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THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

A COMPARISON OF SMALL SHIPMENT USERS' ATTITUDES TOWARD A REVISED RATE STRUCTURE

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

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BY

ROGER EUGENE JERMAN

Norman, Oklahoma

1974

A COMPARISON OF SMALL SHIPMENT USERS' ATTITUDES

TOWARD A REVISED RATE STRUCTURE

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DISSERTATION COMMITTEE

DEDICATION

To

My Father, who will never know of this study, but yet does know

And To

My Mother, who is responsible for her child's education

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

One of the problems which constantly plagues businesses and industrial organizations is the problem of sending and receiving small shipments of material and equipment. The small shipments problem has numerous aspects, some of which go even beyond the field of transportation. This research project is an attempt to identify and find solutions only for those areas of small shipment problems which relate directly to transportation by common motor carriers. The emphasis will be on general commodity carriers as opposed to United Parcel Service (UPS), Parcel Post, etc. The thrust will be further refined to encompass attitudinal views on pricing or rates.

The purpose of this study will be attitudinal in nature. This research project investigates the "attitudinal feasibility" of a particular rate structure, that is, the transportation users' attitudes toward a proposed rate structure are studied.

As such, the research will be investigating an area and subject in which there is insufficient knowledge to formulate detailed research questions. This study is therefore an exploratory study. The exploratory study has as its major purpose the identification of problems, including the

identification of relevant variables and the formulation of new alternative courses of action or the formulation of new hypotheses.[1] This study is the first in a series of projects which will culminate with the drawing of inferences which can be used as the basis of management action.

BACKGROUND AND NEED FOR THE STUDY

Hundreds of thousands of dollars have been spent researching the small shipments problem. What is the justification for this study? A literature search indicates that most writings have been discussions of the situation and its effects. Their thrust has been "something should be done." The "something" is usually to increase rates. Of course, there are exceptions. For example, East-Central Motor Freight Bureau proposed a modification of the structure as did Ryder Truck Lines.

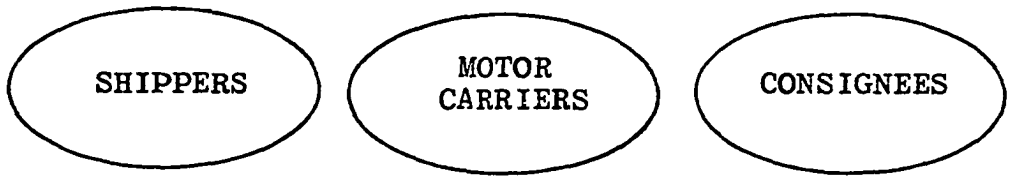
Most studies have been "solutions" oriented rather than "identification" oriented. Further, the "solutions" have usually assured the propriety of the present framework and have been made within it. For example, they have continued emphasis on weight. The end results is that most studies have been identifying the wrong problem; namely concentrating on shipping rate level rather than shipping rate structure.

---

[1]Paul E. Green and Donald S. Tull, Research for Marketing Decisions (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1970). p. 73.

The need for this study can be seen by examining the views of the following major actors in the small shipments problem:

Fig. 1-1 Selected Major Actors in the Small Shipments Problem



The service problems involved cut across modal lines, but the most crucial area relates to the motor carrier industry. Therefore, because of their importance and dominance in the handling of small shipments, only the pricing mechanism of the motor carriers will be considered.

STATEMENT OF THE PROBLEM

The small shipments problem relates to the entire transportation industry, but it consists in the final analysis of a great many individual problems which arise in connection with the relationship between individual carriers and shippers and/or receivers. One of the major traffic problems facing business firms today is how to send a small shipment economically and satisfactorily. Because of ever-rising costs, carriers are becoming reluctant to handle the small, expensive-to-handle shipment. Neither

motor carriers nor shippers and/or receivers are happy about the current small shipment services.

The problem in a nutshell is increasing demand and dwindling supply. There is a steadily increasing demand for small, fast, and frequent service that transport companies seem unwilling or unable to supply at existing rates.

Why Are There Small Shipments?

It is not easy to answer this question since there are so many different kinds of movements, different kinds of materials to be moved, as well as different kinds of shippers and receivers of small shipments. First, the nature of many business operations necessitates the shipping and receiving of small shipments. For example, many small businessmen are forced to buy in small quantities, and larger firms who have multiple outlets are also forced to deal in small shipments.

Second, increasing inventory costs are encouraging many buyers to purchase on a hand-to-mouth basis, which means small shipments. In effect it is a storage system designed to assist in reducing stock.

Third, there is increasing competition at point-of-purchase, revolving around stockouts. This situation can represent a marketing opportunity and many firms are using small shipments as an offensive marketing tool.

Fourth, above the minimum charge level, the rate structure is so designed that small shipments are encouraged while it provides little incentive to make larger shipments.

The existing rate structure does not encourage shippers to make one fairly large shipment (for example of 1,000 pounds) instead of several smaller ones. This is one of the main causes of the small shipments problem, but it also presents one of the keys to its solution.

Small Shipments Problem From Various Viewpoints

Figure 1-2 summarizes the rank-ordered complaints recorded in a recently completed study.[2]

Fig. 1-2 Rank Order Complaints About Small Shipment Services as Reported by Shippers and Consignees and Motor Carriers

1. Shippers' and Consignees' Viewpoint
   - A. Excessive delays in picking up small shipments
   - B. Overall slowness of delivery to consignee
   - C. Excessively rapid rate increases on small shipments
   - D. Loss and damage problems
   - E. Decreased service available to rural areas
2. Carriers' Point-of-View
   - A. Insufficient rates
   - B. Short receiving/delivery times
   - C. Inadequate receiving facilities

[2] James. C. Johnson, "The Small Shipment Problem--How Much Fact or Fiction?" Distribution Worldwide, (December, 1972), pp. 34-38.

The shippers' and consignees' complaints can be summarized as lack of service caused by carrier selectivity. This selectivity shows up in the carrier practice of selecting the commodities they desire to transport because of their (the commodity's) physical characteristics, of selecting shipments on the basis of the volume tendered, or geographical selectivity from or to small cities or areas not generating large amounts of traffic. Shippers and consignees are also concerned about the inability of carriers to interline in certain circumstances, thereby preventing the through movement of a shipment.[3]

Carriers are concerned over the many competently managed companies that have been forced out of business because of their inability to operate at a profit.[4] Carriers feel that when they have attempted to change rates to minimize the problem they have been restricted. They tend to feel that certain special interests have found means of turning the rate structure to their own advantage. Every wage increase faced by the motor carriers creates a new crisis and an apparent need for tremendous rate increases.

Motor carriers have found that when they try to serve

---

[3]For a more complete discussion see Small Shipments Problem, Report of the Ad Hoc Committee of the Interstate Commerce Commission, (U.S. Government Printing Office, 1967), p. 2.

[4]"Many Small Truckers Go Out of Business," The Wall Street Journal, (February 24, 1971), p. 28.

all points and handle all traffic offered without practicing the selectivity discussed in the above section, they find that choice traffic has suddenly disappeared into private carriage, pool trucks, shippers' associations, or that it is siphoned off by some carrier that handles only "selected" traffic--a carrier that picks out the larger, more profitable, shipments and reduced the rates on them.[5] This is only one of the symptoms of the small shipments problem.

Cause of the Small Shipments Problem

Shipping price is at the root of the small shipments problem.[6] Carriers have to be economically sound to offer adequate transportation service. However, motor carriers have convinced themselves through poor statistical sampling techniques and highly questionable costing methods that they are losing money on small shipments.[7]

---

[5]The previous portion of this paragraph was summarized from F. S. Thompson, "An Economic Analysis of the Small-Shipment Problem," (Reprinted from Traffic World, 815 Washington Building, Washington, D.C. 20005).

[6]A significant cause of the problem arises from operating practices of the carriers which do not reflect the economic characteristics of the industry. That aspect of the problem is beyond the scope of this study and is considered only tangentially. The problem for this study is considered to be a pricing problem.

[7]Josephy Joy, "A Primer On Shipper Co-Ops," Distribution Worldwide, (February, 1973), p. 44.

The less informed a carrier the more likely he is to believe this myth. The small carriers, which handle most of the smaller shipments, tend to lack adequate information about their costs and the characteristics of their traffic. As a group they have been caught between mounting operating costs and narrowing profit margins.

Problem solving for these carriers in the past has been largely confined to petitioning the regulatory body for rate increases on the basis that revenues don't cover operating costs. On the other hand, the obvious solution of calling for an increase in rates is really only a reaction to a symptom. The real villan is the rate structure rather than the rate level itself.

Rate Level vs. Rate Structure

Basic to an understanding of pricing is the recognition of the important differences between "price level" and "price structure." Price level is the amount paid for a given shipment and is largely determined by market demand and competition. Price structure refers to the framework of the pricing pattern. It relates to the difference between prices that exist for different services, different volumes, different distances, etc.[8]

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[8]These definitions were adapted from Robert S. Reebie, "Railroad Pricing--Cause of Past and Future Bankruptcies," Handling & Shipping, (August, 1973), pp. 64-66, on p. 65.

Applied to transportation pricing, the rate level is concerned with the magnitude or the amount of the charge for transport of a commodity or group of commodities. Thus, the concern of carriers is with whether rates are high enough. Needless to say, shippers oftentimes have the opposite concern.

Structure is defined as: (1) manner of building, constructing, organizing; (2) something built or constructed; (3) the arrangement or interrelation of all parts of a whole. The proposed rate structure that is described in Chapter 2 was constructed with concern for the manner of building and concern for the interrelationship of all parts of the whole.

It is the price structure which determines the type and amount of different services the shipper will buy, and thus the business in which the carrier will exist. It determines the extent to which shippers buy and carriers supply "wholesaler" versus "retail" services. It determines the long-term economic viability of carrier operation.[9]

Because price level has a dramatic effect on shipper and carrier economics, it usually receives much attention. Because the effects of price structure are generally long range, it seldom gets the carrier or regulatory attention its vital influence deserves.

Therefore, in the past, the carriers have concentrated

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[9] Ibid.

on getting the right price level with no apparent concern for the proper price structure. When the rate level is first determined, the structure may or may not be sound. The premise underlying the proposed new rate structure is that if we get the right structure (by considering the function of the function), the level will take care of itself.

Ramifications Of The Small Shipments Problem

The transporting of small shipments is creating various difficulties for the for-hire trucking industry and the community at large. The misconceptions and inadequate understanding embodied in the present rate structure have led to the following carrier actions: (1) carriers discouraging small shipments, (2) exorbitantly high charges on small shipments and, (3) very poor small shipment services.

The end result has been small shipment problems becoming so acute in certain areas that they pose a threat to the future growth of important segments of the economy. The failure of small shipment transportation to satisfy shippers' and consignees' needs is beginning to reshape patterns of industrial distribution. Shippers and receivers are being forced to assume and to undertake the role formerly reserved for the carrier. For example, the trend in small shipment pricing appears to be diverting many shipments from for-hire motor carriers to private carriage,

shipping associations, etc. The end result is a change in production scheduling and marketing distribution in an attempt to meet the rate restrictions. Thus, inefficient and uneconomical transport of small shipments, with corresponding disproportionate increases in small shipment costs, have a tendency to shift and restructure the nation's distributive system.[10] This is as it should be if carriers' pricing policies are good, but there is mounting evidence that they are not.[11]

The present pricing structure has led carriers to involve themselves in activities where their service is plainly uneconomic. In fact, the structure has frequently encouraged shippers to design a complete distribution system around an uneconomic use of carrier services. It is uneconomic from the carriers' point of view. The shipper finds it economic--so far as his transportation cost is concerned.

AN ATTITUDINAL STUDY OF SMALL SHIPMENT PROBLEMS

In the past, it has been difficult to convince the various parties involved in the small shipment problem

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[10]Barrie Vreeland, "An Imaginative Possible Solution to the Small Shipment Problems," Transportation Journal, (Winter, 1971), p. 4.

[11]For instance see F. S. Thompson, op. cit. See also Arthur W. Todd, "A Modern Freight Rate Structure--If We Want One, How Do We Get It?" Handling & Shipping, (October, 1973), pp. 46-47.

(such as shippers, carriers, consignees, regulators, courts) that the rate structure does not reflect the economic characteristics of the industry. The problem of any change at present is one of attitudes. Professor Plowman captured this when recently said:

> "It is almost impossible for most business executive who are concerned with freight rates, as they are used by the common carriers of the United States, to think rationally about them. The reason is that each individual freight rate or charge has evolved to its present level and its present applicability within the environment or context of the web of inherited ideas and procedures. It is difficult to think about freight rates without taking for granted the seemingly built-in constrainst that have developed in the past. Yet we must free our thinking from this restraining and limiting background. Only by breaking away from tradition can we provide the common carriers with expanding opportunities to serve industry and commerce comensurate with their economic and sccial value."[12]

The primary purpose of this research effort was to examine the attitudes of Wholesalers, Manufacturers, and Retailers (shippers and consignees) toward the present and then toward a proposed rate structure. The researcher also sought opinions about their transportation buying characteristics both as they presently exist and as they would be if they were to conceptually accept the rate structure being proposed. These opinions are extremely important to the logistics portion of the marketing process. If a certain shipping and/or receiving characteristic is held

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[12]Dr. E. Grosvenor Plowman, "Modernize Freight Rates," Traffic World, (November 22, 1971), pp. 23-26, on p. 23.

opinionwise, even though it is not true factually, for decision making it might as well be.

HYPOTHESES

The research question and the research hypothesis are stated in Figure 1-3.

Fig. 1-3 Research Question And Research Hypothesis

Research Question:	Would the concept underlying the proposed rate structure change the logistics decision portion of the marketing process?
Research Hypothesis:	The concept underlying the proposed new rate structure would not significantly change the logistics decision portion of the marketing process.

The general hypothesis underlying this study is that the small shipments problem could be reduced, if not eliminated, by a newly designed rate structure. The crux of the problem lies primarily in the rate structure and secondarily in the operations of the carriers. If the rate structure is corrected, the rate level, which tends to receive much of the emphasis, will eventually be corrected automatically.

Table 1-1 summarizes the specific hypotheses, stated in null form, which were tested in this study.

TABLE 1.1

THE TWENTY-FOUR NULL HYPOTHESES TESTED IN THE STUDY

Ho_1	There is no statistically significant difference between the number of times each of the three groups chose the seven (7) employee categories in indicating the company employee who handles transportation problems and decisions for their particular company.
Ho_2	There is no statistically significant difference between the weight of shipments sent (in pounds) by the Wholesalers and the Weight of shipments sent by the Manufacturers.
Ho_3	There is no statistically significant difference between the size of the shipments sent (in number of packages sent per shipment) as reported by the Wholesalers and the size of shipments sent as reported by the Manufacturers.
Ho_4	There is no statistically significant difference between the number of shipments sent per month by the Wholesalers and the number of shipments sent per month by the Manufacturers.
Ho_5	There is no statistically significant difference between the percent of outgoing shipping expenses being paid by the Wholesalers and the percent of outgoing shipping expenses being paid by the Manufacturers.
Ho_6	There is no statistically significant differences among the weights (in pounds) of shipments received as reported by the Wholesalers and the weights of shipments received as reported by the Manufacturers and Retailers.
Ho_7	There is no statistically significant differences among the sizes (in number of packages per shipment) of shipments received as reported by the Wholesalers and the size of the shipments received as reported by the Manufacturers and Retailers.
Ho_8	There is no statistically significant differences among the numbers of shipments received per month by the Wholesalers and the number of shipments received per month by the Manufacturers and Retailers.
Ho_9	There is no statistically significant differences among the percent of incoming shipping expenses being paid by the Wholesalers and the percent of incoming shipping expenses being paid by the Manufacturers and Retailers.
Ho_{10}	There is no statistically significant differences among the weight categories chosen by the Wholesalers as being indicative of a "Small Shipment" and the weight categories chosen by the Manufacturers and Retailers as being indicative of a "Small Shipment."
Ho_{11}	There is no statistically significant differences among the amount of satisfaction/dissatisfaction with small shipments services as expressed by the Wholesalers and the amount of satisfaction/dissatisfaction with small shipment services expressed by the Manufacturers and Retailers.
Ho_{12}	There is no statistically significant differences among the importance ratings Wholesalers give to seven (7) small shipment problem areas and the importance ratings Manufacturers and Retailers give to these same small shipment problem areas.
Ho_{13}	There is no statistically significant difference between the Wholesalers' reactions to the proposed rate structure and the Manufacturers' reactions to the proposed rate structure.

------Table 1.1 Continued on Following Page ----------

----------Table 1.1 Continued----------

Ho_{14} There is no statistically significant difference between the degree of anticipated usefulness the Wholesalers (as Shippers) attach to the proposed rate structure and the degree of anticipated usefulness the Manufacturers (as Shippers) attach to the proposed rate structure.

Ho_{15} There is no statistically significant difference among the levels of Acceptance/Rejection of the proposed rate structure as reported by the Wholesalers (as Receivers) and the levels of Acceptance/Rejection of the proposed rate structure as reported by the Manufacturers and Retailers (as Receivers).

Ho_{16} There is no statistically significant differences among the "Usefulness-of-Program" percentages reported by the Wholesalers (concerning the proposed rate structure) and the "Usefulness-of-Program" percentages reported by the Manufacturers and Retailers for the some proposed rate structure.

Ho_{17} There is no statistically significant difference between the "Customer-Acceptance-of-Program" percentages reported by the Wholesalers and the "Customer-Acceptance-of-Program" percentages reported by the Manufacturers (concerning the proposed rate structure).

Ho_{18} There is no statistically significant difference between the "Usefulness-to-Customer" percentages reported by the Wholesalers (concerning the proposed rate structure) and the "Usefulness-to-Customer" percentages reported by the Manufacturers for the same rate structure.

Ho_{19} There is no statistically significant differences among the Wholesalers' Agreement/Disagreement percentages concerning a Flat-Charge-Per-Shipment Pricing Structure and Manufacturers' and Retailers' Agreement/Disagreement percentages concerning the same issue.

Ho_{20} There is no statistically significant difference among the Wholesalers' Agreement/Disagreement percentages concerning the amount of cost per shipment on small shipments and Manufacturers' and Retailers' Agreement/Disagreement percentages concerning that same issue.

Ho_{21} There is no statistically significant differences among the Wholesalers' Agreement/Disagreement percentages concerning the Prepayment of Small Shipment Costs and the Manufacturers' and Retailers' Agreement Disagreement percentages concerning that same issue.

Ho_{22} There is no statistically significant differences among the Wholesalers' Agreement/Disagreement percentages concerning the Preparation of Shipping Documents and the Manufacturers' and Retailers' Agreement.

Ho_{23} There is no statistically significant differences among the Wholesalers' Agreement/Disagreement percentages concerning a Limitation of Liability on Small Shipments and Manufacturers' and Retailers' Agreement/Disagreement percentages concerning that same issue.

Ho_{24} There is no statistically significant differences among the Wholesalers' Agreement/Disagreement percentages concerning a Plan of Reduced Rates for Multiple Shipments Tendered and Manufacturers' and Retailers' Agreement/Disagreement Percentages concerning that same issue.

DEFINITION AND CHARACTERISTICS OF SMALL SHIPMENTS

The term small shipment, never at any time succinctly identified, has taken on a variety of meanings, loosely applied by differing groups. The sharp distinctions necessary for a clear focus on the basic characteristics of small shipments and the exact nature of the various problems associated with their transport have been lacking.

In this study, small shipments are defined as those which weigh less than 1,000 pounds. The motor carrier industry handles most of these small shipments. Nationally, shipments weighing under 1,000 pounds account for about 84 percent of a general-commodity motor carrier's total number of shipments, but only 20 percent of the total weight moved.[13] In a study of carriers serving Oklahoma it was found that 87 percent of a general-commodity carrier's total number of shipments accounting for 28 percent of the total weight weighed under 1,000 pounds.[14]

An operating ratio is the percentage of operating income going for operating expenses.[15] Nationally, the small

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[13]Small Shipments Problem, Report of the Ad Hoc Committee of the Interstate Commerce Commission, (U.S. Government Printing Office, 1967), p. 11.

[14]James A. Constantin and Raymond L. Smith, Oklahoma Rate-Making Practice and Structure Analysis and Recommendations for Economically More Effective Rate and Service Schedules, Ozarks Regional Commission, 125 Mart Building, Little Rock, Arkansas, pp. 127 and 129.

[15]Roy J. Sampson and Martin T. Farris, Domestic Transportation: Practice, Theory and Policy (2nd ed.; Boston: Houghton Mifflin Company, 1971), p. 61.

shipments contribute only 30 percent of the revenues and result in operating ratios of about 105.6. These carrier data, while unofficially compiled, have been recognized by the Interstate Commerce Commission and are used to form the basis for carrier allegations about rate inequities.[16]

STUDY LIMITATIONS

While the small shipments problem is national in scope, any significant resolution must first be tried on a smaller scale. In transportation, this can often be best accomplished at the intrastate level. Therefore, the purpose of this study is to examine the acceptability of a new rate structure, by studying its effects on selected Oklahoma shippers and consignees.

Oklahoma shippers and consignees, represented by Wholesalers, Manufacturers and Retailers, will be the subject of this study. The intrastate carriers that serve these shippers and consignees are usually small regional carriers operating wholly within Oklahoma and generally are the only carriers serving small towns. Their operating authorities are granted by the Oklahoma Corporation Commission.

This research effort has been limited by the time and financial resources available to the researcher. The sample survey design limited the sample population boundaries geographically to include only Wholesalers, Manufacturers and

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[16] Small Shipments Problem, op. cit., p. 11.

Retailers located within the State of Oklahoma. Thus, the findings can only be used to make inferences about firms within the State.

ORGANIZATION OF THE STUDY

The study is composed of five chapters. This first chapter has served to introduce the study by focusing on the small shipments problem and examining its causes and ramifications. In addition, the attitudinal purpose, research question and hypotheses, and limitations were set forth.

Chapter Two provides a literature search, a review of the present rate structure, and an explanation of the proposed rate structure. Chapter Three outlines the methodology used in the study. There is a discussion of the research design, development of data collection instrument, sample survey design, and statistical tests used in analyzing the data. Chapter Four presents a detailed analysis of the quantitative data with an interpretation of the significant findings. Ancillary findings are also enumerated and used in supplementing and interpreting the quantitative analysis. Chapter Five summarizes the findings and their implications and concludes with suggestions for additional research efforts.

CHAPTER II

LITERATURE REVIEW AND PROPOSED RATE STRUCTURE

INTRODUCTION

Like every other segment of the economy, the trucking industry has had to consider raising prices to keep up with rising costs, which have hit the labor-intensive trucking industry particularly hard. The trucking industry has taken the easy way out through percentage price increases over broad areas of traffic. The resulting rate structure overprices many categories of freight while seriously underpricing many others. The problem has become particularly acute in small shipments, with truckers tending to lose money on their most widely used service.

What is now bringing the rate structure into focus for both carriers and users is not so much the structure itself (a static framework), but the effect of continuous rate increases.[1] While there is a lack of definite evidence as to the actual effects of the various small shipment rate increases, general economic principles and available data indicate that higher rates alone will not provide

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[1]Arthur W. Todd, "A Modern Freight Rate Structure--If We Want One, How Do We Get It?" Handling & Shipping, (October, 1973), pp. 46-47, on p.47.

a permanent answer to the problems of how to offset rising unit costs of small shipment operations.[2] In addition, the loss of any sizable volume of traffic tends to stimulate requests for additional rate adjustments, thereby setting into motion a constantly escalating scale of rate setting.[3] Each time rates are increased, distribution patterns change on that traffic where greatest profits might have occurred. There appears to be a limit to what common motor carrier traffic will bear in rate increases on small shipments.[4] Compounding the problem is the fact that losses on small shipment traffic are covered by the rates on the more profitable larger shipments. This cross-subsidization in turn makes the larger shipments more vulnerable to competition from private carriers.

