THE RELATIONSHIP OF FLEET SAFETY PROGRAMS TO ACCIDENT FREQUENCY RATES IN SELECTED CITY DELIVERY FLEETS

by

Walter D. Weiss

AN ABSTRACT

Submitted to
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ABSTRACT

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For more than three decades fleet safety programs have been employed by motor vehicle fleets throughout the United States. These programs are based on the premise that most vehicular accidents result from human failures; failures that can be reduced to a minimum through, among other things, fleet safety program activity.

The major purpose of fleet safety programs is to prevent accidents under routine conditions. In police fleets most accidents occur under routine patrol conditions, when they can best be prevented. Thus, fleet accident prevention takes on importance to the police administrator in operating an efficient department. Reduced accident experience in police fleets: (1) lowers the cost of fleet operation; (2) helps to maintain man-power at peak strength; and (3) assists the police administrator in building good public relations.

Safety administrators have put a great deal of faith in the ability of fleet safety programs to favorably affect the accident experience of their drivers.

A search of the available literature on fleet safety

programs revealed studies that point up definite reductions in company accident frequency rates. These studies conclude that these reductions result, at least partially, from fleet safety program activity. No comparative studies were found in the literature that revealed the trend of accident experience in companies with similar exposure but contrasting fleet safety programs.

The author hypothesizes that there is no difference in the trends of accident frequency rates in motor vehicle fleets employing standard fleet safety programs and fleets employing sub-standard programs.

A study was designed to test this hypothesis since no data was found in the literature that either support or reject the hypothesis.

A relatively homogeneous group of wholesale bakeries in Detroit, Michigan serves as the population in this study. A questionnaire was used to survey these companies in an effort to gather data on each of their: (1) delivery operations; (2) driver selection procedures; (3) accident prevention activities; (4) maintenance policies; and (5) mileage and accident experience.

These data were used in a comparison of accident frequency rate trends of companies with standard fleet safety programs and companies with sub-standard programs.

In all but one of the comparisons, a difference in frequency rate trends occurred in companies with standard fleet safety programs as contrasted to those using sub-standard programs.

Since an exception existed, the author felt it could not be concluded that the data either support or reject the hypothesis.

Data from the study show, however, that in each case where a standard fleet safety program was in effect, each of the companies experienced a reduction in their accident frequency rate trend.

Because of the large number of variables involved in any study outside a controlled environment, this study being no exception, a great deal of additional research is needed to provide information on the relationship of the variety of factors that might influence accident frequency rate trends in motor vehicle fleets.

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Also, I wish to express my appreciation to Mr. Raymond T. Galvin for his suggestions and guidance in the writing of this paper.

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CHAPTER I

THE PROBLEM

At the onset of the motor vehicle era, accidents were regarded as strictly chance happenings due to bad luck. Accidents were called wrecks and if one occurred, the after effects were cleared away and it was hoped it would not happen again.

As the motor vehicle began to take on more prominence in the American way of life and their numbers increased, laws and ordinances were developed as a means of keeping these vehicles from running into each other as well as into pedestrians and fixed objects. This resulted in a substantial contribution to accident prevention and a change in the motorist's concept of accident involvement. Traffic laws and ordinances directed the driver's attention toward determining whether one of these regulations had been violated. Thus, he attempted to establish legal blame in accident situations.

Commercial vehicle fleet safety directors realized that even though their drivers obeyed traffic laws and

regulations, they were still being involved in accidents. They looked beyond legal fault in accident situations to try to develop means, in addition to obedience to traffic laws, by which accidents could be prevented.[1] The search for an answer to the accident problem brought about the fleet safety program which has as its major purpose the prevention of accidents.

For more than three decades[2] accident prevention activities have been employed by motor vehicle fleets throughout the United States. The National Safety Council and the American Trucking Associations, Inc., among others, have served as clearing houses for ideas on how to prevent vehicular accidents. These ideas evolved into fleet safety programs which are currently in use by their respective members. In addition, a number of companies have designed their own programs to fit the peculiarities of their particular type of fleet operations.

Today, safety administrators generally agree that the great majority of traffic accidents result from human

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[1] Chris Imhoff, Better Driving Is Better Business (Chicago, Illinois: National Safety Council, 1964), pp. 4-6.

[2] National Safety Congress - Transactions, Historical copies of these publications described fleet safety programs in use prior to 1934. (Chicago, Illinois: National Safety Council).

failures, failures on the part of drivers to adjust their driving to mental, physical and environmental conditions. The National Safety Council booklet, ACCIDENT FACTS states that improper driving is a contributing element in over 90 per cent of all motor vehicle accidents.[3]

Human failures might stem from a variety of factors. For example, a driver may be unable to adjust his driving to his environment due to his physical qualities or characteristics. Selection procedures have been developed by the transportation industry to reduce this problem to a minimum.

Driver failures might also stem from an individual's lack of knowledge in how to adjust his driving to his environment. Likewise, human failures in driving can occur when the knowledgeable driver is unwilling to adjust his driving to the environment.

Considerable information is available that describes fleet safety programs and how they have been used to try to reduce human failures in an effort to prevent vehicular accidents.

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[3] Accident Facts, 1965 Edition, (Chicago, Illinois: National Safety Council, 1965), p. 48.

Many companies have, in fact, stated that a fleet safety program has played a role in reducing their motor vehicle accident frequency rate. Following an internal evaluation of their safety program, a number of companies have pointed out definite reductions in their accident frequency rates and have concluded that the reductions are a result, at least partially, of their fleet safety program.

I. THE PROBLEM

Statement of the Problem. Although definite reductions in accident frequency rates have been attributed to fleet safety program activity, no study is known to have presented comparative data that shows the trend of accident experience in companies with similar exposure but differing fleet safety programs or no program whatsoever. The purpose of this study is to compile information about companies operating fleets of motor vehicles that have similar exposure but differing fleet safety programs in order to: (1) determine whether there is a difference in the trends of accident frequency rates in fleets employing standard fleet safety programs[4] and

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[4] See Definitions, "Standard Fleet Safety Program"

fleets employing sub-standard programs;[5] (2) determine whether there is a difference in accident frequency rates in fleets that have a fleet safety program and those that have no program; and (3) establish whether the use of a fleet safety program consistently results in reduced accident frequency rates.

Hypothesis. There is no difference in the trends of accident frequency rates in motor vehicle fleets employing standard fleet safety programs, as defined, and fleets employing sub-standard programs, as defined.

It is also conjectured that available literature is neither sufficiently objective nor sufficiently complete to either support or contradict the hypothesis.

Methodology. In order to establish what a fleet safety program involves, a search of available literature was conducted for descriptions of fleet safety program activities. Also, available literature was scrutinized for research conducted on the relationship of fleet safety programs to accident trends.

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[5] See Definitions, "Sub-standard Fleet Safety Program"

The four elements[6] described by the National Safety Council as being basic to effective fleet safety activity were used to define a standard fleet safety program.

A questionnaire was developed using the standard fleet safety program as a frame of reference. Through the use of this questionnaire, a survey of current operations and fleet safety program activities in selected city delivery fleets was conducted. The findings are included in the study.

An analysis of the data obtained through the questionnaire coupled with the review of literature was used to test the hypothesis.

Limitations of the Study. The universe for this study includes all wholesale bakeries operating within the Detroit metropolitan area, including suburbs. A list of these bakeries was acquired from the Michigan Bell Telephone Yellow Pages Directory for Detroit.

The population used for this study is limited to those wholesale bakeries which operated a fleet of motor vehicles as defined, i.e., ten or more delivery trucks.

No attempt is made to evaluate specific parts of standard or sub-standard fleet safety programs and the individual relationships of these parts to the various

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[6] Chris Imhoff, Better Driving Is Better Business (Chicago, Illinois: National Safety Council, 1964), p. 4.

companies' accident frequency rates. An evaluation of this type would require the manipulation of company fleet safety program activities and policies over a number of years along with subsequent comparisons of accident trends. This type of evaluation is behond the scope of this study.

This study, likewise, does not attempt to evaluate the relationship between differences in the application of the specific parts of standard or sub-standard fleet safety programs and the companies' accident frequency rates. Such an evaluation is also beyond the scope of this study.

Environmental elements were assumed to work equally on all subjects since all the fleets that cooperated in this study operated within the Detroit metropolitan area, including suburbs, during the period of time involved in the investigation. Therefore, the effects of road, weather, road-side environment, location, traffic, light conditions, time of day or week, etc., will be considered negligible variables.

An attempt was made to resolve variables such as types of equipment used, employment practices, maintenance programs, size of fleet, etc., by matching fleets with similar equipment and policies.

II. IMPORTANCE OF THE STUDY

The question of the relationship between fleet safety programs and accident experience in motor vehicle fleets has been subjected to considerable study. However, the objectiveness and completeness of these studies is questionable if the published literature is any criterion.

Safety administrators have put a great deal of faith in the ability of fleet safety program activity to favorably affect the accident experience of their drivers.

A. R. Hoenniger, Safety Officer, San Diego County, California, stated that:

> "Proper preliminary training and a continuous safety program are necessary elements of any realistic approach to prevention of traffic collisions involving police drivers and vehicles."[7]

Gerald O'Connell, Assistant Director, Traffic Institute, Northwestern University, also stated that:

> "Success in preventing police vehicle accidents requires participation by every division, and active support by all command and supervisory personnel for requirements of the (fleet safety) program."[8]

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[7] A. R. Hoenniger, "Police Fleet Safety," Traffic Digest and Review, March, 1962, p. 10.

[8] Gerald O'Connell, "Safety Program Tops Operating Policies For Police Fleets," Traffic Digest and Review, February, 1963, p. 8.

It is important, then, that an objective attempt be made to evaluate the relationship between fleet safety programs and fleet accident experience in an effort to substantiate the faith put in fleet safety programs.

While police fleets are not specifically involved in this study, their basic accident problems are substantially the same as any other fleet operation, including wholesale bakery fleets. Although operating a police vehicle is unique in some respects, accidents occur in police fleets due to human failures much like in any other fleet.

Emergency operation of police vehicles places law enforcement officers in positions not encountered by most other drivers. Often they must exceed the speed limit, abridge right-of-way regulations, and take other risks when on emergency runs; and usually in city traffic where driving conditions are most congested. It would seem, then, that a police officer pursuing a fleeing car would have little time to think about the refinements of safe driving. Accident involvement under these conditions would not seem too surprising.

However, contrary to popular belief, high speed pursuit or the emergency run are not the principle factors in accidents involving police vehicles. One police agency

reported that during a twelve-month period, approximately 78 per cent of its accidents occurred during routine patrol duty, and only 22 per cent during emergency or pursuit driving.[9]

Another police department reported over 84 per cent of all moving accidents occurred during routine patrol.[10]

A survey conducted by the Highway Safety Division of the International Association of Chiefs of Police in 1962 found that approximately 90 per cent of reported police accidents occurred during routine patrol or when the vehicle was parked.[11]

Not taken into consideration in these figures is the ratio of routine patrol miles to pursuit or emergency-run miles driven. Were these facts known, it might show that accidents occurring during pursuit driving or emergency runs are proportionately higher to the miles driven during pursuit than those occurring during routine patrol.

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[9] Paul H. Coburn, "For Safer Police Drivers," Traffic Digest and Review, October, 1953, p. 14.

[10] Figures obtained from the City of Dallas Police Department, Dallas, Texas, in a letter dated April, 1965.

[11] "Safe Driving Techniques," Training Key # 20, Field Service Division, International Association of Chiefs of Police, 1319 18th St., N.W., Washington, D. C. 10026, 1964.

However, the fact remains that most accidents do occur on routine patrol when they can best be prevented.

> Most police vehicle collisions, however, occur during normal patrol operations and not during pursuit. The sudden erratic movement of another vehicle or the momentary distraction of the patrol driver while cruising can bring about collisions in much the same way as accidents occur to John or Jane Doe.[12]

The importance of fleet accident prevention to the police administrator is three fold. First, reduced accident experience lowers the cost of fleet operation through lower insurance premiums, less vehicle repair and fewer man-hours wasted.

Second, reduced accident experience helps to maintain present man-power at peak strength by preventing:

a. Loss of personnel due to injury
b. Loss of efficiency because of inexperienced personnel replacing experienced men
c. Man-power loss due to investigating accidents involving department vehicles and personnel.

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[12] A. C. Finch, "Police Fleets Need Safety Too," The Police Chief, November, 1956, p. 41.

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Finally, reduced accident experience helps to build better public relations and helps to establish police personnel and police departments as leaders in accident prevention in the community.

Lt. V. K. Hipskind of the Dallas Police Department, concluded in one of his many articles in police journals that, "A definite safety program is necessary for the efficient and economical operation of a police department."[13]

Fleet safety programs are usually designed to prevent accidents under routine driving conditions. Thus, the police administrator may be in a position to reduce his accident frequency rate by using the techniques of fleet safety programming found in private transportation concerns.

III. DEFINITION OF TERMS

Certain terms are defined in order to make this study more meaningful. These terms and definitions follow.

STANDARD FLEET SAFETY PROGRAM

For purposes of this study, a standard fleet safety

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[13] V. K. Hipskind, "The Development of a Police Safety Program," Police, January-February, 1965, p. 63.

program contains four elements the National Safety Council calls essential for effective fleet safety activity. These elements are:

1. A standard of driving performance
2. Driver training
3. Record keeping on individual drivers' performances
4. Recognition for good driving performance[14]

An outline of a standard fleet safety program model might include the following:

ELEMENT 1. Standard of Driving Performance

An example of a standard of driving performance is: Driving with the objective of preventing accidents through the continuous exercise of every resource of alertness, foresight, knowledge, judgement, and skill necessary to avoid preventable accidents.

ELEMENT 2. Driver Training

The following are examples of methods and materials that might be employed in driver training.

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[14] Chris Imhoff, Better Driving Is Better Business, Chicago Illinois: National Safety Council, 1964, p. 4.

a. Methods of Training

Examples:

1. Initial indoctrination
2. On-the-job instruction (behind-the-wheel)
3. Check-rides and inspections
4. Safety meetings
   a. Lectures
   b. Demonstrations- including use of films
5. Bulletin boards - posting accident prevention information
6. Mail safety material to home

b. Materials and Publications used in training that contain safe driving information

Examples:

1. Driver magazine (containing defensive driving and safety information)
2. Driver letter (containing defensive driving and safety information)
3. Booklets (containing defensive driving and safety information)
4. Safety posters
   a. In terminal building
   b. In vehicle

5. Bulletins (containing safety information)
6. Motion pictures
7. Slide shows

ELEMENT 3. Record Keeping

This element includes:

a. Definition of an accident
b. Definition of a reportable accident
c. Definition of a preventable accident
d. A policy requiring all accidents to be reported
e. A systematic record of the individual driving performance of each driver

ELEMENT 4. Recognition

a. Recognition based on a standard of performance (See Element 1)
b. Well defined rules describing the standard of recognition
c. Forms of recognition
    1. Safe driver awards (pins, emblems, certificates, etc.)
    2. Cash or merchandise bonuses
    3. Incentives of many different types and values (vacation trips, letter of commendation, etc.)

SUB-STANDARD FLEET SAFETY PROGRAM

A program that contains less than all of the four basic elements of a standard fleet safety program.

NO FLEET SAFETY PROGRAM

A motor vehicle fleet program that fails to employ any of the four basic elements of a standard fleet safety program.

DEFENSIVE DRIVING

Driving so as to commit no driving errors and to avoid accidents that could result from the actions of other drivers or adverse conditions.

ACCIDENT

Any occurrence involving a fleet motor vehicle in which there was death, injury, or porperty damage.[15]

PREVENTABLE ACCIDENT (For Individual Drivers)

Any occurrence involving a motor vehicle in which there was death, injury or property damage, where the driver in question failed to do everything he reasonably could have done to prevent the accident.[16]

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[15] Safe Driver Award Rules, (Chicago, Illinois: National Safety Council, January, 1964), p. 2.

[16] Ibid., p. 3.

REPORTABLE ACCIDENT

Any occurrence involving a fleet motor vehicle which results in death, injury, or property damage, unless such fleet vehicle is properly parked. Who was injured, what property was damaged or to what extent, where it occurred, or who was responsible is not a factor.[17]

MINIMUM MAINTENANCE

Regular schedule of servicing and checking a vehicle to help prevent vehicle defects that might result in vehicle accidents.

FLEET

Ten or more vehicles of a single type (bus, truck or passenger car) comprising identical motor transportation operations.[18]

FREQUENCY RATE

Reportable accidents per million vehicle viles[19]

$$F R = \frac{\text{Reportable Accidents} \times 1{,}000{,}000}{\text{Vehicle Miles}}$$

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[17] Contest Rules, National Fleet Safety Contest. (Chicago, Illinois: National Safety Council, revised July 1, 1964). p. 1.

[18] Ibid., p. 1.

[19] Ibid., pp. 4 and 5.

IV. ORGANIZATION OF REMAINDER OF THESIS

A review and analysis of the literature on accident prevention and fleet safety programing are presented in Chapter II.

Chapter III relates the method used to gather fleet safety program and accident experience data. Details outlining the development of the questionnaire used in the survey, the source of the data collected, and variables involved are also included in this chapter.

Chapter IV reviews and analyzes the data collected in the survey.

Conclusions drawn from the analysis of the survey data are presented in Chapter V. Finally, the need for further research is discussed.

CHAPTER II

REVIEW OF THE LITERATURE

A search for the available literature on fleet safety programs was conducted at the National Safety Council Library, Chicago, Illinois; Michigan State University Traffic Library, East Lansing, Michigan; and the Northwestern University Transportation Library, Evanston, Illinois. In addition, inquiries were sent to:

1. New York University, Center for Safety Education, New York, New York
2. University of California at Los Angeles, Institute of Transportation and Traffic Engineering, Los Angeles, California
3. University of Illinois, Highway Traffic Safety Center, Urbana, Illinois
4. Pennsylvania State University, Institute of Public Safety, University Park, Pennsylvania
5. U. S. Government Printing Office, Superintendent of Documents, Washington, D. C.[20]

Most of the material obtained was of a descriptive

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[20] See Appendix B for sample letter number 1 used in the inquiry to the latter 5 organizations.

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nature presenting brief outlines of safety programs or simply stating that a fleet safety program was in effect. Accident and accident frequency rate reductions were also cited.

Literature describing comparative data that exhibits the trend of accident experience in companies with similar exposure but differing fleet safety programs appears to be non-existent. However, literature describing fleet safety programs and improvement in accident experience are numerous and are reviewed in the selected materials presented in this chapter.

Major General Paul F. Yount, in his talk before the 1955 National Safety Congress, Commercial Vehicle Section, reported a reduction of the Army Transportation Corps' accident frequency rate from 2.6 to 1.4 accidents per 100,000 vehicle miles between 1946 and 1954. He credits this reduction to a number of factors.[21]

> Specific safety objectives, teamwork, strong command support, able technical advisors, and making safety the responsibility of every commander are the

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[21] P. F. Yount, "The Army Transportation Corps Safety Program," National Safety Congress - Transactions, Vol. 1, (Chicago, Illinois: National Safety Council, 1955), p. 19.

essential factors of our program.[22]

A 63 per cent decrease in the number of persons killed between 1946 and 1954 in accidents involving buses operated by interstate carriers who reported to the Interstate Commerce Commission was attributed to the use of fleet safety programs according to Harold Hosea, Director of Research, National Association of Motor Bus Owners.[23]

Mr. Hosea cited some of the ingredients in the programs employed by these companies operating buses interstate and cited as most important driver selection and training.

> Most of the carriers, especially the larger companies, have set up minimum physical and psychological hiring standards considerably more rigorous than required by I.C.C. safety regulations. A great deal of emphasis is put on the aptitude and personality characteristics of driver applicants.[24]

Considerable emphasis was also placed on vehicle inspection and maintenance by Mr. Hosea.

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[22] Ibid.

[23] Harold R. Hosea, "Safety Programs Pay Off In Intercity Bus Operations." Public Safety, March, 1956, p. 17.

[24] Ibid.

At the 1954 National Safety Congress Motor Transportation Conference, Carlton Alexander, then Director of Safety, Mclean Trucking Company, Winston-Salem, North Carolina, outlined, among other things, in-service training in his company.

According to Mr. Alexander, the purpose of driver training in his company was three-fold:

(1) To develop skill in the driver enabling him to maneuver the vehicle in a safe manner.

