.198	.613

were associated with those of transport users. In the latter case, motor carriers were closely estimating the relative usefulness of their services to shippers. Profitability ratings, on the other hand, did not seem to be related to usefulness; some services that were profitable to carriers were not as useful to shippers. The opposite was also true.

Differences between average profitability ratings and transport user ratings were found in Service # 11, Service # 12, Service # 13, and Service # 21. Service # 11 (published dispatch schedules) was rated 2.636 by motor carriers but only 1.875 by transport users. Service # 12 (special handling for emergency shipments) was given a rating of 3.433 by transport users but only 1.980 by carriers. Service # 13 (expedited shipments) had an average profitability rating of 2.280 but a usefulness rating of 3.614. And Service # 21 (small package express) received an average of only 1.461 by motor carriers and 3.086 by shippers.

Motor carriers slightly overestimated the transport user usefulness for Service # 11. The rest of Group I services were relatively close to the transport users ratings.

Pickup and Delivery Services

Profitability ratings were again low and estimates of usefulness were high relative to the transport user

ratings for pickup and delivery services. However, the ratings were very closely associated with each other. A service that was rated high by motor carriers was also rated high by transport users. Coefficients of .928 and .882 reflected a high degree of association between the sets of ratings. Motor carriers and transport users were in close accord on their relative ratings of profitability and usefulness.

Services Requiring Special Equipment

Both motor carrier ratings for this group of services were higher than the transport user ratings. Profitability ratings did seem to be related with a coefficient of .601. This, together with the fact that the average profitability ratings were only slightly higher than transport user ratings, would indicate that the motor carriers believed special equipment was important to their operations. On the other hand, they over-estimated the usefulness of these services. There was only a small relationship present between their estimates and transport user ratings of usefulness. The coefficient was only .375. Many carriers apparently had high hopes of filling customer needs with specialized equipment but may not have known what these needs actually were.

Terminal Services

An interesting anomaly appeared when the ratings of terminal services were compared. Profitability ratings

were not only lower than usefulness ratings, but the correlation coefficient between them was negative. At the same time, the carriers' ratings of usefulness were higher than the transport users' and were very positively correlated. Most differences in ratings occurred in the shipment information services. Transport users felt that these were extremely important to them in performing their procurement and distribution activities. Motor carriers agreed in their ratings of usefulness. These same services, however, required carriers to perform activities that were not normally covered in the rate structure. Thus, the carriers rated profitability as low. The possibility of an indirect profit contribution was generally overlooked by most carriers. On the surface it would appear that these services were offered by motor carriers only as a response to transport user need for them. Two examples were found in Services # 58 (shipment tracing) and Service # 59 (proof of delivery). Motor carriers rated the profitability of Service # 58 at only 1.686 while transport users gave it an average usefulness rating of 3.747. Service # 59 had a profitability rating of 1.653 and a usefulness rating of 3.511. Several carriers had rated each of these services at high net revenue contribution level recognizing the opportunity to make an indirect profit through satisfied customers.

Advisory Services

Both average ratings by motor carriers were higher than transport user ratings for advisory services. Profitability was rated only a little higher but usefulness estimates were considerably higher. The profitability ratings correlated positively with the transport user ratings; motor carrier estimates of usefulness, on the other hand, were unrelated.

Motor carriers, then, tended to error in their perception of the usefulness of advisory services. A possible explanation may be in the fact that all services involved were non-transportation and non-revenue services. In addition, advisory services are such that a carrier must offer them rather than expect the shipper to request that they be performed. High usefulness may exist in the minds of motor carrier management, only. Unless the motor carrier communicates its willingness and ability to perform advisory services to those shippers unable to perform them for themselves, the services will not have any general usefulness.

Total Services

The overall average rating of profitability was fairly close to transport users ratings. The correlation coefficient of .198 belies the fact that several functional groups were highly related and one was even negatively related.

As a whole, motor carriers tended to over-estimate usefulness. Especially was this true for advisory services. A strong relationship generally was indicated for usefulness estimates with the correlation coefficient of .613.

Ratings and Motor Carrier Profitability

Ratios of Ratings

This section will examine the relationship between individual motor carrier ratings and transport user ratings and link these with carrier profitability. In order to compare the sets of ratings it was necessary to compute the average rating by the transport users for each carrier's unique services mix. This involved identifying every service offered by the carrier and computing an average of the ratings for them by transport users. Once this figure was obtained for each carrier, a ratio could be obtained between the average rating by the carrier of services profitability and usefulness and the adjusted average rating of transport users. The calculation is illustrated for Carrier # 1:

$$\frac{\text{Motor Carrier Services Profitability Rating}}{\text{Transport User Services Usefulness Rating}} = \frac{2.429}{2.808} = .865$$

$$\frac{\text{MCSP}}{\text{TUSU}} = \text{MCSP/TUSU Ratio}$$

The ratio of .865 reflects the fact that Carrier # 1 rated the profitability of its services at a lower level than did

the transport users for the same set of services. Similarly, a ratio between the carrier's estimate of usefulness and an adjusted transport user rating was obtained.⁴ This ratio was 1.111 for Carrier # 1 indicating that it had rated usefulness higher than transport users. Ratios were calculated for all carriers in the same way.

The distribution of ratios between individual carrier profitability ratings and adjusted transport user ratings is contained in Table 40. The ratios ranged from a low of .539 to a high of 1.194. The average ratio for all carriers was .860. The fact that most carriers had rated profitability lower than the transport users had rated usefulness has already been pointed out. This table supports the findings by relating it to just those services which each carrier offered. It should be noted, however, that two-thirds of the motor carriers had ratios that were within twenty per cent of the transport users ratings. A vast majority of motor carriers had average profitability ratings for their services mixes that were close to the transport users ratings of the same services.

The ratios for carriers' ratings of usefulness and transport users' ratings are shown in Table 41. Here the ratios ranged from a low of .717 to a high of 1.556. The average ratio was 1.195. These ratios were higher by about

⁴
$$\frac{\text{Motor Carrier Services Usefulness Ratings}}{\text{Transport User Services Usefulness Ratings}} = \frac{\text{MCSU/TUSU}}{\text{Ratio}}$$

TABLE 40.--Distribution of MCSP/TUSU Ratios.

Range of Ratios	Number of Carriers	Per Cent
Less than .700	8	11.1
.700 but less than .800	16	22.2
.800 but less than .900	25	34.7
.900 but less than 1.000	13	18.1
1.000 or more	10	13.9
Total	72	100.0

TABLE 41.--Distribution of MCSU/TUSU Ratios.

Range of Ratios	Number of Carriers	Per Cent
Less than 1.000	4	5.4
1.000 but less than 1.100	15	20.2
1.100 but less than 1.200	20	27.0
1.200 but less than 1.300	17	23.0
1.300 but less than 1.400	9	12.2
1.400 or more	9	12.2
Total	74	100.0

the same amount that the profitability to usefulness ratios were lower, except that only 52.6 per cent of the motor carriers had ratios within twenty per cent of the transport users' ratings.

Relative Profitability Ratios

In earlier sections of this study the "operating ratio" was used as a measure of motor carrier actual

profitability. It must be recognized, though, that average operating ratios for carriers not only were influenced by management action but were also subject to exogenous factors such as strikes and general economic conditions experienced by the entire industry. A measure of carrier profitability was needed which would relate individual carrier profits to the motor carrier industry profits. Such a measure was found in the concept of Relative Profitability Ratios for each carrier.⁵ Specifically, a Relative Profitability Ratio (RP) could be calculated for each carrier by taking the difference between the carrier's operating expenses and operating revenues (profit margin) for each year in the period 1960-1971. This difference was then divided by the carrier's operating revenues in each year. The percentage thus determined for each year was divided by the industry's percentage, using all Class I and Class II motor carriers of general freight. An annual Relative Profitability Ratio for each carrier was the result. Next, the average of each carrier's RP ratios for the twelve years, 1960-1971, was calculated. This ratio for each carrier related its profitability to the rest of the motor carrier industry and smoothed out the annual fluctuations that occurred because of exogenous factors. If a carrier, during

⁵Relative Profitability = $\frac{\text{Carrier Profit Margin}}{\text{Carrier Operating Revenue}} \div \frac{\text{Industry Profit Margin}}{\text{Industry Operating Revenue}}$
 Relative Profitability = RP

the period under study, had a better operating ratio than the industry, its RP ratio would be greater than 1.000. If its profit performance was poorer than the industry's, the average RP ratio would be less than 1.000. If in fact, a specific motor common carrier had done very poorly during the period, it possibly could have a negative relative profitability ratio.

The distribution of relative profitability ratios for all seventy-eight responding motor carriers is presented in Table 42.

TABLE 42.--Distribution of Relative Profitability Ratios.

Range of Ratios	Number of Carriers	Per Cent
Less than .500	24	30.8
.500 but less than 1.000	19	24.4
1.000 but less than 1.500	20	25.6
1.500 but less than 2.000	9	11.5
2.000 or more	6	7.7
Total	78	100.0
Average	.976	

The overall average relative profitability ratio, RP ratio, was .976 or an amount very close to the industry. However, it can be seen from the table that almost one-third of the responding carriers had ratios that were less than .500. In that group of twenty-four carriers there were three that had negative RP ratios. Thirty-five carriers

had ratios higher than 1.000, and among them, there were six with ratios greater than 2.000.

The following sections will use the RP ratios and the MCSP/TUSU and MCSU/TUSU ratios. Motor carriers will be grouped into several categories for a comparison of the ratios. The first grouping to be studied will be revenue size of carriers.

Revenue Size

The size of the carriers based on revenues is a grouping used previously. The significance of size is based primarily on the management styles used by carriers as they increase in number of customers and revenues. The smaller carriers have more informal management styles and the owner/manager is involved in day to day operations of the carrier and frequently contacts customers. Larger carriers have more formal management styles and employ specialists in the functional operating areas. Their top executives would be less involved with daily operations and would have fewer direct contacts with customers. A comparison of MCSP/TUSU and MCSU/TUSU and RP ratios for carriers grouped by revenue sizes are shown in Table 43.

Small carriers had the lowest average RP ratio at .652, reflecting the higher average operating ratio previously mentioned. They had the highest MCSP/TUSU ratios, however. The ratio of .899 suggests that the small carriers were estimating their services profitability at close to what

TABLE 43.--Comparison of RP Ratios With MCSP/TUSU and MCSU/TUSU Ratios by Revenue Size.

Revenue Size	(1)		(2)		(3)		Correlation	
	Average Ratio: MCSP/TUSU		Average Ratio: MCSU/TUSU		Average Ratio: RP		Coefficients (1) to (3) (2) to (3)	
Small Carriers	.899		1.179		.652		.401	.151
Medium Small Carriers	.823		1.226		.878		-.100	-.258
Medium Carriers	.839		1.171		.833		.129	.006
Medium Large Carriers	.877		1.136		1.650		.070	-.319
Large Carriers	.875		1.256		.990		.401	.045
Total	.860		1.195		.976		.214	-.058

shippers were estimating the same services' usefulness. The correlation coefficient between these ratios and RP ratios for small carriers was .401. The relationship was not too strong but did indicate that the higher MCSP/TUSU ratios were generally associated with higher RP ratios for most carriers. The fact that the two sets of ratios were positively correlated is significant, also. Since most MCSP/TUSU ratios were less than 1.000 (less than the transport user ratings of usefulness), it is not surprising that the closer the MCSP/TUSU ratios came to 1.000 the higher the average RP ratios of the carriers.