THE PRESENT RATE STRUCTURE ON SMALL SHIPMENTS

The present rate structure is the result of an aggregation of the classification system, weight, and mileage progressions. The classification of commodities is the first

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[2]Gilbert L. Gifford, "The Small Shipment Problem," Transportation Journal, (Fall, 1970), p. 19.

[3]Interstate Commerce Commission Bureau of Economics, The Role of Regulated Motor Carriers in the Handling of Small Shipments, Statement No. 67-2, November, 1967, (U.S. Government Printing Office), p. 2.

[4]Barrie Vreeland, "An Imaginative Solution to the Small Shipment Problems," Transportation Journal, (Winter, 1971), p. 35.

step in the total pricing process. In this process each commodity is placed in one of several groups based upon an evaluation of the cost and demand factors associated with that commodity. The second step is taken when a price is set for transporting 100 pounds of the basic group over a minimum distance. A scale of progression of rates for all distances is then determined by the third step. The scale includes elements of both cost of service and value of service.[5]

Figure 2-1 shows the 15 criteria prescribed for classifying commodities.

Criteria Used by Motor Carriers for Classification of Commodities

Fig. 2-1

1. Shipping weight per cubic foot
2. Susceptibility to damage
3. Possibility of causing damage to other commodities
4. Perishability
5. Susceptibility to theft
6. Susceptibility to spontaneous combustion
7. Value per pound in comparison with other articles
8. Ease or difficulty in loading or unloading
9. Stowability
10. Excessive weight
11. Excessive length
12. Care and attention required in loading or transporting
13. Trade conditions
14. Value of service
15. Competition with other commodities transported

[5]For a more detailed discussion of this process see Charles A. Taff, Commerical Motor Transportation, (4th ed.; Homewood, Illinois: Richard D. Irwin, Inc., 1969), Chapter 14, "Motor Freight Classification," pp. 309-326 and Chapter 15, "Rates," pp. 327-364.

The commodity classification system shows in Figure 2.1 is widely accepted by businesses and industries.[6] However, other less complicated schemes are sometimes employed.

The previous criteria show a mixture of a monopoly or value-of-service-concept of costing and pricing and a competitive application of the principles of short and long-run marginal costing and pricing.[7] In actual rate-making practice and theory, the value-of-service concept often is hybridized with the supply-oriented cost-of-service. That is, it is said that value-of-service establishes a ceiling beyond which rates cannot go, and cost-of-service (however cost may be defined or determined), establishes a floor below which they should not fall. Between is a "Zone of Reasonableness" within which the actual rate may vary, and is, set.[8]

This Zone of Reasonableness, however, is a legal not an economic concept. "In economic terms, the concept of a little bit of value-of-service, a little bit of cost-of-service is analogous with the medical concept 'a little

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[6]W.J. Hudson and J.A. Constantin, Motor Transportation, (New York: The Ronald Press Company, 1958), pp. 399-400.

[7]Herbert O. Whitten, "Updating Freight Pricing and Costing," Distribution Worldwide, (November, 1970), p.39.

[8]Hugh S. Norton, Modern Transport Economics (Columbus, Ohio: Charles E. Merrill Books, Inc., 1963), pp. 142-143.

bit pregnant'."[9]

The end result has been a very bad system of incentives built into the rate structure. The rate structure is in the process of destroying the transportation system. Shippers have been required to bear higher transportation costs than necessary. Even this has not given relief to the carriers. The present structure artificially encourages small shipments which do not pay their way. It makes for high prices on larger shipments which must provide a subsidy. In addition, the present structure makes larger shipments, especially the volume long-distance shipments, vulnerable to competition. The loss of these is beginning to lead the motor carrier industry into disaster.

The Zone of Reasonableness Pricing, when and insofar as it actually does consider some version of cost as a floor for rates, despite its lip service to demand, is a tacit admission that when all the chips are down, rates more nearly reflect cost than value-of-service. Thus, a new orthodoxy has emerged, disparaging value-of-service pricing and eulogizing cost-of-service pricing.[10] The proposed

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[9]Roy J. Sampson, "Transportation Pricing in the 1970's: A Movement Toward Present Realities?" Found in: Transportation: The 1970's (Conference Proceedings, Upper Great Plains Transportation Institute, 1968), pp. 13-31, at p. 16.

[10]George W. Wilson, Essays on Some Unsettled Questions in Economics of Transportation (Bureau of Business Research, Indiana University, 1962), p. 150.

rate structure that follows is part of this new orthodoxy.

A PROPOSED RATE STRUCTURE FOR SMALL SHIPMENTS

Truckers need to change their rate structure.[11] There is mounting evidence that a pricing structure based on costs needs to be instituted.[12] The end result would be a lowering of some rates and an increase in others.

Before this can be done a prerequisite is more accurate answers to the question of just how much it really costs to handle a particular type of freight. In fact, the opportunities available in small shipments grow out of knowing the cost of each element of the business and being able to price the service accordingly.

In the past, available cost data have not been sufficiently precise to support a determination that a specific rate or rates generally are too low to cover costs. These data are not generally available primarily because the carriers themselves, especially the smaller ones, do not know what their functional costs are.

These data are now available, and the results of research show that the present rate structure is incompatible

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[11]"Making Small Shipments Pay Their Way," Business Week, (July 17, 1971), pp. 82-84, on p. 82.

[12]For example see Arthur C. Roy, "Here's A Possible Route To Simpler, More Sensible Freight Rate Structure," Traffic World, (January 24, 1972), pp. 70-73 and also a five-part series on this subject written by Robert S. Reebie appearing in Handling & Shipping from July through November 1973.

with the economic characteristics of the industry.[13] As a secondary feature, one can see many carrier operating practices which violate the economic characteristics of the industry. From the results of this research Constantin has developed a new rate structure.[14] The results of simulation are favorable regarding the carriers operations.[15]

To design a rate structure compatible with industry characteristics it is necessary to (1) identify the several functional centers and determine the nature of the cost generating factors in those centers, and (2) to analyze the behavior of those costs under differing circumstances. The

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[13]See the following studies and reports of these studies:

1. Raymond Leo Smith,"An Anlysis of the Rate Structure of Oklahoma Distribution Motor Carriers and the Economic Characteristics of the Industry," (Unpublished Dissertation, Norman, Oklahoma: The University of Oklahoma, 1971).

2. James A. Constantin and Raymond L. Smith, Oklahoma Rate-Making Practice and Structure Analysis and Recommendations for Economically More Effective Rate and Service Schedules, Ozarks Regional Commission, 125 Mart Building, Little Rock, Arkansas 72202.

3. James A. Constantin and Raymond L. Smith, "Review of Trucking Industry Rates," Oklahoma Business Bulletin, (October, 1971), pp. 10-17.

[14]For a conceptual overview of this rate structure see James A. Constantin, "One Step Toward the Small Shipments Bonanza," Paper Presented at Conference on Small Shipments, San Francisco, California, January 26-27, 1972.

[15]For the results of simulation using the new rate structure see James A. Constantin,,"An Approach to Rate-Making for Small Shipments," Educators' Conference, National Council of Physical Distribution Management, Chicago, October, 1972.

following discussion describes one such attempt and the resulting rate structure for shipments weighing less than 1,000 pounds.

The Cost Centers And Cost Generating Factors

There are four identifiable transportation-related functions performed by motor carriers. These are shown in Figure 2-2.

Fig. 2-2 Transportation-related Functions Performed by Motor Freight Carriers

1. Pickup and delivery
2. Platform handling
3. Documentation
4. Line haul transportation

There are two types of cost items associated with and traceable to each of these functional activities as shown in Figure 2-3.

The Two Major Sources of Costs for Motor Freight Carriers

1. Those related to ownership and operation of machines and facilities
   - A. Amortization
   - B. Repairs
   - C. Fuel
   - D. Tags
   - E. Etc.
2. Managerial and labor costs
   - A. Wages
   - B. Fringe benefits
   - C. Etc.

Another cost center which must be used is for general and administrative costs which are not traceable to particular functions. This is the fifth module of the rate structure.

Pickup and Delivery Costs

The pickup and delivery function may be considered in two parts: the stem time between customers' docks and the stop time while at those docks. These costs are oriented to time required to handle the shipment. Driving to and from customers' docks accounts for about 40-50 per cent of the time spent in performing this function. These costs of the driver-vehicle unit are independent of the size, weight, and destination of the shipment. They are simply incurred because the trip is made.

Significantly, recent studies show that stop time is not influenced materially by the weight of the shipment. About the same time is required for a shipment in the 0 - 299 pound group as for one in the 2,000 - 3,999 pound group. This means that up to a point, stop time is associated with the shipment itself and not with its weight.

Pickup and delivery costs are time-oriented, and time spent is directly related to the shipment. Therefore, the cost of handling a shipment in pickup and delivery service arises because the shipment is made and not because a certain number of pounds are shipped.

Platform Costs

These costs are incurred because time is required to handle a package, and not because a given amount of weight is handled. Weight influences cost to the extent that there are several "normal" methods of handling. "Normal" may be one unassisted man handling a package; or one man assisted by a cart; or one man assisted by a lift truck. The nominal influence of weight may be taken into the rate structure by (1) the use of time standards and (2) average number of pieces per shipment. Thus time oriented platform costs per package can be translated into cost per shipment.[16]

Documentation Costs

These costs are clearly generated by the shipment and are in no way influenced by weight. The number of different items to be rated have a nominal effect on cost for two reasons. First, such a large proportion of shipments are made at the minimum charge (46 percent for carriers serving Oklahoma) that the number of different items to be rated is almost irrelevant. Second, most shipments have only one item to be rated (92 percent for carriers serving Oklahoma). The costs of this function are directly traceable to the shipment.

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[16]For further information see Interstate Commerce Commission, Bureau of Accounts, Motor Carrier Platform Study: Determination of Minutes Per Hundredweight in Handling Freight Across a Motor Carrier Platform, Statement No 2s51-70, June, 1973, (U.S. Government Printing Office).

Line-Haul Costs

These costs are incurred because the driver-vehicle unit is operated; because a trip is made, and not because of the lading. They will vary with the time required to travel a given distance. While there will be some variation in time when highway and traffic conditions vary, these variations can be taken into account in designing the rate structure by using a statistically determined average speed. Since time is the only variable, the time costs can be stated in terms of cost per mile.

While the cost per mile for the driver-vehicle unit may be determined with a reasonable degree of accuracy, the trip cost is common to all shipments in the load. Therefore, it must be allocated to each shipment. This is the only functional activity for which costs must be allocated rather than determined.

General and Administrative Overhead

All other costs which cannot be determined can be lumped in this category. Allocation to the small shipment is a managerial decision to be evaluated by regulatory authorities.

These costs arise from managing the firm while the others arise from performing a specific function. Included in this category are those cost items normally thought of as being overhead (president's salary, traffic management, general office space and equipment, accounting). In

addition some costs are included which are performed in behalf of more than one function. For example ownership and supervision of the facilities and equipment for repair and maintenance of line-haul and pickup trucks cannot be traced to either function. That portion of those costs so traceable to a function should be functionally assigned.

Several things have emerged from the discussion of these five modules of a rate structure.

1. Only direct costs of performing the first four functions are included in each cost module of the rate structure. Those direct costs include both the fixed and the variable costs.

2. The costs in each functional area can be stated reasonably in terms of cost for each shipment without doing violence either to accepted accounting practice or to widely used business techniques, including techniques used by motor carriers now.

a. Time--and cost--required to pickup and deliver a shipment of less than 1,000 pounds does not vary appreciably with the weight of the shipment.

b. Platform costs result from a package being handled; so these costs can be converted to cost for each shipment by using an average number of pieces per shipment as a base. The use of average density, average weight, average number of pieces per hundred pounds is already common in motor transportation.

c. Documentation costs are definitely related to each shipment.

d. The line-haul costs are determinable and on the basis of averages again they may be allocated to each shipment under 1,000 pounds.

3. As a cost generating factor, weight is relatively unimportant.

4. General and administrative costs of managing the company cannot be traced to any one function; so their allocation to the shipment will depend upon managerial discretion subject to review by the regulatory authority.

PROPOSED RATE STRUCTURE

Each of the four functional areas is a module for rate making purposes. Documentation has been excluded as a carrier cost with the expectation that the shipper would provide that service on an appropriate form, since he has to provide it anyway. The expense of having the carrier duplicate the process can be avoided.

Figure 2-4 shows the computation per shipment and the development of a rate-per-shipment pricing structure using costs reflecting 1970-71 conditions.

The pickup and delivery costs per shipment were estimated to be $1.50 each based upon the then prevailing wage rates, vehicle, and other costs. Platform costs were estimated to be 45 cents per shipment. The pickup, delivery, and platform costs are summed to arrive at what is called

Detailed Explanation of a Price-Per-Shipment Pricing Structure Based on 1970-71 Conditions[17]

Fig. 2-4

Pickup	1.50
Delivery	1.50
Platform	.45
Total: Basic Cost	3.45
Add: Line Haul Cost Allocation	____
Total Direct Cost	____
Add: Overhead Cost Allocation	____
Total Cost	____
Add: Profit Allocation	____
Rate	____
(Operating Ratio ____)	

the basic cost. These three basic costs are independent of distance. Therefore, this basic cost will be the same for every shipment under 1,000 pounds regardless of the distance it moves.

The allocated line-haul cost per shipment is added to the basic cost to arrive at total direct cost per shipment. It is strongly emphasized that the allocation of overhead and the allocation for profit are managerial decisions to be evaluated by the regulatory agency. For the purpose of illustrating a concept and to enable comparisons to be made with actual rates and charges, allocations have been made to arrive at a "rate." Ten percent of the basic costs

[17]The dollar cost figures are used to illustrate a point. Their magnitude is not conceptually important.

were added for overhead to arrive at a total cost. To the total cost additional profit costs were added to provide an operating ratio of about 93. The sum of these is the rate.

Figure 2-5 shows assumptions and bases for the calculations.

Fig. 2-5 Cost Assumptions And Their Bases

1. Line Haul (Road) Cost: 35 cents per vehicle mile (Oklahoma Cost)

2. Trip cost recoverable from
   a. Shipments weighing under 1,000 pounds - 75 percent
      (1) 87 percent of shipments
      (2) 28 percent of weight
   b. Shipments weighing over 1,000 pounds - 25 percent

3. Shipments under 1,000 pounds
   a. Use 20,000 pounds of vehicle capacity
   b. Assumed to weigh 250 pounds
   c. Consist of 80 shipments per vehicle to share round trip costs equally

4. Shipments under 300 pounds
   a. Account for 60 percent of all shipments; 10 percent of weight
   b. 68 percent of shipments weighing under 1,000 pounds

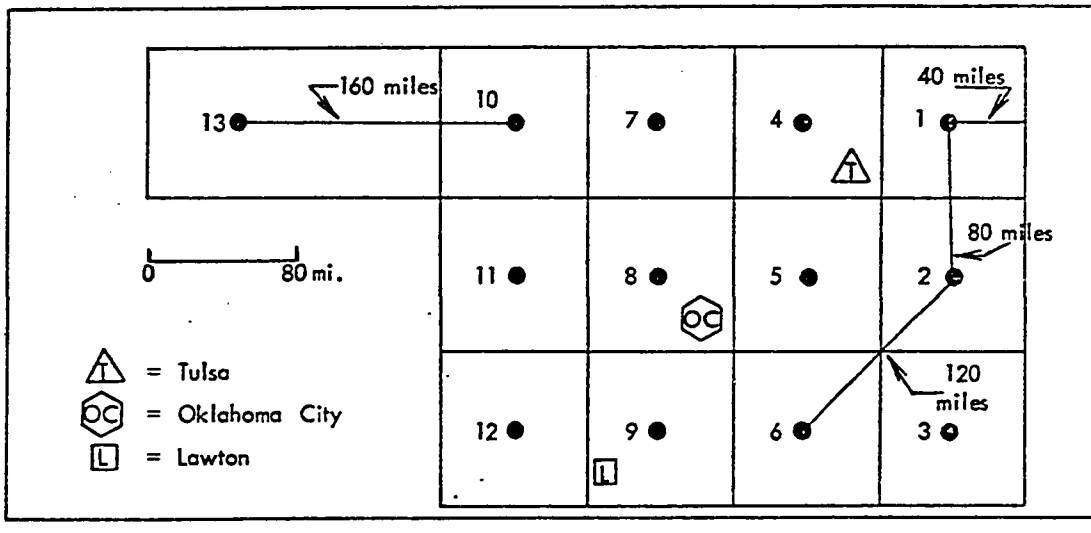
Oklahoma carriers estimate line-haul costs at approximately 35 cent per mile. (The figure was used in the present pricing scheme). For this analysis 75 percent of the trip cost was allocated to shipments weighing under 1,000 pounds and 25 percent to other LTL shipments. No attempt was made to "prove" the adequacy of the figure, the basic goal was to develop a workable concept and not to "make rates." Shipments under 1,000 pounds account for eighty-seven

percent of all LTL shipments and 28 percent of the weight. Thus, the 75 percent allocator was considered to be suitable for discussion purposes.

Further, shipments under 1,000 pounds were assumed to use 20,000 pounds of vehicle capacity, and they were assumed to weigh 250 pounds each. Thus the 80 shipments per vehicle share the roundtrip costs equally. The 250 pound weight per shipment did not seem out of line when shipments under 300 pounds account for about 60 percent of all shipments and 68 percent of all shipments weighing under 1,000 pounds.

The line-haul module was developed on a zone basis as is illustrated in Figure 2-6.

Fig.2-6 Zone Boundaries and Interzonal Distances Used to Develop the Proposed Rate Structure for the State of Oklahoma



To establish the correct zonal rates, zones 80 miles square were set up. The pattern of shipments in Oklahoma is mostly one-way with little or no back-haul. Since the outbound rate would have to cover the round trip cost, the outbound cost per mile was doubled. The intra-zone distances were considered to be 40 miles from mid-zone to the outer edge. Inter-zone distances between adjacent zones were considered to be from mid-zone to mid-zone or 80 miles. For other zones, direct mileages through mid-zone points were determined.

Using the previously described process, the resulting per shipment "rate" ranged from $4.40 for a 40 mile shipment to $7.75 for moving shipments 480 miles. If more than one shipment is tendered at one time the per shipment charges range from $3.65 (40 miles) to $7.00 (480 miles). Pickup costs do not rise proportionately with the increase in the number of shipments. In fact, there is no noticeable increase in cost when two shipments are tendered instead of one. These proposed charges apply to shipments weighing under 1,000 pounds.

Figure 2.7 is a proposed tariff, and can be designed to fit on the back of the waybill.

If this structure should be adopted, the level of charges originally derived from it would have to be considered transitional. The costs developed as bases for the structure were based upon present characteristics of shipments--size, number of pieces, frequency, etc. Since the

proposed structure would encourage larger and fewer shipments, cost characteristics may change. Nevertheless, the modular structure will accommodate any change.

Fig.2-7 Interzonal Distances and Shipment Charges of the Proposed Rate Structure Designed to Fit the Back of a Waybill

INTERZONAL DISTANCES AND SHIPMENT CHARGES

"INTERZONAL DISTANCES" (miles)		40mi.	80mi.	120mi.	160mi.	200mi.	240mi.	280mi.	320mi.	360mi.	400mi.	440mi.	480mi.
"CHARGES"*	One Shipment	$4.40	$4.70	$5.00	$5.30	$5.60	$5.90	$6.25	$6.55	$6.85	$7.15	$7.45	$7.75
	Two or More Shipments (each)	$3.65	$3.95	$4.25	$4.55	$4.85	$5.15	$5.50	$5.80	$6.10	$6.40	$6.70	$7.00

	"FROM"	"TO"	DESTINATION ZONES										
	1	1	2,4	5	3,7	6,8	9,10	11	12	x	13	x	x
	2	2	1,3,5	4,6	8	7,9	11	10,12	x	x	x	13	x
	3	3	2,6	5	1,9	4,8	7,12	11	10	x	x	x	13
	4	4	1,5,7	2,8	6,10	3,9,11	12	x	13	x	x	x	x
	5	5	2,4,6,8	1,3,7,9	11	10,12	x	x	x	13	x	x	x
	6	6	3,5,9	2,8	4,12	1,7,11	10	x	x	x	13	x	x
	7	7	4,8,10	5,11	1,9	2,6,12	3,13	x	x	x	x	x	x
	8	8	5,7,9,11	4,6,10,12	2	1,3	x	13	x	x	x	x	x
	9	9	6,8,12	5,11	3,7	2,4,10	1	x	x	13	x	x	x
	10	10	7,11	8	4,12,13	5,9	1,6	2	3	x	x	x	x
	11	11	8,10,12	7,9	5	4,6	2,13	1,3	x	x	x	x	x
	12	12	9,11	8	6,10	5,7	3,4	2	1,13	x	x	x	x
	13	x	13	x	10	x	7,11	8	4,12	5,9	1,6	2	3

INSTRUCTIONS: (1) Move vertically (down) the "FROM" column to the number of your zone. Then move horizontally at the same level until you find the number of the zone you are shipping "TO". Next, move (up) that column to the "CHARGES" chart to determine the costs of sending one or more shipments to the desired destination.

*The charges shown are for illustrative purposes only. No attempt is being made to suggest shipping rates.

To illustrate this approach the following two examples are given.

(EXAMPLE 1) Assume that you want to determine the charges for one shipment, weighing less than 1,000 pounds, from Oklahoma City (Zone 8) to Tulsa (Zone 4). Move vertically down the "FROM" column to Zone 8 (the proper zone for Oklahoma City). Then move horizontally at the same level until the rectangle containing Zone 4 (the proper zone for Tulsa) is found. Next, move vertically up that column to the "CHARGES" chart to find the charge of $5.00 for one shipment or $4.25 each for two or more shipments.

(EXAMPLE 2) Assume that you want to determine the charges for one shipment, weighing less than 1,000 pounds, from Tulsa (Zone 4) to Lawton (Zone 9). Move vertically down the "FROM" column to Zone 4 (the proper zone for Tulsa). Then, move horizontally at the same level until the rectangle containing Zone 9 (the proper zone for Lawton) is found. Next, move vertically up that column to the "CHARGES" chart to find the charge of $5.60 for one shipment or $4.85 each for two or more shipments.

CHAPTER III

RESEARCH DESIGN AND METHODLOGY

INTRODUCTION

Three survey questionnaires were developed to collect data from twenty (N=20) Wholesalers, seventy (N=70) Manufacturers, and one-hundred twenty (N=120) Retailers in the State of Oklahoma concerning their attitudes about their present small shipment service and opinions concerning a proposed rate structure for small shipments. Collection of the responses required three mailings of the data collection instruments and one follow-up letter. The data were coded and the statistical tests chosen for testing twenty-four null hypotheses which had been stated earlier.

The methods and procedures used in the conduct of the study were actually divided into three distinct segments or time orientations; (1) the pre-survey procedures--all those tasks which were performed prior to the data collection, (2) the survey procedures--the actual procedures followed in collecting the data from the three groups of participants, and (3) the data analysis procedures--the procedures used in analyzing the data and testing the hypotheses. Each areas of methods and procedures is discussed in the following sections, while a short summary of the methodology is presented at the end of the chapter.

PRE-SURVEY PROCEDURES

The Selection of a Research Design

A research design is the specification of methods and procedures for acquiring the information needed.[1] The research design is the over-all operational pattern or framework for this research project. It is the researcher's equivalent of a set of blueprints and specifications.[2] The following sections stipulate the kinds of information to be collected in the study, the data sources, and the specific procedures to be used in collecting these data.[3]

Research designs may be classified by many criteria. One of the more practical classification systems categorizes designs according to the major purposes of the investigation. Tull and Green have developed a format which classifies research design and general sources of information collected. Their classification paradigm is shown in Figure 3-1.[4]

Exploratory studies have as their major purposes the isolation and quantification of the effects of relevant

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[1]Paul E. Green and Donald S. Tull, Research for Marketing Decisions (2nd ed.; Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1970), p. 73.