(2) To develop the necessary amount of knowledge to permit the driver, to operate the vehicle.

(3) To instill proper attitudes so the driver utilizes his acquired skill and knowledge in performing the operation of safe driving.

In his presentation, he cited principles of driver training and made suggestions as to what type person or employee might make good trainers. Although the subject matter to be taught was not covered, tools that could be used in in-service training were mentioned, as follows: (1) bulletins; (2) letters; (3) posters; (4) cartoons; (5) house organs; and (6) others. Job analysis, accident analysis, and training records were suggested as those factors that should give direction to the use of these tools.

He also pointed out other devices which, although their primary function is not training, could have a secondary value as a training tool: (1) award programs; (2) accident review committee; (3) safety committees; and (4) supervisory techniques.

Mr. Alexander reported a study involving 52 McLean drivers in which some of these in-service training devices were used. In addition to two weeks of recruit training, each of the 52 drivers received one week of in-service training and a three day refresher or second in-service training course. This training was conducted over a three year period and a before and after study showed the following:[25]

(1) Before In-Service Training - 114,791 miles per accident

(2) After In-Service Training - 252,000 miles per accident

(3) After Second In-Service Training - 330,000 miles per accident.

The miles per accident operated by the 52 drivers furing the periods before and after training were reported

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[25] Carlton Alexander, "Evaluating Progress Through In-Service Driver Training," National Safety Congress - Transactions, Vol. 18, (Chicago, Illinois: National Safety Council, 1954), pp. 14-17.

by Mr. Alexander as, "the results which have been accomplished by the utilization of some of the in-service training devices mentioned above."[26]

Robert Meyer, in an article about the Chicago Sun-Times' fleet safety program, reported this company's fleet had a frequency rate of 14.31 accidents per 100,000 vehicle miles in 1952. By 1959, six years after their fleet safety program had been inaugurated, their rate dropped to 3.03.

In addition to the fleet safety program which was designed around the National Safety Council's Complete Motor Transportation service, close attention was given to the driver selection procedure which included reference checks, driving history checks, physical examinations, personal interviews, attitude and road tests. Close supervision on the road and regularly scheduled maintenance completed the over-all program.[27]

Spector Freight System supported a sound accident prevention program in citing a drop in the System's total number of accidents of more than 31 per cent from 1952

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[26] Ibid., p. 17.

[27] Robert Meyer, "Chicago Sun-Times Headlines Safety," Traffic Safety, (March, 1959), pp. 30-32.

to 1954 despite a 10 per cent increase in total mileage during that period.

An article written about Spector's program related that Spector officials regard careful driver selections as a fundamental principle of a good safety program. Their selecting standards were reported as high. Screening includes:

(1) A personal interview by a driver supervisor. Past experience, appearance and attitude are sized up and evaluated in this interview.

(2) A thorough check of the applicants' work history, police record, driving record, and personal references.

(3) A physical examination.

(4) A road test if the previous employer's opinion of the applicant's performance and ability indicates one is needed.

The National Safety Council's Complete Motor Transportation Services were described as an integral part of Spector's accident prevention program.[28]

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[28] John Gwin, "Spector Success Story," Public Safety, (September, 1955), pp. 20-21.

In October, 1954, the Baltimore Yellow Cab Company introduced a fleet safety program into its operations. Coupled with this program were a regularly scheduled preventive maintenance and inspection procedure for its vehicles, a comprehensive driver selection procedure, and street supervisors who patroled the streets and observed drivers under actual driving conditions.

When violations of safety regulations were observed by the street supervisors, they stopped the driver and explained why the violation could be serious. Both driver and supervisor were then scheduled into the main office and disciplinary action or retraining decided upon. A similar meeting was scheduled when a driver was involved in a preventable accident.

Over a three year period, 1954 through 1956, the Yellow Cab Company experienced an accident rate reduction from 7.41 accidents per 100,000 miles to a rate of 5.22.[29]

In 1950, I. C. Thomas, Superintendent of Safety, Sioux Falls Transit Company reported that the company's fleet safety program resulted in a 60 per cent reduction in accidents five years after the program was introduced.

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[29] Frank Davin, "Safety Rates Top Priority at Baltimore Yellow Cab," Traffic Safety, (August, 1957), pp. 50-53.

Incorporated in the program was the use of bulletin boards to give helpful aids in how to prevent accidents as well as a running account of how the fleet was doing regarding accident experience.

In addition, safety meetings were held quarterly at the start of the safety program. Drivers having earned safe driver awards received them at these meetings. Three years after the start of the program, safety meetings were scheduled every six weeks and award presentation meetings were held twice a year.[30]

Mr. Thomas stated in his article that, "We found that safety pays off in tangible ways. Our accident prevention program has put money in the bank for both our company and our drivers."[31]

When 1962 performance was compared with that of 1958, Lincoln Coach Lines, Irwin, Pennsylvania, found a 53.9 per cent reduction in total accidents. The company used 1958 as the base year for comparison because that was the year prior to the adoption of the company's present fleet safety program.

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[30] I. C. Thomas, "Sioux Falls Transit Is Safer," Public Safety, (October, 1950), pp. 8-9.

[31] Ibid., p. 9.

The core of Lincoln's safety program was described as a bi-weekly evening discussion limited to seven participants. Employees attended on a rotating basis and during the course of a year each man had studied the various parts of the total safety program.

A comprehensive maintenance program was also reported as part of the company's safety effort. Coaches undergo a thorough mechanical over hauling every 4,000 miles.

Both the company and the drivers enjoy a favorable image in the community and have received excellent press, radio, and television coverage of their safety activities.[32]

A reduction in the number of preventable accidents from more than 4 per month to less than one a month was attributed to the use of short weekly safety meetings at the New Orleans terminal of Couch Motor Lines.

At another company terminal, after the terminal manager began to participate in the weekly meetings, the number of accidents went from two per month to no accidents for nine months from the date of the first meeting. After three years of weekly meetings at this terminal, the rate has remained under four accidents per year.

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[32] "Lincoln Coach Lines Program Cuts Total Accidents In Half," Traffic Safety, (July, 1963), p. 23.

W. T. Couch, Safety Engineer for Couch Motor Lines concluded:

> From the success of these two experiements we know where to begin our safety efforts. We know the men will be no safer than their boss. They will think, act, drive safely, if their superior sincerely promotes accident prevention.[33]

Vehicle maintenance and cooperation with drivers by quickly checking any complaints about the vehicles adds to the safety attitude of the drivers according to Mr. Couch.[34]

Although a fleet safety program was in effect at Pacific Intermountain Express employing, among other things, a safe driver award program, frequent visits to branches, and personal letters to drivers from the safety director, one branch of city drivers was experiencing frequent and costly accidents. In view of this, the safety department tried a new approach; an individual interview with each driver at the branch.

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[33] A. E. Nichols, "How to Organize an Effective Fleet Safety Program in a Large Fleet," National Safety Congress - Transactions, Vol. 18, (Chicago, Illinois: National Safety Council, 1955), pp. 32.

[34] Ibid.

Interviews lasted about 15 minutes and were held during the first hour of work each morning in a quiet office away from distractions. It took two months to cover all 100 drivers.

The driver was sent to the office where the interviewer first tried to put him at ease and then outlined the seriousness of the accident problem in the branch. The driver was then asked for his cooperation and was asked whether he had any suggestions for reducing accidents in the fleet. This brought out complaints about equipment as well as constructive suggestions.

No reference was made of the driver's accident record unless the driver brought the subject up and started to talk about it. No written records were kept of the interview except for making a note of complaints or suggestions after the interview was completed.

At the conclusion of the interview a plea for help was made, especially slanted at the more experienced drivers to pass on some of their knowledge to the new men.

In the three months immediately prior to the meetings, the accident rate for this branch was 90.81 accidents per million miles. In the next three months, during and following the interviews, the rate dropped to 39.95. A year later the rate was 41.92.

Frank M. Williams, Assistant Director of Safety for Pacific Intermountain Express, concluded that there were other things that may have interacted with the interviews to bring about the reduction, but that much of the change could be traced to the interviews.[35]

The Industrial Psychological Services of Johannesburg, South Africa, at one time the personnel selection department of the Johannesburg Public Utility Transport Corporation, placed strong emphasis on personality tests in an attempt to predict accident involvement in their bus operators.

Two tests were used, the Thematic Apperception Test and a Social Relations Test which was developed by the Industrial Psychological Services.

For selection purposes, these tests were used to distinguish between good and bad risks. For in-service drivers the tests were used to diagnose a driver's difficulty when he suddenly ran into trouble, i.e., increased accident involvement.

In both cases the tests were used to determine an employee's or potential employee's weaknesses and, armed

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[35] Frank M. Williams, "P-I-E's Safety Program Has the Personal Touch," Traffic Safety, (November, 1963). pp. 21.

with this information, training could be used to overcome these weaknesses. At a talk before the Transit Section at the National Safety Congress, October, 1965, Lynette Shaw, Manager of the Industrial Psychological Services organization concluded that the psychological testing program appeared to be the controlling factor in a reduction of over 50 per cent in the accident frequency rate when the supply of applicants was sufficient to turn down the majority of applicants that failed the tests.

Her conclusion was based on the company's experience in 1964 when it expanded, with a general South African industrial boom, to the point of a sudden need for 200 new drivers.

The company was forced to lower its selection standards and signed on 200 drivers irrespective of their test results. Each of the 200 men had prior experience in and had drivers licenses for heavy vehicles. It was reported that 75 per cent of these applicants had failed the personality tests.[36]

> The dangers of this reversal of policy were appreciated only too well, and, cosequently, supervision was stepped up to the hitherto unprecedented degree. Despite this fact, the

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[36] Lynette Shaw, "The Practical Use of Projective Personality Tests as Accident Predictors," National Safety Congress - Transactions, Vol. 17, (Chicago, Illinois: National Safety Council, 1965), pp. 39-43.

> records of the majority of these men have already proved blatently unsatisfactory; the PUTCO buses have been involved in the sort of accidents that had become a thing of the past, and the corporate accident rate of the company had stopped declining and is showing a most ominous increase.[37]

Summary. Most of the material obtained in the search for literature on fleet safety programs was of a descriptive nature presenting brief outlines of fleet safety programs and citing reductions in accident experience.

The review of literature as presented should not be construed to be all-inclusive of the available data on fleet safety programs. Rather, these materials are presented as representative examples of the types of studies that have been conducted regarding fleet safety programs and their relationship to accident experience.

The review of the foregoing published materials supports the conjecture that the available literature is neither sufficiently objective nor complete to either support or contradict the hypothesis.

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[37] Ibid., p. 43.

The objectivity of the published materials is questioned because:

1. Company safety administrators or personnel of safety oriented organizations assembled the materials as a means of illustrating the effects of safety program activities on accident experience.
2. These materials were designed for presentation in safety oriented publications.
3. It is only natural, therefore, that positive results, i.e., a reduction in accident experience, would be presented.

All of the literature cited improvements in accident experience. Some of the materials related this improvement to a change in the fleet safety program activity. The improvements in accident experience cited in the studies appear to serve primarily an illustrative purpose and lack objectivity.

Since negative results of fleet safety programs were not presented in the literature, two possible conclusions might be drawn from this:

1. Fleet safety programs consistently result in generally reduced accident experience

2. Reports of fleet safety programs that show no reduction in accident experience have not been published.

In all cases, the literature was not sufficiently complete to determine whether the safety program activity fell within the definitions of the terms standard fleet safety program or sub-standard program.

Finally, it was not possible to determine from the available literature whether there is a difference in accident frequency rates in fleets that have a fleet safety program and those that have no program since no published material was found that presented these comparative data.

CHAPTER III

THE SURVEY

I. DEVELOPMENT OF THE FLEET SAFETY PROGRAM ACTIVITY QUESTIONNAIRE

The initial development of the questionnaire centered around a search for literature containing accident prevention and fleet safety program information. Specifically, literature was sought that:

(1) Described research on the effectiveness of fleet safety programs relative to reducing accident frequency rates;

(2) Described actual fleet safety programs;

(3) Described materials used in fleet safety programs.

The questionnaire was designed as a five part form. Among other sources, the following were relied on heavily in the development of the "Selection of Drivers" and "Accident Prevention Programming" sections of the questionnaire:

(1) Fleet Safety Manual - National Safety Council

(2) Complete Motor Transportation Service Brochure - National Safety Council

(3) Driver Selection Procedure - American Trucking Associations, Inc.

(4) Sights on Safety Service - American Trucking Associations, Inc.

The "Operations," "Selection of Drivers," and "Vehicle Maintenance" sections were designed to provide a means by which similarities in the cooperating fleets could be matched for making possible comparisons of these fleets in the analysis of fleet safety programs and accident frequency rates.

OPERATIONS

The "Operations" section of the questionnaire was developed in an attempt to aid in the matching of fleets relative to size, type of vehicles operated, type of delivery service, area in which they operated, the time of day the drivers were driving and whether regular drivers covered the same assigned routes each week.

SELECTION OF DRIVERS

Questions pertaining to procedures used in selection of drivers were developed to determine if the screening of applicants for driver-salesmen was similar in each of the cooperating bakery fleets. This information was also utilized in the attempt to match fleets for later analysis.

ACCIDENT PREVENTION PROGRAMING

This section was designed to measure the application of the four basic elements in a standard fleet safety program as defined.[38] The data developed from this section was the basis for comparison of fleet safety programs in the cooperating bakery fleets.

VEHICLE MAINTENANCE

This was considered in the questionnaire to ascertain whether or not the vehicles being operated by the fleets included in this study received at least a minimum amount of maintenance.[39]

ACCIDENT AND MILEAGE DATA

Finally, the accident and mileage data requested was essential for the computation of accident frequency rates for each of the cooperating bakery fleets. These data were used in conjunction with the information from the other questionnaire sections in an attempt to determine trends in accident frequency rates.

It is recognized that any of the five sections of the questionnaire could have contained a great variety of

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[38] See Definitions - "Standard Fleet Safety Program", Chapter I, p. 7.

[39] See Definitions - "Minimum Maintenance", Chapter I, p. 10.

detailed questions and, in fact, did in its initial developmental stages. However, it was condensed to the major points of concern in terms of this study to facilitate a workable questionnaire; one that would not too readily discourage the cooperation of the wholesale bakery companies that had a fleet of delivery trucks that fell within the definition of the term fleet.[40]

II. TESTING THE INITIAL QUESTIONNAIRE

Once the questionnaire was condensed, i.e., after questions not essential to the study were deleted, it was field tested. Six dairy companies operating in the greater metropolitan Chicago area were contacted and agreed to serve as test fleets for the questionnaire. Using the initial questionnaire, each of these fleets was surveyed at the company office. The survey was conducted as though these companies were actual fleets to be included in the study and the questionnaire was in final form.

The field tests were conducted to determine:

(1) Whether the questions and the wording used were understandable and clear.

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[40] See Definitions - "Fleet", Chapter I, p. 10.

(2) Whether it was possible to get the information requested.

(3) The time it required for the survey to determine the feasibility of this approach.

The field test suggested a number of revisions in the wording of several questions which were incorporated into the final questionnaire.

Throughout the period of designing the questionnaire, the Research Department and the Motor Transportation Department of the National Safety Council were consulted for critical reviews of each of the questionnaire drafts.

III. SOURCE OF DATA

Recognizing the large number of variables involved in any study outside a laboratory environment, especially when dealing with several organizations and many individuals spread over a wide geographic area, it was desirable that subjects for this study be as homogeneous as possible, in sufficient numbers, and assessable for a meaningful and workable study.

To reduce the size of the geographical area in which the study would be conducted, only city delivery fleets were considered. Few industries in any given city have a number of companies with similar operations that would lend

themselves to this type of study. To obtain a satisfactory number of fleets, an industry was needed which would provide an adequate number of companies operating in one city.

Of the few industries that fell into this category, three appeared to be the most promising: dairy; laundry; and bakery. Dairy and laundry have mixed delivery services, both wholesale and retail, to stores as well as private homes. They also have a wide variety of types of trucks in operation.

Wholesale bakeries appeared to be the most homogeneous in all areas.

(1) They operate the same kind and size of trucks for the most part.

(2) They deliver primarily to retail store outlets or institutions.

(3) Different companies frequently deliver to the same locations consequently the geographical area covered is similar.

On this basis, and because of the availability of these companies, Detroit metropolitan wholesale bakers and distributors operating in the Detroit metropolitan area including suburbs were chosen.

The Michigan Bell Telephone Company Yellow Pages for Detroit were used as the source of wholesale bakery names

and locations. In all, there were 86 wholesale bakeries listed which, to the writers knowledge, is all the wholesale bakeries in Detroit. Each of these companies was telephoned to determine if it had ten or more delivery trucks to constitute a fleet.

Eighteen companies of the 86 qualified, i.e., had a fleet of ten or more vehicles, and all agreed to cooperate in the study. These eighteen fleets made up the population or sample for the study.

IV. VARIABLES INVOLVED

Exposure

Environmental elements. Since all fleets in the study operate in the same geographical area, this variable will be assumed to affect each fleet equally. Therefore, road, weather, road-side environment, location, traffic, light conditions, time of day, day of week, etc., will be considered negligible variables.

Exposure based on number of miles operated. An attempt will be made to match companies operating approximately the same number of miles to nullify this exposure variable.

Equipment

For the most part, the fleets in the study operate equipment that is similar in body style, i.e., van type trucks, and weight. An attempt was made to match fleets

on the basis of equipment. Therefore, where this was done it is assumed that equipment variables are negligible.

Selection of Drivers

One section of the questionnaire was devoted to selection and employment of driver-salesmen. Where these procedures are the same or similar in companies and an attempt has been made to match them in all other respects, selection procedures will be assumed a negligible variable.

Training of Drivers

Training was covered in the questionnaire in an attempt to match this factor and where matched in fleets, this variable will be considered negligible. However, a fleet safety program can be considered in-service training which might vary from fleet to fleet.

Type of Operation

The subjects all operate within the greater Detroit metropolitan area including suburbs. The study was limited to this geographical area in an effort to reduce the exposure variable.

All companies involved in the study deliver to retail stores and institutions, consequently all encounter similar delivery experience and exposure. This factor will be considered negligible when other factors are matched.

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Likewise, hours of operation, length of driver tenure, and route coverage will all be considered negligible variables when they are similar in the fleets in the study groups.

V. METHOD OF CONDUCTING THE SURVEY

Phase I - Initial Contact

The initial contact with each of the 86 Detroit metropolitan wholesale bakeries was made by telephone. After a brief explanation that the call was regarding a study of the fleet safety programs of Detroit metropolitan bakeries, each company was asked the number of delivery trucks in its fleet.

In each case where the company had ten or more trucks a more detailed description of the study was presented including the several areas of investigation covered in the questionnaire.

At this point the cooperation of each of the subject fleets was solicited and a date set for a personal visit to the company offices. Each company was assured that company names and places would remain strictly confidential in the analysis of the data and writing of the survey report.

Four companies of the eighteen cooperating in the study requested that the questionnaire be mailed to them because of their busy schedules or because only the parent company had the authority to give out some of the information.

Phase II - The Survey

A second phone call was made to each of the cooperating companies on the day the meeting had been set for the survey to confirm the meeting time and convenience with the company representative.

From one to two hours was spent on the survey at each company during which time each question on the questionnaire was discussed.

Where it was not possible to visit the company offices, the questionnaire was sent via mail accompanied by a cover letter.[41]

Phase III - Follow-Up

Accident and mileage data not available at the time of the survey was given to the writer by mail or arrangements were made to return to the company at a time when such data was obtainable.

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[41] See Appendix B for sample letter No. 2.

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CHAPTER IV

SUMMARY AND ANALYSIS OF DATA

The representatives of the eighteen cooperating wholesale bakeries were generally open and free with information about their companies and appeared to make a concentrated effort to remain objective in their responses to the questionnaire.

When a change in any of the programs occurred during the study period, each of the company representatives willingly provided the information that corresponded with the year and the changes. Most of the representatives had been with their companies during the years covered by the study.

Of the original eighteen wholesale bakery companies that agreed to cooperate in the study, fourteen companies furnished information on all five sections of the questionnaire. The remaining four companies were unable to provide accident or mileage data and are not included in the summary and analysis of the survey results.