Small Carriers had an average MCSU/TUSU ratio of 1.179 which was slightly below the average for all responding carriers. The correlation coefficient for MCSU/TUSU ratios and RP ratios for the small carriers was .151. The coefficient was too low to indicate a significant relationship between the two factors. The positive coefficient showed that higher MCSU/TUSU ratios were somewhat associated with higher RP ratios. Since all of the MCSU/TUSU ratios for the small carrier group were greater than 1.000 it would seem that what little relationship existed was in favor of over-estimating the usefulness of services to transport users.

The thirteen medium carriers had an average RP ratio of .878 which was below the industry. Their MCSP/TUSU ratio was the lowest of all groups of carriers at .823. A

coefficient of $-.100$ was obtained when MCSP/TUSU ratios were correlated to the individual carrier RP ratios. Such a low coefficient demonstrated virtually no relationship between the two ratios, and further it was negative in sign. Any relationship that did occur was between the lower MCSP/TUSU ratios and higher RP ratios. The medium small carriers average MCSU/TUSU ratio was 1.226 and was the highest of the revenue groupings of carriers. The correlation coefficient between MCSU/TUSU and RP ratios was $-.258$. While relatively low, it reflected a small association of lower MCSU/TUSU ratios and higher RP ratios.

Twenty-four carriers were in the medium revenue size group but only twenty evaluated services in terms of profitability and twenty-two evaluated services on the basis of usefulness. The average RP ratio for medium carriers was $.833$. The average MCSP/TUSU ratio was also low at only $.839$. A very slight relationship was found between RP ratios and MCSP/TUSU ratios; the correlation coefficient was $.129$. The average MCSU/TUSU ratio was 1.171 , but no relationship existed between them and RP ratios for individual carriers within the group. The coefficient was only $.006$.

Medium large carriers had the best average RP ratio at 1.650 , indicating that as a group these carriers were considerably more profitable than the industry. The average MCSP/TUSU ratio was the second highest of all revenue groups at $.877$. The correlation coefficient for

MCSP/TUSU ratios and RP ratios was only .070, so low as to indicate practically no relationship. On the other hand, the average MCSU/TUSU ratio was 1.136 and it correlated with RP ratios with a coefficient equal to $-.319$. The negative relationship indicated by the coefficient shows the association of lower MCSU/TUSU ratios with higher RP ratios and vice versa.

The sixteen large carriers had an average RP ratio very close to the industry profitability at .990. The average MCSP/TUSU ratio was .875, and those for the individual carriers were somewhat related to individual RP ratios. The correlation coefficient was .401. The large carrier average MCSU/TUSU ratio was the highest of any group at 1.256 but no relationship was evident between the individual carrier MCSU/TUSU and RP ratios. The coefficient was only .045.

The analysis found that the small and large carrier groupings had the best relationship between MCSP/TUSU and RP ratios, but these groupings of carriers displayed limited correlation between MCSU/TUSU and RP ratios. The medium small and medium large carrier groupings had the highest negative correlation coefficients for MCSU/TUSU and RP ratios. Almost no relationship existed between MCSP/TUSU and RP ratios for these carriers, however. It was found that the carrier groupings either had good ratings for profitability or for usefulness, but rarely did both ratings

have good relationships. The next section will seek additional information to help explain the relationships by grouping the carriers according to the factor they used to evaluate services.

Factors Used in Evaluating Services

The factors relied on to evaluate services could be expected to affect the average ratings of profitability and usefulness by motor carriers. If ratings of profitability were perceived too low, the carrier could be misled into discontinuing services that otherwise would make a contribution to net revenues. If ratings of usefulness were too low, carriers might erroneously assume that no need exists for the services and, therefore, discontinue them or not offer them to customers. On the other hand, if usefulness ratings were too high, carriers could commit men or equipment to services for which limited or no usefulness exists among customers. This section will identify those factors that had the best relationships between MCSP/TUSU and MCSU/TUSU ratios and RP ratios.

A comparison of RP ratios with MCSP/TUSU and MCSU/TUSU ratios by factors used in evaluating services is contained in Table 44.

Factor "a".--The motor carriers using Factor "a" were relying primarily on judgments rather than specific cost studies or other methods. For the carriers listing this as the most important method of evaluation, the

TABLE 44.--Comparison of RP Ratios With MCSP/TUSU and MCSU/TUSU Ratios by Factors Used to Evaluate Services.

Factors of Evaluation	(1)	(2)	(3)	Correlation Coefficients	
	Average Ratio: Profitability Ratings/Usefulness MCSP/TUSU	Average Ratio: M/C Estimates of Usefulness T/U Usefulness MCSU/TUSU	Average Ratio: Relative Profitability RP	(1) to (3)	(2) to (3)
Factor "a"	.891	1.160	.946	.190	.003
Factor "b"	.818	1.244	.986	.428	-.230
Factor "c"	.832	1.237	.820	-.309	.656
Factors "d", "e", and "f"	.832	1.225	.952	.058	-.310
Total	.860	1.195	.976	.214	-.058

average MCSP/TUSU ratio was .891 and was the highest of all carrier groupings based on evaluation factors. The average MCSU/TUSU ratio was the lowest for any grouping at 1.160. The average RP ratio was reasonably close to the industry average at .946. A coefficient of .190 was found for the relationship of MCSP/TUSU and RP ratios and only .003 for MCSU/TUSU and RP ratios. In the first instance only a very slight relationship existed and none existed in the latter case. Factor "a" then was not very helpful in disclosing relationships between the ratios.

Factor "b".--The seventeen carriers using Factor "b", breakeven factors for customers, shipments, vehicles, routes, loads, and terminals, had an average MCSP/TUSU ratio of .818. This average was the lowest of the groupings according to factors of evaluation. The average MCSU/TUSU ratio was 1.244 and was the highest for grouping of carriers. The average RP ratio of .986 was also higher than any other average RP ratio. The carriers using Factor "b" had some relationship between MCSP/TUSU ratios and their RP ratios as shown by the coefficient of .428. The coefficient for MCSU/TUSU ratios and RP ratios was smaller at -.230 but nevertheless demonstrated an association of lower MCSU/TUSU ratios with higher RP ratios. While the average MCSU/TUSU ratio was high, within the group, the lower ratios were found with carriers having higher RP ratios and vice versa. For this group of carriers, both the ratings of services'

profitability and usefulness, when linked to transport users' ratings of the same services, tended to be associated with each carrier's actual profitability better than any other grouping of carriers.

Factor "c".--The eight carriers using Factor "c", forecasts of revenues, tonnage, ton-miles, had an average MCSP/TUSU ratio of .832 and an average MCSU/TUSU ratio of 1.237. Ratios of RP's varied from .443 to 1.224, while the average was .820. Significant differences in correlation coefficients, however, were found for this group of carriers. The coefficient for MCSP/TUSU ratios and RP ratios was -.309. The negative coefficient disclosed an association of the higher MCSP/TUSU ratios with lower RP ratios, while the lower MCSP/TUSU ratios were found with the carriers having higher RP ratios. This was just the opposite of the carriers using Factor "b" for evaluation. The coefficient for MCSU/TUSU ratios and RP ratios was .656, indicating a strong positive relationship between the ratios. It would be interpreted, however, to show a relationship between the higher MCSU/TUSU ratios and higher RP ratios, and the lower MCSU/TUSU ratios would be found with the lower motor carrier RP ratios. The group of carriers using Factor "c" had estimates of service profitability and usefulness which ran counter to the other groupings of carriers.

Factors "d", "e", "f".--The carriers indicating a reliance on Factors "d", "e", and "f", which included

periodic or continuing cost studies or other methods, had an average MCSP/TUSU ratio of .832 and an average MCSU/TUSU ratio of 1.225. The coefficient for MCSP/TUSU ratios and RP ratios was only .058, with virtually no relationship present. The coefficient for MCSU/TUSU ratios and RP ratios, on the other hand, was $-.310$. This coefficient showed the strongest relationship among all groups for lower MCSU/TUSU and higher RP ratios.

In summary, the two groups of motor carriers that used Factor "b" and Factor "c" had correlation coefficients indicating some relationship between their ratings and their actual profitability. The relationships as reflected in the coefficients, however, were opposites. The carriers using Factor "b" had higher MCSP/TUSU ratios associated with higher RP ratios while lower MCSU/TUSU ratios were found with higher RP ratios. Factor "c" carriers, on the other hand, had the lower MCSP/TUSU ratios related to higher RP ratios and the higher MCSU/TUSU ratios associated with higher RP ratios. Intuitively, the coefficients for Factor "b" carriers seemed to reflect the proper relationship. The next section will group the carriers by the title of person completing the questionnaire and should yield additional insights into the relationships between ratings and actual carrier profitability.

Title of Executive Completing Questionnaire

The grouping of motor carriers by title of executive completing the questionnaire was suggested by the fact that only 43.6 per cent were completed by presidents to whom the original questionnaire was addressed while the remaining 56.4 per cent were completed by individuals with a wide variety of functional responsibilities within carrier organizations. This grouping of carriers was also based on the belief that the job an executive performed may have had an effect on how the services were evaluated. For example a financial officer or traffic manager could be expected to have a better understanding of the net revenue contribution of each service while marketing or sales executives who probably had closer contacts with customers, would be able to estimate each service's usefulness better. The comparison of MCSP/TUSU ratios, MCSU/TUSU ratios, and RP ratios is shown in Table 45.

The thirty-four responses by presidents of motor carriers represented a group of carriers that had an average RP ratio of .888. Specific RP ratios within the group ranged from a low of -.018 to a high of 2.282.

Thirty-two of the thirty-four carriers evaluated MCSP and had an average MCSP/TUSU ratio of .805. Their average MCSU/TUSU ratio was 1.197 which was almost exactly the same as for all surveyed carriers. Correlation coefficients were .244 and -.164 for MCSP/TUSU and RP ratios and

TABLE 45.--Comparison of RP Ratios With MCSP/TUSU and MCSU/TUSU Ratios by Title of Executive Completing Questionnaire.

Title of Executive Completing Questionnaire	(1) Average Ratio: MCSP/TUSU	(2) Average Ratio: MCSU/TUSU	(3) Average Ratio: Relative Profitability RP	Correlation Coefficients	
				(1) to (3)	(2) to (3)
Presidents	.805	1.197	.888	.244	-.164
Financial Officers	.886	1.237	.989	.200	.294
Operations and General Managers	.818	1.223	.758	.346	.034
Traffic Managers	.911	1.166	1.118	.200	-.044
Marketing and Sales Managers	.869	1.093	1.180	-.157	-.658
Other Responses	.900	1.206	.754	.415	.289
Total	.860	1.195	.976	.214	-.058

MCSU/TUSU and RP ratios respectively. Both indicated only slight relationships present between the ratios.

A total of fifteen responses were received from executives with titles of treasurer, vice-president of finance, or controller. The carriers involved had an average MCSP/TUSU of .886 and an average MCSU/TUSU ratio of 1.237. The average RP ratio was very close to the industry average at .989. The correlation coefficient for MCSP/TUSU and RP ratios was .200, only slightly below the coefficient found for the responses of presidents. On the other hand, the coefficient for MCSU/TUSU and RP ratios was a positive .294, evidencing a slight relationship between higher MCSU/TUSU ratios and higher RP ratios.

Only four responses were received from executives with titles of general manager or operations manager. Admittedly just four carriers in this group limit their comparability with other groups, but they will be included in order to hold to a consistent pattern of analysis. The average MCSP/TUSU ratio was .818, and the average MCSU/TUSU ratio was 1.223. RP ratios were lower for this group resulting in an average of only .758. The coefficient of MCSP/TUSU and RP ratios was .346 while the coefficient for MCSU/TUSU and RP ratios was positive but only .034. Some relationship was present between the first two sets of ratios but virtually none existed for the second.