[2]Jerrey E. Drake and Frank I. Millar, Marketing Research: Intelligence and Management (Scranton, Pennsylvania: International Textbook Company, 1969), p. 104.

[3]For an excellent source which was used as a guide see John B. Lansing and James N. Morgan, Economic Survey Methods (Ann Arbor, Michigan: The University of Michigan Institute for Social Research, 1971), particularly Chapter 2, "The Design of Surveys," pp. 11-48.

[4]Green and Tull, op. cit., p. 73.

Fig. 3-1

Research Classification Paradigm
Suggested by Green & Tull

Purpose of Research Design	General Sources Of Information
1. Exploratory	1. Secondary Information
2. Descriptive	2. Surveys
3. Causal	3. Natural Experiments
	4. Controlled Experiments
	5. Simulation

independent variables upon predetermined data sources. From these identified relationships come the formulation of new alternative courses of action or the formulation of new hypotheses. Descriptive research, in contrast to exploratory research, is marked by the prior formulation of specific questions which are answered by "describing" these questions with the data collected. Causal studies search for the reasons why. The purpose is to find the relationships of causal factors to the effects of what the researcher is predicting.[5]

The design of this research project was primarily exploratory in nature, with some aspects of descriptive

[5]The previous definitions were summarized from Green and Tull, op. cit., pp. 73, 76, and 77.

research design. The first two chapters reviewed the most applicable secondary information or literature search as a general source of information. A survey questionnaire was the primary source of information.

DEVELOPMENT OF DATA COLLECTION INSTRUMENT

Mail Questionnaire

The customary reservations with regard to the use of mail questionnaires were reviewed.[6] The chief drawbacks are the problem of nonresponse and the problem of limited sampling regarding both procedure and knowledge possessed by the sample.

It will be seen in one of the following sections on choice of population and samples that there was an up-to-date mailing list available of Oklahoma Wholesalers, Manufacturers, and Retailers. This probability sample had achieved a high rate of response and the respondents' answers indicated knowledge about their transportation operating characteristics that could be generalized to this research project.

In addition to the above general inherent limitations of mail questionnaires, the problems peculiarly associated with mail surveys stemming largely from the lack of personal communication between those conducting the study and the

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[6] Paul L. Erdos, Professional Mail Surveys (New York: McGraw-Hill, Inc., 1970), pp. 10-13 and 138-150.

respondents were specific limitations of this research effort.[7] The chief questions were whether or not the concepts underlying the proposed rate structure and the resulting pricing matrix could be adequately explained in the space available on the questionnaire, and whether the potential respondents had records enough to respond intelligently to the questions asked. After much discussion with committee members and selected sampling among physical distribution and traffic managers known by the researcher, it was decided the mail survey was feasible if the questionnaire was properly constructed.

Questionnaire Construction

According to Erdos,[8] a fifty percent response to mail surveys is the general minimum level that should ordinarily be accepted. However, the researcher imposed more stringent constraints. The goal was set at fifty-percent usable responses for each group before analysis was to begin.

The actual preparation of the data collection instruments was influenced by the goal of obtaining this level of response to the research questionnaire. This necessitated having both an effective letter of transmittal and a well-developed survey questionnaire.

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[7]David J. Luck, Hugh G. Wales, and Donald A. Taylor, Marketing Research (3rd ed.; Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1970), p. 282.

[8]Erdos, op. cit., p. 144.

It was decided to limit the questionnaire to less than four pages in length. It would be 8½ inches by 11 inches so that folded, it would be returnable in a number nine size envelope.

The nature and format of information to be collected with the survey instrument was determined through (1) an inspection of the small shipment literature, (2) the results of previous studies and studies in related areas, (3) consultation with the doctoral committee directing the study, (4) information and/or requests made by selected physical distribution and traffic managers, (5) personal preferences of the researcher, and (6) the limitations imposed by questionnaire construction.

The information sought by the questionnaire could be divided into eight (8) specific areas or categories. The questionnaire's eight sections are depicted in Figure 3-2. A copy of the three different data collection questionnaires is included in Appendices A and B.

In constructing the questionnaire, it was necessary to consider the dual role of Manufacturers and Wholesalers as both consignees and shippers. However, Retailers were treated as consignees only. Manufacturers and Wholesalers received the same questionnaire except for different color codings, while Retailers received a consignee-oriented questionnaire.

Fig. 3-2

The Eight Categories Considered in Developing the Survey Questionnaire

1. Questions concerning descriptive information about respondents' companies
2. Questions concerning shippers' and/or receivers' operating characteristics
3. Questions regarding the respondents' present attitudes toward their small shipment service
4. Explanation of the proposed rate structure
5. Shippers' and/or receivers' reactions to the proposed rate structure and percentage of usefulness of the proposed pricing matrix
6. Projected customers' and/or suppliers' reactions to the proposed rate structure and percentage of usefulness of the proposed pricing matrix
7. Six attitudinal questions concerning concepts underlying the proposed rate structure
8. Open-ended question

The questions concerning descriptive information about respondents' companies (gross sales and number of employees) were included primarily as a device for determining the non-respondents.

Manufacturers and Wholesalers were asked questions about both shipping and receiving operating characteristics

of their company. On the other hand, retailers were only asked questions about their receiving operating characteristics, since they are primarily consignees, with shipping operations usually negligible.

One question focused on where transportation decisions were made and where problems were handled in the potential respondents' organization. Additional questions were asked on:

(1) the percentage of weight and number of packages by categories (pounds per shipment and number of packages per shipment) shipped and/or received;

(2) the number of shipments sent and/or received per day and per month;

(3) the percentage of incoming and/or outcoming shipments having the freight paid by the respondents' company.

The purpose of these questions was to facilitate the comparison of respondents in this study with those responding to other studies, and to be able to correlate these operating characteristics with subsequent questions on various attitudes held.[9]

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[9]For an excellent source which was used as a guideline on both the validity of attitudinal research and how to design questions to measure beliefs, attitudes, and action tendencies, see G. David Hughes, Attitude Measurement for Marketing Strategies (Glenview, Illinois: Scott, Foresman and Company, 1971).

All three groups were asked to indicate how small shipments should be defined in terms of weight categories. They were then asked to express their satisfaction-dissatisfaction with their present service on small shipments. The respondents were further asked to make first, second, and third importance rankings of seven (7) nationwide complaints concerning small shipment service.

There is a difference of opinion of what constitutes a "small shipment." The Interstate Commerce Commission defines a shipment weighing less than 10,000 pounds as a small shipment. Some think of them as weighing less than 300 pounds while others consider a shipment weighing less than 500 to be small. In fact, almost all weight groups have been considered small by various people. One purpose of this research effort was to determine how the groups of respondents would operationally define a "small shipment" in terms of weight in pounds.

The other two questions were asked to determine if the small shipment problem is more apparent than real and to determine the chief problem areas given the operating characteristics asked in the previous series of questions.

Next, the proposed rate structure for small shipments and the end-result pricing matrix were explained, giving examples familiar to all potential respondents.

After the explanation, reactions to the proposed rate structure were requested from shippers and/or receivers.

Responding on a one-to-five continuum, they were asked to project the percentage of usefulness of the proposed pricing matrix.

The next series of questions asked for a projected reaction on a one-to-five continuum of customers' and/or suppliers' reactions toward the proposed rate structure and percentage of usefulness of the proposed pricing matrix.

The last page of the questionnaire consisted of six questions on attitudinal acceptability, rated on a one-to-five continuum, concerning concepts underlying the proposed rate structure for small shipments.

The last page also contained an open-ended question asking the potential respondent for comments and/or suggestions which he felt would improve the proposed rate structure.

The process of printing the questionnaire included a place for a code number in the upper right hand corner of the first page. Code numbers indicating the order of mailing (Wholesalers from 1 to 20, Manufacturers from 1 to 70, and Retailers from 1 to 120) plus the random number from the sampling process were entered by hand by the researcher for each addressee. This was necessary in order to facilitate follow-up mailings to the initial nonrespondents.

Choice of Population and Samples

The population groups and the specific samples that were used in this study were provided by Dr. Evans and Dr. Southard from a recently completed study. This section is a summary

of their research methods.[10]

The desired study population consisted of all consignees and shippers in Oklahoma. This was broken down into three subsets: Manufacturers, Wholesalers, and Retailers. The enumeration task utilized the listings in the Oklahoma Directory of Manufacturers, telephone directories, and membership rolls of the Oklahoma Retailers Association to identify populations of Manufacturers, Wholesalers, and Retailers respectively. The potential exclusion bias resulting from the population identification sources was recognized, particularly in the case of retailers.

One simple random sample was drawn from each of the three groups. Sample sizes were 20, 70, and 120 for the wholesalers, manufacturers, and retailers respectively. The formula[11] for sample size determination is shown in Figure 3-3.

The Evans and Southard study had response rates of 60, 55, and 30 percent for Manufacturers, Wholesalers, and

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[10]For further explanation of Evans' and Southard's choice of population and samples see R.E. Evans and W.R. Southard, "The Carrier Choice Decision: Carriers Vs.Consignees," Paper Presented at the 3rd Annual Transportation and Logistics Educators Conference, San Francisco, California: September, 1973, and R.E. Evans and W.R. Southard, "Carriers and Shippers: Different Perceptions of the Carrier Choice Decision," The Logistics and Transportation Review, forthcoming.

[11]The formula used is from Morris H. Hansen, William N. Hurwitz, and William G. Madow, Sample Survey Methods and Theory (New York: John Wiley & Sons, Inc., 1953), p. 127.

Figure 3-3

INFORMATION CONCERNING THE CHOICE OF POPULATIONS AND THE CALCULATION OF SAMPLE SIZES FOR THE WHOLESALERS, MANUFACTURERS AND RETAILERS

Participating Group	WHOLESALERS	MANUFACTURERS	RETAILERS
Source of Information	Oklahoma Directory of Manufacturers	Telephone Directories	Membership Rolls of the Okla. Retailers Association
Number in Total Population	N = 312	N = 3,885	N = 1,905
Sampling Criteria; If Any	None Specified	a.) More than 15 employees b.) > county-wide distribut.	None specified
Number Meeting Criteria	N = 312	N = 1,093	N = 1,905
Sampling Error Allowed	5%	5%	5%
Level of Confidence	95%	95%	95%
Sampling Formula Used	$n = \frac{k^2NV^{2**}}{ND^2 + k^2V^2}$	$n = \frac{k^2NV^{2**}}{ND^2 + k^2V^2}$	$n = \frac{k^2NV^{2**}}{ND^2 + k^2V^2}$
Sample Size Chosen	N = 20	N = 70	N = 120

**An explanation of the formula symbols is as follows:

"n" = Sample size being sought
"k" = Constant chosen by the researcher
"N" = Number contained in the overall population
"V" = Coefficient of Variation (standard deviation/mean)
"D" = Sampling error allowed by the researcher

Retailers respectively. Analyses showed that, in respect to firm size and geographical dispersion, nonrespondents were no different than the respondents.

QUESTIONNAIRE ADMINISTRATION

Initial Mailing

The accompanying letter of transmittal, which stressed the confidential handling of the respondents' answers, was separately typed and addressed. The initial letter of transmittal was sent to the three groups--exhibits and copies of which are contained in the Appendices. Additional materials sent were as follows:

(1) A letter separately typed and personally addressed where possible.[12] If a personal address was not available, it was sent to their business address. This letter informed the addressee of the nature of the study, and asked for their cooperation. These letters were personally signed by both the Committee Chairman and the researcher. (See Appendix C)

(2) A folded questionnaire (coded)

(3) A self-addressed stamped envelope of number nine size with the name and return address of both the Committee Chairman and the researcher, addressed

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[12](a) All correspondence to Manufacturers was personally addressed
(b) Some correspondence to Wholesalers was personally addressed
(c) Very little of the correspondence to Retailers was personally addressed

in care of the Department of Marketing.

(4) A mailing envelope of number ten size, imprinted in red with the seal of The University of Oklahoma and the return address of the Committee Chairman, the researcher, and the Department of Marketing.

(5) A self-addressed postcard in care of the Department of Marketing. If the potential respondent wanted a copy of the research results, he was to fill out his name and address and send it back independent of the questionnaire to protect identity.

This initial mailing was done on September 14, 1973.

First Follow-Up Mailing to Non-Respondents

Four weeks later (October 12, 1973) a new letter of transmittal (See Appendix D), again signed by both the Committee Chairman and the researcher plus the content of the initial mailing were mailed to the non-respondents.

Reminder Letter

One week later (October 19, 1973) a reminder letter (See Appendix E) only was sent to the individual who had not yet responded. This letter was signed by the researcher only.

Second Follow-Up Mailing to Non-Respondents.

After an additional ten days (October 29, 1973), the volume of responses indicated that a third complete mailing was needed to achieve the predetermined response rate. Each of these letters of transmittal (See Appendix F)

were individually typed by the researcher and included a hand written note asking for the potential respondent's cooperation. This mailing included all the contents of the initial mailing except the postcard.

This process took nearly two weeks. (October 29 to November 12). The last questionnaire to arrive that brought the retailer group up to the desired 50 percent usable response rate came on Thursday, November 29, 1973.

With the arrival of this last questionnaire, the field data-gathering phase of the study was completed. It had covered approximately 2½ months (11 weeks--September 14, 1973 to November 29, 1973).

Additional Correspondence to Study Participants

As soon as the research project was fully completed, a copy of the tabulated data results was mailed to each respondent who requested a copy.

DATA ANALYSIS PROCEDURES

The data analysis procedures began as soon as the responses began to return. However, the researcher did not devote his full efforts to the analysis of the questionnaire responses until the data collection procedures had been finalized. The data analysis procedures were actually subdivided into two types of tasks; (1) preliminary procedures and (2) statistical manipulation of the data.

Preliminary Procedures

The preliminary statistical procedures involved the

following tasks: (1) determining the usability of the questionnaire responses, (2) coding of data into more manageable terms, (3) transfer of responses from the questionnaires to data analysis sheets, and (4) the choice of statistical procedures to be used in the calculations.

The choice of a proper statistical procedure is an important part of data analysis, since it is not possible to test hypotheses for significance without a testing statistic such as a Student's t-test, Chi Square test, F-test, or Z-test. Several criteria must be considered in selecting the proper statistical test for making any comparison(s). The criteria considered in the present study were as follows: (1) the measurement level of the data collected (most of the data were of the Nominal level--frequencies), (2) the nature of the question being considered in the hypothesis being tested, (3) the number of groups or frequencies being considered at any one time, (4) the number of persons, frequencies, or measures within any one group, and (5) the assumptions underlying the statistical tests chosen. The two primary statistical tests chosen for the present study were the Chi Square test for frequencies within a contingency table and a Contingency Coefficient, actually an extension of the Chi Square test. The Contingency Coefficient was used to determine the relationship (correlation) between two variables from nominal level data.[13]

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[13]N.M. Downie and R.W. Heath, Basic Statistical Methods (2nd ed.; New York: Harper & Row, Publishers, 1965).

Statistical Manipulation of the Data

The second part of the data analysis procedures was the actual manipulation of the data and the testing of the stated hypotheses for significance. This was accomplished through the use of a Monroe 1766 Digital Computer. The 1766 has an 8K live core, 25K of large-core storage, and is equipped with a series of pre-written statistical programs which can be stored and recalled at the operator's discretion. Some of the programs developed for this statistical package were used to analyze the data collected in this study. These electronic data processing procedures were used as a means of minimizing errors due to hand calculations and to reduce the amount of time needed to complete the analysis procedures. The analysis of the data was completed within a three day period.

SUMMARY OF METHODS AND PROCEDURES

The previous sections have contained a rather long and detailed account of the methods and procedures followed in the conduct of this study. While this is quite necessary for the proper reporting of the study's results, the reader may fail to grasp the chronological order and/or interrelationships of the methods and procedures used unless they can be cogently summarized. Such a summary would be as follows:

1. Selected the general research design of the study

2. Constructed survey questionnaires for shippers and consignees concerning present operating characteristics and attitudes toward a proposed rate structure for small shipments

3. Chose populations of Wholesalers, Manufacturers, and Retailers in Oklahoma to serve as parent groups for the final samples of participants

4. Determined the sample size needed and chose samples of Wholesalers, Retailers, and Manufacturers from the previously chosen populations

5. Mailed questionnaires and additional materials to persons selected in the three sample groups

6. Sent a new letter of transmittal plus the contents of the initial mailing to nonrespondents

7. Sent a reminder letter to the nonrespondents

8. Sent a new letter of transmittal plus the questionnaires to nonrespondents for the second time

9. Determined usable responses from the questionnaires

10. Coded data and transferred them to data analysis sheets

11. Chose statistical procedures to be used in testing the hypotheses

12. Performed statistical analysis and tested hypotheses

13. Prepared tables and figures of results

14. Prepared final report of investigation

15. Concluded the study

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

INTRODUCTION

Data collected from questionnaires completed by twelve (N=12) Wholesalers, forty-four (N=44) Manufacturers, and sixty (N=60) Retailers were used to test twenty-four null hypotheses concerning the three groups' attitudes about their present small shipment service and their opinions about a new rate structure which was being proposed by the researcher. Figures computed for the three groups were compared with a Chi Square test for percentages and a Contingency Coefficient for nominal level data (frequencies).

The data and the analyses are presented in four different sections of this chapter. These four sections are: (1) response patterns; (2) characteristics of respondents; (3) the null hypotheses; and (4) ancillary findings. In the section devoted to the hypotheses, each null hypothesis tested is presented immediately preceding the table containing the statistical results of the testing.

RESPONSE PATTERNS

In this study, as in any study where mail questionnaires are used, failure to respond was a major problem. Questionnaires were mailed to twenty (N=20) Wholesalers, seventy

(N=70) Manufacturers, and one-hundred twenty (N=120) Retailers. Most of the participants contacted responded to the questionnaire. Some of the responses brought about a second problem however--the problem of unusable responses. Some respondents indicated that they had switched to private carriage for small shipments; some had gone out of business; some only partially completed the questionnaire; and still others responded but refused to complete the questionnaire. In spite of these problems, the minimum of fifty percent usable responses for each group of participants was obtained. Complete information concerning the response patterns of the three groups is presented in Table 4.1.

The data presented in Table 4.1 indicate that the three groups' response rates were as follows: (1) of the 20 Wholesalers contacted, 14 (70%) responded with 12 (60%) usable responses; (2) of the 70 Manufacturers contacted, 57 (81%) responded with 44 (63%) usable responses; (3) of the 120 Retailers contacted, 74 (62%) responded with 60 (50%) usable responses; and (4) of the 210 total participants chosen for the three sample groups 145 (69%) responded with 116 (55%) usable responses.

CHARACTERISTICS OF RESPONDENTS

Part of the data collected on the survey questionnaire was not intended to be used for testing the hypotheses. These data were simply collected as a means of determining the size and operating characteristics of the individual

TABLE 4.1

RESPONSE PATTERNS/RATES OF THE THREE GROUPS OF PARTICIPANTS TO THE FIRST, SECOND, AND THIRD MAILINGS OF THE SURVEY QUESTIONNAIRE

Groups	First Mailing			Second Mailing			Third Mailing			Total Usable Responses	Total Unusable Responses	GRAND TOTAL Responses
	Usable Responses	Unusable Responses	Reason for Unusability*	Usable Responses	Unusable Responses	Reason for Unusability*	Usable Responses	Unusable Responses	Reason for Unusability*			
WHOLE-SALERS	4	0	---	3	1	1 (1)	5	1	4 (1)	12	2	14
MANUFAC-TURERS	22	4	1 (3) 2 (1)	11	6	1 (2) 2 (1) 3 (1) 4 (2)	11	3	1 (1) 2 (1) 4 (1)	44	13	57
RETAILERS	22	6	1 (1) 2 (1) 3 (4)	20	4	1 (1) 2 (2) 4 (1)	18	4	1 (1) 2 (1) 3 (2)	60	14	74
TOTALS...	48	10	----	34	11	----	34	8	----	116	29	145

*Unusability Codes Are As Follows:

1 = Respondent refused to complete the questionnaire

2 = Questionnaire was only partially completed

3 = Respondent went out of business

4 = Respondent used private carrier for small shipments

firms represented. In particular, the researcher wanted to know the firms' annual sales volume, number of full time employees, the number of small shipments sent and/or received per day. The annual sales volume figures for the Wholesalers and Manufacturers are presented in Table 4.2, while the annual sales volume data for the Retailers are presented in Table 4.3. The number of shipments sent per day by the Wholesalers and Manufacturers is presented in Table 4.5 (Theoretically, Retailers do not ship but only receive materials). The number of shipments received per day by the three groups is shown in Table 4.6.

Summary of Respondent Characteristics

The data reported by the three groups show that eighty-three percent (83%) of the Wholesalers and Manufacturers had an annual sales volume between $250,000 and $2,000,000. On the other hand, the remaining seventeen percent (17%) of the Wholesalers had an annual sales volume of more than $50 million, while only twelve percent (12%) of the Manufacturers reported an annual sales volume over $50 million.

The Retailers responded to a different set of categories of annual sales volume since their sales volume is usually much less than that of Wholesalers and Manufacturers. Seventy-three percent (73%) showed an annual sales volume of less than $700,000. However, twenty-two percent (22%) showed an annual sales volume of more than $1,000,000.

TABLE 4.2

ANNUAL GROSS SALES VOLUME REPORTED BY THE WHOLESALERS AND MANUFACTURERS

SALES VOLUME CATEGORIES	WHOLESALERS		MANUFACTURERS	
	Number of Group	Percent of Group	Number of Group	Percent of Group
Less Than $250,000	0	0	0	0
$250,000--$1,000,000	2	17	14	32
$1,000,000--$5,000,000	4	33	13	30
$5,000,000--$20,000,000	4	33	9	21
$20,000,000--$50,000,000	0	0	2	5
More Than $50,000,000	2	17	5	12
TOTALS. . .	12	100	43*	100

*One (1) of the Manufacturers failed to complete this particular section of the questionnaire, thereby reducing the number of usable responses to 43 (N=43)

TABLE 4.3

ANNUAL GROSS SALES VOLUME REPORTED BY THE RETAILERS

SALES VOLUME CATEGORIES	RETAILERS	
	Number of Group	Percent of Group
Less Than $100,000	11	18
$100,001--$200,000	12	20
$200,001--$400,000	11	18
$400,001--$700,000	10	17
$700,001--$1,000,000	3	5
More Than $1,000,001	13	22
TOTALS. . .	60	100

TABLE 4.4

FREQUENCY DISTRIBUTION SHOWING THE TOTAL NUMBER OF COMPANY EMPLOYEES REPORTED BY THE WHOLESALERS, MANUFACTURERS AND RETAILERS

WHOLESALERS		MANUFACTURERS		RETAILERS	
Number of Employees	Number of Times Reported	Number of Employees	Number of Times Reported	Number of Employees	Number of Times Reported
8	2	12	1	1	2
10	1	20	1	2	5
20	1	22	2	3	3
22	1	26	1	4	6
31	1	30	5	5	5
Median		32	1	6	3
35	1	35	5	Median	
60	1	40	1	7	4
130	1	46	1	8	2
145	1	50	1	9	1
150	1	55	1	10	2
5,000	1	60	1	11	1
TOTAL . . . N=12		Median		14	1
		64	1	15	1
		65	1	20	1
		70	2	25	3
		75	1	28	1
		92	1	30	1
		100	1	38	1
		115	1	60	1
		125	2	80	1
		150	1	85	2
		180	1	95	1
		260	1	300	1
		275	1	350	1
		300	1	1,000	1
		415	1	TOTAL . . . N=51**	
		550	2		
		600	1		
		654	1		
		1,000	1		
		TOTAL. . . N=42*			

*Two (2) of the Manufacturers failed to complete this particular section of the questionnaire, thereby reducing the number of usable responses to forty two (N=42)

**Nine (9) of the Retailers failed to complete this particular section of the questionnaire, thereby reducing the number of usable responses to fifty one (N=51)

TABLE 4.5

FREQUENCY DISTRIBUTIONS SHOWING THE ESTIMATED NUMBER OF SHIPMENTS SENT (PER DAY) VIA COMMON MOTOR CARRIER AS REPORTED BY WHOLESALERS AND MANUFACTURERS

WHOLESALERS		MANUFACTURERS	
Number of Shipments Sent Per Day	Number of Times Reported	Number of Shipments Sent Per Day	Number of Times Reported
<1 Per Day	3	<1 Per Day	6
1 Per Day	2	1 Per Day	4
15 Per Day	3	2 Per Day	4
20 Per Day	2	3 Per Day	3
225 Per Day	1	4 Per Day	3
	11*	5 Per Day	6
		6 Per Day	3
		8 Per Day	2
		10 Per Day	3
		12 Per Day	1
		15 Per Day	2
		20 Per Day	2
		25 Per Day	1
		30 Per Day	2
		40 Per Day	1
			43**

*One of the Wholesalers failed to complete this particular section of the questionnaire thereby reducing the number of usable responses to eleven (N=11).