Since exposure, in terms of miles traveled, is probably one of the most critical variables in this study, the fourteen fleets are divided into three groups on the basis of their

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annual mileage. This also helps to facilitate a more workable summary and analysis of the data.

The average mileage for each of the companies in Group 1 ranges from 150,000 to 252,000 miles per year and includes six bakeries; code numbers 3, 4, 13, 16, 17, and 19.

The average mileage for each of the companies in Group 2 ranges from 800,000 to 950,000 miles per year and includes three bakeries; code numbers 6, 8, and 12.

In Group 3, the average mileage for each of the companies ranges from 1,155,000 to 3,110,000 and includes five bakeries; code numbers 5, 9, 10, 11, and 14.

A complete summary of the survey data for each of these groups is found in Appendix C. Summary tables showing the responses to each of the questions in the survey are found in Appendix D.

The remainder of this chapter is devoted to a summary and analysis of the survey data by groups. For purposes of this analysis, an increase or decrease in the frequency rate trend of each of the companies in the study is based on whether or not the frequency rate of each company in the year 1964 is higher or lower than at the start of each company's reported experience.

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I. GROUP 1

Operations

Generally, the six companies in Group 1 are similar in their operations. Differences were noted in only four areas.

Five of the six companies in Group 1 make 90 per cent or more of their deliveries to retail stores, with delivery to restaurants and institutions such as hospitals, schools, etc., making up the remainder of their deliveries. Company 4 delivers solely to restaurants and institutions.

This latter company's delivery hours also differ most widely from the others. Its restaurant and institution deliveries are made between the hours of 3:00 a.m. and 6:00 p.m. These hours extended beyond the other five companies which have a range of delivery hours of 5:00 a.m. to 5:00 p.m.

The maximum number of hours a driver may work each day varies from 8 to 12 hours in the six companies.

Four of the six companies (3, 4, 16, and 19) had a change in their operations during the ten-year period of the study. Three of these experienced a general increase in the size of their delivery area. The fourth, Company 16, increased delivery to larger supermarkets and decreased delivery to small grocery stores. However, no mileage increase was experienced.

Select

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Selection of Drivers

Of the sixteen items investigated in the driver selection procedure section of the questionnaire, differences in seven of the items were found. These seven are:

1. Three companies (4, 13, and 19) use a planned-interview checklist when interviewing an applicant. Companies 3, 16, and 17 do not.
2. All but one company (16) check references and previous employers of applicants.
3. Three companies (3, 13, and 19) check applicants' driving records through local or state government agencies. Companies 4, 16, and 17 do not.
4. A physical examination is required before employment by three companies (3, 13, and 16). Three companies (4, 17, and 19) do not require pre-employment physical examinations.
5. Two companies (13 and 19) give pre-employment driving tests which are conducted on the road under actual traffic conditions.
6. All but one company (17) have age limits for applicants. These limits range from 21 to 45.
7. Four companies (3, 13, 17, and 19) have minimum educational requirements, i.e., high school. Two companies have no minimum education requirements (4, 16).

Maintenance

All of the companies in Group 1 employ a maintenance program as defined.

Frequency Rate

There is no over-all trend presented by the frequency rates of the six companies in Group 1. Generally, the yearly fluctuations of accident frequency rates in any one company are quite pronounced, see Figure 1. This is not too surprising since the mileage of each company is relatively low, ranging from 150,000 to 252,000. Thus, each accident has considerable impact on the final year-end frequency rate.

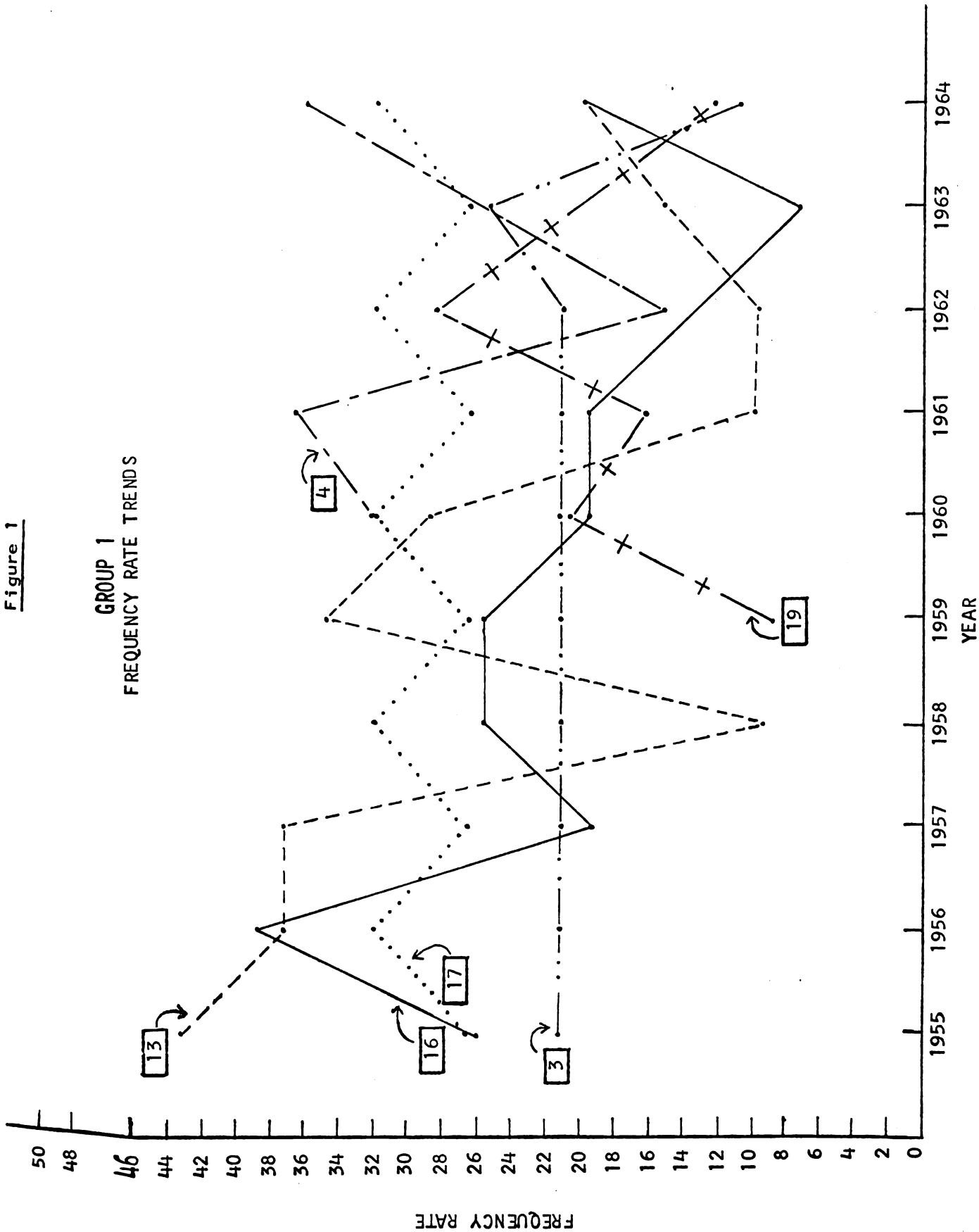
Two companies, (13 and 16), show a general reduction in frequency rate over the ten-year period.

Two companies, (4 and 19), show a general increase, although the fluctuations of the frequency rate for these companies over the five and six year periods shown in Figure 1 show little change in the rate from the first year of their reported experience compared to the last year, 1964.

Company 17, did not supply exact accident data but estimated the average number of accidents over the ten-year period. Company 3 began record keeping in 1963 and gave exact accident data for 1963 and 1964. Prior to this, accident experience was estimated by this company. Neither company is included in the final analysis because of the

Figure 1

GROUP 1
FREQUENCY RATE TRENDS



limited amount of exact accident experience available.

Company 3. The accident data provided by this company was estimated through 1962. Accurate accident records were started in 1963 and actual accident data was available for 1963 and 1964. However, this did not provide enough information for frequency rate trend comparison with the other companies in the group.

In 1964, monthly driver letters and more frequent safety meetings were introduced in this company. Prior to this, safety posters (changed monthly) and bulletin boards for safety materials constituted this company's fleet safety program. It is interesting to note the decrease in the accident frequency rate experienced by this company in 1964. However, not enough data is available to determine the cause of this reduction.

This company employs two of the four elements basic to an standard fleet safety program. These are: (1) driver training (through the fleet safety program materials); and (2) record keeping on individual drivers' records.

Company 4. Accurate accident data was available from this company from 1960 through 1964, a five-year period. Considerable fluctuations in the accident frequency rate occurred in this company during the five years of reported experience. However, there was little difference between

the rates at the beginning of the reporting period, 1960 and the last year in the reporting period, 1964.

The frequency rate trend for this company shows a general increase over the 5 year reporting period.

This company's fleet safety program activity remained the same from 1960 through 1964 and consisted of the use of safety posters and monthly safety meetings.

Two of the four basic elements in a standard fleet safety program are employed by this company. Therefore, its program is considered sub-standard. The elements used are: (1) driver training (through the use of fleet safety program materials); and (2) record keeping on the individual drivers' performances.

Company 13. The greatest amount of accident frequency rate fluctuation of any company in this group was experienced by Company 13 throughout the ten-year period of the study. In spite of fluctuating rates, the frequency rate trend shows a decrease from 1955 through 1964.

A sub-standard fleet safety program was in operation and remained unchanged throughout the study period. Three of the elements of a standard program were used: (1) driver training (through the fleet safety program materials); (2) record keeping on individual drivers' performances; and (3) recognition for good driving performances. No standard

of driving performance, the fourth basic element in a standard program, was specified by this company.

Safety program materials and activities used by this company include the following: (1) monthly driver letters; (2) safety posters, changed monthly; (3) bulletin board materials; and (4) an annual safety meeting.

Company 16. Company 16 experienced the least fluctuation in its frequency rate trends. The over-all trend for the ten-year study period was a general decrease in the frequency rate.

Of the six companies in Group 1, Company 16 is the only one with a standard fleet safety program as defined. This program remained unchanged for the study period, 1955 through 1964.

This company bases their standard of driving on the number of traffic violations a driver has. If any driver has excessive violations, he is taken off the road.

Their fleet safety program materials and activities include: (1) monthly driver magazines; (2) occasional booklets on safe driving practices; (3) safety posters changed monthly; (4) use of bulletin boards for safety information; and (5) monthly safety meetings.

It is interesting to note that this company reported no initial training of new drivers on vehicles or route layout.

This company is also the only one of the six in this group to:

1. Give remedial training on the basis of individual accident experience
2. Keep an accident analysis sheet
3. Analyze accidents as to primary types

Company 17. Accident data was estimated by this company for the ten-year period of the study and could not be used in the analysis.

Company 19. Accurate accident data was available from this company for a six year period, 1959 through 1964, and showed considerable fluctuation during these six years. However, there was little difference between the experience reported in 1959 and that reported at the end of the period in 1964. But this difference does show an increase in the frequency rate trend during this time period.

The fleet safety program employed by this company remained the same for the reporting period and included the use of: (1) occasional booklets on safe driving practices; (2) safety posters changed monthly; (3) bulletin board for safety information; and (4) quarterly safety meetings.

Two elements of a standard fleet safety program are employed by Company 19. Its fleet safety program, therefore, is considered sub-standard. The two elements used are:

(1) driver training (through the fleet safety program materials); and (2) record keeping on individual drivers' performances.

II. GROUP 2

Operations

Of the companies within each of the three groups, the companies in Group 2 differ the most from each other regarding their general operating policies.

1. Each company operates a different type of vehicle.
2. Each has different operating hours.
3. Two companies (8 and 12) have a policy on the maximum hours a driver can work per day; the maximum being eight hours. Company 6 has no maximum hours policy.
4. The drivers in two companies (6 and 8) cover the same assigned routes each week. In Company 12, the drivers change routes periodically so that in time each driver will cover every route operated by the company.

Selection of Drivers

The divergence of practices and policies in the selection of drivers was less pronounced than in the data obtained from the operations section of the questionnaire for Group 2. Four areas of variation were found.

1. A planned-interview checklist is used by one company (6). Companies 8 and 12 do not use a checklist.
2. Two companies (6 and 8) give behind-the-wheel driving tests to the applicant. Company 12 hires only men inexperienced in driving the type vehicles used by this company and trains them from the beginning on company equipment.
3. Company 6 administers an arithmetic test but none of the other tests listed in the questionnaire. Companies 8 and 12 give no written tests.
4. Company 12 will hire no one under 21. The other two companies (6 and 8) have no age limit.

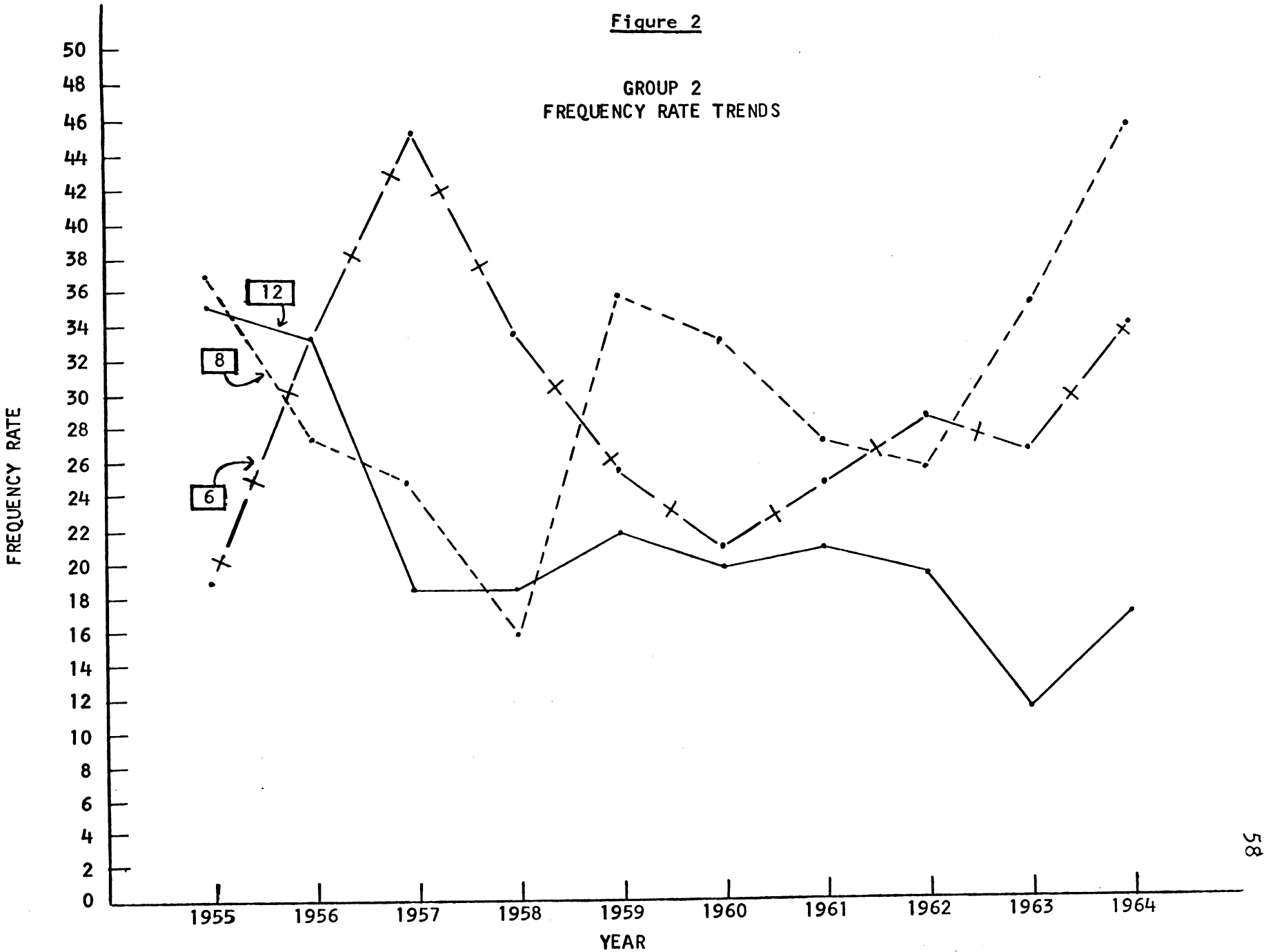
Maintenance

Each of the companies in Group 2 employed a maintenance program as defined.

Frequency Rate

The three companies in Group 2 have no over-all combined accident frequency rate trend. Rather, each company's accident experience trend varies directionally from the other as shown in Figure 2. One company shows a general increase in frequency rate trend. Another company shows a general decrease in the trend of accident frequency rate. The third takes a middle course; at first declining and then swinging back up to an increase in the trend.

Figure 2


GROUP 2
FREQUENCY RATE TRENDS
FREQUENCY RATE
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The types of fleet safety programs used varied considerably. During the ten years of this study, Company 12 had a standard fleet safety program, Company 6 had a sub-standard program and Company 8 had no program at all.

The mileage for these companies ranged from 800,000 to 950,000 miles per year. Consequently, each accident the companies experienced had less impact on their accident frequency rates than was experienced by the companies in Group 1 which had considerably lower mileage. Although fluctuation in the rates from year to year is quite evident, for the most part, this fluctuation is considerably less than Group 1 experienced. This results in a clearer picture of the direction the trends take. Accurate accident data for the ten years of the study was obtained for all three companies.

Company 6. Company 6 employed a standard fleet safety program until 1959. In 1959, their activity was reduced to a sub-standard program when records on individual drivers' performances were no longer kept and recognition for good driving performance was terminated.

After a sharp increase in the accident frequency rate from 1955 through 1957, a sharp reverse trend occurred and continued through 1960. It is interesting to note that

a general increase occurred after 1960, one year after the standard fleet safety program had been altered to a sub-standard program. The over-all accident frequency rate trend for Company 6 shows a general increase.

Safety program materials used by Company 6 include the following: (1) occasional booklets containing safe driving information; (2) safety posters changed monthly; (3) bulletin boards for safety materials; and (4) safety meetings combined with sales meetings held monthly.

Company 8. The frequency rate for this company fluctuated considerably over the ten-year period of this study. However, there was definitely a general increase in the frequency rate trend.

Company 8 had no fleet safety program throughout the study period. No standard of driving performance was outlined by this company, fleet safety program materials and activities were not regularly scheduled, and driver records and recognition were also absent.

Company 8 is the only one of the fourteen companies used in the study without a fleet safety program.

Company 12. Throughout the ten-year period of this study, Company 12 had a standard fleet safety program in effect.

The frequency rate of this company fluctuated the

least of the three companies. The over-all rate trend for the ten year period was a general decrease.

This company operated only tractor, semi-trailer combinations whereas the other companies operated 2-axle vehicles exclusively. Company 12 was also the only company in Group 2 or in the entire study that trained unskilled employees to drive company equipment via a scheduled behind-the-wheel training program. In addition, they employed fleet safety program materials on a regularly scheduled basis.

Company 12 used the following safety program materials: (1) occasional booklets containing safe driving information; (2) safety posters changed weekly; (3) bulletin boards for safety materials; and (4) safety meetings held bi-monthly.

III. GROUP 3

Operations

For the most part, the operations of the companies in Group 3 are quite similar. Each company operates a van-type truck ranging from 6,000 to 14,000 pounds. All but one company delivers 90 per cent or more to retail stores. One company (14) delivers 75 per cent to retail stores and 25 per cent to restaurants.

Hours of delivery range around the clock. However,

over 90 per cent of the deliveries are made between 4:30 a.m. and 5:00 p.m. Company 14 again deviates the greatest from the group since only 75 per cent of its deliveries are made between the above hours and 25 per cent are made between 10:00 p.m. and 6:00 a.m.

Two companies have policies on the maximum number of hours their drivers may work. In Company 9 the maximum number of hours is 7, and in Company 14 the maximum is 8.

Only Company 9 reported a change in operations which resulted in shorter working hours for drivers. At one time this company's drivers were allowed to stay on the road as long as they wished.

Selection of Drivers

It is interesting to note that in 5 of the 16 items investigated in the driver selection procedure section of the questionnaire, Companies 9 and 10 deviated from the rest of the group by including a procedure or policy in their selection process that the rest of the group did not have. In two of these five areas, as indicated in the following list, Company 5 also followed the procedure of Companies 9 and 10.