Ten motor carrier questionnaires were completed by carriers' traffic managers. Since these men were

familiar with setting rates on services, their evaluations of profitability could be expected to come fairly close to transport users' ratings of usefulness. In fact, the average MCSP/TUSU ratio was the highest of any group of carriers regardless of the method of grouping used in this analysis. The average ratio was .911. The average MCSU/TUSU ratio at 1.166 was slightly below the average for all surveyed carriers. This group of carriers was more profitable than the industry with an average RP ratio of 1.118. The correlation coefficient for MCSP/TUSU and RP ratios was .200 and for MCSU/TUSU to RP ratios was $-.044$. Only the MCSP/TUSU to RP ratios appeared correlated.

Seven questionnaires were completed by executives with titles of sales managers or directors of marketing. In theory these men should probably have the best perception of each service's usefulness to transport users. The average MCSP/TUSU ratio was .869, or right at the average for all surveyed carriers. On the other hand, the average MCSU/TUSU ratio was only 1.093. This average represented the lowest ratio of MCSU/TUSU of all groups of motor carriers and was very close to the average ratings of transport users. This group also possessed the strongest relationship between MCSU/TUSU and RP ratios; the coefficient for the two sets of ratios was $-.658$. Within this group of carriers the lower MCSU/TUSU ratios were consistently associated with higher RP ratios. The coefficient for

MCSP/TUSU and RP ratios was negative and only $-.157$. Marketing and sales executives were indeed good estimators of usefulness of services but relatively poor estimators of each service's profitability.

The last grouping was necessary because some of the responses were by individuals who did not fit into any of the other categories. For example several were completed by more than one executive, another was from the research department. One carrier in this group did not evaluate either profitability or usefulness of services and another only evaluated usefulness. The average MCSP/TUSU ratio was high at $.900$ and the MCSU/TUSU ratio was only slightly above the overall average at 1.206 . The average RP ratio, on the other hand, was very low at $.754$. Both correlation coefficients were positive; MCSP/TUSU to RP ratios was $.415$, while MCSU/TUSU to RP ratios equaled $.289$. These carriers' responses demonstrated a good relationship with profitability but were weak in the perception of usefulness.

The analysis of ratings by title of executive completing the questionnaire revealed that marketing and sales executives have a good perception of usefulness of services but a poor idea of each service's profitability to the carrier. The highest coefficient for MCSU/TUSU and RP ratios was found in those carriers where marketing or sales executives responded to the questionnaire. All of

the other responses had relatively small but positive relationships between MCSP/TUSU ratios and RP ratios.

In summary, this chapter has examined the number of services, the changes in number offered over time, the effect of no knowledge about services profitability and usefulness, and the specific ratings of profitability and usefulness given by motor common carriers and transport users. Profitability and usefulness ratings relative to carrier performance were also discussed.

CHAPTER V

CONCLUSIONS

The final chapter will summarize the findings of the study of motor common carrier services. It will also present some implications of the findings for the managements of motor common carriers. In addition, the possibilities of future study of motor carrier services will be discussed.

General Findings of Study

The Services Mix of Individual Carriers

Responses to the motor common carrier questionnaire defined a services mix for each carrier. Analysis of the responses disclosed that each carrier had a services mix which was unique in composition. Also, the number of services in each carrier's mix was probably larger than most carriers and transport users had imagined. The majority of motor common carriers listed between forty to sixty services that they offered to transport users. Smaller short-haul carriers tended to offer fewer services than the larger long-haul carriers, but the difference in averages was not statistically significant. Each carrier's services mix was unique in that it represented a different set of services. No two carriers had all of the same services.

On the other hand, there were three services offered by all responding carriers, and twenty services offered by at least 90 per cent of the carriers.

Motor carriers were apparently responding to a complex of factors when selecting services to offer. Probably the most important factor was the carrier's operating authority. In addition, each carrier had a perception of most services' contribution to net revenues, and also, the services' usefulness to transport users. Right or wrong, the perceived profitability and usefulness of services also interacted with the fact that a large number of competing carriers were offering a specific service.

Changes in Services Mix

The study found that motor common carriers changed the composition of their services mix during the twelve years under investigation. Additions to services far outnumbered the discontinuances, however. Most responding carriers had more services in 1970 than they did in 1960. The data indicated that discontinued services were generally perceived as unprofitable to the carrier although the same services may have been viewed as useful to transport users by the carrier. Additions to services mixes had high profitability ratings as well as high usefulness ratings by carriers. The services that were added most often included the coordinated transportation group, i.e.,

Service # 7 (air/truck), Service # 8 (rail/truck), Service # 9 (T.O.F.C.), and Service # 10 (water/truck), and a group of services requiring special equipment, i.e., Service # 37 (converter-vans), Service # 38 (hi-cube vans), Service # 40 (containers), Service # 41 (bins, cages, racks, etc.), Service # 42 (tie-down & special stowage devices), and Service # 43 (double-floors, stabilizers or compartments). The special equipment group of services seemed related to the coordinated transportation group of services, and both seemed to reflect an effort to provide a complete transportation service to transport users. This would also suggest that the carriers may have been responding to recognition of a growing transport need for improved service. New services may have been part of a strategy to obtain additional sources of revenue, to meet other carrier competition, or to try to improve the carrier's operating ratio. Evidence was found in the data that the carriers having the greatest increase in number of services had trends in operating ratios that were either improving or worsening, while the carriers that had no changes in the composition of their services mixes had operating ratios that remained almost static.

Number of Services Offered and Carrier Profitability

The number of services in the services mix, per se, did not relate statistically to actual profits for the

responding motor common carriers as a whole. There were a number of carriers among the seventy-eight respondents that offered a limited number of services and had better operating ratios than other carriers that offered a large number of services. On the other hand, some carriers with a large number of services had better operating ratios than those offering fewer services. When the carriers were grouped and analyzed by revenue size, the study found that the small carriers' number of services offered correlated with their operating ratios. But, the relationship showed lower operating ratios (hence better profits) were found with carriers offering fewer services. Only the medium size motor common carriers were found to have a correlation between lower operating ratios and higher number of services. For the small size carriers the low number of services associated with better operating ratios seemed intuitively correct because these carriers typically have smaller operating territories, fewer customers, more limited capital resources and less specialized management. Apparently the specific composition of the services mix and/or how well the motor common carrier performed the services it offered were more important than the mere number.

Factors of Evaluation

The analysis of the responses revealed that Factor "a" (judgment) was the most important factor in evaluating the profitability and usefulness of services. Next in

importance were Factor "b" (breakeven factors), Factor "e" (continuing cost studies), Factor "c" (forecasts), and Factor "d" (periodic cost studies). Small carriers' responses were generally completed by company presidents who relied on judgments or "eye-ball" techniques to evaluate profitability and usefulness of services offered. As the size of the carrier increased, the study found that the responses tended to come from other executives and in some cases specialists. These carriers utilized the more complex evaluation tools or techniques, e.g., breakeven factors, forecasts, and periodic and continuous studies.

When the motor common carriers were grouped according to revenue size, the small, medium large, and large carrier groupings were found to have the strongest relationships between their perceptions of service profitability and the carrier's actual profitability. Ratings by small carrier presidents based on judgments had the best correlation coefficient. Apparently, the small carrier president was familiar enough with the services offered and the costs associated with them to make a fairly good estimate of profitability. Responses from medium small and medium size carriers failed to reflect any correlation between average ratings of profitability and operating ratios. In fact, these carriers tended to have higher profitability ratings associated with higher operating ratios. The medium large and large carriers' responses

were completed by executives other than company presidents and generally were specialists in particular facets of the carrier's operations. The factors used to evaluate services were typically forecasts, breakeven factors, and periodic or continuous cost studies rather than judgments.

Number Evaluated to Number Offered

Motor common carriers did not evaluate all of the services that they offered. Analysis of the data suggested that some services on the list of seventy-two may have been more difficult to rate on a profitability basis than others. For example, the most often evaluated services were the line-haul, pickup and delivery, and services requiring special equipment groups. The services with the lowest proportion of evaluated to offered were found among terminal and advisory groups. The former groups represented motor common carrier activities for which a specific revenue could be associated with specific costs to perform them. The latter groups involved services which typically were non-revenue and required the assessment of the subjective impact of customer loyalty on carrier net revenues. Another explanation for not evaluating every service offered, of course, could be a company policy prohibiting the disclosure of the information or that the person who completed the questionnaire simply did not want to be bothered with rating all of the services.

While it was not possible to assign a causal relationship between a carrier's operating ratio and a high proportion of services not evaluated (no knowledge of profitability), the study found that carriers with a high percentage of evaluated to offered services had lower operating ratios than those carriers that had a low percentage of services evaluated. Logically a carrier that was able to rate the profitability of each service would seem to be in better position to adjust or control that service in terms of a profit contribution better than a carrier that had no rating or evaluation of the service.

Perception of Services' Profitability

The overall average of rating of profitableness for the seventy-two services was just above the breakeven point. This fact was not too surprising in view of the poor industry operating ratios in 1970. Over a fourth of the individual services received average ratings below the breakeven point, while only 12.5 per cent of them received ratings at the average profitability level or higher. A limited number of basic services were viewed by the motor common carriers as making a substantial contribution to carrier profits and, thereby, subsidizing many of the others. Line-haul and special equipment services received the highest average ratings. Terminal services had the lowest ratings, e.g., the shipment information services

consistently received ratings of net loss by the carriers offering them to transport users.

The study also found that some carriers had a high proportion of services rated at the net loss level. When these carriers were compared with those having only a few net loss rated services in their services mix, the former tended to have slightly poorer operating ratios. While some of the unprofitable services were among those that were discontinued, apparently many carriers continued to offer services that they perceived as unprofitable to them. Thus, these carriers had knowledge of the unprofitable nature of services in their services mixes but were unable to control or adjust them sufficiently to avoid a drain on profits.

Perception of Services' Usefulness

One of the most interesting findings of the study was the fact that motor common carriers considerably overestimated the usefulness of their services to transport users. This was determined by comparing the motor carrier ratings with those received from a separate survey of a sample of transport users who rated the same types of services in terms of usefulness to them in the performance of procurement or distribution activities. None of the services rated by motor common carriers received an average rating below the moderately useful level while 18.3 per cent of transport user rated services received ratings below that

level. When the two sets of ratings were compared, it was found that the line-haul, pickup and delivery, and terminal services were positively correlated with the higher motor carrier ratings associated with higher transport user ratings, and vice versa. However, motor common carriers not only overestimated the usefulness of advisory services in Group V, but their ratings were not correlated with the transport users at all. The only responses by motor carriers which closely approximated the transport user ratings of usefulness were those received from the carriers that had marketing or sales executives complete the questionnaires. All of the other responses had considerably higher ratings of usefulness.

Implications of the Study For Motor Carrier Managements

The findings of the study of motor common carrier services have definite implications for the managements of carriers striving to maintain or improve their market position in a competitive and innovative industry.

The most important result of the study is the fact that the carriers that responded to the questionnaires have already started thinking about the profitability and usefulness of each service or activity performed. While a follow-up with respondents was not undertaken, subsequent contacts with several carriers revealed that they had been stimulated to perform a self-study of their services. For some carriers'

managements this was the first time that a listing of motor common carrier services was presented. The questionnaire also forced them to assess the profitability and usefulness of a number of the carrier's activities that were non-revenue in nature. Several carriers are in the process of refining methods of evaluating services and have found services that can make indirect profit contributions where none was thought possible before.