**One of the Manufacturers failed to complete this particular section of the questionnaire thereby reducing the number of usable responses to forty three (N=43).

TABLE 4.6

FREQUENCY DISTRIBUTIONS SHOWING THE ESTIMATED NUMBER OF SHIPMENTS RECEIVED (PER DAY) VIA COMMON MOTOR CARRIER AS REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS

WHOLESALERS		MANUFACTURERS		RETAILERS	
Number of Shipments Received Per Day	Number of Times Reported	Number of Shipments Received Per Day	Number of Times Reported	Number of Shipments Received Per Day	Number of Times Reported
<1 Per Day	1	<1 Per Day	3	<1 Per Day	12
1 Per Day	1	1 Per Day	5	1 Per Day	13
3 Per Day	1	2 Per Day	3	2 Per Day	12
5 Per Day	5	3 Per Day	7	3 Per Day	2
12 Per Day	1	4 Per Day	2	4 Per Day	3
15 Per Day	1	5 Per Day	9	4.5 Per Day	1
30 Per Day	1	6 Per Day	3	5 Per Day	1
125 Per Day	1	7 Per Day	1	6 Per Day	3
	12	10 Per Day	4	7 Per Day	2
		18 Per Day	1	8 Per Day	1
		25 Per Day	1	10 Per Day	2
		120 Per Day	1	20 Per Day	1
			40*		53**

*Four of the Manufacturers failed to complete this particular section of the questionnaire, thereby reducing the number of usable responses to forty (N=40).

**Seven of the Retailers failed to complete this particular section of the questionnaire, thereby reducing the number of usable responses to fifty three (N=53).

The number of company employees reported by the three groups varied greatly. The number ranged from a low of one (1) to a high of three thousand (3,000). The median number of employees shown in Table 4.4 was as follows: (1) Wholesalers--N=33; (2) Manufacturers--N=62; and (3) Retailers--N=6.5 employees. As expected, the Manufacturers had the greatest number of employees and the Retailers had the smallest number.

Concerning the number of small shipments sent per day, over ninety percent (90%) of the Wholesalers sent between one and twenty small shipments per day, while ninety-one percent (91%) of the Manufacturers sent between one and twenty (1-20) small shipments per day. However, nine percent (9%) of the Manufacturers made between twenty and forty (20-40) small shipments per day.

The receiving information shown in Table 4.6 indicates that most of the Wholesalers received about five (5) small shipments per day. The number of shipments received per day by the Manufacturers was slightly higher, and ranged from one to ten (1-10). The Retailers received the least number of small shipments per day of any group. More than two-thirds (68%) of the Retailers received less than four (4) small shipments per day.

After the researcher had examined the respondents' characteristics, the twenty-four null hypotheses were tested. The results of testing these hypotheses are presented in the following sections of the dissertation.

THE NULL HYPOTHESES

Testing the Hypotheses

Results of Testing Null Hypothesis Number One

The first null hypothesis concerning the company employee who handles transportation problems and decisions was tested as follows:

Ho_1 There is no statistically significant difference between the number of times each of the three groups chose the seven (7) employee categories in indicating the company employee who handles transportation problems and decisions for their particular company.

The first null hypothesis was tested by performing Chi Squares (X^2) among the group percentages found in each Company Employee category. Percentages were used in these and all ensuing calculations of Chi Square, since the wide variations among the numbers within each group would not allow a meaningful comparison of frequencies. The Groups' frequencies, percentages and results are presented in Table 4.7.

The results presented in Table 4.7 indicate that significant differences exist among the percentages computed for the three groups, and the first null hypothesis was rejected. The statistical results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 23.88$; df=6, $p < .00$
2. Wholesalers vs. Retailers: $X^2 = 52.33$; df=6, $p < .001$
3. Manufacturers vs. Retailers: $X^2 = 88.28$; df=6, $p < .001$

From these results it was concluded that the Shipping Clerk was the company employee who handled transportation problems and decisions most frequently for the Wholesalers,

TABLE 4.7

THE COMPANY EMPLOYEE WHO HANDLES TRANSPORTATION DECISIONS AND PROBLEMS AS REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS

The Company Employee Who Handles Transportation Decisions and Problems as ··rted by the 3 Groups	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
1. Shipping Clerk	22	19	3	28	16	37	3	5
2. Traffic/Physical Distribution Manager	18	16	2	18	11	25	5	8
3. Production Manager	5	4	0	0	4	9	1	2
4. Marketing/Sales Manager	11	10	1	9	5	11	5	8
5. Purchasing Agent	9	8	1	9	1	2	7	12
6. Company President/Owner	41	35	2	18	3	7	36	60
7. Other (Specify)	9	8	2*	18	4**	9	3***	5
TOTALS. . .	115****	100	11****	100	44	100	60	100

*The two "Others" reported by the Wholesalers were (1) Warehouse Foreman and (2) Operating Manager

**The four "Others" reported by the Manufacturers were (1) Manager of Shipping and Receiving, (2) Company Secretary, (3) Parts Manager, and (4) Plant Manager

***The three "Others" reported by the Retailers were (1) Office Manager, (2) Parts Manager, and (3) Warehouse Manager

****One (1) of the Whole alers failed to complete this particular section of the questionnaire, thereby reducing the number of usable responses to 11 (N=11)

while the Manufacturers indicated the Shipping Clerk and Traffic/Physical Distribution Manager performed these tasks in their organizations more often than any other employee and the Retailers indicated that the Company President/ Owner made these decisions within their companies over sixty percent (60%) of the time. However, the biggest differences among the response patterns of the three groups was noted between the responses of the Retailers and the responses of the Wholesalers and Manufacturers.

Results of Testing Hypotheses Number Two and Three

The second and third null hypotheses concerning the weight (in pounds) and size (in number of packages sent per shipment) were tested as follows:

Ho_2 There is no statistically significant difference between the weight of shipments sent (in pounds) by the Wholesalers and the Weight of shipments sent by the Manufacturers.

Ho_3 There is no statistically significant difference between the size of the shipments sent (in number of packages sent per shipment) as reported by the Wholesalers and the size of shipments sent as reported by the Manufacturers.

The second and third null hypotheses were tested in conjunction with each other, since the data needed to test both was taken from the same questionnaire item. Chi Squares were performed between the percentages computed for each group in each of the Weight-in-Pounds and Number-of-Packages categories. The statistical results are presented in Table 4.8 along with the percentages for the

TABLE 4.8

SHIPPING INFORMATION REPORTED BY WHOLESALERS AND MANUFACTURERS CONCERNING THE NUMBER AND SIZE OF SHIPMENTS MADE

COMBINED GROUPS				WHOLESALERS*				MANUFACTURERS**			
Size of Shipments		Number of Shipments		Size of Shipments		Number of Shipments		Size of Shipments		Number of Shipments	
Weight in Pounds	Percent of Shipments	Number of Packages	Percent of Shipments	Weight in Pounds	Percent of Shipments	Number of Packages	Percent of Shipments	Weight in Pounds	Percent of Shipments	Number of Packages	Percent of Shipments
0-250	48	1-5	56	0-250	53	1-5	49	0-250	43	1-5	62
251-500	23	6-10	14	251-500	33	6-10	14	251-500	12	6-10	14
501-1,000	9	11-50	17	501-1,000	11	11-50	23	501-1,000	7	11-50	10
1,001-5,000	6	51-100	3	1,001-5,000	3	51-100	3	1,001-5,000	9	51-100	4
5,001-10,000	3	101-500	7	5,001-10,000	0	101-500	11	5,001-10,000	6	101-500	4
Over 10,000	11	Over 500	3	Over 10,000	0	Over 500	0	Over 10,000	23	Over 500	6
TOTALS. . .	100		100		100		100		100		100

*Two (2) of the Wholesalers failed to complete this particular section of the questionnaire, thereby reducing the number of usable responses to ten (N=10).

**One (1) of the Manufacturers failed to complete this particular section of the questionnaire, thereby reducing the number of usable responses to forty three (N=43). However, four (4) of the remaining number failed to report the number of packages sent per shipment and the number of usable reponses was further reduced to thirty nine (N=39).

Wholesalers, Manufacturers and the combined groups.

The results presented in Table 4.8 indicate that a significant difference exists between the weight categories chosen by the two groups, and the second null hypothesis was rejected ($X^2 = 43.75$; df=5, $p < .0001$). It was concluded that more than half (53 percent) of the shipments sent by the Wholesalers weighed less than 250 lbs. On the other hand, twenty-three percent (23%) of the shipments made by the Manufacturers weighed more than 10,000 lbs.

The results of testing hypothesis number three, presented in Table 4.8, indicate that a significant difference exists between the size categories chosen by the two groups, and the third null hypothesis was rejected ($X^2 = 16.05$; df=5, $p < .01$). It was concluded from the data presented in the Table that almost two-thirds (62 percent) of the shipments sent by the Manufacturers contained less than five packages. However, shipments of this size comprised less than half (49 percent) of the total shipments tendered by the Wholesalers. These were the primary differences among the responses of the two groups.

Results of Testing Null Hypothesis Number Four

The fourth null hypothesis concerning the number of shipments sent per month by the Wholesalers and Manufacturers was tested as follows:

Ho_4 There is no statistically significant difference between the number of shipments sent per month by the Wholesalers and the number of shipments sent per month by the Manufacturers.

The fourth null hypothesis was tested by performing a Chi Square test between the percentages computed for each group in the number-of-shipments-sent categories. The results of these statistical calculations are presented in Table 4.9 along with the number and percentage of each groups' responses for each of the categories.

The results presented in Table 4.9 indicate that there was a significant difference between the number of packages sent per month by the two groups of shippers, and the fourth null hypothesis was rejected ($X^2 = 39.81$; df=5, $p < .001$). It was concluded that one-half (50 percent) of the Wholesalers made more than 150 shipments per month, while only thirty-five percent (35%) of the Manufacturers made this many shipments per month.

Results of Testing Null Hypothesis Number Five

The fifth null hypothesis concerning the percent of outgoing shipping expenses being paid by the sender was tested as follows:

Ho_5 There is no statistically significant difference between the percent of outgoing shipping expenses being paid by the Wholesalers and the percent of outgoing shipping expenses being paid by the Manufacturers.

The fifth null hypothesis was tested by performing a Chi Square test between the percentages computed for each group in the four response categories. The results of these statistical calculations are presented in Table 4.10 along with the numbers and percentages computed for the combined groups and for each group individually.

TABLE 4.9

SHIPPING INFORMATION REPORTED BY WHOLESALERS AND MANUFACTURERS CONCERNING THE NUMBER OF SHIPMENTS MADE PER MONTH

NUMBER OF SHIPMENTS MADE PER MONTH	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
0--10 Shipments	8	14	3	25	5	11
11--20 Shipments	10	18	2	17	8	18
21--40 Shipments	3	5	1	8	2	5
41--80 Shipments	5	9	0	0	5	11
81--150 Shipments	9	16	0	0	9	20
Over 150 Shipments	21	38	6	50	15	35
TOTALS	56	100	12	100	44	100

TABLE 4.10

SHIPPING INFORMATION REPORTED BY WHOLESALERS AND MANUFACTURERS CONCERNING THE PAYMENT OF FREIGHT CHARGES ON OUTGOING SHIPMENTS

Percent of OUTGOING Shipments Having Freight Prepaid by the Shipper	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
0--25 Percent	28	50	6	50	22	50
26--50 Percent	9	16	2	17	7	16
51--75 Percent	4	7	1	8	3	7
76--100 Percent	15	27	3	25	12	27
TOTALS	56	100	12	100	44	100

The results presented in Table 4.10 indicate that there was not a significant difference between the percent of outgoing shipments having the freight prepaid by the Wholesalers and the percent of outgoing shipments having the freight prepaid by the Manufacturers ($X^2 = 0.174$; df=3, $p < .05$). A close inspection of the percentages computed for the two groups will indicate that they are almost identical. It is of particular importance to note that one-half (50 percent) of the companies prepay the freight on small shipments.

Results of Testing Null Hypotheses Number Six and Seven

The sixth and seventh null hypotheses concerning the weight (in pounds) and size (in number of packages received per shipment) were tested as follows:

Ho_6 There is no statistically significant differences among the weights (in pounds) of shipments received as reported by the Wholesalers and the weights of shipments received as reported by the Manufacturers and Retailers.

Ho_7 There is no statistically significant differences among the sizes (in number of packages per shipment) of shipments received as reported by the Wholesalers and the size of the shipments received as reported by the Manufacturers and Retailers.

Hypotheses number six and seven are expanded versions of hypotheses number two and three, and were treated in much the same way statistically. They were tested in conjunction with each other since the information needed to test both was taken from the same questionnaire item. Chi Squares were performed among the percentages computed for

each of the groups in each of the Weight-in-Pounds and Number-of-Packages categories. The statistical results of these calculations are presented in Table 4.11 along with the numbers and percentages for each group and for all groups combined.

Concerning hypothesis number six, the results presented in Table 4.11 indicate that significant differences exist among the weights of shipments received by the three groups of participants. The statistical results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 12.29$; df=5, $p < .05$
2. Wholesalers vs. Retailers: $X^2 = 33.26$; df=4, $p < .001$
3. Manufacturers vs. Retailers: $X^2 = 18.25$; df=5, $p < .01$

These results allowed the researcher to reject the sixth null hypothesis and conclude that the biggest differences were noted between the Wholesalers (only 27 percent of the shipments received were in the 0-250 pound category) and the Retailers (over 67 percent of the shipments received were in the 0-250 pound category).

Concerning hypothesis number seven, the results presented in Table 4.11 indicate that two of the three comparisons made among the Number-of-Packages categories were significant, and the seventh null hypothesis was rejected. The statistical results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 21.45$; df=4, $p < .001$
2. Wholesalers vs. Retailers: $X^2 = 28.07$; df=4, $p < .001$
3. Manufacturers vs. Retailers: $X^2 = 1.05$; df=4, $p > .05$

TABLE 4.11

RECEIVING INFORMATION CONCERNING THE WEIGHT (POUNDS) AND SIZE (NUMBER OF PACKAGES PER SHIPMENT) OF SMALL SHIPMENTS RECEIVED AS REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS

COMBINED GROUPS (N=116)				WHOLESALERS (N=12)				MANUFACTURERS (N=44)*				RETAILERS (N=60)**			
Size of Shipments		Number of Shipments		Size of Shipments		Number of Shipments		Size of Shipments		Number of Shipments		Size of Shipments		Number of Shipments	
Weight in Pounds	Percent of Shipments	Number of Packages	Percent of Shipments	Weight in Pounds	Percent of Shipments	Number of Packages	Percent of Shipments	Weight in Pounds	Percent of Shipments	Number of Packages	Percent of Shipments	Weight in Pounds	Percent of Shipments	Number of Packages	Percent of Shipments
0-250	47	1-5	43	0-250	27	1-5	24	0-250	46	1-5	49	0-250	67	1-5	55
251-500	19	6-10	21	251-500	28	6-10	24	251-500	14	6-10	21	251-500	16	6-10	17
501-1,000	13	11-50	15	501-1,000	18	11-50	13	501-1,000	14	11-50	16	501-1,000	8	11-50	16
1,001-5,000	12	51-100	10	1,001-5,000	16	51-100	17	1,001-5,000	14	51-100	8	1,001-5,000	6	51-100	6
5,001-10,000	8	101-500	11	5,001-10,000	11	101-500	22	5,001-10,000	10	101-500	6	5,001-10,000	3	101-500	6
Over 10,000	1	Over 500	0	Over 10,000	0	Over 500	0	Over 10,000	2	Over 500	0	Over 10,000	0	Over 500	0
TOTALS. . .	100		100		100		100		100		100		100		100

*Two (2) of the Manufacturers failed to complete the Weight-in-Pounds section of the questionnaire, thereby reducing the number of usable responses for determining the weight of shipments received to forty two (N=42). In addition, three (3) of the remaining number failed to complete the Number-of-Packages section of the questionnaire, thereby further reducing the remaining number of usable responses for determining the size of shipments received from forty two to thirty nine (N=39).

**Five (5) of the Retailers failed to complete the Weight-in-Pounds section of the questionnaire, thereby reducing the number of usable responses for determining the weight of shipments recieved to fifty five (N=55). In addition, one (1) of the remaining number failed to complete the Number-of-Packages section of the questionnaire, thereby further reducing the remaining number of usable responses for determining the size of shipments received from fifty five to fifty four (N=54).

These results led to the conclusion that the biggest differences were between the Wholesalers and Retailers. Twenty-four percent (24%) of the shipments received by the Wholesalers were in the 1-5 packages category. On the other hand, fifty-five percent (55%) of the shipments received by the Retailers were in the 1-5 packages category.

Results of Testing Null Hypothesis Number Eight

The eighth null hypothesis concerning the number of shipments received per month by the three groups was tested as follows:

Ho_8 There is no statistically significant differences among the numbers of shipments received per month by the Wholesalers and the number of shipments received per month by the Manufacturers and Retailers.

The eighth null hypothesis was tested by performing Chi Square tests among the percentages computed for the three groups in each of the four Percent-of-Shipments categories. The numbers and percentages for all three groups combined and for each group individually are presented in Table 4.12 along with the statistical results of the calculations.

The results presented in Table 4.12 indicate that there were significant differences among the numbers of small shipments received per month by the three groups of receivers, and the eighth null hypothesis was rejected. The statistical results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 33.01$; df=3, $p < .001$

TABLE 4.12

RECEIVING INFORMATION REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS CONCERNING THE NUMBER OF SHIPMENTS RECEIVED PER MONTH

NUMBER OF SHIPMENTS RECEIVED PER MONTH	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
0--10 Shipments	16	14	1	8	2	3	13	22
11--20 Shipments	18	16	0	0	6	14	12	20
21--40 Shipments	20	17	1	8	6	14	13	22
41--80 Shipments	20	17	1	8	10	23	9	15
81--150 Shipments	24	20	4	33	10	23	10	16
Over 150 Shipments	18	16	5	43	10	23	3	5
TOTALS	116	100	12	100	44	100	60	100

2. Wholesalers vs. Retailers: $X^2 = 71.18$; df=3, $p < .001$
3. Manufacturers vs. Retailers: $X^2 = 31.79$; df=3, $p < .001$

From these results it was concluded that the most significant difference was between the percentages of the Wholesalers and the percentages of the Retailers. Forty-three percent (43%) of the Wholesalers received more than 150 small shipments per month. On the other hand, only five percent (5%) of the Retailers received more than 150 small shipments per month.

Results of Testing Null Hypothesis Number Nine

The ninth null hypothesis concerning the percent of incoming shipping expenses paid by the three groups was tested as follows:

Ho_9 There is no statistically significant differences among the percent of incoming shipping expenses being paid by the Wholesalers and the percent of incoming shipping expenses being paid by the Manufacturers and Retailers.

The ninth null hypothesis was tested by performing Chi Square tests among the percentages computed for each of the three groups in the four response categories of Table 4.13. The results of the statistical calculations are presented in Table 4.13 along with the numbers and percentages computed for each group and for the three groups combined.

The statistical results indicate that significant differences exist among the percentages computed for the three groups, and the ninth null hypothesis was rejected. The statistical results were as follows:

TABLE 4.13

RECEIVING INFORMATION REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS CONCERNING THE PAYMENT OF FREIGHT CHARGES ON INCOMING SHIPMENTS (PERCENTAGES)

Percent of INCOMING Shipments Having the Shipping Charges Paid by the Receiver	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
0--25 Percent	33	28	5	42	13	29	15	25
26--50 Percent	15	13	3	25	7	16	5	8
51--75 Percent	19	17	1	8	10	23	8	13
76--100 Percent	49	42	3	25	14	32	32	54
TOTALS	116	100	12	100	44	100	60	100

1. Wholesalers vs. Manufacturers: $X^2 = 12.47$; df=3, $p < .01$
2. Wholesalers vs. Retailers: $X^2 = 24.91$; df=3, $p < .001$
3. Manufacturers vs. Retailers: $X^2 = 11.37$; df=3, $p < .05$

These results led to the conclusion that the biggest differences were between the Wholesalers (only twenty-five percent paid all the freight charges on incoming shipments) and the Retailers (fifty-four percent of the Retailers paid all freight charges on incoming shipments).

Results of Testing Null Hypothesis Number Ten

The tenth null hypothesis concerning the weight (in pounds) of a "Small Shipment" was tested as follows:

Ho_{10} There is no statistically significant differences among the weight categories chosen by the Wholesalers as being indicative of a "Small Shipment" and the weight categories chosen by the Manufacturers and Retailers as being indicative of a "Small Shipment."

The tenth null hypothesis was tested by performing Chi Square tests among the percentages of each group who had chosen the various weight categories in defining a "Small Shipment." The results of these statistical calculations are presented in Table 4.14 along with the numbers and percentages of each group and the numbers and percentages computed for the three groups combined.

The statistical results indicate that significant differences exist among the percentages computed for two of the three groups, and the tenth null hypothesis was rejected. The statistical results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 17.43$; df=5, $p < .01$

TABLE 4.14

"SMALL SHIPMENTS" DEFINED IN TERMS OF WEIGHT CATEGORIES BY WHOLESALERS, MANUFACTURERS AND RETAILERS

WEIGHT CATEGORIES FOR SMALL SHIPMENTS	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
0--250 lbs.	77	66	8	67	25	57	44	72
0--500 lbs.	22	19	3	25	9	20	10	17
0--1,000 lbs.	8	7	0	0	4	9	4	7
0--1,500 lbs.	2	2	0	0	1	2	1	2
0--5,000 lbs.	5	4	1	8	3	7	1	2
0--10,000 lbs.	2	2	0	0	2	5	0	0
TOTALS	116	100	12	100	44	100	60	100

2. Wholesalers vs. Retailers: $X^2 = 14.30$; df=4, $p < .01$

3. Manufacturers vs. Retailers: $X^2 = 10.02$; df=5, $p < .05$

These results led to the conclusion that the biggest differences among the definitions of a "Small Shipment" were between the Wholesalers and the Manufacturers. Sixty-seven percent (67%) of the Wholesalers felt that 0-250 pounds should be considered a small shipment, while only fifty-seven percent (57%) of the Manufacturers held this opinion.

Results of Testing Null Hypothesis Number Eleven

The eleventh null hypothesis concerning the amount of satisfaction/dissatisfaction with small shipment services as expressed by the three groups was tested as follows:

Ho_{11} There is no statistically significant differences among the amount of satisfaction/dissatisfaction with small shipments services as expressed by the Wholesalers and the amount of satisfaction/dissatisfaction with small shipment services expressed by the Manufacturers and Retailers.

The eleventh null hypothesis was tested by performing a Chi Square test among the percentages of each group who had chosen the various categories of Satisfaction/Dissatisfaction in expressing their opinion of their small shipment services. The results of these statistical calculations are presented in Table 4.15 along with the numbers and percentages computed for the three groups combined and the numbers and percentages computed for the three individual groups.