The five items incorporated into their selection program by Companies 9 and 10 and not used by the other companies are:

1. They use an interview checklist.
2. They check the driving record of the applicant before hiring (Company 5 also does this).
3. Each gives an on-the-road driving test to check the applicants' skills before hiring.
4. A laws and ordinances test is given by each company (Company 5 also does this).
5. Both companies have age limits

Other deviations in driver selection procedure between companies in Group 3 include the following:

1. Only two companies (5 and 9) give traffic and driving knowledge tests.
2. These same two companies give other written tests. Company 5 administers the Wonderlicht Personality Test to applicants. Company 9 gives I.Q. and Sales Aptitude tests.
3. Company 10 is the only company in Group 3 that requires minimum driving experience but the minimum was not stated.
4. Two companies (5 and 14) have minimum education requirements, a high school diploma being required by both.

Maintenance

Each of the companies in Group 3 employed a maintenance

program as defined.

Frequency Rate

As in the other two groups, there is no over-all trend of frequency rates in the five companies in Group 3, see Figure 3.

Annual fluctuations of accident frequency rates is generally the least of all groups as might be expected since the annual mileage for these fleets runs highest of the three groups, ranging from 1,155,000 to 3,110,000 miles. Thus, one or two accidents in any one year would not change the frequency rate picture as much as it might in other companies with less annual mileage.

Companies 9 and 10 show a general reduction in their rates over the ten years of the study period. Companies 5 and 14 show a general increase in their accident frequency rate; especially Company 14 which (except for one year) shows an increase each year during its reporting period, 1958 through 1964.

Company 11 had accident data for only 1963 and 1964. Consequently, this did not provide enough information for comparison with other companies.

Company 5. Accident data for this company was available from 1961 through 1964, a period of four years. A decrease in accident frequency rate occurred during

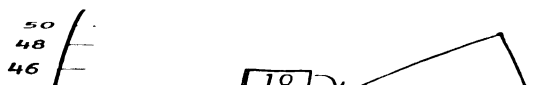


Figure 3

GROUP 3
FREQUENCY RATE TRENDS

Figure 3

GROUP 3
FREQUENCY RATE TRENDS

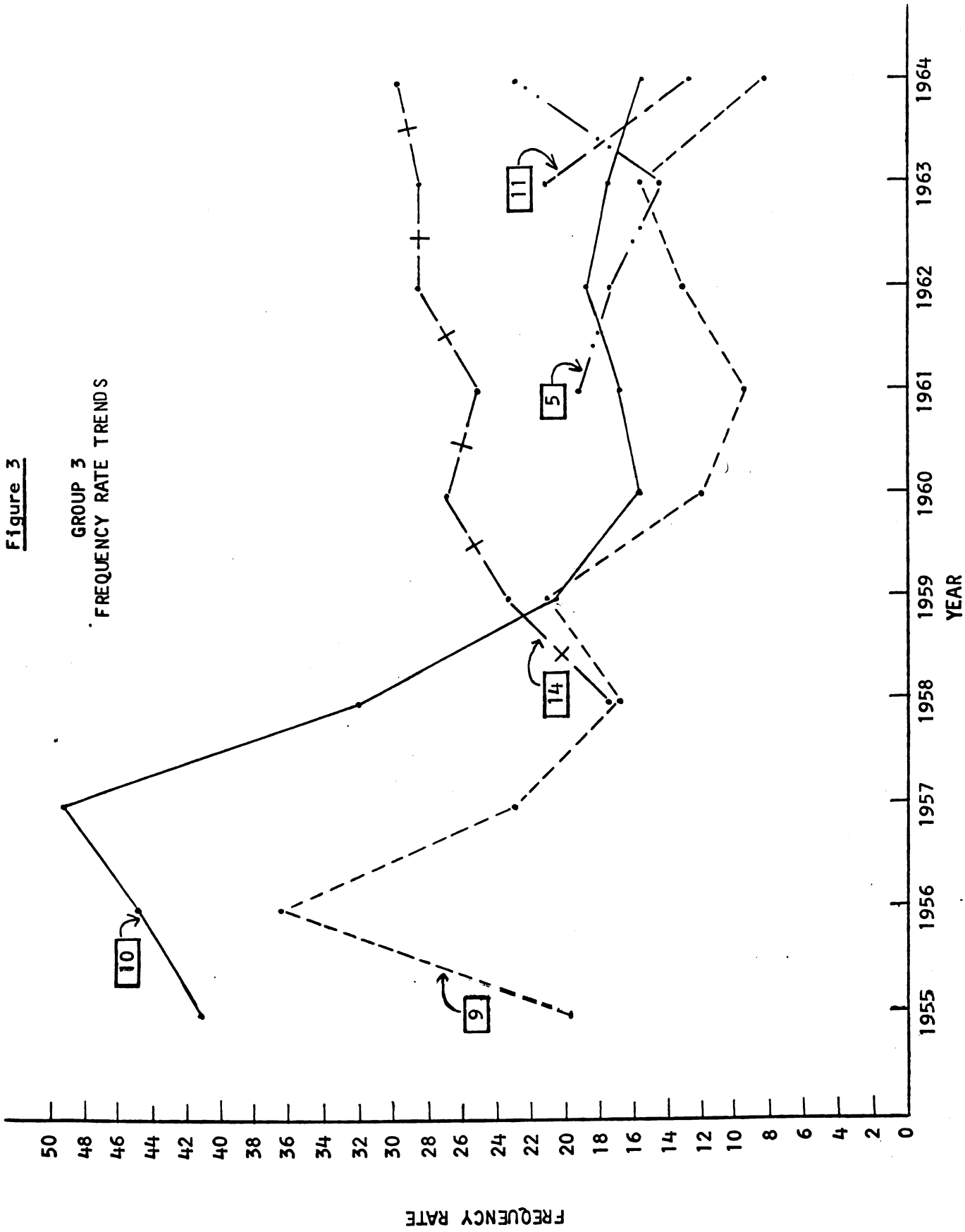
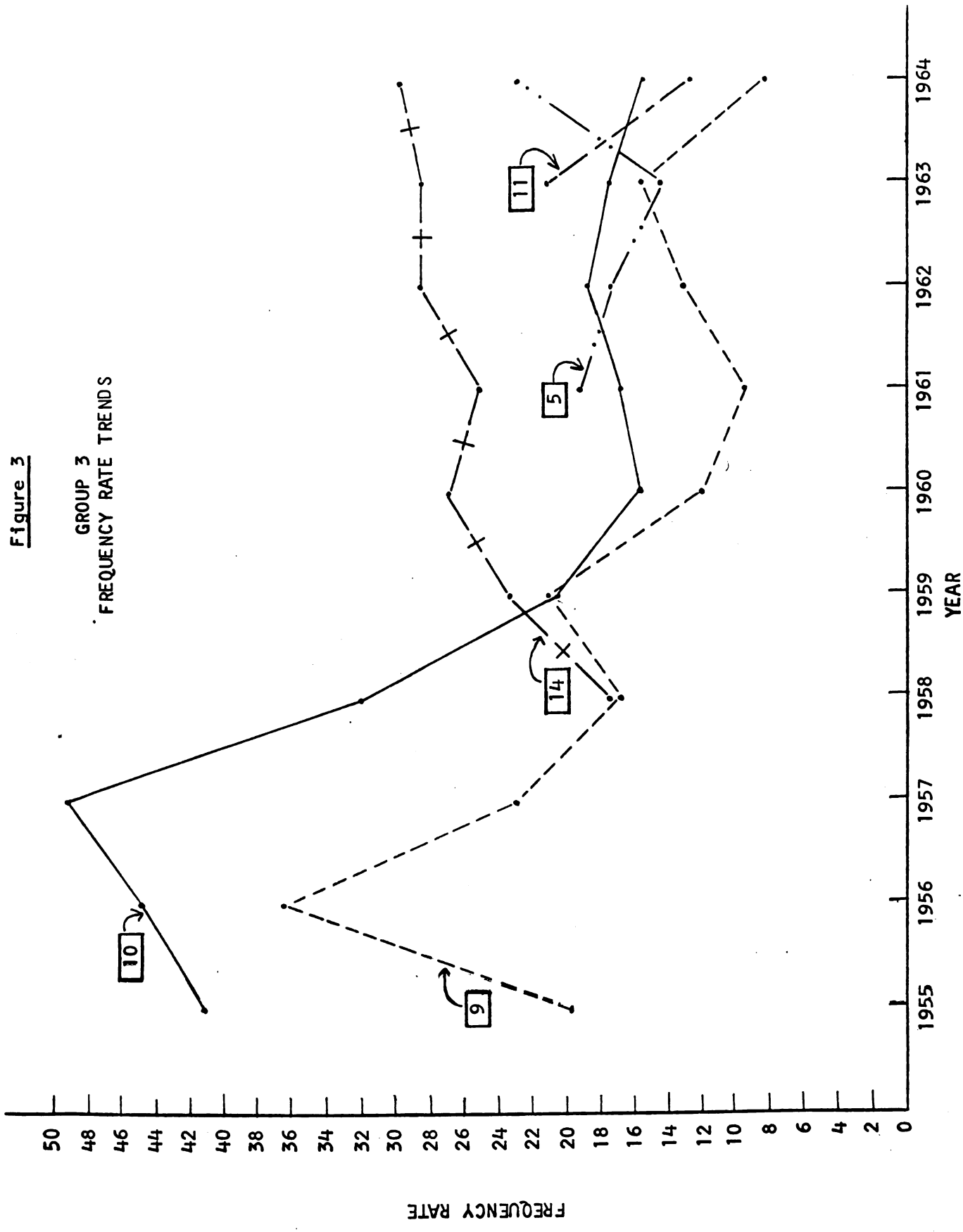


Figure 3

GROUP 3
FREQUENCY RATE TRENDS



two years, 1962 and 1963. However, in 1964 the rate increased above the 1961 starting level.

The over-all trend of the frequency rate for Company 5 shows a general increase.

Company 5 is one of two companies in Group 3 that trains all new drivers in the basic driving skills, in addition to the fleet safety program materials used.

This company's fleet safety program activity has not changed through the reporting period of 1961 through 1964.

Three of the basic elements in a standard fleet safety program are employed. Therefore, this company's program is considered sub-standard by definition. The elements used are: (1) driver training (both behind-the-wheel and through the use of fleet safety program materials); (2) record keeping on individual drivers' performances; and (3) recognition for good driving performance.

Fleet safety program materials used by Company 5 include: (1) occasional booklets on safe driving practices; (2) safety posters changed monthly; and (3) safety meetings conducted monthly.

Company 9. Accident data was obtained for the ten-year study period and the accident frequency rate trend for Company 9 showed a general decline for this period.

This company had a standard fleet safety program

which remained unchanged throughout the ten-year study period.

This company's standard of driving performance is based on a given number of accidents during a given period of time. If a driver experiences more than three accidents in five years, he is subject to dismissal.

The fleet safety program materials used by Company 9 include: (1) occasional booklets on safe driving practices; (2) safety posters changed monthly; (3) bulletin boards; and (4) safety meetings held semi-annually.

Three types of safe driver awards are given by this company; pins or emblems, merchandise and special letters of commendation. Company 9 is the only one in this group and in the entire study that gives three different types of awards.

Company 10. Company 10 experienced the most marked reduction in their accident frequency rate during the study period of any of the companies in the study. The rate trend for this company shows a definite decline.

A standard fleet safety program was employed by this company during the study period, 1955 through 1964. It is interesting to note the changes that occurred in this program over these years.

In 1957, posters and bulletins were introduced into

the fleet safety program as added materials. Also in 1957, a fleet safety director was appointed. In 1959, an improved system of keeping drivers' individual driving performances was initiated. Also in 1959, following irregularities in making safe driver awards during the years 1955 through 1958, their recognition program was put on a more systematic basis.

Company 10 also provides training in basic driving skills for all new drivers, in addition to the in-service training provided through the fleet safety program materials.

Fleet safety program materials and activities used by this company are: (1) occasional booklets of safe driving practices; (2) safety posters changed monthly; (3) bulletin boards for safety literature; and (4) safety meetings held quarterly.

Company 11. Accident data from this company was available only from 1963 when their accident record keeping system was inaugurated. This did not provide enough information for frequency rate trend comparisons with other companies in the group.

Safety posters, bulletin boards for safety materials, and occasional distribution of booklets comprise this company's fleet safety program.

This company employed three of the four standard

fleet safety program elements. Therefore, their program was classified as sub-standard. A standard of driving performance was not included in the program of Company 11.

Company 14. Accident information for seven years (1958 through 1964) was available from Company 14. The frequency rate trend for this period showed a gradual increase.

A sub-standard fleet safety program was in operation throughout this time which included: (1) driver training (through the use of fleet safety program materials); (2) record keeping on individual drivers' performances; and (3) recognition for good driving performance.

Although cumulative records of individual drivers' performances were not kept, copies of the actual accident report submitted by drivers were kept in their personnel file.

During this company's reporting period recognition was awarded every six months when each deserving driver was given points applicable toward merchandise gifts.

Fleet safety program materials used by Company 14 include: (1) occasional booklets on safe driving techniques; (2) safety posters changed bi-monthly; (3) bulletin boards for safety literature; and (4) safety meetings held quarterly.

CHAPTER V

CONCLUSIONS AND NEED FOR FURTHER RESEARCH

I. CONCLUSIONS

GROUP 1

The data outlined in Group 1 of this study neither support nor reject the hypothesis that there is no difference in the trends of accident frequency rates in motor vehicle fleets employing standard fleet safety programs, as defined, and fleets employing sub-standard programs, as defined.

Discussion. A comparison of accident frequency rate trends of Company 13 using a sub-standard program and Company 16 with a standard program shows that both experienced a general reduction in their rates over the ten-year period of the study. However, Company 16 shows a generally more stable frequency rate pattern.

A comparison of the accident frequency rate trend of Company 16 with the rate trends of Companies 4 and 19, both with sub-standard programs, tends to reject the hypothesis. The rates of both Company 4 and Company 19 generally tended to increase during comparable periods of time, 1959 through 1964. However, the rate trend of Company 16 decreased during this period pointing up a difference in the trends of accident frequency rates in

fleets employing a standard fleet safety program as contrasted to fleets using a sub-standard program.

Group 1 data also shows that the use of a fleet safety program does not always result in over-all reduced accident frequency rate trends.

GROUP 2

The hypothesis is rejected by the frequency rate data presented in Group 2. An accident frequency rate comparison of Company 12 with its standard fleet safety program and Companies 6 and 8 with their sub-standard programs shows a noticeable difference in the frequency rate trends over the ten-year period of the study.

Discussion. The differences in the over-all rate trends are seen in Figure 2, page 58. Further support of the conclusion reached from Group 2 data is seen in the variation in the frequency rate trend for Company 6.

A standard fleet safety program was used by Company 6 from 1955 through 1959. During this period, except for a sharp rise in 1957, this company experienced a general decline in their frequency rate. At the end of 1959, two parts of their program were discontinued, to wit: (1) record keeping on individual drivers' performances; and (2) recognition for good driving performance. In 1960, following the termination of these two elements of their standard

fleet safety program, the frequency rate trend for Company 6 reversed and showed a gradual increase which continued through 1964.

Group 2 data also shows that the use of a fleet safety program does not necessarily always result in over-all reduced accident frequency rate trends. This is especially evident in the experience of Company 6.

Finally, the data from this group tends to show a difference in trends of frequency rates in companies with fleet safety programs and those with no fleet safety program. This difference is particularly evident in the frequency rate trend comparison of Company 8 with no program and Company 12 with a standard program.

GROUP 3

The data outlined in Group 3 of this study rejects the hypothesis that there is no difference in frequency rate trends of companies using standard fleet safety programs and companies using sub-standard programs.

Discussion. Comparisons of Companies 9 and 10, both using standard fleet safety programs, with Companies 5 and 14, both using sub-standard programs, show over-all differences in the frequency rate trends. The frequency rate experience of Company 11 was too limited for purposes of comparison.

Data in this group also show that the use of fleet safety programs does not always result in reduced frequency rate trends.

It is also interesting to note the rate trend of Company 10 and the changes which occurred in this company's fleet safety program activities during 1957 and 1959. In 1957, a safety director was appointed and safety posters and bulletins were initiated.

Following an irregular application of their safe driver award program during 1955 through 1958, their recognition program was put on a more regular basis in 1959.

SUMMARY

In all the comparisons except one, a difference in frequency rate trends occurred in companies with standard fleet safety programs as contrasted to those using sub-standard programs.

Regarding the exception noted above, to obtain additional information with respect to this company (which might explain the contradictory results) would require going beyond the scope of this study.

Since the above exception does exist, it cannot be concluded that the data in this study either supports or rejects the hypothesis that there is no difference in the trends of accident frequency rates in motor vehicle

fleets employing standard fleet safety programs and fleets employing sub-standard programs.

Data from the study does show, however, that in each case where a standard fleet safety program was in effect, each of the companies experienced a reduction in their accident frequency rate trend.

The study also illustrates, with one exception, that companies using sub-standard fleet safety programs experience increases in their frequency rate trends. This supports the conclusion reached in the review of the literature which stated that reports of fleet safety programs showing no reduction in accident experience failed to get published.

Only one company was found in the study that had no fleet safety program of any kind. Even though the frequency rate trend of this company showed an increase during the study period, it was felt that the experience of one company was insufficient to permit drawing a conclusion as to whether there are differences in accident frequency rate trends in companies with fleet safety programs and those without programs.

II. NEED FOR FURTHER STUDY

It is recognized that a large number of variables

are involved in any study outside a controlled environment, especially when dealing with several organizations, and many individuals administering in a variety of ways the differing safety programs and policies within these organizations. This study is no exception.

Because of these variables many questions remain unanswered. Considerably more research is needed to provide the data required to resolve these questions. Additional research into the relationship of the variety of factors that might influence accident frequency rate trends in motor vehicle fleets includes:

1. Further study of pre-employment and in-service driver training to determine the relationship of this factor to accident frequency rate trends.
2. Research into whether the four elements of a standard fleet safety program as defined in this study provide the best criteria for judging the effectiveness of a fleet safety program.
3. A detailed study of the various parts of fleet safety programs and the individual relationship of these parts to accident frequency rates of fleets.
4. Detailed evaluation of the relationship between differences in the application of the specific

parts of standard and sub-standard fleet safety programs and accident frequency rate trends.

5. A study of the role top management's support of safety policies and fleet safety program activities plays in accident frequency rate trends.
6. Research into the relationship between differing driver selection techniques and company accident frequency rate trends.
7. A study of the relationship of different environmental elements such as road, weather, and traffic conditions, time of day or week, etc., to accident frequency rate trends.
8. Investigation into whether the type of vehicle operated by a company is a factor in increased or decreased frequency rate trends.

It can be seen from the above list that considerable data is still needed to determine the true relationship of fleet safety programs to accident frequency rate trends.

This study, therefore, represents the beginning of needed research into the multiplicity of factors surrounding fleet safety programs and the determination of the relationship of these factors to accident frequency rate trends. It should be considered by no means and end product but

rather a preview of vast amounts of information yet to be compiled, digested and ultimately used to benefit mankind.

SELECTED BIBLIOGRAPHY

A. BOOKS

The Driver-Trainer, His Role in the Fleet Safety Program. American Trucking Associations, Inc., Washington, D.C., 1955.

Simons, R. H. and Grimaldi, J. V. Safety Management. Richard D. Irwin, Inc., Homewood, Illinois, 1956. 555 pp.

B. PUBLICATIONS OF LEARNED SOCIETIES AND OTHER ORGANIZATIONS

Accident Reports and Records. Fleet Safety Manual Part IV. Chicago, Illinois: National Safety Council, revised, 1957.

The Accident Review Committee. Fleet Safety Manual Part VIII. Chicago, Illinois: National Safety Council, revised, 1959.

Alexander, Carlton. Evaluating Progress Through In-Service Training. National Safety Congress - Transactions. Vol. 18, pp. 14-17. Chicago, Illinois: National Safety Council, 1954.

American Standard Method of Recording and Measuring Motor Vehicle Fleet Accident Experience - D15.1-1960. New York, New York: American Standards Association, Inc., November 29, 1960.

Carter, William W. Selecting the Right Design For Your Fleet Safety Program. National Safety Congress - Transactions. Vol. 8, pp. 11 plus. Chicago, Illinois: National Safety Council, 1958.