From the marketing viewpoint, the findings of the study verifies the existence of a package or mix of services for motor common carriers. The service mix of a motor common carrier can be compared to the product mix of an industrial firm. The study also suggests some ways of evaluating each service that is or should be included in a specific carrier's mix in order for that carrier to attain a degree of market differentiation.

Each motor common carrier is unique in terms of its operating territory, its management's interest and competence, and its customers. There probably cannot be a ready-made or "ideal" services mix that can be applied to all carriers. There is, however, a common denominator of essential services for a motor common carrier which could be viewed as basic to any services mix. In addition, there are a number of other services that can be offered at the discretion of each carrier's management in order to achieve significant differentiation for it within the

motor carrier industry. The findings of the study provide four criteria for defining the essential services. These criteria are:

1. A majority of motor common carriers offered the specific service. If most carriers already offer the service, any carrier not providing it may be at a competitive disadvantage. The study found that forty-six services were offered by at least half or more of the motor common carriers responding to the survey questionnaire.

2. A majority of transport users utilized the service in the performance of procurement or distribution activities. At least fifty-six services were used by a majority of transport users responding to the survey questionnaire. These services represent an area of potential, if not actual need, that any carrier not currently offering the service should seriously consider.

3. The perceived profitability of the service by motor common carriers was greater than the breakeven level. This would assure that all services on the essential list were viewed by the responding survey carriers as making some contribution to net revenues. The study found that fifty-two services met this requirement.

4. The perceived usefulness to procurement and distribution activities by transport users exceeded the marginal usefulness level. This would mean that each service on the essential list was above the marginal useful

level, and thus needed, by the transport users responding to the survey. Fifty-eight specific services were found by the study to meet this criterion.

The essential list of services for motor common carriers was developed by comparing the lists of services meeting each criterion, i.e., the forty-six offered by a majority of motor common carriers; the fifty-six used by a majority of transport users; the fifty-two rated above the breakeven profitability level by motor common carriers; and the fifty-eight rated above the marginally useful level by transport users. Every service on the essential list had to appear on all four of the above lists to qualify. If a service did not appear on all lists, it was then placed on the discretionary list of services. Thirty services were found to satisfy all four criteria and are shown in Table 46. The remaining forty-two services were considered discretionary and are found in Table 47.

Most of the services composing the essential list are basic to what a motor common carrier is in business to do. Somewhat surprising, though, are the five advisory services on the list. All five are non-revenue services and are linked to the physical movement of freight only indirectly. The services can assist the carrier's profit position by reducing shipper claims and improving the handling of shipments from the transport user.

TABLE 46.--List of Essential Services.

Service Number	Description of Service
<u>Group I. Line-Haul Services</u>	
1	Less-than-truckload
2	Truckload
3	Volume
4	Direct or single line
5	Interline
6	Trailer Interchange
7	Air/Truck connections
8	Rail/Truck connections
9	T.O.F.C.
13	Expedited shipments
14	Exclusive use of vehicle
15	Loading/Unloading service
16	Reconsignment/Diversion
17	Consolidation/Distribution
18	Stop-offs in transit for partial loading or unloading
20	Bonded or customs shipments
<u>Group II. Pickup or Delivery Services</u>	
24	Scheduled pickup or delivery
25	Intra-Plant split P & D
<u>Group III. Services Requiring Special Equipment</u>	
35	Open-top trailers
36	Flat-Bed or low-boy trailers
38	Hi-cube vans
<u>Group IV. Terminal Services</u>	
47	Export documentation
56	Rate quotations
57	Route selections
60	Advanced notification of arrival to consignee
<u>Group V. Advisory Services to Customers</u>	
64	Loss & damage claims prevention programs
65	Advice on packaging materials, packing methods, & loading techniques
66	Advice on order size or shipment quantities
67	Assistance in shipment documentation
68	Advice on material handling or shipment preparation techniques

TABLE 47.--List of Discretionary Services.

Service Number	Description of Service
<u>Group I. Line-Haul Services</u>	
10	Water/Truck connections
11	Published dispatch schedules
12	Special handling for emergency shipments
19	Other In-transit privileges
21	Small package express
22	Return of empty pallets, bins, racks, cages, etc.
23	Other Line-haul services
<u>Group II. Pickup or Delivery Services</u>	
26	P&D at private residences
27	P&D at off-hours
28	P&D at positions not immediately adj. to vehicle
29	Redelivery
30	Other pickup and delivery
<u>Group III. Services Requiring Special Equipment</u>	
31	Refrigerated or humidity controlled trailers
32	Heated or insulated trailers
33	Tank or bulk trailers
34	Hopper or dry bulk trailers
37	Converter-vans
39	Air-ride trailers
40	Containers
41	Bins, cages, racks, or pallets provided by carrier
42	Tie-down & special stowage devices
43	Double-floors, stabilizers or compartments
44	Other special equipment
<u>Group IV. Terminal Services</u>	
45	C.O.D. shipments
46	Order/Notify shipments
48	Sorting or segregating shipments
49	Marking or tagging freight
50	Storage or warehousing
51	Packing or crating (including re-packing or re-crating)
52	Armed guard and/or escort vehicle
53	Furnishing extra driver
54	Furnishing helper labor
55	Direct Advertising on carrier's vehicle
58	Shipment tracing
59	Proof of delivery
61	Pre-arrival confirmation to shipper
62	Over, short, or damage location
<u>Group V. Advisory Services to Customers</u>	
63	Distribution cost studies or audits
69	Advice on inventory control systems
70	Warehouse or plant site location studies
71	Advice on shipping or receiving facility design for plants or warehouses
72	Other advisory services

A carrier should examine carefully every service on the essential list. Admittedly, market differentiation on the basis of services would not be possible in terms of these services. Offering them, however, would assure the motor common carrier of maintaining or improving its competitive position relative to other carriers.

For greatest marketing differential advantage, motor common carrier managements should focus on the forty-two services appearing on the list of discretionary services. A carrier should consider the full range of these services within the context of its profit objectives, its operating authority, its customers' needs, the competitive environment it faces, and the interest and competence of its management. This should be done independently of what other motor common carriers may have done and independently of what appears to be fashionable at the time. The mere number of services offered should not be the sole factor either.

One responding motor common carrier has already benefited from a self-study of its operations and services. The initial self-study was stimulated by an operating ratio of 100.0 in the year 1970. The operations department emphasized the necessity of improving the control and planning of equipment and driver movements within the carrier's operating system. They sought a computer assisted information system that kept track of every vehicle and shipment from the point of pickup to point of delivery.

The marketing department saw a spin-off benefit from the information system which would permit the carrier to offer several customer services in a way that would differentiate the carrier from its competitors. In the survey response these services were perceived as unprofitable; using the computer assisted information system the services could be offered in a way that would make them positive contributors to the carrier's net revenues. Specifically, the carrier could then provide shipment tracing, proof of delivery, advance notification of arrival to consignee, and pre-arrival confirmation to shipper as services which definitely improved customer loyalty through aiding the transport user to perform procurement and distribution activities. Knowledge of the services previously having unprofitable ratings helped focus attention on the need to change the way the services were performed. The fact that this carrier has now reversed a poor operating ratio trend seems more than coincidence. Several other motor common carriers are currently experimenting with similar systems. All of them are without doubt enjoying a degree of marketing differentiation not heretofore possible.

Another possibility for service differentiation is found in the performance of several of the essential advisory services. If the carrier offered Service # 65 (advice on packaging materials, packing methods, and loading techniques), and Service # 68 (materials handling

or shipment preparation techniques), it could readily extend the special equipment services such as Service # 40 (containers), Service # 41 (bins, cages, racks, or pallets provided by carrier), Service # 42 (tie-down & special stowage devices), or Service # 43 (double-floors, stabilizers or compartments). The special equipment services would go hand-in-hand with the essential advisory services.

The findings of the study suggest that motor carrier managements must improve the communications interface with their transport user customers. For example, the management of a carrier must place greater reliance on information inputs from marketing and sales personnel about the usefulness of services. In addition, the carrier must find ways of inducing transport users to communicate their needs for services. The improvement of communication may necessitate the breaking down of traditional antagonisms between the transport user and the carrier. It also requires an unprecedented degree of cooperation on all matters from which both parties may mutually benefit. The best argument for the transport user cooperation rests on the ultimate improvements in the cost/service package offered by the common carrier and available to the transport user. If the carrier can obtain an accurate perception of user needs, it can eliminate those services that drain net profits and replace them with services that are needed and can contribute to profits. The incentive to the motor

common carrier is obvious, i.e., more traffic and improved profits. The incentive to the transport user may not be as clear. Nevertheless, the transport user stands to also profit from a healthy motor common carrier which can offer a package of services leading to improved transport user customer service levels. This, in turn, should result in more sales revenues and better profits for the transport user, as well. Motor carrier management should stress the benefits to be gained through cooperation when seeking information about service needs from transport users.

The process of evaluation of present and potential services must be done continuously by the management of a motor common carrier. The study clearly shows that the decision to offer a new service, or to discontinue an existing service, must involve a number of executives within the carrier's management. Executives in sales and marketing can give insights into usefulness; executives responsible for finance, operations, and traffic can help assess the profitability. Each can bring to bear on the decision a range of experiences and contacts with operating departments and transport user customers. No doubt this joint decision-making is standard practice for the larger carriers. The smaller carriers, however, must seek advice from outside specialists if competent specialists are not available within the organization. The costs of consulting advice

may be readily recouped from the increased profits, or the avoidance of losses, resulting from the best decision.

In conclusion, the study found that motor common carriers definitely have services mixes. It was possible, also, for a carrier to differentiate itself in its market by offering a unique services mix. A particular motor common carrier's services mix may have been developed through conscious effort necessary to keep it in balance with the carrier's profit objectives and customer needs. On the other hand, the study suggests that many carriers may have services mixes which evolved from a more or less random process with little or no concern for profits or needs. A major effort, involving careful self-study of operations and services, is necessary to improve the composition of such carriers' services mixes. If a carrier uses competent management to select and then to control its services, the carrier should have a good chance to survive in the highly competitive battle for a share of the total freight traffic in the United States.

Implications for Future Study

The present study was a macro-examination of the services offered by motor common carriers and was limited to those doing business in the midwest. An obvious follow-up study would seem to be that of motor common carriers in other regions of the United States to verify if the profitability and usefulness ratings were comparable. It would

also seem necessary to determine if the services mixes of motor common carriers in other regions were similar in composition. While the sample of motor common carriers used for the present study included a number domiciled in states outside the midwest, a study based on responses from the west coast or from the east coast would seem to be necessary for verification of general applications of the present study's findings.

An in-depth study of a selected group of motor common carriers is also suggested from the present findings. Specifically, the process of evaluating services internally within the carrier needs to be investigated. Interviews with key executives involved in the evaluation process should yield insights into the process and into the relative importance of each evaluation factor in determining the profitability and usefulness of services. This investigation seems most necessary for the evaluation of the non-revenue and/or non-transportation services in the services mix. The present findings would provide the basis for selecting the motor common carriers for further study. Carriers that could be selected are those that appeared in the groupings of carriers, i.e., by revenue size, by the factor used in evaluation, and by the title of executive completing the questionnaire, where the highest correlation coefficients were found between the average ratings of profitability and the carriers' actual profitability and, also, between

the carriers' ratings of profitability and usefulness related to the transport users' ratings of usefulness. A preliminary check of possible carriers indicated that there were six motor common carriers that appeared on each of the groupings that had the highest correlations. An intensive micro-study of these carriers would be most beneficial in understanding the process of evaluation used by them. Such an investigation would permit the determination of which factor was best suited for the evaluation of each of the services that the carrier offers, also. This was something that the present study did not do. A micro-study of the motor common carrier's services mix does appear, then, to be a logical sequel to the present macro-study.