TABLE 4.15

DEGREE OF SATISFACTION/DISSATISFACTION WITH SMALL SHIPMENT SERVICE AS EXPRESSED BY WHOLESALERS, MANUFACTURERS AND RETAILERS

CATEGORIES OF SATISFACTION/ DISSATISFACTION	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
1. Strongly Satisfied (5)	1	1	0	0	0	0	1	2
2. Satisfied (4)	56	48	6	50	22	50	28	46
3. Uncertain (3)	23	20	2	17	9	20	12	20
4. Dissatisfied (2)	29	25	3	25	11	25	15	25
5. Strongly Dissatisfied (1)	7	6	1	8	2	5	4	7
TOTALS	116	100	12	100	44	100	60	100
Satisfaction/Dissatisfaction Rating Indices* . .		313		309		316		303

*Satisfaction/Dissatisfaction Rating Indices were computed by multiplying the rating scale values (1 through 5) by the percent of the group who chose each particular point of satisfaction/dissatisfaction on the rating continuum. The resulting products were then summed in order to determine the final Satisfaction/Dissatisfaction Rating Indices. The highest possible value was 500 (5 x 100% = 500), while the lowest possible value was 100 (1 x 100% = 100).

The statistical results indicate that there were no significant differences among the percentages computed for the three groups, and the eleventh null hypothesis could not be rejected. The actual statistical results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 0.94$; df=3, $p > .05$
2. Wholesalers vs. Retailers: $X^2 = 2.48$; df=4, $p > .05$
3. Manufacturers vs. Retailers: $X^2 = 2.50$; df=4, $p > .05$

These results and the Satisfaction/Dissatisfaction Rating Indices shown in Table 4.15 led to the conclusion that the three groups were more satisfied than dissatisfied with their small shipment services.

Results of Testing Null Hypothesis Number Twelve

The twelfth null hypothesis concerning seven problem areas often encountered in small shipment services was tested as follows:

Ho_{12} There is no statistically significant differences among the importance ratings Wholesalers give to seven (7) small shipment problem areas and the importance ratings Manufacturers and Retailers give to these same small shipment problem areas.

The twelfth null hypothesis was tested by computing a Chi Square tests among the Total Rating Indices computed for each of the problem areas as rated by each of the three groups of participants. These Total Rating Indices, shown in Table 4.16, were reduced to a common metric system thereby making the rating indices comparable for all groups combined or for each individual group. The results of the

TABLE 4.16

PROBLEM IMPORTANCE RATINGS GIVEN TO SEVEN SMALL-SHIPMENT PROBLEM AREAS AS REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS

SMALL SHIPMENT PROBLEM AREAS BEING RATED	COMBINED GROUPS				WHOLESALERS				MANUFACTURERS				RETAILERS			
	Number and Rank of Ratings Mode			Total Rating Indices* for Problem Areas	Number and Rank of Ratings Mode			Total Rating Indices* for Problem Areas	Number and Rank of Ratings Mode			Total Rating Indices* for Problem Areas	Number and Rank of Ratings Mode			Total Rating Indices* for Problem Areas
	1st	2nd	3rd		1st	2nd	3rd		1st	2nd	3rd		1st	2nd	3rd	
1. Shipping Rates	30	32	27	181	3	2	4	164	9	13	12	171	18	17	11	191
2. Pickup Service	14	12	12	78	2	2	3	126	12	5	5	134	0	5	4	27
3. Delivery Service	16	14	13	89	0	1	0	19	1	0	1	11	15	13	12	160
4. Interline Problems	14	18	16	94	3	2	1	135	8	12	7	145	3	4	8	48
5. Abandonment or Loss of Service	5	13	13	54	1	1	1	58	2	6	7	66	2	6	5	44
6. Loss and/or Damage to Freight	33	27	31	184	3	4	3	193	9	8	12	145	21	15	16	211
7. Other Shipping Problems (Please Specify)	4	0	0	12	0	0	0	0	3**	0	0	24	1***	0	0	6
TOTALS.	116	116	112		12	12	12		44	44	44		60	60	56****	

**The three "Others" reported by the Manufacturers were (1) Tracing Information, (2) Time in Transit, and (3) Time in Transit

***The one "Others" reported by the Retailers was (1) Routing of Express

*The Problem Importance Indices were computed by giving weights to the different ratings. Number one ratings were given a value of three (3); number two ratings were given a value of two (2); and number three ratings were given a value of one (1). These weights were then multiplied by the percentages of each group who chose that particular problem. The resulting products were then summed to determine the Problem Importance Index for each problem.

****Four (4) of the Retailers failed to make a third rating, thus reducing the number of third ratings made by that group to fifty six (N=56).

statistical calculations are presented in Table 4.16 along with the number of first, second, and third rankings made by each group for each problem area. These statistical calculations were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 4.41$; df=6, $p > .05$
2. Wholesalers vs. Retailers: $X^2 = 31.57$; df=6, $p < .001$
3. Manufacturers vs. Retailers: $X^2 = 38.12$; df=6, $p < .001$

These results allowed the researcher to reject the twelfth null hypothesis and conclude that the biggest differences were between the Manufacturers and Retailers rankings. This was especially true concerning the Delivery Service problems. This can be explained easily in light of the fact that most of the Retailers contact with small shipment service is via deliveries.

Results of Testing Null Hypothesis Number Thirteen

The thirteenth null hypothesis concerning the Wholesalers' and Manufacturers' reactions to the proposed rate structure was tested as follows:

Ho_{13} There is no statistically significant difference between the Wholesalers' reactions to the proposed rate structure and the Manufacturers' reactions to the proposed rate structure.

The thirteenth null hypothesis was tested by computing a Chi Square test between the percentages of the Wholesalers and Manufacturers who had chosen the various categories of Acceptance/Rejection concerning the shippers' reaction to the proposed rate structure. The numbers and percentages of each group, the Acceptance/Rejection Rating

TABLE 4.17

THE SHIPPERS' REACTIONS TO THE PROPOSED RATE STRUCTURE AS REPORTED BY WHOLESALERS AND MANUFACTURERS

REACTION CATEGORIES MARKED BY SHIPPERS	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
1. I Would Strongly Accept (5)	5	9	1	9	4	9
2. I Would Accept (4)	23	41	4	33	19	43
3. I Would Be Uncertain (3)	19	34	4	33	15	34
4. I Would Reject (2)	7	12	3	25	4	9
5. I Would Strongly Reject (1)	2	4	0	0	2	5
TOTALS	56	100	12	100	44	100
Acceptance/Rejection Rating Indices. . .		339		326		342

*Acceptance/Rejection Rating Indices were computed by multiplying the rating scale values (1 through 5) by the percent of the group who chose each particular point of acceptance/rejection on the rating continuum. The resulting products were then summed in order to determine the final Acceptance/Rejection Rating Indices. The highest possible value was 500 (5 x 100% = 500), while the lowest possible value was 100 (1 x 100% = 100).

Indices, and the results of the statistical calculations are presented in Table 4.17.

The results indicate that the differences between the percentages computed for the two groups was significant, and the null hypothesis number thirteen was rejected (X^2 = 13.86; df=4, $p < .01$). A comparison of the data presented for the two groups shows that while the reactions of both groups was generally favorable overall, the Manufacturers gave a more favorable response (Rating Index of 342/500) than the Wholesalers (Rating Index of 326/500).

Results of Testing Null Hypothesis Number Fourteen

The fourteenth null hypothesis concerning the usefulness of the proposed rate structure to Shippers was tested as follows:

Ho_{14} There is no statistically significant difference between the degree of anticipated usefulness the Wholesalers (as Shippers) attach to the proposed rate structure and the degree of anticipated usefulness the Manufacturers (as Shippers) attach to the proposed rate structure.

The fourteenth null hypothesis was tested by computing a Chi Square test between the percentages computed for the two groups of shippers in the various percent-of-usefulness categories. The results of these calculations are presented in Table 4.18 along with the numbers and percentages of both the individual groups and the two groups combined.

The results shown in Table 4.18 show that there was a significant difference between the percentages computed for the two groups of shippers, and the null hypothesis number

TABLE 4.18

DEGREE OF ANTICIPATED USEFULNESS OF THE PROPOSED RATE STRUCTURE TO SHIPPERS
(WHOLESALERS AND MANUFACTURERS)

Percent of shipments being SENT to which the proposed rate structure could be advantageously applied	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
0-25 Percent	37	66	9	75	28	63
26-50 Percent	13	23	2	17	11	25
51-75 Percent	3	5	1	8	2	5
76-100 Percent	3	5	0	0	3	7
TOTALS	56	100	12	100	44	100

fourteen was rejected ($X^2 = 10.25$; df=3, $p < .05$). These results allowed the researcher to conclude that the Manufacturers anticipated that the proposed rate structure would be much more useful to them than it would be for the Wholesalers. However, for the most part both groups felt that the proposed rate structure could be advantageously applied to less than one-half of the shipments being sent at the present time.

Results of Testing Null Hypothesis Number Fifteen

The fifteenth null hypothesis concerning the Receivers' Acceptance/Rejection of the proposed rate structure was tested as follows:

Ho_{15} There is no statistically significant difference among the levels of Acceptance/Rejection of the proposed rate structure as reported by the Wholesalers (as Receivers) and the levels of Acceptance/Rejection of the proposed rate structure as reported by the Manufacturers and Retailers (as Receivers).

The fifteenth null hypothesis was tested by computing Chi Square tests among the percentages computed for the three groups as receivers. Each group had marked their Acceptance/Rejection of the proposed rate structure on a five-point continuum. The numbers and percentages of each group who chose each of the five rating points are presented in Table 4.19 along with the totals for the three groups combined and the statistical results of the calculations.

The three Chi Square results indicated that two of the three comparisons made were significant, and the fifteenth null hypothesis could be rejected. The statistical

TABLE 4.19

THE CONSIGNEES' (RECEIVERS') REACTIONS TO THE PROPOSED RATE STRUCTURE AS REPORTED BY THE WHOLESALERS, MANUFACTURERS AND RETAILERS

REACTION CATEGORIES MARKED BY RECEIVERS	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
1. I Would Strongly Accept (5)	6	5	0	0	3	7	3	5
2. I Would Accept (4)	48	41	5	42	21	47	22	37
3. I Would Be Uncertain (3)	46	40	5	42	15	34	26	43
4. I Would Reject (2)	11	10	2	16	3	7	6	10
5. I Would Strongly Reject (1)	5	4	0	0	2	5	3	5
TOTALS	116	100	12	100	44	100	60	100
Acceptance/Rejection Rating Indices . . .	333		326		344		327	

*Acceptance/Rejection Rating Indices were computed by multiplying the rating scale values (1 through 5) by the percent of the group who chose each particular point of acceptance/rejection on the rating continuum. The resulting products were then summed to determine the final Acceptance/Rejection Rating Indices. The highest possible value was 500 (5 x 100% = 500), while the lowest possible value was 100 (1 x 100% = 100).

results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 16.65$; df=4, $p < .01$
2. Wholesalers vs. Retailers: $X^2 = 9.69$; df=4, $p < .05$
3. Manufacturers vs. Retailers: $X^2 = 3.11$; df=4, $p > .05$

Even though the fifteenth null hypothesis was rejected, it should be noted that there was no significant difference between the Manufacturers and Retailers.

Results of Testing Null Hypothesis Number Sixteen

The sixteenth null hypothesis concerning the usefulness of the proposed rate structure to Receivers was tested as follows:

Ho_{16} There is no statistically significant differences among the "Usefulness-of-Program" percentages reported by the Wholesalers (concerning the proposed rate structure) and the "Usefulness-of-Program" percentages reported by the Manufacturers and Retailers for the same proposed rate structure.

The sixteenth null hypothesis was tested by computing Chi Square tests among the percentages computed for the three groups of receivers in the various percent-of-usefulness categories. The results of these calculations are presented in Table 4.20 along with the numbers and percentages of all three groups combined and for each of the individual groups.

The results shown in Table 4.20 show that there were significant differences among the percentages computed for the three groups of receivers, and the sixteenth null hypothesis was rejected. The actual statistical results were as follows:

TABLE 4.20

DEGREE OF ANTICIPATED USEFULNESS OF THE PROPOSED RATE STRUCTURE TO RECEIVERS (WHOLESALERS, MANUFACTURERS AND RETAILERS)

Percent of shipments being RECEIVED to which the proposed rate structure could be advantageously applied	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
0-25 Percent	87	75	10	83	27	61	50	83
26-50 Percent	17	15	2	17	11	25	4	7
51-75 Percent	8	7	0	0	4	9	4	7
76-100 Percent	4	3	0	0	2	5	2	3
TOTALS	116	100	12	100	44	100	60	100

1. Wholesalers vs. Manufacturers: $X^2 = 18.88$; df=3, $p < .001$
2. Wholesalers vs. Retailers: $X^2 = 14.17$; df=3, $p < .01$
3. Manufacturers vs. Retailers: $X^2 = 14.24$; df=3, $p < .01$

These results allowed the researcher to conclude that the largest differences were between the percentages computed for the Wholesalers and the Manufacturers. Eighty-three percent (83%) of the shipments received by the Wholesalers could be processed advantageously with the proposed rate structure. On the other hand, the Manufacturers indicated that the proposed rate structure could be advantageously applied to only sixty-one percent (61%) of their incoming shipments. It should be further noted that none of the Wholesalers felt that the proposed rate structure could be advantageously applied to more than fifty percent (50%) of their incoming shipments.

Results of Testing Null Hypothesis Number Seventeen

The seventeenth null hypothesis concerning the customers' Acceptance/Rejection of the proposed rate structure was tested as follows:

Ho_{17} There is no statistically significant difference between the "Customer-Acceptance-of-Program" percentages reported by the Wholesalers and the "Customer-Acceptance-of-Program" percentages reported by the Manufacturers (concerning the proposed rate structure).

The seventeenth null hypothesis was tested by computing a Chi Square test between the percentages of the Wholesalers and Manufacturers who had chosen the various categories of Acceptance/Rejection concerning the projected

customers' reactions to the proposed rate structure. The numbers and percentages of each group, the Acceptance/ Rejection Rating Indices, and the results of the statistical calculations are presented in Table 4.21.

The results indicate that the differences between the percentages computed for the two groups were significant, and the seventeenth null hypothesis was rejected ($X^2 = 37.75$; df=4, $p < .001$). A comparison of the data presented for the two groups indicates that while the reactions of both groups was highly favorable, the Wholesalers gave a more favorable projection of the customers' reactions (Rating Index of 342/500) than the Manufacturers (Rating Index of 336/500).

Results of Testing Null Hypothesis Number Eighteen

The eighteenth null hypothesis concerning the usefulness of the proposed rate structure to customers was tested as follows:

Ho_{18} There is no statistically significant difference between the "Usefulness-to-Customer" percentages reported by the Wholesalers (concerning the proposed rate structure) and the "Usefulness-to-Customer" percentages reported by the Manufacturers for the same rate structure.

The eighteenth null hypothesis was tested by computing a Chi Square test between the percentages computed for the two groups of shippers concerning the projected usefulness of the proposed rate structure to customers. The results of these calculations are presented in Table 4.22 along with the numbers and percentages for each group and the

TABLE 4.21

PROJECTED CUSTOMERS' REACTIONS TO THE PROPOSED RATE STRUCTURE AS REPORTED BY WHOLESALERS AND MANUFACTURERS

ACCEPTANCE/REJECTION CATEGORIES MARKED	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
1. They Would Strongly Accept (5)	2	4	0	0	2	5
2. They Would Accept (4)	26	47	8	67	18	42
3. They Would Be Uncertain (3)	18	33	1	8	17	39
4. They Would Reject (2)	8	14	3	25	5	12
5. They Would Strongly Reject (1)	1	2	0	0	1	2
TOTALS	55	100	12	100	43**	100
Acceptance/Rejection Rating Indices*. . .		337		342		336

*Acceptance/Rejection Rating Indices were computed by multiplying the rating scale values (1 through 5) by the percent of the group who chose each particular point of acceptance/rejection. The resulting products were then summed to determine the final Acceptance/Rejection Rating Index. The highest possible value was 500 (5 x 100% = 500), while the lowest possible value was 100 (1 x 100% = 100).

**One of the manufacturers failed to complete this section of the questionnaire, thereby reducing the number of usable responses to forty three (N=43).

TABLE 4.22

DEGREE OF ANTICIPATED USEFULNESS OF THE PROPOSED RATE STRUCTURE TO RECEIVING CUSTOMERS AS PROJECTED BY THE SHIPPERS (WHOLESALERS AND MANUFACTURERS)

Percent of shipments being RECEIVED by customers to which the proposed rate structure could be advantageously applied (Projected)	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
0-25 Percent	32	58	7	58	25	58
26-50 Percent	14	25	3	25	11	25
51-75 Percent	7	13	2	17	5	12
76-100 Percent	2	4	0	0	2	5
TOTALS	55	100	12	100	43*	100

*One of the manufacturers failed to complete this section of the questionnaire, thereby reducing the number of usable responses to forty-three (N=43)

numbers and percentages for both groups combined.

The statistical results presented in Table 4.22 show that there was not a significant difference between the percentages computed for the two groups of shippers, and the eighteenth null hypothesis could not be rejected (X^2 = 5.86; df=3, p $>$.05). These results allowed the researcher to conclude that over eighty percent (83%) of both groups felt the proposed rate structure could be applied to 0-50% of the shipments being received by their typical customers.

Results of Testing Null Hypothesis Number Nineteen

The nineteenth null hypothesis concerning a Flat-Charge-Per-Shipment pricing structure was tested as follows:

Ho_{19} There is no statistically significant difference among the Wholesalers' Agreement/Disagreement percentages concerning a Flat-Charge-Per-Shipment Pricing Structure and Manufacturers' and Retailers' Agreement/Disagreement percentages concerning that same issue.

The nineteenth null hypothesis was tested by computing Chi Square tests among the Acceptance/Rejection percentages calculated for the three groups concerning the issue of a "flat-charge-per-shipment pricing structure." The numbers and percentages of each group who chose each of the five rating points are presented in Table 4.23 along with the totals for the three groups combined and the statistical results of the calculations. The actual Chi Square results were as follows:

1. Wholesalers vs. Manufacturers: X^2 = 10.67; df=4, p $<$.05

TABLE 4.23

THE AMOUNT OF AGREEMENT/DISAGREEMENT REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS CONCERNING A FLAT-CHARGE-PER-SHIPMENT PRICING STRUCTURE

Questionnaire Statement Being Rated: "A flat charge per shipment for most shipments (excluding extraordinary items) would be workable when applied to your operating characteristics."

AGREEMENT/DISAGREEMENT RATING CATEGORIES	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
1. I Strongly Agree (5)	16	14	2	17	7	16	7	12
2. I Agree (4)	45	39	5	41	18	41	22	36
3. I Am Uncertain (3)	26	22	2	17	9	20	15	25
4. I Disagree (2)	22	19	1	8	8	18	13	22
5. I Strongly Disagree (1)	7	6	2	17	2	5	3	5
TOTALS. . .	116	100	12	100	44	100	60	100
Agreement/Disagreement Rating Indices*.		336		333		345		328

*Agreement/Disagreement Rating Indices were computed by multiplying the rating scale values (1 through 5) by the percent of the group who chose each particular point of agreement/disagreement on the rating continuum. The resulting products were then summed in order to determine the final Agreement/Disagreement Rating Index. The highest possible value was 500 (5 x 100% = 500), while the lowest possible value was 100 (1 x 100% = 100).

2. Wholesalers vs. Retailers: $X^2 = 15.79$; df=4, $p < .01$

3. Manufacturers vs. Retailers: $X^2 = 1.85$; df=4, $p > .05$

If should be noted that all groups made favorable responses toward the issue involved; Rating Index of Manufacturers-- 345/500; Rating Index of Wholesalers--333/500; Retailers--328/500.

Results of Testing Null Hypothesis Number Twenty

The twentieth null hypothesis concerning the amount of cost per shipment on small shipments was tested as follows:

Ho_{20} There is no statistically significant differences among the Wholesalers' Agreement/Disagreement percentages concerning the Amount of Cost Per Shipment and the Manufacturers' and Retailers' Agreement/Disagreement percentages concerning that same issue.

The twentieth null hypothesis was tested by computing Chi Square tests among the Acceptance/Rejection percentages calculated for the three groups concerning the "amount of cost per shipment on small shipments." The numbers and percentages of each group who chose each of the five rating points are presented in Table 4.24 along with the totals for the three groups combined and the statistical results of the calculations. The actual Chi Square results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 25.87$; df=4, $p < .001$

2. Wholesalers vs. Retailers: $X^2 = 4.73$; df=3, $p > .05$

3. Manufacturers vs. Retailers: $X^2 = 13.20$; df=4, $p < .05$

All three groups made highly favorable responses to the shipping issue being judged: Manufacturers--396/500;

TABLE 4.24

THE AMOUNT OF AGREEMENT/DISAGREEMENT REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS CONCERNING THE AMOUNT OF COST PER SHIPMENT

Questionnaire Statement Being Rated: "All shipments should cover the direct cost of providing the service and make some contribution to overhead."

AGREEMENT/DISAGREEMENT RATING CATEGORIES	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
1. I Strongly Agree (5)	23	20	2	17	11	25	10	17
2. I Agree (4)	71	61	7	58	26	59	38	63
3. I Am Uncertain (3)	15	13	3	25	2	5	10	17
4. I Disagree (2)	6	5	0	0	4	9	2	3
5. I Strongly Disagree (1)	1	1	0	0	1	2	0	0
TOTALS. . .	116	100	12	100	44	100	60	100
Agreement/Disagreement Rating Indices*.		394		392		396		394

*Agreement/Disagreement Rating Indices were computed by multiplying the rating scale values (1 through 5) by the percent of the group who chose each particular point of agreement/disagreement on the rating continuum. The resulting products were then summed in order to determine the final Agreement/Disagreement Rating Index. The highest possible value was 500 (5 x 100% = 500), while the lowest possible value was 100 (1 x 100% = 100).

Retailers--394/500; Wholesalers--392/500.

Results of Testing Null Hypothesis Number Twenty-One

The twenty-first null hypothesis concerning prepayment of small shipment freight costs was tested as follows:

Ho_{21} There is no statistically significant differences among the Wholesalers' Agreement/Disagreement percentages concerning the Prepayment of small Shipment Costs and the Manufacturers' and Retailers' Agreement/Disagreement percentages concerning that same issue.

The twenty-first null hypothesis was tested by computing Chi Square tests among the Acceptance/Rejection percentages calculated for the three groups concerning the issue of a "prepayment of small shipment freight costs." The numbers and percentages of each group who chose each of the five rating points are presented in Table 4.25 along with the totals for the three groups combined and the statistical results of the calculations. The actual Chi Square results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 29.87$; df=4, $p < .001$
2. Wholesalers vs. Retailers: $X^2 = 86.51$; df=4, $p < .0001$
3. Manufacturers vs. Retailers: $X^2 = 25.70$; df=4, $p < .001$

The twenty-first null hypothesis was rejected and it was concluded that significant differences existed among the percentages computed for the three groups of participants. It should be further noted that the differences noted above were quite obviously reflected in the Rating Indices of the three groups. These were: Retailers--349/500; Manufacturers--278/500; Wholesalers--182/500; Combined--306/500.

TABLE 4.25

THE AMOUNT OF AGREEMENT/DISAGREEMENT REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS CONCERNING THE PREPAYMENT OF SMALL SHIPMENT COSTS

Questionnaire Statement Being Rated: "Small shipment costs should be prepaid."