Complete Motor Transportation Service. (Brochure describing the National Safety Council's fleet safety service.) Chicago, Illinois: National Safety Council, 1962.

Contest Rules, National Fleet Safety Contest. Chicago, Illinois: National Safety Council, revised July 1, 1964.

Cooke, Max. How to Choose an Architect for Your Fleet Safety Program. National Safety Congress - Transactions. Vol. 8, pp 8-11. Chicago, Illinois: National Safety Council, 1958.

Couch, W. T. How to Organize an Effective Fleet Safety Program in Small Fleets. National Safety Congress - Transactions. Vol. 18, pp. 31-33. Chicago, Illinois: National Safety Council, 1955.

Curcio, E. A. Building the Foundation For Your Fleet Safety Program. National Safety Congress - Transactions. Vol. 8, pp. 19-21. Chicago, Illinois: National Safety Council, 1958.

Driver Training. Fleet Safety Manual Part III. Chicago, Illinois: National Safety Council, revised, 1963.

Ellison, David E. A Doctor Prescribes for Transit Safety. National Safety Congress - Transactions. Vol. 28, pp.6-9. Chicago, Illinois: National Safety Council, 1955.

Emond, E. J. How to Put Accident Cost Information to Work. National Safety Congress - Transactions. Vol. 18, pp. 27-29. Chicago, Illinois: National Safety Council, 1955.

Evaluation of Safety Programs. Research on Techniques of Accident Analysis and Prevention, Vol. 2. pp. 31 plus. Stamford, Connecticut: Dunlap and Associates, Inc., 1957.

Fleet Safety Posters. Fleet Safety Memo Number 2. Chicago, Illinois: National Safety Council, revised, 1964.

The Fleet Safety Program. Fleet Safety Manual Part I. Chicago, Illinois: National Safety Council, revised, 1962.

For Experts Only. Chicago, Illinois: National Safety Council, 1966.

Foust, Arthur S. Personal Injury Problems of Vehicle Operators - A Symposium; Selections. National Safety Congress - Transactions. Vol. 13, p. 16. Chicago, Illinois: National Safety Council, 1958.

Getting Started. Chicago, Illinois: National Safety Council, revised, 1964.

Hightower, J. P. How to Measure the Value of Your Accident Prevention Program. National Safety Congress - Transactions. Vol. 18, pp. 33-35. Chicago, Illinois: National Safety Council, 1955.

Imhoff, Chris. Better Driving is Better Business. Chicago, Illinois: National Safety Council, 1964.

Knudson, J. K. Motor Transportation - Its Vital Role and Its Needless Cost. National Safety Congress - Transactions. Vol. 20, pp. 5-8. Chicago, Illinois: National Safety Council, 1951.

Lowden, Harry. Adding the Finishing Touches to Your Fleet Safety Program. National Safety Congress - Transactions. Vol. 8, pp. 25-28. Chicago, Illinois: National Safety Council, 1958.

Lyell, Melvin G. What We Expect From Operators of Highway Vehicles. National Safety Congress - Transactions. Vol. 7, pp. 64-67. Chicago, Illinois: National Safety Council, 1957.

McFarland, Ross A. and Moseley, Alfred L. Human Factors In Highway Transport Safety. Boston, Massachusettes: Harvard School of Public Safety, 1954.

Minimum Standards For Selection and Training of Personnel. Washington, D. C.: American Trucking Associations, Inc., 1956.

National Safety Congress - Transactions. (Historical copies of these publications describe fleet safety programs in use prior to 1934). Chicago, Illinois: National Safety Council.

Nichols, A. E. How to Organize an Effective Fleet Safety Program in a Large Fleet. National Safety Congress - Transactions. Vol. 18, pp. 30-31. Chicago, Illinois: National Safety Council, 1955.

Reeves, Elmer R. Dividends Resulting From Standardized Accident Reporting and Analysis. National Safety Congress - Transactions. Vol. 20, pp. 21-24. Chicago, Illinois: National Safety Council, 1950.

Safe Driver Award Rules. Chicago, Illinois: National Safety Council, January, 1964.

Safe Driving Techniques. Training Key # 20, Field Service Division, International Association of Chiefs of Police, 1319 18th Street, N. W., Washington, D. C. 20036. 1964.

Safety Meetings For Commercial Drivers. Fleet Safety Memo Number 13. Chicago, Illinois: National Safety Council, February, 1950.

Selection of Drivers. Fleet Safety Manual Part II. Chicago, Illinois: National Safety Council, February, 1964.

Shaw, Lynette. The Practical Use of Projective Personality Tests as Accident Predictors. National Safety Congress - Transactions. Vol. 17, pp. 39-43. Chicago, Illinois: National Safety Council, 1965.

Sights on Safety, Driver Safety Program. American Trucking Associations, Inc., 1616 P Street, Washington, D. C. (No Date).

Tormey, J. L. How To Determine Fleet Accident Cost. National Safety Congress - Transactions. Vol. 18, pp. 20-27. Chicago, Illinois: National Safety Council, 1955.

Yount, P. F. The Army Transportation Corps Safety Program. National Safety Congress - Transactions. Vol. 1, pp 17-21. Chicago, Illinois: National Safety Council, 1955.

C. PERIODICALS

Alexander, Carlton. "Psychological Tests for Drivers at the McLean Trucking Company," Traffic Quarterly, April, 1953, pp. 186-197.

Coburn, Paul H. "For Safer Police Driving," Traffic Digest and Review, October, 1953, pp. 13-15.

Coslick, Carl. "Million Dollar Fleet Program For $2.47," Public Safety, July, 1954, p. 12.

Davin, Frank. "Safety Rates Top Priority At Baltimore Yellow Cab," Traffic Safety, August, 1957, pp. 50-53.

Deming, W. E., Battey, A. D. and Cunningham, J. D. "A Statistical Test of Significance Applied to a Sociological Problem: Variation in Accident Rates From Motor Vehicles," American Sociological Review, Vol. 17, No. 6, December, 1952, pp. 755-761.

Ehrenberger, Charles. "Standard's Safety Story," Traffic Safety, January, 1959, pp. 30-33.

Finch, A. C. "Police Fleets Need Safety Too," The Police Chief, November, 1956, pp. 41-42.

_____. "You Gotta Dig to Weed Out Accidents," Public Safety, October, 1956, pp. 12-13.

Goldstein, Leon G. "Accident Prevention Research," Public Health Reports, Vol. 78, No. 7, July, 1963, pp. 565-567.

Gwin, John. "Spector Success Story," Public Safety, September, 1955, pp. 20-22.

Hipskind, V. K. "The Development of a Police Safety Program," Police, January-February, 1965, pp. 60-63.

Hoenniger, A. R. "Police Fleet Safety," Traffic Digest and Review, March, 1962, pp. 10-15 plus.

Hosea, Harold R. "Safety Programs Pay Off in Intercity Bus Operations," Public Safety, March, 1956, p. 17.

"It Takes More Than Luck," Public Safety, August, 1952, pp. 4-6 plus.

"Lincoln Coach Lines Program Cuts Total Accidents In Half," Traffic Safety, July, 1963, p. 23.

Lumpkin, J. W. "Fleet Safety On The Move," Traffic Safety, May, 1963, pp. 28-30 plus.

McGlade, Frank and Laws, F. D. "Classifying Accidents: A Theoretical Viewpoint," Traffic Safety Research Review, Vol. 6, No. 1, March, 1962, pp. 2-8.

Meyer, Robert. "Chicago Sun-Times Headlines Safety," Traffic Safety, March, 1959, pp. 30-32.

Michaels, Richard M. "Two Simple Techniques For Determining The Significance of Accident-Reducing Measures," Traffic Safety, June, 1960, pp. 16-17.

O'Connell, Gerald. "Safety Program Tops Operating Policies For Police Fleets," Traffic Digest and Review, February, 1963, pp. 8-12.

Ross, H. Lawrence. "Schematic Analysis of the Driving Situation," Traffic Safety Research Review, Vol. 4, No. 3, September, 1960, pp. 21-24.

"Safety Protects Profits," Commercial Car Journal, July, 1964, pp. 126-129.

"Seattle Reports 1953-54 City Vehicle Fleet Record," Public Safety, January, 1955, p. 27.

Shaw, L. and Sichel, H. A. "The Reduction of Accidents in a Transport Company by the Determination of the Accident Liability of Individual Drivers," Traffic Safety Research Review, Vol. 5, No. 4, December, 1961, pp. 2-12.

Stewart, Roger G. "Driving Exposure: What Does it Mean? How is it Measured?," Traffic Safety, June, 1960, pp. 9-11.

Thomas, I. C. "Sioux Falls Transit is Safer," Public Safety, October, 1950, pp. 8-9.

"10 Step Safety Program," Public Safety, September, 1958, pp. 62-78.

"Urges Truckers to Share Know-How," Traffic Safety, July, 1963, p. 22.

Williams, Frank M. "P-I-E's Safety Program Has the Personal Touch," Traffic Safety, November, 1963, pp. 21 plus.

D. UNPUBLISHED MATERIALS

Brody, Leon. "What We Really Know, Really Don't Know, and Really Ought to Know About Commercial Vehicle Drivers," (Address at the 23rd Annual Convention of the Greater New York Safety Council, March 25, 1953). Reproduced by the Accident Prevention Department, Association of Casualty and Surety Companies, 60 John Street, New York, New York.

Finch, A. C. "Motor Transportation Services," (address at the Institute for Safety Council Administration, National Safety Council, October 19-22, 1964). Chicago, Illinois: National Safety Council.

Letter from the Dallas Police Department, Dallas, Texas, April, 1965.

APPENDIX A

FLEET SAFETY PROGRAM ACTIVITY QUESTIONNAIRE

FLEET SAFETY PROGRAM ACTIVITY QUESTIONNAIRE

Code No. ☐

OPERATIONS - City Delivery

1. Average number of vehicles, 1955 thru 1964 _____

2. Average number of drivers, 1955 thru 1964 _____

3. Type of vehicles operated

   ☐ Van type - under 6,000 lbs.

   ☐ Van type - 6,000 to 14,000 lbs.

   ☐ Other trucks, describe: _____

4. Type of Operation

   ☐ Retail store delivery ☐ Home delivery

   ☐ Other, describe: _____

   a. What percent of your operations is devoted to delivery to:

      Retail stores _____

      Homes _____

      Other _____

   b. Have the operations changed from 1955 thru 1964? (i.e., geographical delivery areas, increased store or increased home delivery, etc.) _____

      _____

5. Area of Operation

   ☐ Inside metropolitan area, including suburbs

   ☐ Inside city limits, not including suburbs

   ☐ Other, describe: _____

6.

7.

8.

9.

SELECT

1.

2.

3.

4.

6. Between what hours of the day do your drivers usually work?

Retail store delivery drivers: _____

Home delivery drivers: _____

Other drivers: _____

7. Do you have a policy on the maximum hours a driver can work each day?

☐ Yes ☐ No

If yes, describe: _____

8. Do your regular drivers cover the same assigned routes each week?

☐ Yes ☐ No

9. Have any of the above changed from 1955 thru 1964?

☐ Yes ☐ No

If yes, describe: _____

SELECTION OF DRIVERS

1. Is an applicant required to complete an application form?

☐ Yes ☐ No

2. Is the applicant interviewed?

☐ Yes ☐ No

If yes, is a planned-interview checklist used giving specific questions that are asked the applicant?

☐ Yes ☐ No

3. Are the applicant's references and previous employers checked?

☐ Yes ☐ No

4. Is the applicant's driving record checked through local or state government agencies?

☐ Yes ☐ No

5. Is the applicant given a physical examination?

☐ Yes ☐ No

6. Is the applicant given a behind-the-wheel driving test before being hired?

☐ Yes ☐ No

If yes, is this test conducted:

☐ Over a given course ☐ On-the-road

☐ Off-the-road ☐ For a given length of time

Is a driving check-list used for this test?

☐ Yes ☐ No

7. Is the applicant tested for traffic and driving knowledge by written test?

☐ Yes ☐ No

8. Is the applicant tested for traffic laws and ordinances knowledge?

☐ Yes ☐ No

9. List any other written tests given to applicant:

_____

10. Do you have age limits for driver applicants?

☐ Yes ☐ No

If yes, what are the limits: _____

11. Do you have minimum driving experience requirements?

☐ Yes ☐ No

If yes, what are the requirements? _____

12. Do you have minimum educational requirements?

☐ Yes ☐ No

☐ High school ☐ Grade through the 8th grade

☐ Other, describe: _____

13. What is the average length of driving tenure with the company?

_____

ACCIDENT PREVENTION PROGRAMING

1. Who administers your accident prevention programing?

_____
(Give title of employee)

2. How much time per month is devoted to the administration of the accident prevention program?

☐ Full time ☐ Part time _____
(% of time or hours)

3. Do you define a Standard of Driving Performance for all drivers?

☐ Yes ☐ No

If yes, describe: _____

4. Do you have a Driver Training procedure?

☐ Yes ☐ No

a. Initial driver training

1. Do all new driver-employees receive initial driver training?

☐ Yes ☐ No

2. If no, what is the deciding factor for initial training?

☐ No experience on type of vehicle company uses

☐ No previous driving experience (any vehicle)

☐ Initial behind-the-wheel test indicates need

☐ Other, describe: _____

3. Who does the training? _____
(Title of employee)

4. Which of the following areas are covered in your initial training program?

☐ Orientation (Job requirements, company policy, safety program, etc.)

☐ Motor vehicle accident problem (e.g., major company accident types, major accident areas and types in these areas)

☐ Causes of traffic accidents (driver, vehicle, environment)

☐ Personal traits relating to safe driving (Physical and mental)

☐ The vehicle (operations of, limitations of, mechanical condition of)

☐ Traffic laws and regulations

☐ Basic driving maneuvers

5. Are new drivers accompanied by experienced men?

☐ Yes ☐ No

If yes, principle duty of the trainer is:

☐ Instruct new employee in route layout and work procedure

☐ Instruct new employee in safe driving techniques

6. Are drivers instructed in a procedure to follow in case of accident?

☐ Yes ☐ No

7. How many hours are devoted to initial training?

In the class room: _____ hours

On the route: _____ hours

8. Is refresher training given to your drivers?

☐ Yes ☐ No

If yes: ☐ Annually ☐ Other, describe:

_____

9. Is remedial training, on the basis of accident experience, given to your drivers?

☐ Yes ☐ No

b. Does a regularly scheduled flow of safety materials go to your drivers?

☐ Yes ☐ No

If yes, do you employ any of the following:

☐ Special monthly driver magazines distributed to drivers

☐ Monthly driver letters containing safe driving or defensive driving information

☐ Occasional booklets with safe driving or defensive driving information

☐ Safety posters on safe driving or defensive driving?

How often changed? _____

☐ Bulletin boards

☐ Safety meetings

How often are they held? _____

5. Do you have an Accident Record Keeping System?

☐ Yes ☐ No

a. When did you start this system? _____ (year)

b. What is your definition of a reportable motor vehicle accident for your fleet accident records?

_____

_____

c. Do you require your drivers to report all accidents regardless of cost, amount of damage, or personal injury?

☐ Yes ☐ No

d. Do you keep an accident register for all accidents?

☐ Yes ☐ No

e. Do you keep an accident analysis sheet?

☐ Yes ☐ No

f. Do you analyze accidents to determine:

☐ Primary accident types (head-on, sideswipe, etc.)

☐ Primary accident causes

☐ Problem areas that might need special attention

☐ Other: _____

g. Are accident rates computed for your fleet?

☐ Yes ☐ No

If yes, for your rate do you use accidents per:

☐ 100,000 miles ☐ 1,000,000 miles

☐ Other, describe: _____

If yes, to compute your fleet mileage figures, do you use: (may check more than one)

☐ Odometer readings

☐ Trip records or route mileage

☐ Gasoline consumption

☐ Other, describe: _____

h. Do you keep an individual driver accident record?

☐ Yes ☐ No

i. Do you use your definition of a reportable accident for purposes of recording driver accidents on their individual driving records?

☐ Yes ☐ No

If no, what accidents do you record?_____

j. Do you judge your driver's accidents as to whether or not they are preventable?

☐ Yes ☐ No

k. Does your company have an accident review committee?

☐ Yes ☐ No

If yes, are both top management and drivers on the committee?

☐ Yes ☐ No

If no, who serves on the committee?

_____
(Titles of Employees)

How often does the committee meet? _____

6. Do you have a method for <u>Recognizing Safe Driving Performance</u>?

☐ Yes ☐ No

a. What type of recognition do you use?

☐ Safe driver awards (pins, cards, certificates)

☐ Cash or savings bond bonus

☐ Vacation trips

☐ Merchandise awards

☐ Special letters of commendation

☐ Other, describe: _____

b. Is this recognition based on operating without a preventable accident for a certain period of time?

☐ Yes ☐ No

Is "one year" the period of time used?

☐ Yes ☐ No

If no, describe system: _____

c. Are all accidents charged against the driver's safe driving record regardless if the accidents are preventable or not?

☐ Yes ☐ No

If no, only those accidents judged preventable?

☐ Yes ☐ No

d. Is the recognition you use governed by rules to insure it is awarded only to those who measure up to your standard?

☐ Yes ☐ No

7. Do you have special campaigns aimed at specific types of accidents when they occur more frequently than usual?

☐ Yes ☐ No

8. Has any of the above accident prevention programing or procedure been changed from 1955 thru 1964?

☐ Yes ☐ No

If yes, describe changes: _____

_____

VEHICLE MAINTENANCE

1. Are your drivers required to perform pre-trip vehicle inspections?

   ☐ Yes ☐ No

2. Are your drivers required to turn in vehicle performance sheets at the end of each day?

   ☐ Yes ☐ No

3. Are vehicles checked and repaired on the basis of driver repair orders or malfunction reports?

   ☐ Yes ☐ No

4. Is only the item written up by the driver checked and repaired or is the rest of the vehicle inspected for defects also?

   ☐ Only the item written is repaired (no further check)

   ☐ Item is repaired and vehicle inspected

5. Is a regularly scheduled preventive maintenance program in effect?

   ☐ Yes ☐ No

   If yes, is this scheduled on the basis of:

   ☐ Mileage ☐ Time

6. Please describe the program. (Show what is done at what interval)

   _____

   _____

7. Has this procedure remained the same from 1955 thru 1964?

   ☐ Yes ☐ No

   If no, describe changes: _____

   _____

NUMBER OF REPORTABLE ACCIDENTS FLEET HAS EXPERIENCED

1955 _____	1960 _____
1956 _____	1961 _____
1957 _____	1962 _____
1958 _____	1963 _____
1959 _____	1964 _____

NUMBER OF MILES FLEET ACCUMULATED

1955 _____	1960 _____
1956 _____	1961 _____
1957 _____	1962 _____
1958 _____	1963 _____
1959 _____	1964 _____

APPENDIX B

SAMPLE LETTERS USED IN STUDY

SAMPLE LETTER NO. 1

Dr. Walter A. Cutter
Director
Center for Safety Education
New York University
6 Washington Square North
New York, New York 10003

Dear Dr. Cutter:

I am in the process of compiling a bibliography of studies and articles on commercial vehicle fleet safety programs. I am particularly interested in the following:

1. Research on the effectiveness (or ineffectiveness) of commercial vehicle fleet safety programs (or parts of programs).

2. Articles which describe commercial vehicle fleet safety programs and which report improvement (or no improvement) in accident experience and/or reduction in accident costs.

I would very much appreciate any bibliographical information or, where possible, the actual material that you have in these two areas.

Sincerely,

Walter D. Weiss

SAMPLE LETTER NO. 2

Dear

Enclosed is the survey questionnaire which we discussed today in our telephone conversation. The extra copy is for your records if you wish. I am conducting this study in order to write my thesis in partial fulfillment for my Masters Degree work in Highway Traffic Administration from Michigan State University.

Since the outcome of the study hinges primarily on the enclosed questionnaire and especially on obtaining accident and mileage information, I am particularly anxious to get these data, especially for your trucks involved in retail store and/or institutional deliveries in the Detroit metropolitan area. If you have other types of delivery such as to private homes and do not keep separate records for the different types of delivery, total figures will still be important.