APPENDICES

APPENDIX I

MOTOR COMMON CARRIER QUESTIONNAIRE

APPENDIX I

MOTOR COMMON CARRIER QUESTIONNAIRE

Carrier: _____

Name of person completing Questionnaire _____ Title: _____

☐ Please place a check mark (✓) here if you desire a summary of the study's findings. It will be sent directly to you as soon as possible.

INSTRUCTIONS

Please complete both Part I and Part II of the Questionnaire. In general you are asked to simply place a check mark (✓) in the appropriate space. The only exception is found in Part I, Question 4. There you are asked to rank the methods used by your company in determining the contribution to carrier Net Revenue by each separate service provided to customers. Please rank only those methods used by your company.

Part II of the Questionnaire asks three questions about a list of identifiable customer services which may be provided by motor common carriers. These services are listed in five broad groupings and are defined as anything a motor common carrier performs for or provides to a customer which is unique or distinct from all other services. An illustration is the difference between the performance of a movement of freight for a customer under less-than-truckload service from that involved in a truckload service.

Question 1 under Part II seeks to determine the approximate date each service was initiated by your company. If subsequently, the service was discontinued for whatever reason, please indicate the approximate date of discontinuance. If a service has never been offered, you obviously do not need to answer Questions 2 & 3 for it.

Question 2 asks for a ranking of the contribution to Net Revenues by each service. This ranking would be based on the methods used in Part I, Question 4. The question assumes that every carrier uses some measure of profitability to evaluate the services it provides. The method used will indicate the extent that a service adds to the carrier's profits, either directly through revenues generated which are in excess of the costs incurred, or indirectly through the development of customer satisfaction and loyalty such that the customer grows to depend on the carrier for the service. The customer will also be using the more profitable services provided by the carrier. This latter situation would seem to justify the continued performance of services where the direct revenues do not cover costs.

Question 3 is designed to obtain an estimate by the carrier of the usefulness of each service to its customers' procurement and distribution requirements.

Your prompt attention to this Questionnaire will be appreciated. When completed, please fold it in half and place it into the enclosed self-addressed and stamped envelope for return directly to me.

Thank you.

Charles L. Hilton
Associate Professor
School of Business Administration
Tri-State College
Angola, Indiana 46703

PART I. GENERAL CARRIER INFORMATION

1. Total number of employees in Company. _____
2. Total number of employees engaged in Marketing, Sales or Customer Relations activities. _____
3. Proportion of carrier gross revenues budgeted or expended on the total Marketing, Sales or Customer Relations activities. (Please check (✓) the percentage which is your best estimate.)
 - a. Less than 2% _____
 - b. 2% to 4% _____
 - c. 4% to 6% _____
 - d. 6% to 8% _____
 - e. 8% to 10% _____
 - f. More than 10% _____
4. Methods used by your Company in determining the contribution to carrier Net Revenues of each separate service provided to customers. (Please rank each method used by placing the number "1" in the space beside the most important, the number "2" by the second best important, "3" by the third, etc.)

(Rankings)

 - a. Judgments based upon overall profits and performance factors. _____
 - b. Establishment of breakeven factors for customers, shipments, vehicles, routes loads, terminals, etc. _____
 - c. Forecasts of revenues, tonnage, ton-miles, etc. _____
 - d. Periodic cost studies of new services. _____
 - e. Continuing cost studies of individual services. _____
 - f. Other methods of determining the contribution of services to Net Revenues. (Specify) _____

5. Type of Commodity Operating Authority possessed by your Company.

(Check ✓)

 - a. General Commodities _____
 - b. Perishable products _____
 - c. Liquid or dry bulk products _____
 - d. Explosives or dangerous articles _____
 - e. Heavy machinery or equipment _____
 - f. Steel or steel products _____
 - g. Uncrated new furniture, electronic equipment, or household goods _____
 - h. Other specific commodities (Specify) _____

6. Type of Route Operating Authority possessed by your Company.

(Check ✓)

 - a. Regular route - scheduled service _____
 - b. Regular route - non-scheduled service _____
 - c. Irregular route - radial service _____
 - d. Irregular route - non-radial service _____

PART II. EVALUATION OF MOTOR COMMON CARRIER SERVICES

INSTRUCTIONS: Please answer the three questions listed below for each identifiable customer service provided by your company by checking (✓) the appropriate space opposite each service.

QUESTION 1. What was the approximate date that each service was initiated by your company? If subsequently the service was discontinued, please indicate the approximate date.

QUESTION 2. What is the relative importance of each identifiable service provided in terms of its contribution to your carrier's Net Revenues?

QUESTION 3. What is your estimate of the relative importance of each identifiable service provided by your company to procurement and/or distribution needs of its customers?

IDENTIFIABLE
MOTOR COMMON CARRIER
CUSTOMER SERVICES

QUESTION 1
Approximate Date
Service Initiated

QUESTION 2
Contribution to
Carrier
Net Revenues

QUESTION 3
Contribution to
Customer Needs

Check ✓

Check ✓

Check ✓

Never Offered
In 1960 or before
Within 1961-1965
Within 1966-1970
Discontinued (Date?)
Information Not Available
Net Loss
Breaks Even
Average Net Revenue
High Net Revenue
Unknown or Information
Not Available
Not Useful
Marginally Useful
Moderately Useful
Very Useful

GROUP I. LINE-HAUL SERVICES

1. Less-than-truckload

2. Truckload

3. Volume

4. Direct or single line

5. Interline

6. Trailer interchange

7. Air/Truck connections

8. Rail/Truck connections

9. T.O.F.C.

10. Water/Truck connections

11. Published dispatch schedules

12. Special handling for emergency shipments

13. Expedited shipments

14. Exclusive use of vehicle

15. Loading/Unloading service

16. Reconsignment/Diversion

17. Consolidation/Distribution

18. Stop-offs in transit for partial loading
or unloading

#	IDENTIFIABLE MOTOR COMMON CARRIER CUSTOMER SERVICES	QUESTION 1 Approximate Date Service Initiated	QUESTION 2 Contribution to Carrier Net Revenues	QUESTION 3 Contribution to Customer Needs
		Check ✓	Check ✓	Check ✓
		Never Offered In 1960 or before Within 1961-1965 Within 1966-1970 Discontinued (Date?) Information Not Available Net Loss Breaks Even Average Net Revenue High Net Revenue Unknown or Information Not Available Not Useful Marginally Useful Moderately Useful Very Useful	Never Offered In 1960 or before Within 1961-1965 Within 1966-1970 Discontinued (Date?) Information Not Available Net Loss Breaks Even Average Net Revenue High Net Revenue Unknown or Information Not Available Not Useful Marginally Useful Moderately Useful Very Useful	Never Offered In 1960 or before Within 1961-1965 Within 1966-1970 Discontinued (Date?) Information Not Available Net Loss Breaks Even Average Net Revenue High Net Revenue Unknown or Information Not Available Not Useful Marginally Useful Moderately Useful Very Useful
(19)	19. Other In-transit privileges			
(20)	20. Bonded or Customs shipments			
(21)	21. Small package express			
(22)	22. Return of empty pallets, bins, racks, cages, etc.			
(23)	23. Other Line-Haul services (Specify)			
	GROUP II. PICKUP OR DELIVERY SERVICES			
(24)	1. Scheduled pickup or delivery			
(25)	2. Intra-plant split P & D			
(26)	3. P & D at private residences			
(27)	4. P & D at off-hours			
(28)	5. P & D at positions not immediately adjacent to vehicle			
(29)	6. Redelivery			
(30)	7. Other Pickup or Delivery services			
	GROUP III. SERVICES REQUIRING SPECIAL EQUIPMENT			
(31)	1. Refrigerated or humidity controlled trailers			
(32)	2. Heated or insulated trailers			
(33)	3. Tank or bulk liquid trailers			
(34)	4. Hopper or dry bulk trailers			
(35)	5. Open-top trailers			
(36)	6. Flat-bed or low-boy trailers			
(37)	7. Converter-vans			
(38)	8. Hi-cube vans			
(39)	9. Air-ride trailers			

PART II. Cont.-

[illegible]

IDENTIFIABLE
MOTOR COMMON CARRIER
CUSTOMER SERVICES

QUESTION 1
Approximate Date
Service Initiated

QUESTION 2
Contribution to
Carrier
Net Revenues

QUESTION 3
Contribution to
Customer Needs

Check ✓

Check ✓

Check ✓

Never Offered
In 1960 or before
Within 1961-1965
Within 1966-1970
Discontinued (Date?)
Information Not Available
Net Loss
Breaks Even
Average Net Revenue
High Net Revenue
Unknown or Information
Not Available
Not Useful
Marginally Useful
Moderately Useful
Very Useful

#

GROUP V. ADVISORY SERVICES TO CUSTOMERS

- (63) 1. Distribution cost studies or audits
- (64) 2. Loss & damage claims prevention programs
- (65) 3. Advice on packaging materials, packing methods, & loading techniques
- (66) 4. Advice on order size or shipment quantities
- (67) 5. Assistance in shipment documentation
- (68) 6. Advice on materials handling or shipment preparation techniques
- (69) 7. Advice on inventory control systems
- (70) 8. Warehouse or plant site location studies
- (71) 9. Advice on shipping and receiving facility design for plants or warehouses
- (72) 10. Other advisory services (Specify)

APPENDIX II

TRANSPORT USER QUESTIONNAIRE

APPENDIX II

TRANSPORT USER QUESTIONNAIRE

Instructions

Please read the directions for each part of the Questionnaire. In general you are required to place a check mark (✓) in the appropriate space. The only exception is Part I, Question 6. In this question you are asked to rank the criteria used in the selection of Motor Common Carriers for your Company's procurement and distribution needs. Please rank only those criteria that you use.

Your prompt attention to this Questionnaire will be appreciated. When completed, please fold it in half and place it in the enclosed self-addressed and stamped envelope for return to me directly.

Thank you.

Charles L. Hilton
Associate Professor
School of Business Administration
Tri-State College
Angola, Indiana 46703

TRANSPORT USER QUESTIONNAIRE

Company _____ Name of Person Completing: _____

☐ Please place a check mark (✓) here if you desire a summary of the study's findings. It will be sent directly to you as soon as possible.

General Instructions

Please supply the information on the company, subsidiary, division, or plant for which you have traffic or physical distribution responsibilities.

PART I. GENERAL INFORMATION ABOUT THE COMPANY.