AGREEMENT/DISAGREEMENT RATING CATEGORIES	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
1. I Strongly Agree (5)	22	19	0	0	8	18	14	24
2. I Agree (4)	26	22	1	8	8	18	17	28
3. I Am Uncertain (3)	23	21	1	8	5	11	17	28
4. I Disagree (2)	26	22	5	42	13	30	8	13
5. I Strongly Disagree (1)	19	16	5	42	10	23	4	7
TOTALS. . .	116	100	12	100	44	100	60	100
Agreement/Disagreement Rating Indices*.		306		182		278		349

*Agreement/Disagreement Rating Indices were computed by multiplying the rating scale values (1 through 5) by the percent of the group who chose each particular point of agreement/disagreement on the rating continuum. The resulting products were then summed in order to determine the final Agreement/Disagreement Rating Index. The highest possible value was 500 (5 x 100% = 500), while the lowest possible value was 100 (1 x 100% = 100).

Results of Testing Null Hypothesis Number Twenty-Two

The twenty-second null hypothesis concerning the preparation of shipping documents by the sender was tested as follows:

Ho_{22} There is no statistically significant differences among the Wholesalers' Agreement/Disagreement percentages concerning the Preparation of Shipping Documents and the Manufacturers' and Retailers' Agreement/Disagreement percentages concerning that same issue.

The twenty-second null hypothesis was tested by computing Chi Square tests among the Acceptance/Rejection percentages calculated for the three groups concerning the issue of a "preparation of shipping documents by the sender." The numbers and percentages of each group who chose each of the five rating points are presented in Table 4.26 along with the totals for the three groups combined and the statistical results of the calculations. The actual Chi Square results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 13.49$; df=4, $p < .01$
2. Wholesalers vs. Retailers: $X^2 = 14.20$; df=4, $p < .01$
3. Manufacturers vs. Retailers: $X^2 = 5.67$; df=4, $p > .05$

The twenty-second null hypothesis was rejected and it was concluded that there were significant differences among the percentages computed for the three groups. It should be further noted that all groups made an extremely favorable overall rating of the issue. These ratings were as follows: Retailers--428/500; Manufacturers--404/500; Retailers--393/500.

TABLE 4.26

THE AMOUNT OF AGREEMENT/DISAGREEMENT REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS CONCERNING THE PREPARATION OF SHIPPING DOCUMENTS

Questionnaire Statement Being Rated: "The shipper should be responsible for shipping document preparation."

AGREEMENT/DISAGREEMENT RATING CATEGORIES	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
1. I Strongly Agree (5)	42	36	3	25	15	34	24	40
2. I Agree (4)	57	49	7	59	20	45	30	50
3. I Am Uncertain (3)	12	10	1	8	6	14	5	8
4. I Disagree (2)	3	3	0	0	2	5	1	2
5. I Strongly Disagree (1)	2	2	1	8	1	2	0	0
TOTALS. . .	116	100	12	100	44	100	60	100
Agreement/Disagreement Rating Indices*.		414		393		404		428

*Agreement/Disagreement Rating Indices were computed by multiplying the rating scale values (1 through 5) by the percent of the group who chose each particular point of agreement/disagreement on the rating continuum. The resulting products were then summed in order to determine the final Agreement/Disagreement Rating Index. The highest possible value was 500 (5 x 100% = 500), while the lowest possible value was 100 (1 x 100% = 100).

Results of Testing Null Hypothesis Number Twenty-Three

The twenty-third null hypothesis concerning a limitation of the liability on small shipments was tested as follows:

Ho_{23} There is no statistically significant differences among the Wholesalers' Agreement/Disagreement percentages concerning a Limitation of Liability on Small Shipments and Manufacturers' and Retailers' Agreement/Disagreement percentages concerning that same issue.

The twenty-third null hypothesis was tested by computing Chi Square tests among the Acceptance/Rejection percentages calculated for the three groups concerning the issue of a "limitation of the liability on small shipments." The numbers and percentages of each group who chose each of the five rating points are presented in Table 4.27 along with the totals for the three groups combined and the statistical results of the calculations. The actual Chi Square results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 6.92$; $df=4, p > .05$
2. Wholesalers vs. Retailers: $X^2 = 11.09$; $df=4, p < .05$
3. Manufacturers vs. Retailers: $X^2 = 3.36$; $df=4, p > .05$

The twenty-third null hypothesis could not be rejected, and it was concluded that there were no significant differences among the percentages computed for the three groups. It should be further noted that all groups gave a generally disfavorable rating to the issue involved. These ratings were as follows: Manufacturers-269/500; Retailers-254/500; Wholesalers-250/500.

TABLE 4.27

THE AMOUNT OF AGREEMENT/DISAGREEMENT REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS CONCERNING A SET LIMITATION ON SMALL SHIPMENT LIABILITY

Questionnaire Statement Being Rated: "There should be a limitation of liability on small shipments."

AGREEMENT/DISAGREEMENT RATING CATEGORIES	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
1. I Strongly Agree (5)	6	5	0	0	2	4	4	7
2. I Agree (4)	24	21	3	25	11	25	10	17
3. I Am Uncertain (3)	25	21	3	25	10	23	12	20
4. I Disagree (2)	38	33	3	25	14	32	21	35
5. I Strongly Disagree (1)	23	20	3	25	7	16	13	21
TOTALS. . .	116	100	12	100	44	100	60	100
Agreement/Disagreement Rating Indices*.		258		250		269		254

*Agreement/Disagreement Rating Indices were computed by multiplying the rating scale values (1 through 5) by the percent of the group who chose each particular point of agreement/disagreement on the rating continuum. The resulting products were then summed in order to determine the final Agreement/Disagreement Rating Index. The highest possible value was 500 (5 x 100% = 500), while the lowest possible value was 100 (1 x 100% = 100).

Results of Testing Null Hypothesis Number Twenty-Four

The twenty-fourth null hypothesis concerning a plan of reduced rates for multiple shipments tendered was tested as follows:

Ho_{24} There is no statistically significant differences among the Wholesalers' Agreement/Disagreement percentages concerning a Plan of Reduced Rates for Multiple Shipments Tendered and Manufacturers' and Retailers' Agreement/Disagreement percentages concerning that same issue.

The twenty-fourth null hypothesis was tested by computing Chi Square tests among the Acceptance/Rejection percentages calculated for the three groups concerning the issue of a "plan of reduced rates for multiple shipments tendered." The numbers and percentages of each group who chose each of the five rating points are presented in Table 4.28 along with the totals for the three groups combined and the statistical results of the calculations. The actual Chi Square results were as follows:

1. Wholesalers vs. Manufacturers: $X^2 = 12.60$; $df=4, p < .05$
2. Wholesalers vs. Retailers: $X^2 = 8.43$; $df=4$, $p > .05$
3. Manufacturers vs. Retailers: $X^2 = 2.89$; $df=4$, $p > .05$

The twenty-fourth null hypothesis could not be rejected, and it was concluded that there were no significant differences among the percentages computed for the three groups. It should be noted, however, that all groups gave a highly favorable rating to the issue involved. These ratings were as follows: Manufacturers--402/500; Wholesalers--401/500; Retailers--399/500.

TABLE 4.28

THE AMOUNT OF AGREEMENT/DISAGREEMENT REPORTED BY WHOLESALERS, MANUFACTURERS AND RETAILERS CONCERNING A POLICY OF REDUCED RATES FOR MULTIPLE SHIPMENTS

Questionnaire Statement Being Rated: "There should be reduced rates per shipment when multiple shipments are tendered."

AGREEMENT/DISAGREEMENT RATING CATEGORIES	COMBINED GROUPS		WHOLESALERS (ONLY)		MANUFACTURERS (ONLY)		RETAILERS (ONLY)	
	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group	Number of Group	Percent of Group
1. I Strongly Agree (5)	36	31	3	25	16	36	17	28
2. I Agree (4)	54	47	7	59	17	39	30	50
3. I Am Uncertain (3)	19	16	1	8	8	18	10	17
4. I Disagree (2)	5	4	1	8	2	5	2	3
5. I Strongly Disagree (1)	2	2	0	0	1	2	1	2
TOTALS. . .	116	100	12	100	44	100	60	100
Agreement/Disagreement Rating Indices*.		401		401		402		399

*Agreement/Disagreement Rating Indices were computed by multiplying the rating scale values (1 through 5) by the percent of the group who chose each particular point of agreement/disagreement on the rating continuum. The resulting products were then summed in order to determine the final Agreement/Disagreement Rating Index. The highest possible value was 500 (5 x 100% = 500), while the lowest possible value was 100 (1 x 100% = 100).

Summary of Results

The twenty-four null hypotheses consume considerable time and space in their presentation. It is quite difficult to envision the overall results of the study unless they can be summarized in a meaningful way. Such a summary has been prepared and presented in Table 4.29. This table contains the essence of the twenty-four null hypotheses tested and the decision made after the results had been calculated. It should be kept in mind that in all hypothesis testing procedures comparisons were being made between the shippers (Wholesalers and Manufacturers) or among the receivers (Wholesalers, Manufacturers, and Retailers). When the shippers were being compared, only one comparison was necessary. However, when the receivers were being compared, it was necessary to make three contrasts in order to compare all three groups.

Table 4.29 shows that only five (5) of the twenty-four null hypotheses could <u>not</u> be rejected. Each of these tables should be examined carefully to determine the reason for the similarity and/or differences of the percentages computed for the groups involved in the comparisons. In each case, the reader should note which groups gave the most similar responses and which groups made the most dissimilar responses. The self interests of each group are strongly evident in their response patterns.

TABLE 4.29

SUMMARY TABLE OF RESULTS DERIVED FROM TESTING THE TWENTY-FOUR NULL HYPOTHESES

HYPOTHESIS NUMBER	ESSENCE OF THE NULL HYPOTHESIS BEING TESTED	DECISION
Ho_1	A comparison of the company employees from each group who handle transportation problems and decisions	Null was rejected
Ho_2	A comparison of the weight of shipments SENT by Wholesalers and Manufacturers	Null was rejected
Ho_3	A comparison of the size of shipments SENT by the Wholesalers and Manufacturers	Null was rejected
Ho_4	A comparison of the number of shipments sent per month by Wholesalers and Manufacturers	Null was rejected
Ho_5	A comparison of the percent of outgoing shipment freight paid by Wholesalers and freight paid by Manufacturers	Null was accepted
Ho_6	A comparison of the weight of shipments RECEIVED by Wholesalers, Manufacturers, and Retailers	Null was rejected
Ho_7	A comparison of the size of shipments RECEIVED by Wholesalers, Manufacturers, and Retailers	Null was rejected
Ho_8	A comparison of the number of shipments received per month by Wholesalers, Manufacturers, and Retailers	Null was rejected
Ho_9	A comparison of the percent of incoming shipment freight being paid by Wholesalers, Manufacturers, and Retailers	Null was rejected
Ho_{10}	A comparison of the Wholesalers', Manufacturers', and Retailers' definitions of a "Small Shipment"	Null was rejected
Ho_{11}	A comparison of the three groups' Satisfaction/Dissatisfaction with their present small shipment service	Null was accepted
Ho_{12}	A comparison of the three groups' importance ratings given to small shipment problems (seven problems rated)	Null was rejected
Ho_{13}	A comparison of the shippers' reactions to the proposed rate structure	Null was rejected
Ho_{14}	A comparison of the shippers' usability ratings of the proposed rate structure	Null was rejected
Ho_{15}	A comparison of the receivers' reactions to the proposed rate structure	Null was rejected
Ho_{16}	A comparison of the receivers' usability ratings of the proposed rate structure	Null was rejected
Ho_{17}	A comparison of the customers' acceptance ratings of the proposed rate structure	Null was rejected
Ho_{18}	A comparison of the customers' usability ratings of the proposed rate structure	Null was accepted
Ho_{19}	A comparison of the Agreement/Disagreement ratings of a flat-charge-per-shipment pricing structure	Null was rejected
Ho_{20}	A comparison of Agreement/Disagreement ratings of cost-per-shipment issue	Null was rejected
Ho_{21}	A comparison of Agreement/Disagreement ratings of prepayment of small shipment freight costs	Null was rejected
Ho_{22}	A comparison of Agreement/Disagreement ratings of preparation of shipping documents for small shipments	Null was rejected
Ho_{23}	A comparison of Agreement/Disagreement ratings of limitations of liability on small shipments	Null was accepted
Ho_{24}	A comparison of Agreement/Disagreement ratings of reduced rates for multiple shipments tendered	Null was accepted

ANCILLARY FINDINGS

Relationship Between the Number of Shipments Sent and Users' Satisfaction With Small Shipment Services

In the present study, as in any well-ordered research effort, secondary questions began to arise while the hypotheses were being tested. For instance, the researcher wanted to know more about the number of shipments being sent and/or received per month by those who were expressing extreme satisfaction or extreme dissatisfaction with their small shipment services. It could well be that those companies who send and/or receive the most shipments per month receive the best treatment from the transportation companies and, consequently, express the highest levels of satisfaction with their small shipment service. By the same token, those firms who ship and/or receive the largest number of shipments per month should express the most favorable opinions of the proposed rate structure if it can be advantageously applied to their present shipping and/or receiving procedures.

The first proposition was examined by computing a Contingency Coefficient between the number of shipments sent per month by the Wholesalers and Manufacturers and their Satisfaction/Dissatisfaction rating of their small shipment service. The results, presented in Table 4.30, show that a significant correlation exists between the two variables ($C = 0.507$; $p < .01$). In other words, those shippers who sent the most shipments per month made the most favorable ratings of their small shipment service. On the other hand,

TABLE 4.30

RELATIONSHIP BETWEEN THE NUMBER OF SHIPMENTS SENT PER MONTH AND LEVEL OF SATISFACTION/DISSATISFACTION WITH THEIR PRESENT SMALL SHIPMENT SERVICE AS REPORTED BY THE SHIPPERS: WHOLESALERS AND MANUFACTURERS (N=56)

	Levels of Satisfaction/Dissatisfaction with Small Shipment Service											
Groups of Shippers	Strongly Dissatisfied (1)		Dissatisfied (2)		Uncertain (3)		Satisfied (4)		Strongly Satisfied (5)		TOTALS	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
LARGE SHIPPERS (81 to >150 Shipments Per Month)	1	2	8	14	7	13	7	13	0	0	23	42*
SMALL SHIPPERS (0 to 20 Shipments Per Month)	0	0	2	4	1	2	10	18	0	0	13	24*

$C = 0.507$, $p < .01$

*The total percentages of the two groups comprise only sixty-six (66) percent. However, the remaining thirty-four (34) percent responded in the "Medium Shipment" categories, and were not included in the analysis.

those shippers who sent the least number of shipments per month made the least favorable ratings of their small shipment service.

A similar correlation coefficient (Contingency Coefficient) was computed for the three groups as receivers. A correlation was computed between the number of shipments received per month by the Wholesalers, Manufacturers, and Retailers and their Satisfaction/Dissatisfaction ratings of their small shipment service. The results, presented in Table 4.31, show that the resulting correlation was very insignificant ($C = 0.061$; $p > .05$). In other words, the relationship which had been shown for the shippers in Table 4.30 could not be established for the receivers.

Relationship Between the Number of Shipments Sent And Extent of Acceptance of Rate Structure

Contingency Coefficients were also computed between the number of shipments sent per month by the shippers and their Acceptance/Rejection ratings of the proposed rate structure. In addition, a Contingency Coefficient was computed between the number of shipments received per month by the three groups as receivers and their Acceptance/Rejection ratings of the proposed rate structure. However, both of these relationships were insignificant, and no conclusions could be drawn from the results (Shippers: $C = 0.217$; $p > .05$) (Receivers: $C = 0.272$; $p > .05$). The data used in calculating these results are presented in Tables 4.32 and 4.33.

TABLE 4.31

RELATIONSHIP BETWEEN THE NUMBER OF SHIPMENTS RECEIVED PER MONTH AND LEVEL OF SATISFACTION/DISSATISFACTION WITH THEIR PRESENT SMALL SHIPMENT SERVICE AS REPORTED BY THE RECEIVERS: WHOLESALERS, MANUFACTURERS AND RETAILERS (N=116)

	Levels of Satisfaction/Dissatisfaction with Small Shipment Service											
	Strongly Dissatisfied (1)		Dissatisfied (2)		Uncertain (3)		Satisfied (4)		Strongly Satisfied (5)		TOTALS	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
LARGE RECEIVERS (81 to >150 Shipments Per Month)	2	2	11	9	10	9	19	16	0	0	42	36*
SMALL RECEIVERS (0 to 20 Shipments Per Month)	2	2	9	8	7	6	14	12	0	0	32	28*

$C = 0.061$, $p > .05$

*The total percentages shown for the two groups will sum to only sixty-four (64) percent. However, the remaining thirty-six (36) percent of the two groups responded in the "Medium Shipment" categories and were not included in the analysis.

TABLE 4.32

RELATIONSHIP BETWEEN THE NUMBER OF SHIPMENTS SENT PER MONTH AND THEIR REACTIONS TO THE PROPOSED RATE STRUCTURE AS REPORTED BY SHIPPERS: WHOLESALERS AND MANUFACTURERS (N=56)

	Acceptance/Rejection Response Categories											
	Strongly Reject (1)		Reject (2)		Uncertain (3)		Accept (4)		Strongly Accept (5)		TOTALS	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
LARGE SHIPPERS (81 to >150 Shipments Per Month)	0	0	3	5	5	9	9	16	2	4	19	34*
SMALL SHIPPERS (0 to 20 Shipments Per Month)	2	4	2	4	8	14	11	20	2	4	25	46*

$C = 0.217$, $p > .05$

*The total percentages shown for the two groups will sum to only eighty percent (80%). However, the remaining twenty percent (20%) of the two groups responded in the "Medium Shipment" categories and were not included in the analysis.

TABLE 4.33

RELATIONSHIP BETWEEN THE NUMBER OF SHIPMENTS RECEIVED PER MONTH AND THEIR REACTIONS TO THE PROPOSED RATE STRUCTURE AS REPORTED BY RECEIVERS: WHOLESALERS, MANUFACTURERS AND RETAILERS (N=116)

	Acceptance/Rejection Response Categories											
	Strongly Reject (1)		Reject (2)		Uncertain (3)		Accept (4)		Strongly Accept (5)		TOTALS	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
LARGE RECEIVERS (81 to >150 Shipments Per Month)	3	3	5	4	15	13	16	14	3	3	42	37
SMALL RECEIVERS (0 to 20 Shipments Per Month)	0	0	3	3	15	13	15	13	0	0	33	29

$C = 0.272$, $p > .05$

*The total percentages shown for the two groups will sum to only sixty-six percent (66%). However, the remaining thirty-four percent (34%) of the two groups responded in the "Medium Shipment" categories and were not included in the analysis.

Retailer Prediction of Reaction of Wholesalers and Manufacturers to Rate Structure

One additional ancillary finding was concerned with the Retailers' projections of the suppliers' reactions to the proposed rate structure. The Retailers were asked to indicate how well they thought the suppliers (Wholesalers and some Manufacturers) would accept the proposed rate structure and how useful they (the suppliers) would find the proposed rate structure. The responses of the Retailers are presented in Tables 4.34 and 4.35. A Chi Square was computed between the projections made by the Retailers and the data reported for the two groups of suppliers. The results were as follows:

Retailers vs. Wholesalers: $X^2 = 23.76$ df=4, $p < .001$

Retailers vs. Manufacturers: $X^2 = 10.52$; df=3, $p < .05$

These results indicate that the Retailers were <u>not</u> able to predict either the Wholesalers' or the Manufacturers' Acceptance/Rejction levels of the proposed rate structure with any degree of accuracy. On the other hand, they did predict the usefulness of the proposed rate structure to the Wholesalers, but were not able to predict the degree of usefulness of the rate structure to the Manufacturers. One possible explanation for this discrepancy would be that the Retailers are more familiar with the shipping operation of the Wholesalers than they are with the shipping operations of the Manufacturers.

TABLE 4.34

PROJECTED SUPPLIERS' REACTIONS TO THE PROPOSED RATE STRUCTURE AS REPORTED BY THE CONSIGNEES (RETAILERS)

ACCEPTANCE/REJECTION CATEGORIES MARKED	ETAILERS	
	Number of Group	Percent of Group
1. They Would Strongly Accept (5)	2	3
2. They Would Accept (4)	16	27
3. They Would Be Uncertain (3)	34	57
4. They Would Reject (2)	5	8
5. They Would Strongly Reject (1)	3	5
TOTALS	60	100
Acceptance/Rejection Rating Index. . .		315

*Acceptance/Rejection Rating Indices were computed by multiplying the rating scale values (1 through 5) by the percent of the group who chose each particular point of acceptance/rejection. The resulting products were then summed to determine the final Acceptance/Rejection Rating Index. The highest possible value was 500 (5 x 100% = 500), while the lowest possible value was 100 (1 x 100% = 100).

TABLE 4.35

DEGREE OF ANTICIPATED USEFULNESS OF THE PROPOSED RATE STRUCTURE TO TYPICAL SUPPLIERS AS PROJECTED BY THE CONSIGNEES (RETAILERS)

Percent of shipments being SUPPLIED by typical suppliers to which the proposed rate structure could be advantageously applied (Projected)	RETAILERS	
	Number of Group	Percent of Group
0-25 Percent	47	79
26-50 Percent	6	10
51-75 Percent	5	8
76-100 Percent	2	3
TOTALS	60	100

Ancillary Findings and Hypotheses

The ancillary findings should be interpreted in conjunction with the results obtained in testing the hypotheses. While the results presented in these secondary findings are both interesting and enlightening, they should not be construed as the primary research questions being investigated by the researcher. Further comparisons of the numbers and percentages computed for the retailers with the data presented in Tables 4.17, 4.18, 4.19, 4.20, 4.21, and 4.22 should be very enlightening. These ancillary findings will be expanded further in the Implications for Further Research.

Summary of the Hypotheses and Ancillary Findings

It is important that the findings from the hypotheses and the ancillary comparisons be seen in their proper perspective. This can be accomplished by making a summary presentation of the results obtained from the various comparisons and contrasts. The findings which are most relevant to the present research effort are summarized in Table 4.36. This Table contains the general results/findings of the twenty-four hypotheses and five ancillary findings. While some information is lost in the summarizing process, such a synthesis does allow the results to be viewed in their proper perspective.