The definition of a reportable fleet accident for fleet records that I shall use is that of the American Standards Association, namely: "A motor vehicle fleet accident is any occurrence involving a fleet motor vehicle which results in death, injury, or property damage, unless such fleet vehicle is properly parked. Who was injured, what property was damaged or to what extent, where it occurred, or who was responsible is not a factor." If your accident data do not include all accidents except where properly parked please let me know what criteria were used.

All information concerning specific companies and places will be held strictly confidential. Code numbers will be assigned to individual companies for analyzing all data to insure strictest confidence.

Any help you can give me on this will be deeply appreciated. A self-addressed envelope is enclosed for returning the completed questionnaire.

Sincerely,

Walter D. Weiss

APPENDIX C

SUMMARY OF QUESTIONNAIRE DATA

GROUP 1

OPERATIONS - PART I

1. All companies operate similar type vehicles.
2. All but one company (4) deliver to retail stores.
   Company 4 delivers to institutions.
   Four other companies deliver to institutions also - (3, 13, 17, 19).
3. All companies but number 4 deliver 90 per cent or more to retail stores.
   Company 4 delivers only to institutions and restaurants.
4. All companies deliver in the Detroit metropolitan area including suburbs within a 50 mile radius.
5. All but one company (4) operates within the hours of 5:00 a.m. to 5:00 p.m.
6. All companies have policies on the maximum hours a driver can work each day.
   Maximum hours vary from 8 to 12 hours.
7. In all companies, the drivers cover the same routes each week.
8. Two companies did not experience a change in their operations during the ten-year study period - (13, 17).
   Four companies experienced a change in their

operations.

One company decreased deliveries to small stores and increased deliveries to super markets - (16).

Three companies increased their delivery area - (3, 4, 19).

SELECTION OF DRIVERS - PART II

1. All companies use application forms.
2. All companies interview applicants.
3. Three companies use a planned-interview checklist giving specific questions that are asked the applicant - (4, 13, 19).

   Three companies do not use such a checklist - (3, 16, 17).
4. All but one company (16) check references and previous employers.
5. Three companies check applicants' driving records through local or state government agencies - (3, 13, 19).

   Three companies do not check driving records - (4, 16, 17).
6. Three companies require applicants to take a physical examination - (3, 13, 16).

   Three companies do not - (4, 17, 19).

7. Two companies give a driving test before hiring - (13, 19).

   Four companies do not give driving tests - (3, 4, 16, 17).

   The two companies that give driving tests give them on the road in regular traffic. Neither of these companies uses a check-list for the road tests.

8. None of the companies in Group 1 give traffic and driving knowledge tests.
9. Neither do any of them give laws and ordinances knowledge tests.
10. None give any other written tests to the applicants.
11. All but one company (17) have age limits.
12. None of the companies have minimum driving experience requirements.
13. Four companies have minimum educational requirements - (3, 13, 17, 19).

    All of these require a high school education. Two companies do not have a minimum requirements - (4, 16).

14. The range of driving tenure for the companies in Group 1 is from 10 to 15 years ; an average of 11.8 years.

ACCIDENT PREVENTION PROGRAM - PART III

1. Titles of administrators of the accident prevention programs

   Company 3 - Insurance company safety engineer

   Company 4 - General Manager

   Company 13 - Agency Manager

   Company 16 - Local office manager

   Company 17 - Book keeper

   Company 19 - Safety Director of leasing company

2. All administrators spend only part time on their accident prevention programs.

   Three of the six companies gave the per cent of their time spent on their programs as follows: .3 per cent; .6 per cent; and 2 per cent. The average is about 1 per cent of their time spent on accident prevention.

3. One company has a standard of driving performance - (16). Any driver with excess violations is taken off the truck.

   Five companies have no standard of driving performance - (3, 4, 13, 17, 19).

4. No company has driver training for their new employees.

5. Initial training programs include the following:
   a. Orientation (job requirements, company policy, safety program, etc.) - (3, 13, 17, 19)
   b. Motor vehicle accident problem (major company accident types, major accident areas and types in these areas) - (3, 19)
   c. Causes of traffic accidents (driver, vehicle, environment) - (3)
   d. Personal traits relating to safe driving (physical and mental) - (3)
   e. The vehicle (operations of, limitations of, mechanical condition of) - (3, 4, 17, 19)
   f. Traffic laws and regulations - (13)
   g. Basic driving maneuvers - (no companies)

7. New drivers are accompanied by experienced men in five companies - (3, 4, 13, 17, 19).
   One company does not send experienced men with their new drivers - (16).

8. Principle duty of the trainer in each of the five companies is: (1) to instruct in route layout; and (2) to instruct in safe driving techniques.

9. All companies instruct their new drivers in the procedure to follow in case of accident.

10. Time devoted to initial training:

Classroom (includes across the desk orientation)

Three companies - 0 hours (4, 16, 17)

Two companies - 1 hour (3, 13)

One company - 1 day (19)

On the Route

Two companies - 1 to 2 weeks (3, 19)

Two companies - 2 to 3 days (13, 17)

One company - 1 week (4)

One company - no time spent on route (16)

11. No company gives refresher training to their drivers.

12. One company gives remedial training on the basis of accident experience - (16).

Five companies do not give remedial training - (3, 4, 13, 17, 19).

13. All companies reported use of a regularly scheduled flow of safety materials as follows:

a. Special monthly driver magazines distributed to drivers - one company (16)

b. Monthly driver letters containing safe driving or defensive driving information - three (3, 16, 17)

c. Occasional booklets with safe driving or defensive driving information - two companies (16, 19)

d. Safety posters on safe driving or defensive driving - five companies (3, 4, 13, 16, 19)

Three companies change them monthly - (3, 13, 16).

One company changes them quarterly - (10).

One company didn't indicate frequency - (4).

e. Bulletin boards - four companies (3, 13, 16, 19)

f. Safety meetings - five companies (3, 4, 13, 16, 19)

Two companies hold meetings monthly - (4, 16).

Two companies hold meetings quarterly - (3, 19).

One company holds meetings annually - (13).

14. All companies have an accident record keeping system.

Three companies started system prior to 1955 - (13, 16, 17).

One company started system in 1959 - (19).

One company started system in 1960 - (4).

One company started system in 1963 - (3).

15. All companies have definitions of reportable accidents for their fleets. These definitions are similar, e.g., "All accidents regardless of

amount of damage, what property was damaged, who was injured or who was at fault."

16. All companies require their drivers to report all accidents regardless of cost, amount of damage, or personal injury.

17. All companies keep an accident register for all accidents.

18. One company keeps an accident analysis sheet - (16).
Five companies do not - (3, 4, 13, 17, 19).

19. One company analyzes accidents to determine primary types - (16).
Two companies analyze accidents to determine primary causes - (17, 19).

20. Three companies compute accident frequency rates - (13, 16, 19).

21. Two companies base rates on accidents per 100,000 miles - (13, 19).
One company bases its rate on accidents per 1 million miles - (16).

22. Two companies compute their mileage figures from odometer readings - (13, 19).
One company computes its mileage figures from route mileage - (16).

23. Four companies keep individual driver accident records - (3, 4, 16, 19).
Two companies put copies of accident reports in drivers' personnel folders but they are not entered on a continuing driver record card - (13, 17).

24. Five companies put all driver accidents on their individual driving records - (3, 4, 13, 17, 19).
One company did not respond to the question - (16).

25. Four companies judge accidents preventable or non-preventable - (3, 13, 16, 19).
Two companies do not - (4, 17).

26. Two companies have an accident review committee- (3, 16).
Three companies do not have such a committee - (13, 17, 19).
One company did not respond - (4).

27. One company, both top management and drivers serve on the committee, and they meet after each accident - (3).
One company has only top management on the committee which meets monthly - (16).

28. Three companies have a method for recognizing safe driving performance - (13, 16, 17).

Three companies do not recognize safe driving records - (3, 4, 19).

29. Type of recognition used:

Three companies use safe driver award pins - (13, 16, 17).

One company also uses merchandise awards - (13).

30. Two companies base their recognition on operating without a preventable accident for a one year period - (13, 16).

One company bases its recognition on operating with no accidents what-so-ever for one year - (17).

31. One company charges all accidents against the driver's safe driving record regardless if the accidents are preventable or not - (17).

Four companies do not charge all accidents to drivers - (4, 13, 16, 19).

One company did not respond to this question - (3).

32. Four companies charge only accidents found preventable against their drivers' records - (4, 13, 16, 19).

33. The three companies using awards base them on rules - (13, 16, 17).

34. One company has special campaigns aimed at

high frequency accident types - (19).

Five companies do not have special campaigns - (3, 4, 13, 16, 17).

36. Four companies reported that their safety programs did not change 1955 through 1964 - (4, 13, 16, 19).

Two companies indicated their safety programs changed during this period - (3, 17).

Company 3 - Driver letter introduced in 1964; safety meeting frequency was increased

Company 17 - Safe driver awards were introduced in 1963.

VEHICLE MAINTENANCE - PART IV

1. Two companies require their drivers to perform pre-trip vehicle inspections - (13, 19).

Four companies do not require pre-trip inspections - (3, 4, 16, 17).

2. Only one company requires drivers to turn in vehicle performance sheets at the end of each day - (16).

One company requires such reports on a weekly basis - (13).

Three companies require vehicle performance reports only when a defect occurs - (3, 17, 19).

One company does not require any vehicle performance report - (4).

3. All companies repair vehicles on the basis of driver repair orders or malfunction reports.
4. All companies repair item written up and also check vehicles for other items not written up.
5. Five companies have a regularly scheduled preventive maintenance program in effect - (3, 4, 13, 16, 19).

   One company does not have such a program - (17).
6. One company has their PM program on a mileage basis - (13).

   Three companies have PM programs on mileage and time basis - (4, 16, 19).

   One company has its PM program on time basis only - (3).

   One company has no PM program scheduled - (17).
7. Three companies - their preventive maintenance programs remained the same from 1955 through 1964 - (13, 16, 19).

   Two companies - their programs changed during this time - (3, 4).

   One company reported that their program changed but did not state how.

Company 3 - In 1960 a full time mechanic was hired. Prior to this, gas stations did the work.

Company 4 - In 1963, a comprehensive PM program was begun. Prior to this, only defects were repaired by outside agency.

GROUP 2

OPERATIONS - PART I

1. Each of the three companies in Group 2 operates different types of vehicles.

   Company 6 - Vans under 6,000 lbs.

   Company 8 - Vans under 6,000 lbs. and vans 6,000 to 14,000 lbs., mostly the later (over 80 per cent)

   Company 12 - Tractor, semi-trailer units only

2. All three companies deliver 100 per cent to retail stores.

3. All companies deliver in the Detroit metropolitan area including suburbs within a 50 mile radius.

4. Hours of operation vary considerably. The range is 1:00 a.m. to 7:30 p.m.

   Company 6 - operates from 7:30 a.m. to 7:30 p.m.

   Company 8 - operates 50 per cent of the fleet from 1:00 a.m. to 8:00 a.m. and 50 per cent of the fleet from 6:00 a.m. to 3:00 p.m.

   Company 12 - operates from 3:30 a.m. to 12 noon.

5. Two companies have policies on the maximum hours a driver can work each day - (8, 12). One company has no policy on maximum work hours - (6).

Maximum hours - 8 hours for both companies.

6. In two companies, the drivers cover the same assigned routes each week - (6, 8).
   In one company, drivers change routes periodically - (12).
7. In all three companies, the operations changed during the ten years of the study. All three increased the size of their delivery area.

SELECTION OF DRIVERS - PART II

1. All companies use application forms.
2. All companies interview applicants.
3. One company uses a planned-interview checklist giving specific questions that are asked the applicant - (6).
   Two companies do not use such a checklist - (8, 12).
4. All companies check references and previous employers.
5. None of the companies check the applicant's driving record through local or state government agencies.
6. All companies require applicants to take a physical examination.

7. Two companies give a driving test before hiring - (6, 8).

   One company hires only men inexperienced in truck driving - (12).

   One company gives the driving test on the road - (6).

   The other company did not indicate where their driving test was given - (8).

8. None of the companies in Group 2 give traffic and driving knowledge tests.

9. Neither do any of them give laws and ordinances knowledge tests.

10. One company gives an arithmetic test - (6).

    Two companies do not give any other written tests - (8, 12).

11. One company has age limits set for hiring drivers - (12). The applicant must be 21 or over.

    Two companies have no applicant age limits - (6, 8).

12. One company has minimum driving experience requirements - (6).

    Two companies do not have minimum requirements - (8, 12).

Minimum driving experience required by Company 6 is the applicant must have a chauffeurs license.

13. All companies have minimum educational requirements; a high school education.

14. The range of driving tenure for the companies is from 12 to 20 years; an average of 15 years.

ACCIDENT PREVENTION PROGRAM - PART III

1. Titles of administrators of the accident prevention programs:

   Company 6 - Stock foreman

   Company 8 - None

   Company 12 - Garage manager

2. All administrators spend only part time on their accident prevention programs.

   Company 6 - 5 per cent

   Company 8 - none

   Company 12 - 5 per cent

3. Two companies define a standard of driving performance - (6, 12).

   One company does not define such a standard - (8).

   Company 6 - Driver is told what is expected: (1) smooth operation; and (2) safe operation.

Company 12 - Courteous driving, care for equipment and the company, and safe operation.

4. One company has driver training - (12).
   Two companies have no formal driver training program - (6, 8).
5. One company gives driver training to all drivers - (12).
   Two companies do not give driver training to all new drivers - (6, 8).
6. Deciding factor for driver training:
   Company 6 - No new employees receive driver training.
   Company 8 - Only those men with no experience on the type of equipment the company uses are trained.
   Company 12 - All new driver employees are given driver training.
7. Company 8 - An experienced regular driver rides with some new drivers and coaches them.
   Company 12 - The superintendent of Shipping and Warehouse trains each new driver on the company equipment.

8. Initial training programs include the following:
   a. Orientation (job requirements, company policy, safety program, etc.) - (all companies)
   b. Motor vehicle accident problem (i.e., major company accident types, major accident areas and types in these areas) - (6)
   c. Causes of traffic accidents (driver, vehicle, environment) - (6)
   d. Personal traits relating to safe driving (physical and mental) - (6, 12)
   e. The vehicle (operations of, limitations of, mechanical condition of) - (all companies)
   f. Traffic laws and regulations - (no companies)
   g. Basic driving maneuvers - (8, 12)
9. New drivers are accompanied by experienced men in all companies in Group 2.
10. In two companies the duty of the trainer is: (1) to instruct in route layout; and (2) to instruct in safe driving techniques - (8, 12). In one company the duty of the driver trainer is only to instruct new employees in safe driving techniques - (6).

11. All companies instruct their new drivers in the procedure to follow in case of accident.

12. Time devoted to initial training:

Classroom (includes across the desk orientation)

Company 6 - 1 hour

Company 8 - 0 hours

Company 12 - unknown

On-the-Route

Company 6 - 3 weeks

Company 8 - 1 week

Company 12 - unknown

13. No company gives refresher training to their drivers.

14. One company gives remedial training on the basis of accident experience - (12).
Two companies do not give remedial training - (6, 8).

15. Two companies reported use of a regularly scheduled flow of safety materials as follows - (6, 12):

a. Special monthly driver magazines distributed to drivers - (no company)

b. Monthly driver letters containing safe driving or defensive driving information - (no company)

c. Occasional booklets with safe driving or defensive driving information - (6, 12)

d. Safety posters on safe driving or defensive driving - (6, 12)

Company 6 - changes posters monthly

Company 12 - changes posters weekly

e. Bulletin boards - (6, 12)

f. Safety meetings - (6, 12)

Company 6 - holds meetings monthly

Company 12 - holds meetings bi-monthly

16. All companies have an accident record keeping system.

Company 6 - started its system in 1953

Company 8 - unknown when system started

Company 12 started its system in 1956

17. All companies have definitions of reportable accidents for their fleets. These definitions are similar, e.g., "all accidents regardless of amount of damage, what property was damaged, who was injured or who was at fault."

18. All companies require their drivers to report all accidents regardless of cost, amount of damage, or personal injury.

19. Two companies keep an accident register for all accidents - (8, 12).

One company does not keep such a register - (6).

20. All companies keep an accident analysis sheet.

21. Two companies analyzed accident to determine primary types - (8, 12).

One company analyzes accidents to determine primary causes - (6).

One company analyzes accidents to determine special problems - (12).

One company analyzes accidents to determine fault - (6).

22. All companies compute accident frequency rates. Company 6 stopped computing rates in 1961.

23. One company bases its rates on accidents per 1 million miles - (12).

One company bases its rate on accidents per quarter; a time basis - (8).

One company did not indicate the base they use - (6).

24. Two companies compute their mileage figures from odometer readings - (8, 12).

25. Two companies keep individual driver accident records - (6, 12). Company 6 discontinued record in 1959.

One company does not keep such a record - (8).

26. Two companies put all driver accidents on their drivers individual driving records - (6, 12).
Company 6 stopped in 1959.

27. Two companies judge accidents preventable or non-preventable - (6, 12).
One company does not judge accidents - (8).

28. Two companies have an accident review committee - (6, 12).
One company does not have such a committee - (8).
One company has both top management and drivers on the committee which meets monthly - (12).
One company has only top management on the committee which meets every one or two months - (6).

29. Two companies, (6, 12), recognize safe driving performance, however, Company 6 discontinued their recognition program in 1959.
One company does not have a recognition program - (8).

30. Type of recognition used:
One company uses safe driver award pins - (6).
Two companies use cash bonuses - (6, 12).
One company uses merchandise awards - (6).

31. Two companies base their recognition on operating without a preventable accident for a one year

period - (6, 12).

32. Company 6 uses one year as the time period for awards.

    Company 12 uses 6 months as the time period for awards.

33. Ccmpanies 6 and 12 do not charge all accidents against their drivers' records.

34. Both companies charge drivers only with preventable accidents.

35. Companies 6 and 12 have rules governing their awards.

36. Two companies have special campaigns aimed at high frequency accident types - (6, 12).

    One company does not have special campaigns - (8).

37. Two companies reported that their safety programs did not change from 1955 through 1964 - (8, 12).

    One company indicated their safety program changed during this period - (6).

    Company 6 discontinued driver records and safe driver awards in 1959.

VEHICLE MAINTENANCE - PART IV

1. All companies require their drivers to perform pre-trip vehicle inspections.

2. No company requires drivers to turn in vehicle

performance sheets at the end of each day.

3. All companies repair vehicles on the basis of driver repair orders or malfunction reports.
4. All companies repair items written up and also check vehicles for other items not written up.
5. All companies have a regularly scheduled preventive maintenance program in effect.
6. All companies base their preventive maintenance program on both mileage and time.
7. All companies - their preventive programs have remained the same from 1955 through 1964.

GROUP 3

OPERATIONS - PART I

1. Two companies operate van type trucks 6,000 lbs. or under - (9, 14).

   One company operates van type trucks, 6,000 lbs. to 14,000 lbs. - (11).

   Two companies operate both type van trucks, 6,000 lbs. and 6,000 to 14,000 lbs. - (5, 10).

2. All companies deliver to retail stores.

   Companies 9, 10, and 11 - 100 per cent

   Company 5 - 90 per cent retail and 10 per cent other

   Company 14 - 75 per cent retail and 25 per cent restaurants

3. All companies deliver in the Detroit metropolitan area including suburbs within a 50 mile radius.

4. Hours of operation for the companies in Group 3 range around the clock (24 hours a day), but the majority make deliveries from 4:30 a.m. to 5:00 p.m.

   Company 5 - 90 per cent 4:30 a.m. to 5:00 p.m.
   10 per cent 11:00 p.m. to 12 noon

   Company 9 - 100 per cent 8:00 a.m. to 4:00 p.m.

   Company 10 - 100 per cent 6:00 a.m. to 4:00 p.m.

Company 11 - 100 per cent 6:00 a.m. to 5:00 p.m.

Company 14 - 75 per cent 8:00 a.m. to 4:00 p.m.

25 per cent 10:00 p.m. to 6:00 a.m.

5. Two companies have a policy on the maximum hours a driver can work each day - (9, 14).
   Maximum hours vary from 7 to 9.
   Three companies have no policy on maximum hours - (5, 10, 11).
6. In all companies the drivers cover the same routes each week.
7. Four companies experienced no changes in their operations during the ten-year study period - (5, 10, 11, 14).
   One company experienced a change - (9). At one time, drivers could stay out on the route as long as they wished. Now they can stay out only 7 hours.