1. Size:

(a) Approximate Annual Sales in 1970

- | | |
|--|-----------|
| i. Less than \$5 million | (Check ✓) |
| ii. \$5 million but less than \$10 million | _____ |
| iii. \$10 million but less than \$50 million | _____ |
| iv. \$50 million but less than \$100 million | _____ |
| v. Over \$100 million | _____ |

(b) Number & Location of Establishments (Plants & Warehouses)

- | | |
|---|----------|
| i. Central Region (Ind., Mich., Ohio, & Ill.) | (Number) |
| ii. Remainder of U.S. | _____ |
| iii. Abroad | _____ |

(c) Approximate Annual Freight Bill in 1970

- | | |
|--|-----------|
| i. Less than \$100,000 | (Check ✓) |
| ii. \$100,000 but less than \$500,000 | _____ |
| iii. \$500,000 but less than \$1,000,000 | _____ |
| iv. Over \$1,000,000 | _____ |

2. Characteristics of Primary Products: (a) Industrial _____ (b) Consumer _____

3. Geography of Primary Markets:

- | | |
|--|-----------|
| (a) Central Region, only (Ind., Mich., Ohio, & Ill.) | (Check ✓) |
| (b) National | _____ |
| (c) National & International | _____ |

PART I. Cont.-

4. Modes of Transportation Used for Procurement & Distribution Needs:

Mode	(Check ✓)	(Check ✓)
	Procurement (Inbound Raw Materials & Supplies)	Distribution (Outbound Finished Products)
(a) Railroad		
(b) Motor Carrier		
(c) Airline		
(d) Water Carrier		
(e) Pipeline		

NOTE: If your Company does not use Motor Carriers, the Questionnaire is complete. If it does, please go to Question #5.

5. Types of Motor Carriers used:

(Check ✓)

- (a) Common _____
- (b) Contract _____
- (c) Private _____

NOTE: If your Company does not use Motor Common Carriers, the Questionnaire is complete. If it does, please go on to Question #6 and to PART II.

6. What criteria does your Company use in the selection of a Motor Common Carrier for its procurement and distribution needs? Please rank at least five (5) of the following possible criteria using the number "1" for the most important, "2" for the second most important, "3" for the third most important, etc:

- | | (Ranks) |
|---|---------|
| (a) Level of rates | _____ |
| (b) Reputation in transportation industry | _____ |
| (c) Adequacy of equipment & terminals | _____ |
| (d) Operating authority | _____ |
| (e) Low freight loss & damage claims ratio | _____ |
| (f) Prompt settlement of claims | _____ |
| (g) Integrity of top management | _____ |
| (h) Competence of operating management | _____ |
| (i) Financial stability | _____ |
| (j) Reciprocity | _____ |
| (k) Consistency, reliability & dependability of service | _____ |
| (l) Completeness of "services mix" | _____ |
| (m) Other (Please specify) | _____ |

PART II. USEFULNESS OF MOTOR COMMON CARRIER SERVICES.

NOTE: This part of the Questionnaire is designed to obtain information about each unique or identifiable service that a Motor Common Carrier may provide for your Company. Please answer the following question:

"What is the relative usefulness of each service to the effective performance of procurement and/or distribution activities of your Company?"

IDENTIFIABLE MOTOR COMMON CARRIER CUSTOMER SERVICES		(Check ✓ Appropriate Space)				
		CONTRIBUTION TO PROCUREMENT AND/OR DISTRIBUTION NEEDS				
		Not Applicable	Not Useful	Marginally Useful	Moderately Useful	Very Useful
#	GROUP I. LINE-HAUL SERVICES					
(1)	1. Less-than-truckload					
(2)	2. Truckload					
(3)	3. Volume					
(4)	4. Direct or single line					
(5)	5. Interline					
(6)	6. Trailer interchange					
(7)	7. Air/Truck connections					
(8)	8. Rail/Truck connections					
(9)	9. T.O.F.C.					
(10)	10. Water/Truck connections					
(11)	11. Published dispatch schedules					
(12)	12. Special handling for emergency shipments					
(13)	13. Expedited shipments					
(14)	14. Exclusive use of vehicles					
(15)	15. Loading/Unloading service					
(16)	16. Reconsignment/Diversion					
(17)	17. Consolidation/Distribution service					
(18)	18. Stop-offs in transit for partial loading/unloading					
(19)	19. Other In-transit privileges					
	20. Import/Export shipments					
(20)	21. Bonded or Customs shipments					
(21)	22. Small package express					
(22)	23. Return of empty pallets, bins, racks, cages, etc.					
(23)	24. Other Line-Haul services (Specify)					

PART II. Cont.-

IDENTIFIABLE MOTOR COMMON CARRIER CUSTOMER SERVICES		(Check / Appropriate Space)				
		CONTRIBUTION TO PROCUREMENT AND/OR DISTRIBUTION NEEDS				
		Not Applicable	Not Useful	Marginally Useful	Moderately Useful	Very Useful
#	GROUP II. PICKUP OR DELIVERY SERVICES					
(24)	1. Scheduled pickup or delivery					
(25)	2. Intra-plant split P & D					
(26)	3. P & D at private residences					
(27)	4. P & D at off-hours					
(28)	5. P & D at positions not immediately adjacent to vehicle					
(29)	6. Redelivery					
(30)	7. Other P & D services (Specify)					
	GROUP III. SERVICES REQUIRING SPECIAL EQUIPMENT					
(31)	1. Refrigerated or humidity controlled trailers					
(32)	2. Heated or insulated trailers					
(33)	3. Tank or bulk liquid trailers					
(34)	4. Hopper or dry bulk trailers					
(35)	5. Open-top trailers					
(36)	6. Flat-bed or low-boy trailers					
(37)	7. Converter-vans					
(38)	8. Hi-cube vans					
(39)	9. Air-ride trailers					
(40)	10. Containers (any size)					
(41)	11. Bins, cages, racks, or pallets provided by carrier					
(42)	12. Tie-down & special stowage devices					
(43)	13. Double-floors, stabilizers or compartments					
(44)	14. Other special equipment (Specify)					
	GROUP IV. TERMINAL SERVICES					
(45)	1. C.O.D. shipments					
(46)	2. Order/notify shipments					
(47)	3. Sorting or segregating shipments					
(48)	4. Marking or tagging freight					
(49)	5. Export documentation					

PART II. Cont.-

IDENTIFIABLE MOTOR COMMON CARRIER CUSTOMER SERVICES		(Check / Appropriate Space)				
		CONTRIBUTION TO PROCUREMENT AND/OR DISTRIBUTION NEEDS				
		Not Applicable	Not Useful	Marginally Useful	Moderately Useful	Very Useful
#	GROUP IV. TERMINAL SERVICES Cont.-					
(50)	6. Storage or warehousing					
(51)	7. Packing or crating service					
(52)	8. Armed guard and/or escort vehicle					
(53)	9. Furnishing extra driver					
(54)	10. Furnishing helper labor					
(55)	11. Direct advertising on carrier's vehicle					
(56)	12. Rate quotations					
(57)	13. Route selections					
(58)	14. Shipment tracing					
(59)	15. Proof of delivery					
(60)	16. Advanced notification of arrival to consignee					
(61)	17. Pre-arrival confirmation to shipper					
(62)	18. Over, short, or damage location					
	19. Other terminal services (Specify)					
	GROUP V. ADVISORY SERVICES TO CUSTOMERS					
(63)	1. Distribution cost studies or audits					
(64)	2. Loss & damage claims prevention programs					
(65)	3. Advice on packaging materials, packing methods, & loading techniques					
(66)	4. Advice on order size or shipment quantities					
(67)	5. Assistance in shipment documentation					
(68)	6. Advice on materials handling or shipment preparation techniques					
(69)	7. Advice on inventory control systems					
(70)	8. Warehouse or plant site location studies					
(71)	9. Advice on shipping and receiving facility design for plants or warehouses					
(72)	10. Other advisory services (Specify)					

APPENDIX III

LIST OF CARRIERS RESPONDING TO SURVEY

Appendix III

List of Carriers Responding to Survey

A & H Truck Line, Inc. Evansville, Indiana	Middle States Motor Freight, Inc. Cincinnati, Ohio
Eastern Express, Inc. Terre Haute, Indiana	Spector Freight System, Inc. Chicago, Ill.
Renner's Express, Inc. Indianapolis, Indiana	Jones Truck Lines, Inc. Springdale, Ark.
Mead, W. L., Inc. Norwalk, Ohio	Motor Express, Inc., of Indiana Indianapolis, Indiana
Reinhardt Transfer Company, Inc. Portsmouth, Ohio	Belford Trucking Co., Inc. Miami, Fla.
Overland Transportation Co. Akron, Ohio	Rooks Transfer Lines, Inc. Holland, Michigan
The National Transit Corporation Dearborn, Michigan	Ecklar-Morre Express, Inc. Lexington, Ky.
Tucker Freight Lines, Inc. South Bend, Indiana	Mason Dixon Lines, Inc. Kingsport, Tenn.
Service Transport Co. Cleveland, Ohio	Key Line Freight, Inc. Grand Rapids, Michigan
C.A.B.Y. Transportation Co. Cleveland, Ohio	Commercial Motor Freight, Inc. Columbus, Ohio
Be-Mac Transport Co., Inc. St. Louis, Mo.	McLean Trucking Company Winston-Salem, N.C.
Admiral-Merchants Motor Freight, Inc. St. Paul, Minn.	Clairmont Transfer Co. Escanaba, Michigan
Werner Continental, Inc. Roseville, Minn.	Cooper-Jarett, Inc. Orange, N.J.
Hennis Freight Lines, Inc. Winston-Salem, N.C.	Ryder Truck Lines, Inc. Jacksonville, Fla.
Transamerican Freight Lines, Inc. Detroit, Mich.	Interstate Motor Freight System Grand Rapids, Michigan

Terminal Transport Co., Inc.
Atlanta, Ga.

Cook Motor Lines
Akron, Ohio

Tobler, H. J. Transfer, Inc.
Peru, Ill.

Herriott Trucking Co., Inc.
E. Palestine, Ohio

Burlington Truck Lines, Inc.
Balesburg, Ill.

H & W Motor Express Co.
Dubuque, Iowa

Shippers Dispatch, Inc.
South Bend, Indiana

Associated Truck Lines, Inc.
Grand Rapids, Michigan

Safeway Truck Lines, Inc.
South Bend, Indiana

Arkansas-Best Freight System, Inc.
Fort Smith, Ark.

Bruce Motor Freight, Inc.
Des Moines, Iowa

Youngblood Truck Lines, Inc.
Fletcher, N.C.

Illinois-California Express (ICX)
Denver, Colo.

Wolverine Express, Inc.
Muskegon, Michigan

Carolina Freight Carriers Corp.
Charryville, N.C.

Lovelace Truck Service, Inc.
Terre Haute, Indiana

Wilson Freight Co.
Cincinnati, Ohio

Eazor Express, Inc.
Pittsburgh, Pa.

Chippewa Motor Freight, Inc.
Eau Clair, Wis.

Jones Motor
Spring City, Pa.

Long Transportation Co.
Detroit, Michigan

Little Audrey's Transportation Co., Inc.
Fremont, Nebr.

Checker Express, Inc.
Milwaukee Wis.

Mid-American Lines, Inc.
Kansas City, Mo.

Mushroom Transportation Co., Inc.
Philadelphia, Pa.

Lightening Express, Inc.
Pittsburgh, Pa.

I M L Freight, Inc.
Salt Lake City, Utah

Churchill Truck Lines, Inc.
Chillicothe, Mo.

Consolidated Freightways, Inc.
Menlo Park, Cal.

I & S McDaniel, Inc.
Vincennes, Indiana

C W Transport, Inc.
Wisconsin Rapids, Wis.

Courier-Newsom Express, Inc.
Columbus, Indiana

Gateway Transportation Co., Inc.
La Crosse, Wis.

Motor Freight Corporation
Terre Haute, Indiana

Raymond Motor Transportation, Inc.
Minneapolis, Minn.

Holland Motor Express, Inc.
Holland, Michigan

Advance Transportation Company
Milwaukee, Wisc.