The second area which the researcher wished to emphasize was the participants' attitudes and opinions regarding the size of "Small Shipments" and certain shipping and

TABLE 4.36

GENERAL SUMMARY OF RESULTS/FINDINGS OF HYPOTHESES AND ANCILLARY COMPARISONS

Hypothesis Number	Table Number of Data/Results	General Summary of Results/Findings
Ho_1	4.7	(1) a. Shipping Clerk handles transportation problems and decisions for Wholesalers most of the time b. Shipping Clerk and Traffic/Physical Distribution Manager handles transportation problems and decisions for Manufacturers most of the time c. President/Owner handles transportation problems and decisions for Retailers most of the time
Ho_2	4.8	(2) a. Over one-half (53%) of small shipments made by Wholesalers weighed less than 250 pounds b. 23% of small shipments made by Manufacturers weighed more than 10,000 pounds
Ho_3	4.8	(3) a. 62% of small shipments made by Manufacturers contained less than 5 packages b. 49% of small shipments made by Wholesalers contained less than 5 packages
Ho_4	4.9	(4) a. 50% of Wholesalers made greater than 150 small shipments per month b. 35% of Manufacturers made greater than 150 small shipments per month
Ho_5	4.10	(5) a. 50% of Wholesalers prepay freight on outgoing small shipments b. 50% of Manufacturers prepay freight on outgoing small shipments
Ho_6	4.11	(6) a. 27% of small shipments received by Wholesalers were in 0-250 pound category b. 46% of small shipments received by Manufacturers were in 0-250 pound category c. 67% of small shipments received by Retailers were in 0-250 pound category
Ho_7	4.11	(7) a. 24% of small shipments received by Wholesalers were in 1-5 packages category b. 49% of small shipments received by Manufacturers were in 1-5 packages category c. 55% of small shipments received by Retailers were in 1-5 packages category
Ho_8	4.12	(8) a. 43% of Wholesalers received greater than 150 small shipments per month b. 23% of Manufacturers received greater than 150 small shipments per month c. 23% of Retailers received greater than 150 small shipments per month

Table 4.36 Continued on following page

Table 4.36 Continued

Hypothesis Number	Table Number of Data/Results	General Summary of Results/Findings
Ho_9	4.13	(9) a. Wholesalers paid all the freight charges on 25% of incoming small shipments b. Manufacturers paid all the freight charges on 32% of incoming small shipments c. Retailers paid all the freight charges on 54% of incoming small shipments
Ho_{10}	4.14	(10) a. 67% of Wholesalers felt 0-250 pounds is proper definition of small shipment b. 57% of Manufacturers felt 0-250 pounds is proper definition of small shipment c. 72% of Retailers felt 0-250 pounds is proper definition of small shipment
Ho_{11}	4.15	(11) a. 50% of Wholesalers were satisfied with this small shipment service b. 50% of Manufacturers were satisfied with this small shipment service c. 46% of Retailers were satisfied with this small shipment service
Ho_{12}	4.16	(12) Greatest difference in the groups' reactions to seven small shipment problem areas were between the Manufacturers and Retailers, especially concerning delivery services
Ho_{13}	4.17	(13) Both Manufacturers and Wholesalers were generally favorable to proposed rate structure (329/500) as shippers a. Manufacturers' Rating (342/500) b. Wholesalers' Rating (326/500)
Ho_{14}	4.18	(14) Manufacturers felt that the rate structure would be more useful to them as shippers than did the Wholesalers as shippers a. 88% of Manufacturers felt it could be applied to 0-50% of shipments b. 92% of Wholesalers felt it could be applied to 0-50% of shipments
Ho_{15}	4.19	(15) a. No significant differences among levels of Acceptance/Rejection of proposed rate structure as reported by Wholesalers (as Receivers) and levels of Acceptance/Rejection of proposed rate structure as reported by Manufacturers and Retailers (as Receivers) b. However, there was a difference between Wholesalers and Manufacturers

Table 4.36 Continued on following page

Table 4.36 Continued

Hypothesis Number	Table Number of Data/Results	General Summary of Results/Findings
Ho_{16}	4.20	(16) a. 83% of Wholesalers thought rate structure would be useful on 0-25% of incoming shipments; 100% on 0-50% of incoming shipments b. 61% of Manufacturers thought rate structure would be useful on 0-25% of incoming shipments; 86% on 0-50% of incoming shipments c. 83% of Retailers thought rate structure would be useful on 0-25% of incoming shipments; 90% on 0-50% of incoming shipments
Ho_{17}	4.21	(17) Both groups thought their customers would accept the proposed rate structure a. Wholesalers' Projected Acceptance/Rejection Index was 342/500 b. Manufacturers' Projected Acceptance/Rejection Index was 336/500 c. Combined Groups' Projected Acceptance/Rejection Index was 337/500
Ho_{18}	4.22	(18) 83% of both groups felt the proposed rate structure could be applied to 0-50% of the small shipments being received by their typical customers
Ho_{19}	4.23	(19) All groups approved the notion of a flat-charge-per-shipment pricing structure a. Rating Index of Wholesalers' was 333/500 b. Rating Index of Manufacturers was 345/500 c. Rating Index of Retailers was 328/500 d. Combined Groups' Rating Index for all Groups was 336/500
Ho_{20}	4.24	(20) All groups approved the notion that small shipments should cover the direct cost of providing the service and make some contribution to overhead a. Wholesalers' Rating Index was 392/500 b. Manufacturers' Rating Index was 396/500 c. Retailers' Rating Index was 394/500 d. Combined Groups' Rating Index was 394/500
Ho_{21}	4.25	(21) There were differences in Agreement/Disagreement in opinion on prepayment of freight on small shipments a. Wholesalers strongly rejected the idea; (Rating Index of 182/500) b. Manufacturers rejected the idea; (Rating Index of 278/500) c. Retailers generally accepted the idea; (Rating Index of 349/500) d. Combined Groups generally accepted the idea; (Rating Index of 306/500)

Table 4.36 Continued on following page

Table 4.36 Continued

Hypothesis Number	Table Number of Data/Results	General Summary of Results/Findings
Ho_{22}	4.26	(22) All generally agreed that the shipper should prepare shipping documents
Ho_{23}	4.27	(23) All groups generally disapproved of limitation of liability
Ho_{24}	4.28	(24) All groups generally approved of lower rates per shipment for multiple tender
		(ANCILLARY FINDINGS)
NA	4.30	(1) a. Shippers who sent the most shipments made the most favorable ratings of small shipment service b. Those who sent the least made the least favorable ratings
NA	4.31	(2) As receivers, there was no correlation between receiving large number of shipments and attitude toward service
NA	4.32 4.33	(3) No conclusion could be drawn from the number of shipments and acceptance/rejection ratings of proposed structure
NA	4.34	(4) Retailers thought their suppliers would accept the proposed structure
NA	4.35	(5) 90% of Retailers thought their typical suppliers would find structure useful on 0-50% of shipments

receiving procedures. Data concerning these areas are contained in the following section.

Summary of Respondents' Attitudes About Small Shipment Service and the Proposed Rate Structure

Perhaps the most anticipated responses in the present research effort were those related to the participants attitudes about their small-shipment service, their acceptance/rejection of the proposed rate structure, and their agreement/disagreement with statements about the problems associated with small shipment services. The researcher was able to make decisions concerning the future development of the proposed rate structure by analyzing the groups' attitude ratings. A summary of attitudes from ten (10) crucial questionnaire items is presented in Table 4.37. It should be noted that the fourth and fifth rating points have been combined for one category, and the first and second rating categories have also been combined to form one rating category. The group percentiles are presented in the Table along with the Total Rating Indices. Any Rating Index greater than 3.00 indicates a favorable response while Indices less than 3.00 are indicative of an unfavorable response.

The summarized results/findings presented in Table 4.37 show that all but two of the ten questionnaire items received favorable ratings. The first item which received an unfavorable rating was a statement concerning the

TABLE 4.37

SUMMARY OF RESPONDENTS' ATTITUDES AND OPINIONS ABOUT SMALL SHIPMENT SERVICES AND THE PROPOSED RATE STRUCTURE

Hypo. No.	Questionnaire Statement Being Rated	Groups	Agree-ment	Uncer-tainty	Disagree-ment	Agreement Disagreeme Rating Index
Ho_{11}	"Satisfaction with small shipment service." (Table 4.15)	Wholesalers	50	17	33	309/500
		Manufacturers	50	20	30	316/500
		Retailers	48	20	32	303/500
		Combined	49	20	31	313/500
Ho_{13}	"Shippers reaction to proposed rate structure." (Table 4.17)	Wholesalers	42	33	25	326/500
		Manufacturers	52	34	14	342/500
		Retailers	NA	NA	NA	NA
		Combined	50	34	16	339/500
Ho_{15}	"Consignees' reaction to proposed rate structure." (Table 4.19)	Wholesalers	42	42	16	326/500
		Manufacturers	54	34	12	344/500
		Retailers	42	43	15	327/500
		Combined	46	40	14	333/500
Ho_{17}	"Projected reaction of customers to proposed rate structure." (Table 4.21)	Wholesalers	67	8	25	342/500
		Manufacturers	47	39	14	336/500
		Retailers	NA	NA	NA	NA
		Combined	51	33	16	337/500
Ho_{19}	"A flat charge per shipment ... would be workable when applied to your operating characteristics." (Table 4.23)	Wholesalers	58	17	25	333/500
		Manufacturers	57	20	23	345/500
		Retailers	48	25	27	328/500
		Combined	53	22	25	336/500
Ho_{20}	"All shipments should cover direct cost of providing service and make some contribution to overhead." (Table 4.24)	Wholesalers	75	25	0	392/500
		Manufacturers	84	5	11	396/500
		Retailers	80	17	3	394/500
		Combined	81	13	6	394/500
Ho_{21}	"Small shipment costs should be prepaid." (Table 4.25)	Wholesalers	8	8	84	182/500
		Manufacturers	36	11	53	278/500
		Retailers	52	28	20	349/500
		Combined	41	21	38	306/500
Ho_{22}	"Shippers should be responsible for shipping document preparation." (Table 4.26)	Wholesalers	84	8	8	393/500
		Manufacturers	79	14	7	404/500
		Retailers	90	8	2	428/500
		Combined	85	10	5	414/500
Ho_{23}	"There should be a limitation of liability on small shipments." (Table 4.27)	Wholesalers	25	25	50	250/500
		Manufacturers	29	23	48	269/500
		Retailers	24	20	56	254/500
		Combined	26	21	53	258/500
Ho_{24}	"There should be reduced rates per shipment when multiple shipments are tendered." (Table 4.28)	Wholesalers	84	8	8	401/500
		Manufacturers	75	18	7	402/500
		Retailers	78	17	5	399/500
		Combined	78	16	6	401/500

prepayment of small shipment shipping costs. The self interest of each group was strongly reflected in the responses to the questionnaire statement. The Wholesalers were obviously opposed to the issue (Rating Index of 182/500) since it would cost them more. The Manufacturers were opposed to the issue (Rating Index 278/500) for the same reason. The Retailers were strongly in favor of the issue (Rating Index 390/500) since they do very little shipping and the prepayment of small shipment costs would obviously be to their advantage.

The second questionnaire statement which received a negative response was as follows: "There should be a limitation of liability on small shipments." All three groups were generally opposed to this issue simply because it could easily be used as a "loophole" for freight theives. For example, if there was a limit of $5,000 liability on small shipments, a small shipment valued at $20,000 could easily be "lost" in transit. After the shipping company had paid the shipper the $5,000 liability costs the difference would still represent a handsome profit. The Rating Indices for the three groups were as follows: (1) Wholesalers--250/500, (2) Manufacturers--269/500, and (3) Retailers--254/500. The four remaining questionnaire statements all received favorable ratings. However, some were regarded as much more favorable than others. The statements were rated in the following order:

1. "Shippers should be responsible for shipping document preparation."; (Rating Index 414/500)

2. "There should be reduced rates per shipment when multiple shipments are tendered."; (Rating Index 401/500)

3. "All shipments should cover the direct cost of providing the service and make some contribution to overhead."; (Rating Index 396/500)

4. "A flat charge per shipment would be workable when applied to your operating characteristics."; (Rating Index 336/500)

The conclusions drawn from the Results and findings presented in Chapter IV are further expanded in the final chapter (Chapter V). Also contained in Chapter V is a short summary of the entire study, implications and recommendations for further research studies, and a brief section of concluding remarks.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER RESEARCH

INTRODUCTION

Small shipments are far too important to all parties to have been mistreated as they have been. The present production-marketing system demands small shipments; the existing pricing system encourages them but does not provide adequate revenue to compensate the carriers. Generally inadequate small shipment service is the result. With exceptions such as United Parcel Service, we do not have a dependable transportation system for small shipments. Motor carrier operating ratios have climbed to a new high. The carriers are facing new and large wage increases plus the energy crunch. The economy is in no position to absorb increased transportation costs. It is time to look at the real problems.

A general revision in the rate structure is long overdue. It is imperative that constructive steps be taken toward a positive solution. Preliminary studies, such as this one, are a necessary prerequisite to finding a practical first step toward the solution of this major transportation problem.

SUMMARY OF THE PROBLEM

The present rate structure in the United States is completely illogical. Some shippers pay far too little for the services received and are heavily subsidized by others. The

reason for this is relatively clear: the long history of railroad value of service pricing has been adapted almost intact by the motor carrier industry, with little or no regard for the differences in technology and economics.

Value of service pricing, resulting in rates below direct costs, is illogical and has caused the common motor carriers serious trouble. Figure 5-1 summarizes the major problem of the present rate structure.[1]

Fig. 5-1 Major Problems of the Present Rate Structure

1. The rates are inadequately related to the economic structure of the industry.
2. The structure consists of a "negative incentive" or in other words an inducement to get people to do things in the worst possible way.
3. The structure is not market-oriented--that is, it is not directed in such fashion as to implement the physical movement of goods to market in a demographically sensible manner.
4. The geographical features are distorted and unnecessarily complex.
5. The structure is not readily computerable.
6. It is unduly difficult to find a rate and, hence, unduly expensive.
7. There is too much room for error, and errors are very expensive.
8. The relationship, if there need be one, between small shipments, middle size shipments, and large shipments is obsolete.

[1]Arthur W. Todd, "A Modern Freight Rate Structure--If We Want One, How Do We Get It?" Handling & Shipping, (October, 1973), pp. 46-47, on p. 47.

PROPOSED RATE STRUCTURE

Because the rate structure is incompatible with the cost structure, small shipment problems will continue until an adequate rate structure is designed and/or operating practices are revised. Adequate rate structure plans are now available.[2] In fact, Amtrack just recently introduced one.[3]

Price structure, and the decisions related thereto, require costing that focuses more on the configurations of costs than on the level. While the final pricing decisions will be based on the need to implement management policies within the constraints of the market, adequate costing input is a necessary ingredient.

The proposed rate structure, described in Chapter 2, is one attempt to overcome the deficiencies of the present rate structure.

SUMMARY OF RESEARCH RESULTS

The purpose of the present study was to collect information from Oklahoma's Wholesalers, Manufacturers, and Retailers concerning their present small shipment service and

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[2]For example see Arthur C. Roy, "Here's a Possible Route to Simpler, More Sensible Freight Rate Structure," Traffic World, (January 24, 1972), pp. 70-73.

[3]For a description of this plan see (1) "Amtrack Plans to Offer New Express Service for Shipping Packages," The Wall Street Journal, (June 21, 1973), p. 6 and (2) "Package Express Program With 3 Classes of Service Is Announced by Amtrack," Traffic World, (July 2, 1973), p. 4 and 25-26.

to determine their attitudes and opinions concerning a proposed rate structure which would supplement the present rate structure for small shipment services in Oklahoma. Survey questionnaires were developed and distributed to twenty (N=20) Wholesalers, seventy (N=70) Manufacturers, and one-hundred twenty (N=120) Retailers in the State.

Data collected from questionnaire completed by twelve (N=12) Wholesalers, forty-four (N=44) Manufacturers, and sixty (N=60) Retailers were used to test twenty-four null hypotheses concerning the three groups' attitudes about their present small shipment service and their opinions about a new rate structure which was being proposed by the researcher. Figures computed for the three groups were compared with a Chi Square test for percentages and a Contingency Coefficient for nominal level data (frequencies).

The data and the analyses were presented in four different sections. These four sections were: (1) questionnaire response patterns of the four groups; (2) characteristics of respondents; (3) results of testing the null hypotheses; and (4) ancillary findings.

The characteristics of the respondents showed that the Manufacturers had the highest annual sales volume (gross), the greatest number of employees, and received the greatest number of shipments per day of the three groups being compared.

As shippers, the Wholesalers sent more shipments per month than the Manufacturers. However, the shipments sent

by the Manufacturers were generally heavier than those sent by the Wholesalers, and they contained fewer packages per shipment. Both groups paid about fifty percent (50%) of the shipping charges on small shipments tendered.

As receivers, the Wholesalers received the greatest number of shipments per month. At the same time, these shipments were heavier and contained fewer packages than the shipments received by either the Manufacturers or Retailers. However, the Retailers paid a greater percentage of the costs of incoming shipments than either of the other two groups.

All three groups agreed that a shipment weighing from 0-250 pounds should be defined as a "Small Shipment," and that Pick Up and Delivery Service was the most serious problem with small shipment services. It was concluded that all three groups were dissatisfied with their small shipment service, but those who sent and received the least number of shipments were the most dissatisfied and vice versa.

The Wholesalers and Manufacturers (as shippers) and the Wholesalers, Manufacturers and Retailers (as receivers) were asked to make Acceptance/Rejection and Applicability (usefulness) ratings of the proposed rate structure. The groups, as shippers and receivers, made generally favorable ratings of the proposed rate structure. In addition, most felt that the new rate structure could be advantageously applied to their small shipment service although the Retailers felt

that it was more applicable to their small shipments than either of the other two groups.

All participants were asked to make Agreement/Disagreement ratings of six (6) issues concerning small shipment services. Four of the issues received favorable ratings, while two received unfavorable ratings. All three groups were in general agreement with the following statements:

1. "Shippers should be responsible for shipping document preparation."
2. "There should be reduced rates per shipment when multiple shipments are tendered."
3. "All shipment charges should cover the direct cost of providing the service and make some contribution to overhead."
4. "A flat charge per shipment for most shipments (excluding extraordinary items) would be workable when applied to your operating characteristics."

All three groups were in general disagreement with the following statements:

1. "Small shipment costs should be prepaid."
2. "There should be a limitation of liability on small shipments."

The ancillary findings indicated that the three groups were not able to predict the usefulness of the proposed rate structure to the other's situation. The Wholesalers made the most accurate predictions of all three groups, while the Retailers made the least accurate predictions. At the same time, none was able to predict the degree of usefulness of the proposed rate structure to the other's situation with

any degree of accuracy.

INTERPRETATION OF RESEARCH RESULTS

The only way to implement any kind of rate structure is to use it. The over-all reaction of the potential users (shippers and/or consignees) to the proposed rate structure can be interpreted as quite favorable. (Figure 5-2).

Fig. 5-2 Summary of Attitudes Toward Proposed Rate Structure

	Accept	Uncertain	Reject
As Shippers (%)	50	34	16
As Consignees (%)	46	40	14

In other words, in answer to the research question and hypothesis, it appears that the concept underlying the proposed rate structure has the potential to significantly change the logistics decision portion of the marketing process. This is especially so considering that the specific structure examined in this study has not been nor will it be proposed as a complete replacement for the present pricing system. The tariff is proposed as an option, not as a replacement for an existing tariff.

ADDITIONAL RESEARCH

Only with a sound understanding of the structural aspects of transportation pricing can the vitally needed revisions in the regulatory law and practice be made on a sound basis. In

recent years, many carriers have seen the fallacy of the present rate structure, and have attempted to develop new techniques of price quotation. But inertia and inability to change quickly have cost the carriers dearly. In addition, regulatory boards, as well as shippers and carriers, have generally been reluctant to allow drastic change of the old laboriously constructed price structure. Therefore, in spite of inummerable single price changes, the old discriminatory structure still stands.

Decision making in transportation pricing is a several part model with multiple influencers. Therefore, before any major changes can take place in the pricing structure, more knowledge is needed about the attitudes of both carriers and regulatory boards. Specifically needed is their reaction to the concepts and procedures underlying the proposed pricing structure and not a reaction to specific rates.

This study reflects the generally favorable attitudes and reactions of Oklahoma users to a concept of change. Accordingly, the carriers' attitudes should be studies to complete the demand-supply equation. In addition, because the industry is a regulated one, the arbiters of reasonableness--the regulatory bodies should be studied. In one sense, this group requires a different kind of attitude study. Because of the legal process involved, examiners who report and recommend to the regulatory bodies exert a tremendous influence on those bodies, particularly the Interstate

Commerce Commission. The examiners and the commissioners are typically lawyers with their fondness for precedent. It is this attitude which should be studied to determine the cause of official resistance to change.

The proposed structure is a generalized model. It has been applied by simulation to present traffic and cost conditions. Because the structure will encourage fewer but larger shipments, the characteristics of traffic will change. Accordingly, other fruitful areas of research relate to the effect of that change in several areas. First, the structure will affect marketing activities by encouraging fewer but larger orders. Second, it will affect internal costs of shippers and receivers for the same reasons. Third, the larger shipments will require reappraisal of inventory levels and the financial and operational implications of those levels. Fourth, the management science implications are enormous in the development of computer-based rate finding, cost finding, cost reporting and revenue decisions among carriers. In the same area marketing people, in the application of management science, may find new ways of providing consumer satisfaction to their customers through improvements in the physical distribution of goods.

In short, the subject lends itself to behavioral analyses including bodies and carriers; strategic analyses regarding marketing programs and policies, including price policies; managerial analyses regarding information and control; and operational analyses regarding techniques of responding to

and implementation of change. Some of these strategic, managerial and operational factors relate to regulatory agencies, some to carriers, and, of course, some to all three involved groups. Finally, they relate to public policy.

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APPENDIX A

SHIPPER AND CONSIGNEE QUESTIONNAIRE

APPENDIX A

THE UNIVERSITY OF OKLAHOMA DEPARTMENT OF MARKETING
SHIPPER AND CONSIGNEE QUESTIONNAIRE

No._____
For Research Control Purposes Only

1. Indicate your company's annual sales volume.
   - ☐ Less than $250,000
   - ☐ $250,000–$1,000,000
   - ☐ $1,000,000–$5,000,000
   - ☐ $5,000,000–$20,000,000
   - ☐ $20,000,000–$50,000,000
   - ☐ $50,000,000 and above

2. How many employees does your company have? (Approximately) _____

3. Which of the following persons handles transportation decisions and problems in your company?
   - ☐ Shipping clerk
   - ☐ The traffic or physical distribution manager
   - ☐ Other (Please specify) _____
   - ☐ Production manager
   - ☐ Marketing or sales manager
   - ☐ Purchasing agent
   - ☐ Company president or owner

4. Estimate the approximate percentage of shipments that you SEND in each category of weight and number of packages.

Weight in Pounds	Approximate Percentage of Shipments sent	Number of Packages	Approximate Percentage of Shipments sent
0–250 lbs.	_____	1–5	_____
251–500 lbs.	_____	6–10	_____
501–1,000 lbs.	_____	11–50	_____
1,001–5,000 lbs.	_____	51–100	_____
5,001–10,000 lbs.	_____	101–500	_____
Over 10,000 lbs.	_____	Over 500	_____

5. Estimate the average number of shipments you make (per day) via common motor carrier. _____

6. How many outgoing shipments does your firm SHIP in an average month via common motor carriers?
   - ☐ 0–10 Shipments
   - ☐ 11–20 Shipments
   - ☐ 21–40 Shipments
   - ☐ 41–80 Shipments
   - ☐ 81–150 Shipments
   - ☐ Over 150 Shipments

7. What percentage of these outgoing shipments have the freight paid by your company?
   - ☐ 0–25%
   - ☐ 26–50%
   - ☐ 51–75%
   - ☐ 76–100%

7a. If possible, specify the precise percentage: _____

8. Estimate the approximate percentage of shipments that you RECEIVE in each category of weight and number of packages.

Weight in Pounds	Approximate Percentage of Shipments Received	Number of Packages Received	Approximate Percentage of Shipments Received
0–250 lbs.	_____	1–5	_____
251–500 lbs.	_____	6–10	_____
501–1,000 lbs.	_____	11–50	_____
1,001–5,000 lbs.	_____	51–100	_____
5,001–10,000 lbs.	_____	101–500	_____

9. Estimate the average number of shipments you RECEIVE (per day) via common motor carrier. _____

10. How many incoming shipments does your firm RECEIVE in an average month via common motor carrier?
    - ☐ 0–10 Shipments
    - ☐ 11–20 Shipments
    - ☐ 21–40 Shipments
    - ☐ 41–80 Shipments
    - ☐ 81–150 Shipments
    - ☐ Over 150 Shipments

11. What percentage of these incoming shipments have the freight paid by your company?
    - ☐ 0–25%
    - ☐ 26–50%
    - ☐ 51–75%
    - ☐ 76–100%

11a. If possible, specify the precise percentage: _____

12. From your operating characteristics, which of the following weight categories do you feel should be classified as small shipments? (check only one category)

    Shipment size (Pounds)
    - ☐ 0–250 lbs.
    - ☐ 0–500 lbs.
    - ☐ 0–1,000 lbs.
    - ☐ 0–1,500 lbs.
    - ☐ 0–5,000 lbs.
    - ☐ 0–10,000 lbs.