SELECTION OF DRIVERS - PART II

1. All companies use application forms.
2. All companies interview applicants.
3. Two companies use a planned-interview checklist giving specific questions that are asked the applicant - (9, 10).
   Three companies do not use such a checklist - (5, 11, 14).

4. All companies check references and previous employers.

5. Three companies check applicants' driving records through local or state government agencies - (5, 9, 10).
   Two companies do not check driving records - (11, 14).

6. All companies require applicants to take a physical examination.

7. Two companies give driving tests - (9, 10).
   Three companies do not give such tests - (5, 11, 12).
   Both companies that give driving tests give them on the road in regular traffic.
   Company 9 uses a check-list for the test.
   Company 10 does not use a check-list.

8. Two companies give traffic and driving knowledge tests - (5, 9).
   Three companies do not give this type tests - (10, 11, 14).

9. Three companies give laws and ordinances tests - (5, 9, 10).
   Two companies do not give this type tests - (11, 14).

10. Two companies give other written tests - (5, 9).

    Company 5 - Wonderlicht Personality Test

    Company 9 - I.Q. and Sales Aptitude Tests

    Three companies do not give other written tests - (10, 11, 14).

11. Two companies have age limits - (9, 10).

    Company 9 hires no one over 25.

    Company 10 hires only applicants between 21 to 30.

    Three companies have not set age limits - (5, 11, 14).

12. One company has minimum driving experience requirements however did not state what the requirements were - (10).

    Four companies do not set minimum driving experience requirements - (5, 9, 11, 14).

13. Two companies have minimum educational requirements - (5, 14). Both companies require a high school education.

    Three companies do not have such a requirement - (9, 10, 11).

14. The range of driving tenure for the companies in Group 3 is from 10 to 25 years; an average of 16.4 years.

ACCIDENT PREVENTION PROGRAM - PART III

1. Titles of administrators of the accident prevention programs

   Company 5 - Personnel Manager

   Companies 9, 11 - Fleet Superintendent

   Company 10 - Safety Director

   Company 14 - Sales Manager

2. All administrators spend only part time on their accident prevention program.

   Companies 5, 9 - 1.5 per cent of time

   Company 10 - 50 per cent of time

   Company 11 - 5 per cent of time

   Company 14 - 2 per cent of time

3. Two companies have a standard of driving performance defined - (9, 10).

   Company 9- more than three accidents in 5 years, the driver is subject to dismissal.

   Company 10 - Accident free or low accident driving

   Three companies have no such standard of driving - (5, 11, 14).

4. Two companies have driver training - (5, 10). Three companies do not - (9, 11, 14).

5. Two companies - all new drivers get driver training in basic skills - (5, 10).
   Three companies - no drivers get training in the basic driving skills - (9, 11, 14).
6. Company 5 - the Sales Supervisor does the driver training.
   Company 10 - the driver supervisor does the training.
7. Initial training programs include the following:
   a. Orientation (job requirements, company policy, safety program, etc.) - (all companies)
   b. Motor vehicle accident problem (i.e., major company accident types, major accident areas and types in thes areas) - (all companies)
   c. Causes of traffic accidents (driver, vehicle, environment) - (5, 9, 10, 14)
   d. Personal traits relating to safe driving (physical and mental) - (5, 10)
   e. The vehicle (operations of, limitations of, mechanical condition of) - (5, 9, 10)
   f. Traffic laws and regulations - (5, 9, 10)
   g. Basic driving maneuvers - (5, 10)

8. New drivers are accompanied by experienced men in all the companies in Group 3.

9. In four companies, the principle duty of the trainer is: (1) to instruct in route layout; and (2) to instruct in safe driving techniques - (5, 9, 10, 14).

   In one company the trainer's principle duty is to instruct only in route layout - (11).

10. All companies instruct their new drivers in the procedure to follow in case of accident.

11. Time devoted to initial training:

    Classroom (includes across the desk orientation)

    Company 5 - 4 hours

    Company 9 - 1½ hours

    Companies 10, 11 - none

    Company 14 - 1 hour

    One the Route

    Company 5 - 1 to 2 weeks

    Company 9 - 9 weeks

    Companies 10, 11 - 2 weeks

    Company 14 - 1 week

12. One company gives refresher training to their drivers - (5).

    The driver supervisor rides with each driver once each quarter.

Four companies give no refresher training - (9, 10, 11, 14).

13. All companies give remedial training on the basis of accident experience.

14. All companies reported use of a regularly scheduled flow of safety materials as follows:

    a. Special monthly driver magazines distributed to drivers - (no companies)

    b. Monthly driver letters containing safe driving or defensive driving information - (no companies)

    c. Occasional booklets with safe driving or defensive driving information - (all companies)

    d. Safety posters on safe driving or defensive driving - (all companies)

        Three companies change them monthly - (5, 9, 10).

        One company changes them bi-monthly - (14).

        One company - the frequency of change is unknown - (11).

    e. Bulletin boards - (9, 10, 11, 14)

f. Safety meetings - (5, 9, 10, 14)

One company holds meetings monthly - (5).

Two companies hold meetings quarterly - (10, 14).

One company holds meetings semi-annually - (9).

15. All companies have an accident record keeping system.

One company started system in 1955 - (5).

One company started in 1929 - (9).

One company started system in 1957 - (10).

One company started in 1963 - (11).

One company started in 1955 - (14).

16. All companies have similar definitions of reportable accidents for their fleets, e.g., "All accidents regardless of amount of damage, what property was damaged who was injured or who was at fault."

17. All companies require their drivers to report all accidents.

18. Four companies keep an accident register for all accidents - (5, 9, 10, 11).

One company does not keep such a register - (14).

19. One company keeps an accident analysis sheet - (5).

Four companies do not keep an accident analysis sheet - (9, 10, 11, 14).

20. All companies analyze accidents to determine primary types.

Three companies analyze accidents to determine primary causes - (5, 10, 14).

Four companies analyze accidents to determine special accident problems - (5, 10, 11, 14).

21. Three companies compute accident frequency rates - (5, 10, 11).

Two companies do not compute rates - (9, 14).

22. Two companies did not indicate the mileage base used to determine frequency rate - (5, 10).

One company bases its rate on accidents per 100,000 miles - (11).

23. Four companies compute their mileage figures from odometer readings - (5, 9, 11, 14).

One company computes mileage figures from route mileage - (10).

24. Four companies keep individual driver accident records - (5, 9, 10, 11).

One company puts copies of accident reports in drivers' personnel folders but they are not entered on a continuing driver record card - (14).

25. All companies put all driver accidents on their individual driving records.

26. All companies judge accidents preventable or non-preventable.

27. Four companies have an accident review committee - (5, 9, 10, 14).
    One company does not have such a committee - (11).

28. Two companies, both top management and drivers serve on the committee - (5, 9).
    Two companies have only top management on the committee - (10, 14).

29. Accident review committees meet:
    Companies 5, 10 - After each accident
    Company 9 - Monthly
    Company 14 - Every two weeks if accidents occur that frequently

30. All companies have a method for recognizing safe driving performance.

31. Type of recognition used:
    Four companies use safe driver award pins - (5, 9, 10, 11).
    Three companies use merchandise awards - (5, 9, 14).
    Two companies use special letters of commendation - (5, 9).

32. All companies base recognition on driving without preventable accidents.

33. Four companies use one year as the award time period - (5, 9, 10, 11).

34. None of the companies charge all accidents against drivers' records.

35. All companies charge only preventable accidents against drivers.

36. Four companies base their recognition program on rules - (9, 10, 11, 14).

    One company does not have set rules for their recognition program - (5).

37. Two companies conduct special emphasis campaigns against high frequency accident types - (9, 14).

    Three companies do not conduct such campaigns - (5, 10, 11).

38. Two companies reported that their safety programs did not change 1955 through 1964 - (5, 9).

    Two companies indicated their safety programs changed during this period - (10, 14).

    Company 10 - Safe driver award program was spotty 1955 to 1958.

In 1959, full safe driver award program was started.

1957 - posters and bulletins were started.

1957 - safety director was appointed.

Company 14 - More attention to program in later years was indicated. However no further details were given.

One company did not respond to question - (11).

VEHICLE MAINTENANCE - PART IV

1. Three companies require their drivers to perform pre-trip vehicle inspections - (5, 10, 14).
   Two companies do not require pre-trip inspections - (9, 11).
2. Only one company requires drivers to turn in vehicle performance sheets at the end of each day - (11).
   Three companies require vehicle performance reports only when a defect occurs - (5, 9, 14).
   One company does not require any vehicle performance report - (10).
3. All companies repair vehicles on the basis of driver repair orders or malfunction reports.

4. Four companies repair the item written up and also check vehicles for otheritems not written up - (9, 10, 11, 14).

   One company repair only the item written up - (5).

5. All companies have a regularly scheduled preventive maintenance program.

6. Four companies base their preventive maintenance program on both mileage and time - (9, 10, 11, 14).

   One company bases their PM program only on mileage - (5).

7. Three companies - their preventive maintenance programs remained the same from 1955 through 1964 - (5, 9, 10).

   Two companies - their programs changed during this time period - (11, 14).

   Company 11 - changed in 1963 but gave no indication of what the change was.

   Company 14 - in 1960, company began renting trucks and rental agency performs all maintenance.

APPENDIX D

QUESTIONNAIRE RESPONSE TABLES

OPERATIONS - PART I

COMPANY CODE NUMBER	NUMBER OF VEHICLES	NUMBER OF DRIVERS	TYPE OF VEHICLE			TYPE OF OPERATION			PERCENT OF OPERATION			OPERATIONS CHANGED? 1955-1964			AREA OF OPERATION	WORK BETWEEN WHAT HOURS OF THE DAY	POLICY ON MAXIMUM HOURS			COVER SAME ROUTES		OPERATIONS CHANGED? 1955 THROUGH 1964		
			6,000 LBS.	6,000 TO 14,000 LBS.	OTHER	RETAIL STORE	HOME	OTHER	RETAIL STORE	HOME	OTHER	YES	NO	EXPLAIN IF YES	DETROIT METRO. INCLUDING SUBURBS		YES	NO	IF YES, DESCRIBE	YES	NO	YES	NO	IF YES EXPLAIN!
13	10	10	✓			✓		✓ INST.	98%		2%		✓		✓	7am. - 7pm.	✓		12 HRS.	✓			✓	
16	11	11	✓			✓			100%			✓		SEE LAST COLUMN	✓	7:30 am. — 5:00 pm.	✓		60 HRS. PER WK.	✓		✓		DELIVERY TO SUPER MARKETS INCREASED TO SMALLER STORES DECREASED NO MILEAGE CHANGE
19	11	11	✓			✓		✓ INST.	90%		10%	✓		SEE LAST COLUMN	✓	7:00 AM. — 3:00 PM.	✓		10 HRS.	✓			✓	INCREASED DELIVERY AREA TO INCLUDE METROPOLITAN AREA
4	12	9	✓					✓ INST. & REST.			100%	✓		SEE LAST COLUMN	✓	3 AM. - 6 P.M.	✓		8 HRS.	✓		✓		LARGER DELIVERY AREA MORE DRIVERS ADDED
3	14	14	✓			✓		✓ INST.	90%		10%	✓		SEE LAST COLUMN	✓	5 AM. - 3 PM.	✓		9 HRS.	✓		✓		LARGER DELIVERY AREA AFTER 1962
17	14	12	✓			✓		✓ INST.	98%		2%		✓		✓	8AM - 4PM.	✓		9 HRS.	✓			✓	
15b	9	7		✓		✓		✓ WARE-HOUSE	90%		10%	✓		SEE LAST COLUMN	✓	8AM - 5:30 P.M.		✓			✓	✓		LARGER DELIVERY AREA
15a	12	9		✓		✓		✓ INST.	97%		3%	✓			✓	8AM - 5:30 PM		✓			✓		✓	
15	10	7		✓		✓			100%			✓			✓	8AM - 5:30PM		✓		✓			✓	
12	30	35			✓ TRACTOR TRAILER	✓			100%			✓		SEE LAST COLUMN	✓	3:30am - 12 NOON	✓		8 HRS.		✓	✓		LARGER DELIVERY AREA
7	38	38	✓			✓		✓ INST. & REST.	100 INCLUDING OTHER				✓		✓	5AM. - 6P.M		✓		✓			✓	
8	66	66	✓	✓		✓			100%			✓		SEE LAST COLUMN	✓	50% 1AM - 8A.M. 50% 6AM. - 3PM.	✓		8 HRS.	✓		✓		LARGER DELIVERY AREA

OPERATIONS - PART I

COMPANY CODE NUMBER	NUMBER OF VEHICLES	NUMBER OF DRIVERS	TYPE OF VEHICLE			TYPE OF VEHICLE			PERCENT OF OPERATION			OPERATIONS CHANGED? 1955-1964				AREA OF OPERATION	WORK BETWEEN WHAT HOURS OF THE DAY	POLICY ON MAXIMUM HOURS			COVER SAME ROUTES		OPERATIONS CHANGED? 1955 THROUGH 1964		
			6,000 LBS.	6,000 TO 14,000 LBS.	OTHER	RETAIL STORE	HOME	OTHER	RETAIL STORE	HOME	OTHER	YES	NO	EXPLAIN IF YES		DETROIT METRO. INCLUDING SUBURBS		YES	NO	IF YES DESCRIBE	YES	NO	YES	NO	IF YES EXPLAIN!
9	100	115	✓			✓			100%				✓			✓	8AM-4P.M.	✓		7 HRS.	✓		✓		SHORTER WORK HOURS -- AT ONE TIME DRIVERS COULD STAY OUT AS LONG AS THEY DESIRED.
10	100	125	✓	✓		✓			100%				✓			✓	6AM-4PM.		✓		✓			✓	
6	103	103	✓			✓			100%			✓		SEE LAST COLUMN		✓	7:30 AM - 7:30 P.M.		✓		✓		✓		NUMBER OR ROUTES INCREASED LARGER DELIVERY AREA
14	115	115	✓			✓		✓ REST.	75%		25%		✓			✓	75% 8AM - 4:30 P.M. 25% 10PM - 6AM.	✓		8 HRS.	✓			✓	
11	145	155		✓		✓			100%				✓			✓	6 AM - 5PM		✓		✓			✓	
5	180	115	✓	✓		✓		✓ INST. & REST.	90%		10%		✓			✓	90% 4:30AM - 5PM 10% 11PM - 12 NOON		✓		✓			✓	

SELECTION OF DRIVERS - PART II

Company Code Number	Application Form		Interview		Interview Checklist		References & Past Employers Checked		Driving Record Checked		Physical Exam Required		Driving Test Given		If Driving Given - Where?				Checklist Used for Driving Test		Traffic & Driving Knowledge Test		Laws & Ordinances Knowledge Test		Other Written Tests	Age Limits		If Yes, What are Limits	Minimum Driving Experience Required		What are Minimums	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	On the Road	Off the Road	Over Given Course	Time it Takes	Yes	No	Yes	No	Yes	No	Describe	Yes	No		Yes	No		
13	✓		✓		✓		✓		✓		✓		✓		✓					✓		✓		✓	NONE	✓		25-35 EXCEPTIONS		✓		
16	✓		✓			✓		✓		✓	✓			✓								✓		✓	NONE	✓		21 OR OVER		✓		
19	✓		✓		✓		✓		✓			✓	✓		✓					✓		✓			NONE	✓		21-45 EXCEPTIONS		✓		
4	✓		✓		✓		✓			✓		✓		✓								✓			NONE	✓		35 OLDEST		✓		
3	✓		✓			✓	✓		✓		✓			✓								✓			NONE	✓		21-45 EXCEPTIONS		✓		
17	✓		✓			✓	✓			✓		✓		✓								✓		✓	NONE		✓			✓		
15b	✓		✓		✓		✓		✓		✓		✓		✓	✓						✓		✓	ARITHMETIC TEST		✓				TRUCK DRIVING EXPERIENCE	
15a	✓		✓		✓		✓			✓	✓		✓		✓							✓		✓	ARITHMETIC TEST	✓		21 OR UNDER			ONE YEAR	
15	✓		✓		✓		✓		✓		✓			✓								✓		✓	APTITUDE	✓		21 OR UNDER		✓		
12	✓		✓			✓	✓			✓	✓			NA	HIRE INEXPERIENCED MEN AND TRAIN							NA		NA		✓		21 OR UNDER		✓		
7	✓		✓			✓	✓		✓		✓			✓								✓		✓	NONE		✓			✓		
8	✓		✓			✓	✓			✓	✓		✓									✓		✓	NONE		✓			✓		

SELECTION OF DRIVERS - PART II

COMPANY CODE NUMBER	APPLICATION FORM		INTERVIEW		INTERVIEW CHECKLIST		REFERENCES & PAST EMPLOYERS CHECKED		DRIVING RECORD CHECKED		PHYSICAL EXAM REQUIRED		DRIVING TEST GIVEN		IF DRIVING GIVEN - WHERE?				CHECK LIST USED FOR DRIVING TEST		TRAFFIC & DRIVING KNOWLEDGE TEST		LAWS & ORDINANCES KNOWLEDGE TEST		OTHER WRITTEN TESTS	AGE LIMITS		IF YES, WHAT ARE LIMITS	MINIMUM DRIVING EXPERIENCE REQUIRED		WHAT ARE MINIMUMS	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	ON THE ROAD	OFF THE ROAD	OVER GIVEN COURSE	TIME IT TAKES	YES	NO	YES	NO	YES	NO	DESCRIBE	YES	NO		YES	NO		
9	✓		✓		✓		✓		✓		✓		✓		✓			1 HOUR	✓		✓		✓		IQ TEST & SALES TEST	✓		NOT OVER 25		✓		
10	✓		✓		✓		✓		✓		✓		✓		✓			15-20 MIN.		✓		✓	✓		NONE	✓		21-30	✓			
6	✓		✓		✓		✓			✓	✓		✓		✓				✓			✓		✓	ARITHMETIC TEST		✓		✓			
14	✓		✓			✓	✓			✓	✓			✓								✓		✓	NONE		✓			✓		
11	✓		✓			✓	✓			✓	✓			✓								✓		✓	NONE		✓			✓		
5	✓		✓			✓	✓		✓		✓			✓							✓		✓		WONDERLIGHT PERSONALITY TEST		✓			✓		

SELECTION OF DRIVERS - PART II (Continued)

MINIMUM EDUCATION REQUIREMENT		WHAT ARE MINIMUMS			AVERAGE TENURE OF DRIVER IN YEARS	
YES	NO	GRADE SCHOOL	HIGH SCHOOL	OTHER		
✓			✓		15	
	✓				15	
✓			✓		7	
	✓				10	
✓			✓		14	
✓			✓		10	
✓			✓		—	
✓				KNOWLEDGE OF MATH.	16	
	✓				10	
✓			✓		20	
✓			✓		15	
✓			✓		13	

SELECTION OF DRIVERS - PART II (Continued)

MINIMUM EDUCATION REQUIREMENT		WHAT ARE MINIMUMS			AVERAGE TENURE OF DRIVER IN YEARS	
YES	NO	GRADE SCHOOL	HIGH SCHOOL	OTHER		
	✓				17	
	✓				25	
✓					12	
✓					20	
	✓		✓		10	
✓					10	