Suburban Motor Freight, Inc.
Columbus, Ohio

Preston Trucking Company, Inc.
Preston, M.D.

Transport Motor Express, Inc.
Fort Wayne, Indiana

Blue Arrow-Douglass, Inc.
Grand Rapids, Michigan

Rock Island Motor Transit Co.
Des Moines, Iowa

Brady Motorfrate, Inc.
Des Moines, Iowa

Modern Transfer Co., Inc.
Allentown, Pa.

Carstensen Freight Line, Inc.
Clinton, Iowa

Southern Express Co.
Cicero, Ill.

Pacific Intermountain Express, Co.
Oakland, Cal.

Bowman Transportation Inc.
Gadsden, Ala.

APPENDIX IV

LIST OF RESPONDING TRANSPORT USERS

Appendix IV

List of Responding Transport Users

American Welding & Mfg. Co. Warren, Ohio	Cohen & Son Co. Cleveland, Ohio
Fel Pro, Inc. Div. of Felt Products Mfg. Co. Skokie, Ill.	Great Western Steel Co. Chicago, Ill.
Eclipse Fuel Engineering Co. Rockford, Ill.	Youngstown Sheet & Tube Co. Youngstown, Ohio
Mt. Clemens Metal Products Co. Mt. Clemens, Mich.	Detrex Chemical Industries Detroit, Mich.
Freedman Aircraft Engineering Corp. Charlevoix, Mich.	Ex-Cell-O Corp. Detroit, Mich.
Whiting Corp. Harvey, Ill.	H. Kramer & Co. Chicago, Ill.
SCM Corp. Allied Paper Inc. Kalamazoo, Mich.	Ric-Wil, Inc. Breckville, Ohio
Simplicity Pattern Co., Inc. Niles, Mich.	Armour and Co. Chicago, Ill.
Pretty Products Inc. Coshocton, Ohio	Warner Corp. Subs. of Stratton & Terstegge Co. North Manchester, Ind.
Snyder Molasses Co. Chicago, Ill.	A. G. Busch & Co., Inc. Chicago, Ill.
Robinson-Ransbottom Pottery Roseville, Ohio	Service Spring Co. Indianapolis, Ind.
Urbana Mills Co. Urbana, Ohio	Diamond Chain Co. Indianapolis, Ind.
Miracle Adhesives Corp. New Philadelphia, Ohio	Ohio Steel Tube Div. Copperweld Steel Co. Shelby, Ohio
Fleming-Potter Co., Inc. Peoria, Ill.	Heller Tool Div. Wallace & Murray Corp. Newcomerstown, Ohio
U. S. Reduction Co. East Chicago, Ind.	Atlas Industries Inc. Woodville, Ohio

KTS Industries, Inc.
Kalamazoo, Mich.

Railway Supply & Mfg. Co.
Cincinnati, Ohio

O'Brien Corp.
South Bend, Ind.

Lear Siegler, Inc.
Cleveland, Ohio

Howell Co.
St. Charles, Ill.

Outboard Marine Corp.
Waukegan, Ill.

Western Rubber Co.
Goshen, Ind.

Patterson-Ludlow
Div. of Banner Ind.
East Liverpool, Ohio

Barr Rubber Prod. Inc.
Sandusky, Ohio

Toledo Edison Co.
Toledo, Ohio

Kitchens of Sara Lee
Deerfield, Ill.

Capital Paper Co.
Indianapolis, Ind.

Ingram-Richardson, Inc.
Frankfort, Ind.

MacDonald Stamp Co.
Dayton, Ohio

Unistrut Corp.
Wayne, Mich.

Swedish Crucible Steel Co.
Detroit, Mich.

Wagner Mfg. Co.
Sidney, Ohio

Kellogg Co.
Battle Creek, Mich.

Lyon Metal Products Inc.
Aurora, Ill.

Bell & Howell Co.
Chicago, Ill.

Gerber Plumbing Fixtures
Chicago, Ill.

Stewart Bolling & Co., Inc.
Div. of Intercole Automation
Cleveland, Ohio

Republic Steel Corp.
Cleveland, Ohio

Andrews Jergens Co.
Cincinnati, Ohio

Monarch Machine Tool Co.
Sidney, Ohio

Ford Motor Co.
Dearborn, Mich.

Michigan Limestone Operations
Rogers City, Michigan

Lorain
Div. Koehring Co.
Lorain, Ohio

Interlake Steel Corp.
Chicago, Ill.

Continental Steel Corp.
Kokomo, Ind.

North American Mfg. Co.
Cleveland, Ohio

Weatherhead Co.
Cleveland, Ohio

Miami-Carey Co.
Div. Penacon Corp.
Monroe, Butler County, Ohio

Baker Perkins, Inc.
Saginaw, Michigan

Topco Associates, Inc.
Skokie, Ill.

Crosset Co., Inc.
Cincinnati, Ohio

Anchor Hocking Corp.
Lancaster, Ohio

Copeland Refrigeration Corp.
Sidney, Ohio

Ajax Mfg. Co
Cleveland, Ohio

Lake Shore, Inc.
Iron Mountain, Mich.

Dayton Malleable Iron Co.
Dayton, Ohio

Allen Industries, Inc.
Southfield, Michigan

General Box Co.
Des Plaines, Ill.

Faultless Rubber Co.
Ashland, Ohio

Emery Industries Inc.
Cincinnati, Ohio

Apex Smelting Co.
Chicago, Ill.

Natmar Inc.
Cincinnati, Ohio

Dracket Co.
Cincinnati, Ohio

Standard Oil Co. (Ohio)
Cleveland, Ohio

Grand Rapids Chair Co.
Grand Rapids, Mich.

Mastic Corp.
South Bend, Ind.

Buckeye Ware, Inc.
Wooster, Ohio

Harris Hub Co.
Harvey, Ill.

Midwest Manufacturing Corp.
Galesburg, Ill.

Thomas & Skinner, Inc.
Indianapolis, Ind.

Beveridge Paper Co.
Div. of Scott Paper Co.
Indianapolis, Ind.

Bobbs-Merrill Co., Inc.
Indianapolis, Ind.

Globe-Wernicke Co.
Div. Sheller-Globe Corp.
Toledo, Ohio

APPENDIX V

SURVEY DATA BY MOTOR COMMON CARRIER

APPENDIX V
SURVEY DATA BY MOTOR COMMON CARRIER

Carrier Number	Codes *	Average Operating Ratio	Average RP Ratio	Growth Index (1960 base)	Number of Services Offered by Carrier	Average Profitability Rating	Average Usefulness Rating	Average MCSP/TUSU Ratio	Average MCSU/TUSU Ratio
					1960 or before 1965	1966- 1970			
1	3 a P SH	91.62	1.899	214.8	42	41	2.429	3.119	.865
2	5 b P LH	98.45	.343	190.4	46	50	1.686	3.294	.627
3	2 c P SH	94.59	1.224	434.7	33	34	1.786	3.906	.674
4	1 a F LH	92.48	1.798	129.1	30	32	2.469	3.719	.871
5	1 a P SH	98.53	.408	156.6	50	50	1.885	1.919	.665
6	1 a P LH	95.30	1.108	344.5	35	35	2.709	3.889	.985
7	2 a P SH	98.82	.097	183.9	39	40	2.110	3.424	.761
8	3 b G LH	93.73	1.339	556.7	39	44	2.381	3.362	.849
9	1 a T SH	99.24	.130	83.3	35	36	2.943	3.139	1.050
10	1 a T SH	99.91	-.018	182.8	38	39	2.625	3.261	.919
11	3 a P LH	93.65	1.435	227.7	57	56	2.429	2.841	.846
12	3 a F LH	99.09	.190	295.3	33	33	2.818	3.000	.890
13	4 b T LH	87.86	2.597	703.6	39	39	2.542	3.652	.885
14	5 b G LH	96.27	.717	283.1	26	32	2.038	3.966	.766
15	5 b F LH	100.26	-.094	128.9	51	53	2.091	3.340	.786
16	2 a T SH	94.87	1.022	413.3	41	42	2.356	3.311	.853
17	5 a S LH	98.96	.094	264.4	39	59	2.526	3.271	.972
18	3 b P LH	92.31	1.826	273.6	56	57	2.088	3.633	.795
19	1 a P SH	90.18	2.282	229.6	22	22	3.682	3.727	1.194
20	2 c P LH	97.06	.819	225.5	27	28	2.938	3.846	1.000
21	1 a P SH	97.85	.376	187.0	46	47	2.400	3.080	.889
22	2 a P SH	95.34	1.115	284.9	31	30	2.000	3.500	.675
23	5 b T LH	95.31	1.041	317.2	49	52	2.488	2.913	.892
24	3 c F LH	97.06	.660	319.7	29	39	2.225	3.268	.783
25	4 b S SH	93.39	1.525	207.5	43	44	1.889	3.340	.686
26	5 e O LH	94.74	1.254	518.3	42	42	n.a.	n.a.	n.a.
27	3 b G LH	98.00	.542	308.1	42	42	2.400	3.930	.855
28	4 f F LH	96.58	.584	243.8	45	46	2.292	3.318	.865
29	5 e F LH	96.64	.906	348.6	42	42	2.977	3.955	1.083
30	5 a P LH	94.29	1.312	202.63	53	53	2.020	3.038	.779
31	5 a F LH	90.84	2.130	468.9	42	42	3.000	4.000	1.084
32	1 a P SH	96.96	.680	324.0	35	36	2.500	2.949	.886
33	1 b P SH	97.69	.474	272.2	47	50	2.080	2.900	.765
34	1 a P SH	99.33	.068	123.2	30	30	2.300	3.962	.785
35	3 a O LH	101.38	-.234	157.1	37	40	n.a.	2.930	n.a.

APPENDIX V (cont.-)
SURVEY DATA BY MOTOR COMMON CARRIER

Carrier Number	Codes *	Average Operating Ratio	Average RP Ratio	Growth Index (1960 base)	Number of Services Offered by Carrier 1960 or 1961-1966- before 1965 1970	Average Profitability Rating	Average Usefulness Rating	Average MCSP/TUSU Ratio	Average MCSU/TUSU Ratio
36	2 a G SH	98.09	.423	255.3	56	62	62	2.703	1.058
37	3 a F LH	93.96	1.387	452.9	48	48	54	3.236	1.212
38	4 c P SH	94.74	1.179	226.7	42	45	45	3.533	1.302
39	3 a P LH	98.54	.360	181.2	40	36	36	3.688	1.065
40	4 a T LH	90.79	2.255	383.0	35	37	39	3.333	1.138
41	3 b T LH	98.21	.295	177.3	48	51	53	3.792	1.436
42	3 c S LH	96.58	.721	210.1	52	54	57	2.940	1.101
43	4 e T LH	94.09	1.334	171.4	47	49	50	2.235	.840
44	2 a P SH	98.13	.430	192.8	44	50	50	3.571	1.317
45	5 b T LH	94.09	1.399	457.6	52	53	60	3.850	1.478
46	3 a T SH	95.19	1.121	611.1	39	46	52	3.167	1.162
47	5 b O LH	96.41	.807	321.5	34	34	37	3.444	1.236
48	3 c F LH	93.33	.905	161.8	36	36	38	3.526	1.235
49	2 a S LH	91.13	2.000	350.9	39	47	51	2.827	1.070
50	5 e P LH	96.66	.662	391.4	31	33	37	3.351	1.156
51	3 a P LH	97.10	.665	193.7	42	46	49	3.073	1.088
52	3 a F LH	96.43	.983	221.4	24	25	26	3.615	1.292
53	1 b P SH	97.45	.473	367.0	50	54	55	3.968	1.556
54	3 a S LH	91.55	1.732	214.6	44	48	51	2.431	.901
55	3 a P SH	96.67	.774	305.6	39	39	39	3.234	1.167
56	1 a P SH	99.32	.138	143.9	39	39	40	4.000	1.364
57	5 b S LH	90.72	1.980	374.7	43	53	56	2.589	.971
58	2 a P SH	92.93	1.641	595.5	30	35	40	3.486	.945
59	5 e F LH	94.64	1.114	325.6	39	35	32	3.630	1.260
60	2 b P SH	98.41	.362	448.2	35	38	39	3.231	1.151
61	4 a F LH	95.28	1.037	487.5	38	38	40	3.889	1.314
62	3 a P SH	88.17	.361	408.4	38	38	45	3.313	1.186
63	5 a O LH	94.34	1.141	275.6	48	48	48	3.042	1.133
64	3 a S LH	97.62	.199	577.6	56	56	56	n.a.	n.a.
65	1 a P LH	98.75	.209	187.2	50	54	58	3.167	1.149
66	3 d P SH	94.81	1.203	289.3	40	41	41	n.a.	n.a.
67	2 e P SH	96.30	.655	284.6	50	55	57	3.268	1.248
68	3 a F SH	97.43	.559	194.6	23	28	36	3.833	1.115
69	4 a F SH	90.85	2.241	518.0	50	52	55	2.870	1.076
70	4 a P LH	91.62	1.975	352.9	29	47	53	2.821	.922