13. Using the following scale, indicate the degree to which you are satisfied with your present service on small shipments. (Circle only one number)

5	4	3	2	1
Strongly Satisfied	Satisfied	Uncertain	Dissatisfied	Strongly Dissatisfied

14. Whether you are or are not encountering significant small shipment problems, please indicate in order of relative importance to your business which you feel are or could be, the three main problem areas. (For the most important problem area write '1'. Write '2' for the next, and '3' for the one you rank third).
    - _____ Rates
    - _____ Pickup service
    - _____ Interline
    - _____ Abandonment or loss of service
    - _____ Loss and damage
    - _____ Other (Please specify) _____

APPENDIX A (Cont'd)

PROPOSED RATE STRUCTURE FOR SMALL SHIPMENTS

The proposed rate structure for shipments weighing less than 1,000 pounds—excluding extraordinary items such as styrofoam, potato chips and carpeting—is an adaption of parcel post, REA Express, United Parcel Service, and similar rate structures. Zones are established, and a flat charge per shipment, regardless of the commodity, is established between zones, with the charge varying only with interzonal distances. Proposed zone boundaries and interzonal distances for the State of Oklahoma are shown in Figure 1. This figure will be used to illustrate the pro-proposed rate structure.

FIGURE 1

ZONE BOUNDARIES AND INTERZONAL DISTANCES

STATE OF OKLAHOMA

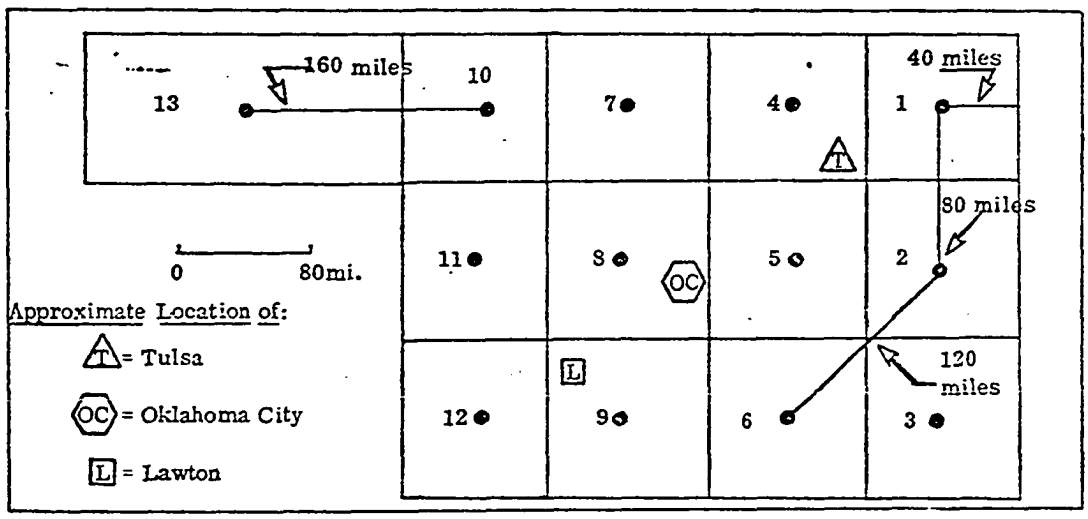


Figure 2 is a proposed tariff, and can be designed to fit on the back of a waybill. To illustrate this approach the following two examples are given.

(EXAMPLE 1) Assume that you want to determine the charges for one shipment, weighing less than 1,000 pounds, from Oklahoma City (Zone 8) to Tulsa (Zone 4). Move vertically down the "FROM" column to Zone 8 (the proper zone for Oklahoma City). Then move horizontally at the same level until the rectangle containing Zone 4 (the proper zone for Tulsa) is found. Next, move vertically up that column to the "CHARGES" chart to find the charge of $5.00 for one shipment or $4.25 each for two or more shipments.

(EXAMPLE 2) Assume that you want to determine the charges for one shipment, weighing less than 1,000 pounds, from Tulsa (Zone 4) to Lawton (Zone 9). Move vertically down the "FROM" column to Zone 4 (the proper zone for Tulsa). Then, move horizontally at the same level until the rectangle containing Zone 9 (the proper zone for Lawton) is found. Next, move vertically up that column to the "CHARGES" chart to find the charge of $5.60 for one shipment or $4.65 each for two or more shipments.

APPENDIX A (Cont'd)

FIGURE 2 SAMPLE WAYBILL (Back)

INTERZONAL DISTANCES AND SHIPMENT CHARGES

"INTERZONAL DISTANCES" (miles)		40mi.	80mi.	120mi.	160mi.	200mi.	240mi.	280mi.	320mi.	360mi.	400mi.	440mi.	480mi.
"CHARGES"*	One Shipment	$4.40	$4.70	$5.00	$5.30	$5.60	$5.90	$6.25	$6.55	$6.85	$7.15	$7.45	$7.75
	Two or More Shipments (each)	$3.65	$3.95	$4.25	$4.55	$4.85	$5.15	$5.50	$5.80	$6.10	$6.40	$6.70	$7.00

"FROM"	"TO"	DESTINATION ZONES										
1	1	2,4	5	3,7	6,8	9,10	11	12	x	13	x	x
2	2	1,3,5	4,6	8	7,9	11	10,12	x	x	x	13	x
3	3	2,6	5	1,9	4,8	7,12	11	10	x	x	x	13
4	4	1,5,7	2,8	6,10	3,9,11	12	x	13	x	x	x	x
5	5	2,4,6,8	1,3,7,9	11	10,12	x	x	x	13	x	x	x
6	6	3,5,9	2,8	4,12	1,7,11	10	x	x	x	13	x	x
7	7	4,8,10	5,11	1,9	2,6,12	3,13	x	x	x	x	x	x
8	8	5,7,9,11	4,6,10,12	2	1,3	x	13	x	x	x	x	x
9	9	6,8,12	5,11	3,7	2,4,10	1	x	x	13	x	x	x
10	10	7,11	8	4,12,13	5,9	1,6	2	3	x	x	x	x
11	11	8,10,12	7,9	5	4,6	2,13	1,3	x	x	x	x	x
12	12	9,11	8	6,10	5,7	3,4	2	1,13	x	x	x	x
13	x	13	x	10	x	7,11	8	4,12	5,9	1,6	2	3

INSTRUCTIONS: (1) Move vertically (down) the "FROM" column to the number of your zone. Then move horizontally at the same level until you find the number of the zone you are shipping "TO". Next, move (up) that column to the "CHARGES" chart to determine the costs of sending one or more shipments to the desired destination.

*The charges shown are for illustrative purposes only. No attempt is being made to suggest shipping rates.

PRELIMINARY ANALYSIS INDICATES THAT THE PROPOSED RATE STRUCTURE WOULD RESULT IN FEWER BUT LARGER SHIPMENTS WITH LOWER TOTAL COST TO THE USER.

1. Indicate your reaction to the proposed rate structure as a shipper by circling the appropriate number.

5	4	3	2	1
I would strongly accept	I would accept	I would be uncertain	I would reject	I would strongly reject

1a. After analyzing the composition of the shipments you send, on what percentage could you use the proposed rate structure to your advantage?

- ☐ 0–25%
- ☐ 26–50%
- ☐ 51–75%
- ☐ 76–100%

2. Indicate your reaction to the proposed rate structure as a RECEIVER or CONSIGNEE by circling the appropriate number.

5	4	3	2	1
I would strongly accept	I would accept	I would be uncertain	I would reject	I would strongly reject

2a. After analyzing the composition of the shipments you RECEIVE, on what percentage could you use the proposed rate structure to your advantage?

- ☐ 0–25%
- ☐ 26–50%
- ☐ 51–75%
- ☐ 76–100%

3. Indicate what you think would be your typical customers' reaction to the proposed rate structure by circling the appropriate number.

5	4	3	2	1
They would strongly accept	They would accept	They would be uncertain	They would reject	They would strongly reject

3a. Estimate the percentage of shipments on which you feel these typical receiving customers could use the proposed rate structure.

- ☐ 0–25%
- ☐ 26–50%
- ☐ 51–75%
- ☐ 76–100%

APPENDIX A (Cont'd)

Using the number codes provided, indicate the number which best reflects your appraisal of the situation presented by the following statements.

5=Strongly Agree
4=Agree
3=Uncertain
2=Disagree
1=Strongly Disagree

(Circle one)

5 4 3 2 1 A flat charge per shipment for most shipments (excluding extraordinary items) would be workable when applied to your operating characteristics.

5 4 3 2 1 All shipments should cover the direct cost of providing the service and make some contribution to overhead.

5 4 3 2 1 Small shipments should be prepaid.

5 4 3 2 1 The shipper should be responsible for shipping document preparation.

5 4 3 2 1 There should be a limitation of liability on small shipments.

5 4 3 2 1 There should be reduced rates per shipment when multiple shipments are tendered.

Thank you for your cooperation. Please make any comments or suggestions which you feel would improve the proposed rate structure. Make your comments on this page or a separate sheet. If separate sheet(s) are used, please return them with the completed questionnaire.

APPENDIX B

CONSIGNEE QUESTIONNAIRE

APPENDIX B

THE UNIVERSITY OF OKLAHOMA DEPARTMENT OF MARKETING
CONSIGNEE QUESTIONNAIRE

No._____
For Research Control Purposes Only

1. Indicate your company's annual sales volume.
   - ☐ Less than $100,000
   - ☐ $100,001–$200,000
   - ☐ $200,001–$400,000
   - ☐ $400,001–$700,000
   - ☐ $700,001–$1,000,000
   - ☐ $1,000,001 and above

2. How many employees does your company have? (Approximately) _____

3. Which of the following persons handles transportation decisions and problems in your company?
   - ☐ The traffic or physical distribution manager
   - ☐ Shipping clerk
   - ☐ Production manager
   - ☐ Other (Please specify) _____
   - ☐ Marketing or sales manager
   - ☐ Purchasing agent
   - ☐ Company president or owner

4. Estimate the approximate percentage of shipments that you RECEIVE in each category of weight and number of packages.

Weight in Pounds	Percentage of Shipments Received	Number of Packages Received	Percentage of Shipments Received
0–250 lbs.	_____	1–5	_____
251–500 lbs.	_____	6–10	_____
501–1,000 lbs.	_____	11–50	_____
1,001–5,000 lbs.	_____	51–100	_____
5,001–10,000 lbs.	_____	101–500	_____

5. Estimate the average number of shipments you RECEIVE (per day) via common motor carrier. _____

6. How many incoming shipments does your firm RECEIVE in an average month via common motor carrier?
   - ☐ 0–10 Shipments
   - ☐ 11–20 Shipments
   - ☐ 21–40 Shipments
   - ☐ 41–80 Shipments
   - ☐ 81–150 Shipments
   - ☐ Over 150 Shipments

7. What percentage of the incoming shipments have the freight paid by your company?
   - ☐ 0–25%
   - ☐ 26–50%
   - ☐ 51–75%
   - ☐ 76–100%

7a. If possible, specify the precise percentage: _____

8. From your operating characteristics, which of the following weight categories do you feel should be classified as small shipments? (Check only one category)

   Shipment Sizes (pounds)
   - ☐ 0–250 lbs.
   - ☐ 0–500 lbs.
   - ☐ 0–1,000 lbs.
   - ☐ 0–1,500 lbs.
   - ☐ 0–5,000 lbs.
   - ☐ 0–10,000 lbs.

9. Using the following scale, indicate the degree to which you are satisfied with your present service on small shipments. (Circle only one number)

5	4	3	2	1
Strongly Satisfied	Satisfied	Uncertain	Dissatisfied	Strongly Dissatisfied

10. Whether you are or are not encountering significant small shipment problems, please indicate in order of relative importance to your business which you feel are or could be, the three main problem areas. (For the most important problem write "1." Write "2" for the next, and "3" for the one you rank third).

    _____Rates
    _____Pickup service
    _____Delivery service
    _____Interline
    _____Abandonment or loss of service
    _____Loss and damage
    _____Other (Please specify) _____

APPENDIX B (Cont'd)

PROPOSED RATE STRUCTURE FOR SMALL SHIPMENTS

The proposed rate structure for shipments weighing less than 1,000 pounds—excluding extraordinary items such as styrofoam, potato chips and carpeting—is an adaptation of parcel post, REA Express, United Parcel Service, and similar rate structures. Zones are established, and a flat charge per shipment, regardless of the commodity, is established between zones, with the charge varying only with interzonal distances. Proposed zone boundaries and interzonal distances for the State of Oklahoma are shown in Figure 1. This figure will be used to illustrate the proposed rate structure.

FIGURE 1

ZONE BOUNDARIES AND INTERZONAL DISTANCES

STATE OF OKLAHOMA

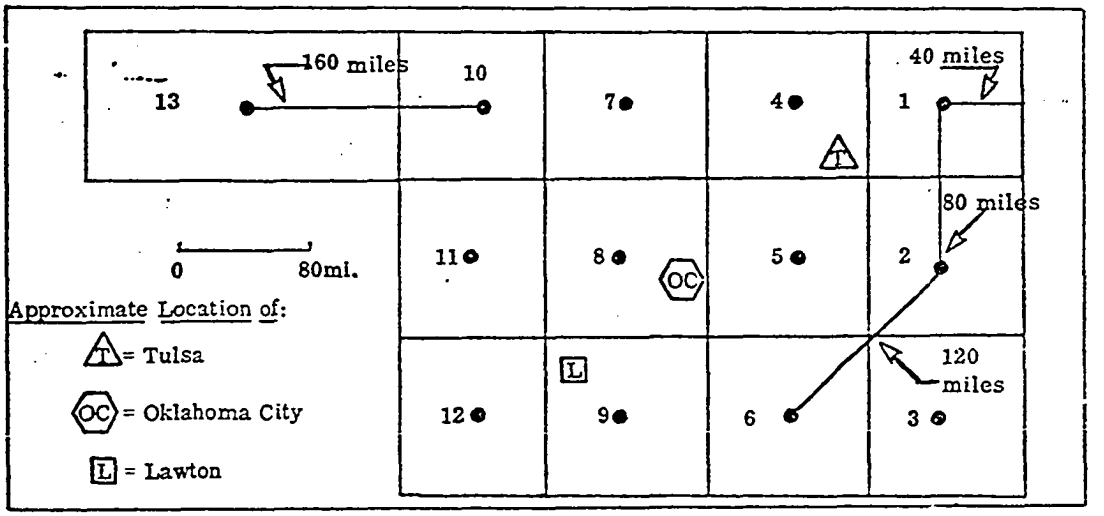


Figure 2 is a proposed tariff, and can be designed to fit on the back of a waybill. To illustrate this approach the following t...e examples are given.

(EXAMPLE 1) Assume that you want to determine the charges for one shipment, weighing less than 1,000 pounds, from Oklahoma City (Zone 8) to Tulsa (Zone 4). Move vertically down the "FROM" column to Zone 8 (the proper zone for Oklahoma City). Then move horizontally at the same level until the rectangle containing Zone 4 (the proper Zone for Tulsa) is found. Next, move vertically up that column to the "CHARGES" chart to find the charge of $5.00 for one shipment or $4.25 each for two or more shipments.

(EXAMPLE 2) Assume that you want to determine the charges for one shipment, weighing less than 1,00 pounds, from Tulsa (Zone 4) to Lawton (Zone 9). Move vertically down the "FROM" column to Zone 4 (the proper zone for Tulsa). Then, move horizontally at the same level until the rectangle containing Zone 9 (the proper zone for Lawton) is found. Next, move vertically up that column to the "CHARGES" chart to find the charge of $5.60 for one shipment or $4.85 each for two or more shipments.

APPENDIX 3 (Cont'd)

FIGURE 2 SAMPLE WAYBILL (Back)

INTERZONAL DISTANCES AND SHIPMENT CHARGES

"INTERZONAL DISTANCES" (miles)		40mi.	80mi.	120mi.	160mi.	200mi.	240mi.	280mi.	320mi.	360mi.	400mi.	440mi.	480mi.
"CHARGES"*	One Shipment	$4.40	$4.70	$5.00	$5.30	$5.60	$5.90	$6.25	$6.55	$6 85	$7.15	$7.45	$7.75
	Two or More Shipments (each)	$3.65	$3.95	$4.25	$4.55	$4.85	$5.15	$5.50	$5.80	$6.10	$6.40	$6.70	$7.00

	"FROM"	"TO"	DESTINATION ZONES										
INSTRUCTIONS: (1) Move vertically (down) the "FROM" column to the number of your zone. Then move horizontally at the same level until you find the number of the zone you are shipping "TO". Next, move (up) that column to the "CHARGES" chart to determine the costs of sending one or more shipments to the desired destination.	1	1	2,4	5	3,7	6,8	9,10	11	12	x	13	x	x
	2	2	1,3,5	4,6	8	7,9	11	10,12	x	x	x	13	x
	3	3	2,6	5	1,9	4,8	7,12	11	10	x	x	x	13
	4	4	1,5,7	2,8	6,10	3,9,11	12	x	13	x	x	x	x
	5	5	2,4,6,8	1,3,7,9	11	10,12	x	x	x	13	x	x	x
	6	6	3,5,9	2,8	4,12	1,7,11	10	x	x	x	13	x	x
	7	7	4,8,10	5,11	1,9	2,6,12	3,13	x	x	x	x	x	x
	8	8	5,7,9,11	4,6,10,12	2	1,3	x	13	x	x	x	x	x
	9	9	6,8,12	5,11	3,7	2,4,10	1	x	x	13	x	x	x
	10	10	7,11	8	4,12,13	5,9	1,6	2	3	x	x	x	x
	11	11	8,10,12	7,9	5	4,6	2,13	1,3	x	x	x	x	x
	12	12	9,11	8	6,10	5,7	3,4	2	1,13	x	x	x	x
	13	x	13	x	10	x	7,11	8	4,12	5,9	1,6	2	3

*The charges shown are for illustrative purposes only. No attempt is being made to suggest shipping rates.

PRELIMINARY ANALYSIS INDICATES THAT THE PROPOSED RATE STRUCTURE WOULD RESULT IN FEWER BUT LARGER SHIPMENTS WITH LOWER TOTAL COST TO THE USER.

1. Indicate your reaction to the proposed rate structure as a RECEIVER or CONSIGNEE by circling the appropriate number below.

5	4	3	2	1
I would strongly accept	I would accept	I would be uncertain	I would reject	I would strongly reject

1a. After analyzing the composition of the shipments you RECEIVE, on what percentage could you use the proposed rate structure to your advantage?

☐ 0–25% ☐ 51–75%
☐ 26–50% ☐ 76–100%

2. Indicate what you think would be your typical suppliers' reaction to the proposed rate structure by circling the appropriate number below.

5	4	3	2	1
They would strongly accept	They would accept	They would be uncertain	They would reject	They would strongly reject

2a. Estimate the percentage of shipments on which you feel these typical suppliers could use the proposed rate structure.

☐ 0–25% ☐ 51–75%
☐ 26–50% ☐ 76–100%

APPENDIX B (Cont'd)

Using the number codes provided, indicate the number which best reflects your appraisal of the situation presented by the following statements.

5=Strongly Agree
4=Agree
3=Uncertain
2=Disagree
1=Strongly Disagree

(Circle one)

5 4 3 2 1 A flat charge per shipment for most shipments (excluding extraordinary items) would be workable when applied to your operating characteristics.

5 4 3 2 1 All shipments should cover the direct cost of providing the service and make some contribution to overhead.

5 4 3 2 1 Small shipments should be prepaid.

5 4 3 2 1 The shipper should be responsible for shipping document preparation.

5 4 3 2 1 There should be a limitation of liability on small shipments.

5 4 3 2 1 There should be reduced rates per shipment when multiple shipments are tendered.

Thank you for your cooperation. Please make any comments or suggestions which you feel would improve the proposed rate structure. Make your comments on this page or a separate sheet. If separate sheet(s) are used, please return them with the completed questionnaire.

APPENDIX C

LETTER OF TRANSMITTAL I

APPENDIX C

The University of Oklahoma 307 West Brooks, Room 106 Norman, Oklahoma 73069

College of
Business Administration
Department of Marketing

September 14, 1973

Mr. John Doe
447 Northwest 23rd Street
Oklahoma City, Oklahoma 73102

Dear Mr. Doe:

Will you help us?

We are asking your help in making a survey of opinion of Oklahoma shippers and receivers of small shipments. The purpose of the research is to find out what shippers and receivers of small shipments think of the present small shipments rate structure and of a proposed modification of that structure. Also, we are interested in your specific suggestions for improvement of either the present or proposed structure.

Your answers will help provide a solution to the small shipments problem which concerns not only you as a user, but also the general public, carriers, and regulatory agencies.

The name of your company appeared in a scientifically selected random sample of Oklahoma firms. Please answer even if you are not involved in intrastate shipments, for it is your opinion of the present and proposed rate structures that is important to the study. No individual or company will be able to be identified. All responses will be tabulated as a group.

It will not take you very long to answer the questions on the enclosed questionnaire and return it in the stamped reply envelope. We plan to make a report of the findings. If you would like to receive a copy of it, please put your name and address on the enclosed postcard.

Our sincere thanks for your cooperation. We appreciate very much your interest and effort.

Sincerely yours,

Roger E. Jerman
Research Director

Dr. James A. Constantin
Professor of Marketing
Chairman, Research Committee

APPENDIX D

LETTER OF TRANSMITTAL II

APPENDIX D

The University of Oklahoma 307 West Brooks, Room 106 Norman, Oklahoma 73069

College of
Business Administration
Department of Marketing

October 12, 1973

Mr. John Doe
447 Northwest 23rd Street
Oklahoma City, Oklahoma 73102

Dear Mr. Doe:

Recently we sent you a short questionnaire asking your opinion as a shipper and/or receiver of small shipments. The purpose of the research is to find out your opinion of the present small shipments rate structure and of a proposed modification of that structure. As we sent out only a limited number of these, your answer is very important to the accuracy of our survey.

Your answers will help provide a solution to the small shipments problem which concerns not only you as a user but also the general public, carriers, and regulatory agencies.

It will take only a moment to answer the questions on the enclosed questionnaire and return it in the stamped reply envelope. If you have not yet had a chance to answer, we would be most grateful if you would do so now. Your responses will be tabulated as a group, and will be held in strict confidence.

We plan to make a report of the findings. If you would like to receive a copy of it, please put your name and address on the enclosed post card.

Your response is vitally needed, and we would appreciate very much your interest and cooperation in helping us with this survey by giving us an early reply.

Sincerely yours,

Roger E. Jerman
Research Director

Dr. James A. Constantin
Professor of Marketing
Chairman, Research Committee

Enclosure

APPENDIX E

REMINDER LETTER

APPENDIX E

COLLEGE OF BUSINESS ADMINISTRATION
DEPARTMENT OF MARKETING

THE UNIVERSITY OF OKLAHOMA

NORMAN, OKLAHOMA 73069

October 19, 1973

John Doe Western Auto
2020 East Main
Woodward, Oklahoma 73801

Gentlemen:

Recently we mailed you a questionnaire asking for your participation in what we feel is an important survey to both you and us. The majority have been kind enough to help us with this small shipments survey by sending in their answers. If you were one of them, please consider this letter a "Thank you" for your valuable help.

In case you were away or too busy to complete the questionnaire before may we ask you to do so now? We are trying to get as near to a "perfect survey" as possible. This means getting a reply from everyone who received a questionnaire.

Many thanks for your help in this research.

Sincerely yours,

Roger E. Jerman
Research Director

APPENDIX F

LETTER OF TRANSMITTAL III

APPENDIX F

The University of Oklahoma 307 West Brooks, Room 106 Norman, Oklahoma 73069

College of
Business Administration
Department of Marketing

October 29, 1973

Mr. John Doe
2020 East Main
Woodward, Oklahoma 73801

Dear Mr. Doe:

Recently we mailed you a questionnaire asking for you participation in an important survey.

If you have already returned the questionnaire, please consider this note a "Thank you" for your valuable help.

If you have not had a chance to do so as yet, may we ask you to return the completed form now? Your participation is vital to the success of our study.

*[I realize the time problems you have and the number of outside duties you are called upon to perform. We believe this is a valuable study. Your response is urgently needed. In addition, your completing the questionnaire will help me in fulfilling the requirements for the Doctoral Degree. Many thanks.]

Sincerely yours,

Roger E. Jerman
Research Director

*The section contained in the brackets was hand written as a post script.