APPENDIX V (cont.-)
SURVEY DATA BY MOTOR COMMON CARRIER

Carrier Number	Codes *	Average Operating Ratio	Average RP Ratio	Growth Index (1960 base)	Number of Services Offered by Carrier		Average Profitability Rating	Average Usefulness Ratting	Average MCSU/TUSU Ratio	Average MCSU/TUSU Ratio	
					1960 or before	1961- 1966- 1965 1970					
71	2 b P SH	95.34	1.144	288.3	17	17	24	2.500	4.000	.813	1.042
72	3 c F LH	98.16	.443	179.7	31	39	41	2.400	3.452	.871	1.187
73	3 c O LH	87.17	.616	358.9	45	46	48	2.333	3.200	.851	1.161
74	2 a P LH	98.06	.481	152.3	42	45	45	2.359	3.886	.875	1.442
75	1 a P SH	96.00	.686	195.5	47	51	51	1.688	n.a.	.668	n.a.
76	1 a O SH	95.31	.977	223.7	11	11	11	3.237	3.237	1.064	1.064
77	5 e O LH	95.10	1.038	257.6	55	57	57	2.000	3.710	.787	1.462
78	4 a P LH	92.47	1.769	495.0	39	40	41	2.385	3.231	.854	1.157

* Note: The following codes were used:

Revenue Size of Carriers

Code

1. Small Carriers-- Less than \$5,000,000
2. Medium Small Carriers -- \$5,000,000 but less than \$10,000,000
3. Medium Carriers -- \$10,000,000 but less than \$25,000,000
4. Medium Large Carriers -- \$25,000,000 but less than \$50,000,000
5. Large Carriers -- \$50,000,000 or more

Type of Carrier

Code

- SH. Short-Haul Carriers
LH. Long-Haul Carriers

Evaluation Factors

Code

- a. Factor "a"--- Judgments
- b. Factor "b" -- Breakeven factors
- c. Factor "c" -- Forecasts
- d. Factor "d" -- Periodic cost studies
- e. Factor "e" -- Continuous cost studies
- f. Factor "f" -- Other methods

Title of Executive Completing Questionnaire

Code

- P. President
- F. Financial officers-Treasurer or controller
- G. General Manager or Operations manager
- T. Traffic Manager
- S. Sales or Marketing Manager
- O. Other executives

APPENDIX VI

SURVEY DATA BY MOTOR COMMON
CARRIER SERVICE

APPENDIX VI
SURVEY DATA BY MOTOR COMMON CARRIER SERVICE

Service Number	Number of Carriers Offering Each Service		Percent of Carriers Offering	Motor Carrier Ratings by Service			Transport User Rating		
	1960 or before	1961-1965	1966-1970	Average Profitability Ratings	Percent Evaluated to Offered	Average Usefulness Ratings	Percent Evaluated to Offered	Average Usefulness Rating	Percent Evaluated
GROUP I									
1	77	77	78	3.044	85.9	3.837	94.9	3.839	97.8
2	78	78	78	3.205	87.2	3.863	93.6	3.617	91.0
3	70	70	70	3.237	84.3	3.859	91.4	3.208	75.3
4	77	77	77	3.544	88.3	3.901	92.2	3.755	96.6
5	78	78	78	2.176	87.2	3.569	92.3	3.312	89.9
6	75	75	75	2.228	76.0	3.288	89.3	2.898	77.5
7	31	42	48	2.727	68.8	3.048	85.4	2.389	66.3
8	27	40	47	2.710	80.9	3.023	91.5	2.454	61.8
9	26	42	57	2.622	77.2	2.760	84.2	2.966	66.3
10	23	27	35	2.782	65.7	3.000	88.6	2.209	48.3
11	16	17	21	2.636	52.4	2.750	114.3	1.875	80.9
12	65	68	69	1.980	72.5	3.640	92.8	3.433	93.3
13	71	74	75	2.280	76.0	3.710	92.0	3.614	93.3
14	74	74	75	3.677	82.7	3.558	89.3	2.375	71.9
15	70	70	71	2.375	67.6	3.389	83.1	2.763	80.9
16	72	72	72	2.166	66.7	3.186	81.9	2.457	78.7
17	62	65	64	2.217	71.9	2.172	50.6	2.467	69.7
18	73	75	76	2.436	72.4	3.538	85.5	3.064	86.5
19	28	32	33	2.280	75.8	2.785	84.8	2.420	56.2
20	60	60	62	2.391	74.2	3.226	85.5	2.803	68.5
21	12	11	12	1.461	100.0	2.705	141.7	3.086	77.5
22	52	58	64	1.519	81.3	3.050	92.2	2.351	60.7
23	3	4	3	1.800	100.0	2.750	133.7	n.a.	n.a.
GROUP II									
24	64	65	63	3.000	77.6	3.700	89.6	3.571	86.5
25	59	62	64	2.519	81.3	3.250	87.5	2.714	55.1
26	68	69	70	1.372	84.3	2.875	80.0	2.219	46.1
27	70	70	69	1.962	76.8	3.066	87.0	2.459	68.5
28	59	60	60	1.545	73.3	2.765	78.3	2.176	57.3
29	73	73	73	1.770	83.6	2.830	80.8	2.523	70.8
30	16	16	17	2.083	70.6	2.916	70.6	2.857	7.9

APPENDIX VI (cont.--)
SURVEY DATA BY MOTOR COMMON CARRIER SERVICE

Service Number	Number of Carriers Offering Each Service		Percent of Carriers Offering	Motor Carrier Ratings by Service				Transport User Ratings		
	1960 or before	1961-1965		1966-1970	Average Profitability Ratings	Percent Evaluated to Offered	Average Usefulness Ratings	Percent Evaluated to Offered	Average Usefulness Ratings	Percent Evaluated
GROUP III										
31	44	44	43	55.1	2.333	97.8	3.571	97.7	1.875	27.0
32	61	63	65	83.3	2.618	84.6	3.534	89.2	2.272	37.1
33	4	4	5	6.4	3.000	100.0	3.625	160.0	2.631	42.7
34	4	6	6	7.7	3.000	66.7	3.857	116.7	2.241	32.6
35	71	72	72	92.3	2.706	80.5	3.548	86.1	2.718	71.9
36	53	56	56	71.8	2.847	82.1	3.500	89.3	2.711	66.3
37	24	27	30	38.5	2.520	83.3	3.241	96.6	1.888	40.4
38	50	60	70	89.7	3.327	78.6	3.525	84.3	3.163	68.5
39	12	12	13	16.7	2.888	69.2	3.000	84.6	2.195	51.7
40	8	18	27	34.6	2.428	100.0	3.035	103.7	2.408	55.1
41	16	25	30	38.5	2.513	86.7	2.593	106.7	1.902	46.1
42	29	35	36	46.2	2.517	80.6	3.166	83.3	2.300	56.2
43	9	17	29	37.2	2.846	89.7	3.241	100.0	1.973	51.7
44	3	5	9	11.5	2.888	100.0	3.444	100.0	3.666	3.4
GROUP IV										
45	77	76	75	92.2	1.883	80.0	3.190	84.0	2.718	80.0
46	77	76	74	94.9	1.750	81.1	2.952	85.1	2.469	74.2
47	40	41	41	52.6	2.161	75.6	3.135	90.2	2.418	61.8
48	38	43	46	59.0	1.542	76.1	2.904	91.3	2.040	55.1
49	24	26	26	33.3	1.764	65.4	2.666	92.3	2.306	69.7
50	25	27	28	35.9	2.500	78.6	2.740	96.4	1.964	64.0
51	7	7	7	9.0	1.600	71.4	2.571	100.0	1.439	46.1
52	11	12	12	15.4	2.454	91.7	2.538	108.3	1.096	34.8
53	33	32	32	41.0	1.800	93.8	2.464	87.5	1.813	48.3
54	47	46	46	59.0	1.775	87.0	2.609	89.1	2.025	44.9
55	15	16	17	21.8	2.545	64.7	2.210	111.8	1.540	41.6
56	77	77	77	98.7	2.019	66.2	3.588	88.3	3.214	94.4
57	66	66	66	84.6	2.162	65.2	3.440	89.4	2.844	86.5
58	74	75	75	96.2	1.686	68.0	3.656	89.3	3.747	97.8
59	75	76	76	97.4	1.653	68.4	3.382	89.5	3.511	96.6
60	54	56	57	73.1	2.024	71.9	3.203	94.7	2.987	87.6
61	44	45	46	59.0	1.986	69.6	3.219	89.1	2.506	82.0
62	63	64	64	82.1	1.688	70.3	3.407	84.4	3.373	93.3

APPENDIX VI (cont.-)
SURVEY DATA BY MOTOR COMMON CARRIER SERVICE

Service Number	Number of Carriers Offering Each Service			Percent of Carriers Offering	Motor Carrier Ratings by Service				Transport User Ratings		
	1960 or before	1961-1965	1966-1970		Average Profitability Ratings	Percent of Evaluated to Offered	Average Usefulness Ratings	Percent Evaluated to Offered	Average Usefulness Ratings	Percent Evaluated	
GROUP V											
63	20	26	29	37.2	2.095	72.4	3.076	89.7	2.086	65.2	
64	38	42	47	60.3	2.656	68.1	3.277	76.6	2.910	87.6	
65	45	47	50	64.1	2.357	54.0	3.225	80.0	2.472	80.9	
66	37	39	40	51.3	2.384	65.0	3.129	77.5	2.050	66.3	
67	49	50	50	64.1	2.214	56.0	3.194	72.0	2.092	73.0	
68	42	46	46	59.0	2.520	54.3	3.200	76.1	2.060	74.2	
69	7	9	10	12.8	1.888	90.0	3.111	90.0	1.660	56.2	
70	16	16	16	20.5	2.181	68.8	3.363	68.8	1.750	58.4	
71	26	27	27	34.6	2.266	55.6	3.400	74.1	1.836	61.8	
72	3	3	3	3.8	2.500	33.3	4.000	66.7	2.333	3.4	

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