ACCIDENT PREVENTION PROGRAM - PART III

COMPANY CODE NUMBER	ADMINISTRATORS TITLE	TIME DEVOTED TO PROGRAM			STANDARD OF DRIVING PERFORMANCE		IF YES WHAT IS STANDARD	HAVE DRIVER TRAINING?		ALL NEW DRIVERS GET DRIVER TRAINING		IF NO, WHAT IS FACTOR?				WHO DOES TRAINING? TITLE OR POSITION -	WHAT IS COVERED IN INITIAL TRAINING							EXPERIENCED MEN RIDE WITH NEW DRIVERS		DUTY OF TRAINER		TRAINING IN REPORTING ACCIDENTS	
		PART TIME	FULL TIME	% OF HOURS	YES	NO		YES	NO	YES	NO	NEVER DRIVE CO. TYPE VEHICLE	NO PREVIOUS DRIVING	DRIVING TEST SHOWS NEED	OTHER		ORIENTATION	ACCIDENT PROBLEMS	CAUSES OF ACCIDENTS	PERSONAL TRAITS IN SAFE DRIVING	THE VEHICLE	LAWS AND ORDINANCES	BASIC DRIVING SKILLS	YES	NO	ROUTE LAYOUT	SAFE DRIVING	YES	NO
13	AGENCY MANAGER	✓		—		✓			✓								✓					✓		✓		✓	✓	✓	
16	LOCAL OFFICE MANAGER	✓			✓		DRIVER WITH EXCESS VIOLATIONS IS TAKEN OFF TRUCK		✓																✓			✓	
19	SAFETY DIRECTOR OF LEASING COMPANY	✓		.3%		✓			✓		✓						✓	✓			✓			✓		✓	✓	✓	
4	GENERAL MANAGER	✓		.6%		✓			✓												✓			✓		✓	✓	
3	INSURANCE COMPANY SAFETY ENGINEER	✓		2%		✓			✓								✓	✓	✓	✓	✓			✓		✓	✓	✓	
17	BOOK KEEPER	✓				✓			✓								✓				✓			✓		✓	✓	✓	
15b	OPERATIONS SUPERVISOR	✓		1%		✓		✓		✓						OLDER EXPERIENCED DRIVER	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
15a	HOME OFFICE	✓															✓				✓			✓		✓		✓	
15	OPERATIONS SUPERVISOR	✓															✓	·	✓	✓	✓	✓							
12	GARAGE MANAGER	✓		5%	✓		COURTEOUS DRIVING, CARE FOR EQUIPMENT & COMPANY, AND SAFE OPERATION	✓		✓						SUPERINTENDENT OF SHIPPING & WAREHOUSE	✓			✓	✓		✓	✓		✓	✓	✓	
7	SALES MANAGER	✓		2%		✓			✓								✓				✓			✓		✓	✓	✓	
8	NOT INDICATED					✓	NO FORMAL DEFINITION		✓		✓	✓				EXPERIENCED REGULAR DRIVER	✓				✓		✓	✓		✓	✓	✓	

ACCIDENT PREVENTION PROGRAM - PART III

COMPANY CODE NUMBER	ADMINISTRATORS TITLE	TIME DEVOTED TO PROGRAM			STANDARD OF DRIVING PERFORMANCE		IF YES WHAT IS STANDARD	HAVE DRIVER TRAINING?		ALL NEW DRIVERS GET DRIVER TRAINING		IF NO WHAT IS FACTOR?				WHO DOES TRAINING? TITLE OR POSITION -	WHAT IS COVERED IN INITIAL TRAINING							EXPERIENCED MEN RIDE WITH NEW DRIVERS		DUTY OF TRAINER		TRAINING IN REPORTING ACCIDENTS	
		PART TIME	FULL TIME	% OF HOURS	YES	NO		YES	NO	YES	NO	NEVER DROVE THIS TYPE VEHICLE	NO PREVIOUS DRIVING	DRIVING TEST SHOW NEED	OTHER		ORIENTATION	ACCIDENT PROBLEMS	CAUSES OF ACCIDENTS	PERSONAL TRAITS IN SAFE DRIVING	THE VEHICLE	LAWS AND ORDINANCES	BASIC DRIVING SKILLS	YES	NO	ROUTE LAYOUT	SAFE DRIVING	YES	NO
9	FLEET SUPERINTENDENT	✓		1½%	✓		MORE THAN 3 ACCIDENTS IN 5 YRS., DRIVER IS SUBJECT TO DISMISSAL		✓	-							✓	✓	✓		✓	✓		✓		✓	✓	✓	
10	SAFETY DIRECTOR	✓		50%	✓		ACCIDENT FREE OR LOW ACCIDENT DRIVING	✓		✓						DRIVER SUPERVISOR	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
6	RECEIVING CLERK & STOCK FORMAN	✓		5%	✓		DRIVER IS TOLD WHAT IS EXPECTED (1) SMOOTH OPERATION (2) SAFE OPERATION		✓		✓	N	O D	N O	E		✓	✓ IN	✓ 1 HR.	✓ - CLASSROOM	✓				✓		✓	✓	
14	SALES MANAGER	✓		2%		✓			✓								✓	✓	✓					✓		✓	✓	✓	
11	FLEET SUPERINTENDENT	✓		5%		✓			✓		✓					SALES SUPERINTENDENT	✓	✓						✓		✓		✓	
5	PERSONNEL MANAGER	✓		1½%		✓		✓		✓						SALES SUPERVISOR	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	✓	

ACCIDENT PREVENTION PROGRAM - PART III (Continued)

HOURS DEVOTED TO ALL TRAINING?		REFRESHER TRAINING GIVEN?				REMEDIAL TRAINING GIVEN?		REGULAR SCHEDULE OF SAFETY MATERIALS USED		ANY OF THE FOLLOWING USED?								ACCIDENT RECORD KEEPING SYSTEM		YEAR STARTED	DEFINITION OF REPORTABLE MOTOR VEHICLE ACCIDENT	DO DRIVERS REPORT ALL ACCIDENTS		IS AN ACCIDENT REGISTER KEPT		IS AN ACCIDENT ANALYSIS SHEET KEPT		ARE ACCIDENTS ANALYZED FOR				ARE RATES COMPUTED	
CLASSROOM	ON ROUTE	YES	NO	ANNUAL	OTHER	YES	NO	YES	NO	MONTHLY MAGAZINES	MONTHLY LETTERS	OCCASIONAL BOOKLETS	SAFETY POSTERS	HOW OFTEN ARE POSTERS CHANGED?	BULLETIN BOARD	SAFETY MEETING	HOW OFTEN ARE MEETINGS HELD?	YES	NO			YES	NO	YES	NO	YES	NO	PRIMARY TYPES	PRIMARY CAUSES	SPECIAL PROBLEMS	OTHER	YES	NO
1 HR.	2 DAYS		✓				✓	✓			✓		✓	MON.	✓	✓	ANNUAL	✓		PRIOR TO 1955	ALL ACCIDENTS REGARDLESS OF COST, SERIOUSNESS OR WHO WAS AT FAULT	✓		✓			✓					✓	
0	0		✓			✓		✓		✓		✓	✓	MON.	✓	✓	MON.	✓		PRIOR TO 1905	EACH AND EVERY ACCIDENT, NO MATTER HOW MINOR	✓		✓		✓		✓				✓	
1 DAY	9 DAYS		✓				✓		✓			✓	✓	QUARTERLY	✓	✓	QUARTERLY	✓		1959	ALL ACCIDENTS, EVEN DENTED FENDER OR SCRATCH	✓		✓			✓		✓			✓	
0	1 WK.		✓				✓	✓					✓	—		✓	MON.	✓		1960	ANY DAMAGE TO VEHICLE OR ACCIDENT WITH ANOTHER VEHICLE	✓		✓			✓						✓
1 HR.	1-2 WKS.		✓				✓	✓			✓		✓	MON.	✓	✓	QUARTERLY	✓		1963	ALL ACCIDENTS REGARDLESS OF DAMAGE, P.I. OR WHOSE FAULT.	✓		✓			✓						✓
0	2-3 DAYS		✓				✓	✓			✓							KEPT HOME NOT AVAILABLE ✓	IN OFFICE	PRIOR TO 1955	ALL ACCIDENTS REGARDLESS OF COST, P.I. OR WHOSE FAULT	✓		✓			✓			✓			✓
			✓				✓	✓			✓	✓	✓	MON.	✓	✓	MON.	✓		—	ANY CONTACT WHATSO EVER WITH ANOTHER VEHICLE OR OBJECT.	✓		✓			✓					✓	
0	9 HRS.		✓				✓	✓			✓	✓	✓	MON.	✓	✓	MON.	✓		—	EVERY ACCIDENT	✓		✓			✓	✓	✓	✓		✓	
			✓				✓	✓			✓	✓	✓	—	✓	✓	MON.	✓		—	ANY ACCIDENT	✓		✓		✓		✓	✓	✓		✓	
			✓			✓		✓				✓	✓	WEEKLY	✓	✓	Bi-MONTHLY	✓		1956	ALL ACCIDENTS REGARDLESS OF DAMAGE, P.I. OR WHO WAS AT FAULT.	✓		✓		✓		✓		✓		✓	
0	3-4 WKS.		✓			✓		✓					✓	MON.	✓	✓	SEMI-ANNUAL	✓		1935	ALL ACCIDENTS REGARDLESS OF COST P.I. OR WHO WAS AT FAULT	✓		✓		✓		✓				✓	✓
0	1 WK.		✓				✓		✓									✓		—	ALL ACCIDENTS REGARDLESS OF DAMAGE OR PERSONAL INJURY	✓		✓		✓		✓				✓	

ACCIDENT PREVENTION PROGRAM - PART III (Continued)

HOURS DEVOTED TO ALL TRAINING		REFRESHER TRAINING GIVEN?				REMEDIAL TRAINING GIVEN?		REGULAR SCHEDULE OF SAFETY MATERIALS USED		ANY OF THE FOLLOWING USED?										ACCIDENT RECORD KEEPING SYSTEM		YEAR STARTED	DEFINITION OF REPORTABLE MOTOR VEHICLE ACCIDENT	DO DRIVERS REPORT ALL ACCIDENTS		IS AN ACCIDENT REGISTER KEPT		IS AN ACCIDENT ANALYSIS SHEET KEPT		ARE ACCIDENTS ANALYZED FOR				I.R.E. RATES COMPUTED	
CLASSROOM	ON ROUTE	YES	NO	ANNUAL	OTHER	YES	NO	YES	NO	MONTHLY MAGAZINES	MONTHLY LETTERS	OCCASSIONAL BOOKLETS	SAFETY POSTERS	HOW OFTEN ARE POSTERS CHANGED?	BULLETIN BOARDS	SAFETY MEETING	HOW OFTEN ARE MEETINGS HELD?	YES	NO			YES	NO	YES	NO	YES	NO	PRIMARY TYPES	PRIMARY CAUSES	SPECIAL PROBLEMS	OTHER	YES	NO
1½	9 WKS		✓			✓		✓				✓	✓	MON.	✓	✓	SEMI-ANNUAL	✓		1929	ALL ACCIDENTS REGARDLESS OF HOW SMALL OR WHO WAS AT FAULT	✓		✓			✓	✓					✓
—	80 HRS		✓	✓ EVALUATED & CHECKED		✓		✓				✓	✓	MON.	✓	✓	QUARTERLY	✓		1957	ALL ACCIDENTS, REGARDLESS OF DAMAGE, EVEN IF ON PRIVATE PROPERTY (PROB) TO 1957 TOO)	✓		✓			✓	✓	—	✓		✓	
8 HR.	3 WKS.		✓				✓	✓				✓	✓	MON.	✓	✓ & SALES	MON.	✓		1953	ALL ACCIDENTS REGARDLESS OF COST OR RESPONSIBILITY OR SERIOUSNESS	✓			✓	✓			✓		FAULT	✓	
1 HR.	1 WK.		✓			✓		✓				✓	✓	Bi-MON.	✓	✓	QUARTERLY	✓		1955	ALL ACCIDENTS REGARDLESS OF COST, DAMAGE OR FAULT	✓			✓		✓	✓	✓	✓			✓
0	80 HRS		✓			✓		✓				✓	✓	—	✓			✓		1963	ANY DAMAGE TO TRUCK	✓		✓		—	—	✓		✓		✓	
4 HRS	1-2 WKS	✓			QUARTERLY	✓			✓			✓	✓	MON.		✓	MON.	✓		PRIOR TO 1955	ALL ACCIDENTS INVOLVING DAMAGE OR INJURY, REGARDLESS OF COST	✓		✓		✓		✓	✓	✓		✓	

ACCIDENT PREVENTION PROGRAM - PART III (Continued)

MILEAGE BASE USED			MILEAGE COMPUTED FROM				IS DRIVER RECORD KEPT		ARE ALL ACCIDENTS PUT ON RECORD		IF NO, WHICH ARE RECORDED	ARE ACCIDENTS JUDGED PREVENTABLE		USE AN ACCIDENT REVIEW COMMITTEE		TOP MANAGEMENT AND DRIVERS OD COMMITTEE		IF NO, WHO SERVES ON COMMITTEE	HOW OFTEN DOES COMMITTEE MEET	IS SAFE DRIVING RECORD RECOGNIZED		TYPE OF RECOGNITION USED							BASED ON NO PREVENTABLE ACCIDENTS		IS ONE YEAR THE TIME PERIOD USED?	
100,000 MILES	1 MILLION MILES	OTHER	ODOMETER	ROUTE MILEAGE	FUEL CONSUMPTION	OTHER	YES	NO	YES	NO		YES	NO	YES	NO	YES	NO			YES	NO	SAFE DRIVER AWARD PINS	CASH BONUS	VACATION TRIPS	MERCHANDISE AWARDS	SPECIAL LETTERS	OTHER	YES	NO	YES	NO
✓			✓					✓	✓			✓			✓					✓		✓			✓			✓		✓	
	✓			✓			✓					✓		✓			✓	TOP MANAGEMENT ONLY	MONTHLY	✓		✓						✓		✓	
✓			✓				✓		✓			✓			✓						✓											
							✓		✓				✓								✓											
				✓			✓		✓			✓		✓		✓			EACH ACCIDENT		✓											
				✓				✓	✓				✓		✓					✓		'63 ✓ '64 ✓						BASED ON NO ACCIDENTS ✓		✓	
✓			✓				✓		✓			✓		✓			✓	INSURANCE CO. REPRESENTATIVE & CO. INSURANCE DIV. REPRESENTATIVE	?	✓		✓			✓	✓		✓		✓	
✓			✓				✓		✓			✓		✓						✓		✓			✓	✓		✓		✓	
—	—	—			✓		✓		✓			✓		✓		✓				✓	.	✓	✓		✓	✓		✓		✓	
	✓		✓				✓		✓			✓		✓		✓			EVERY ONE OR TWO MONTHS	✓			✓				✓			✓	
			✓					✓	✓				✓	1955 THRU 1960 YES		✓			SERIOUS ACCIDENTS ONLY		✓										
		✓ RATE PER QUARTER	✓					✓		✓											✓										

ACCIDENT PREVENTION PROGRAM - PART III (Continued)

MILEAGE BASE USED			MILEAGE COMPUTED FROM				IS DRIVER RECORD KEPT		ARE ALL ACCIDENTS PUT ON RECORD		IF NO, WHICH ARE RECORDED	ARE ACCIDENTS JUDGED PREVENTABLE		USE AN ACCIDENT REVIEW COMMITTEE		TOP MANAGEMENT AND DRIVERS ON COMMITTEE		IF NO, WHO SERVES ON COMMITTEE	HOW OFTEN DOES COMMITTEE MEET	IS SAFE DRIVING RECORD RECOGNIZED		TYPE OF RECOGNITION USED						BASED ON NO PREVENTABLE ACCIDENTS		IS ONE YEAR THE TIME PERIOD USED	
100,000 MILES	1 MILLION MILES	OTHER	ODOMETER	ROUTE MILEAGE	FULL CONSUMPTION	OTHER	YES	NO	YES	NO		YES	NO	YES	NO	YES	NO			YES	NO	SAFE DRIVER AWARD PINS	CASH BONUS	VACATION TRIPS	MERCHANDISE AWARDS	SPECIAL LETTERS	OTHER	YES	NO	YES	NO
—	—	—	✓				✓		✓			✓		✓			✓	TOP MANAGEMENT SALES MGR., FLEET SUPERINTENDENT SUPERVISORS	MON.	✓		✓			✓	✓		✓		✓	
				✓			✓		✓			✓		✓		✓			EACH ACCIDENT	1958-1964 ✓		✓						✓		✓	
				✓			THRU 1959 ✓		THRU 1959 ✓			✓		✓			✓	TOP MANAGEMENT PLANT MGR. PLANT CONTROLLER, CHIEF ENGR., ETC.	MON.	THRU 1959 ✓		✓	✓		✓			✓		✓	
—	—	—	✓					✓	✓			✓		✓		✓			EVERY 2 WEEKS IF ACCIDENTS OCCUR	✓						✓			✓		✓
✓			✓				✓		✓			✓			✓			SALES SUPERVISOR, SALESMAN & PERSONNEL MGR.	EACH ACCIDENT	✓		✓						✓		✓	
			✓				✓		✓			✓		✓			✓	SALES SUPERVISOR, SALESMAN & PERSONNEL MGR.	EACH ACCIDENT	✓		✓			✓	✓		✓		✓	

ACCIDENT PREVENTION PROGRAM - PART III (Continued)

IF NO, DESCRIBE SYSTEM USED	ALL ACCIDENTS CHARGED TO DRIVER?		ONLY PREVENTABLE ACCIDENTS		ARE AWARDS BASED ON RULES		SPECIAL CAMPAIGNS FOR HIGH FREQUENCY ACCIDENT TYPES		HAS PROGRAM CHANGED 1955 - THROUGH 1964		IF YES, DESCRIBE CHANGES	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
		✓	✓		1 ✓			✓		✓		1.-RULES NOT WRITTEN
		✓	✓		✓			✓		✓		
		✓	✓				✓			✓		
		✓	✓					✓		✓		
								✓	✓		MORE MEETINGS ON SAFETY - - - DRIVER LETTER INTRODUCED 1964	
	✓				✓			✓	✓		AWARDS INTRODUCED IN 1963	
		✓	✓		✓		✓			✓		
		✓	✓		✓		✓			✓		
		✓	✓		✓		✓			✓		
6 MONTHS		✓	✓		✓		✓			✓		
							✓			✓		
								✓		✓	PROGRAM INTRODUCED IN 1965	

ACCIDENT PREVENTION PROGRAM - PART III (Continued)

IF NO, DESCRIBE SYSTEM USED	ALL ACCIDENTS CHARGED TO DRIVER?		ONLY PREVENTABLE ACCIDENTS		ARE AWARDS BASED ON RULES		SPECIAL CAMPAIGNS FOR HIGH FREQUENCY ACCIDENT TYPES		HAS PROGRAM CHANGED 1955 THROUGH 1964		IF YES, DESCRIBE CHANGES	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
		✓	✓		✓		✓			✓		
		✓	✓		✓			✓	✓		SDA - HIT OR MISS NSC TYPE AWARD IN "59" POSTER + BULLETINS -- 1957	1958 SAFETY DIRECTOR STARTED, 1957
		✓	✓		✓		✓		✓		AWARDS DROPPED IN 1959 - DRIVER RECORDS ALSO DROPPED -1959	
POINTS AWARD EACH MONTH FOR NO ACCIDENT DRIVING		✓	✓		✓		✓		✓		MORE ATTENTION TO SAFETY PROGRAM NOW THAN IN 1955	
		✓	✓		✓			✓				
		✓	✓			✓		✓		✓		

VEHICLE MAINTENANCE - PART IV

COMPANY CODE NUMBER	PRE-TRIP VEHICLE INSPECTION REQUIRED		DAILY VEHICLE PERFORMANCE SHEETS REQUIRED		VEHICLES REPAIRED ON BASIS OF DRIVER REPORTS		ONLY WRITTEN ITEM REPAIRED	ITEM REPAIRED AND VEHICLE CHECKED	REGULAR SCHEDULED PM PROGRAM		IF YES, ON BASIS OF		DESCRIBE PREVENTIVE MAINTENANCE PROGRAM	HAS PM PROGRAM REMAINED THE SAME 1955-1964		IF NO, DESCRIBE CHANGE	
	YES	NO	YES	NO	YES	NO			YES	NO	MILEAGE	TIME		YES	NO		
13	✓		WEEKLY	✓	✓			✓	✓		✓		2,000 - LUBE, OIL, VISUAL CHECK OF VEHICLE TUNE-UPS, BRAKE CHECK, ETC. ONLY ON BASIS OF DRIVER REPORT	✓			
16		✓	✓		✓			✓	✓		✓	✓	———	✓			
19	✓		ONLY ON DEFECT	✓	✓			✓	✓		✓	✓	1,000 OR 30 DAYS - VISUAL, WALK AROUND CHECK 10,000 - TUNE UP 30,000 - BRAKES, BEARINGS, ETC.	✓			
4		✓		✓	✓			✓	✓		✓	✓	CHECKS FOR OIL LEVEL AND GREASE -- NO SET SCHEDULE FOR THIS OR OTHER MAINTENANCE		✓	1960 - FULL TIME MECHANIC WAS HIRED PRIOR - GAS STATION HANDLED MAINTENANCE	
3		✓	DEFECT REPORT ONLY	✓	✓			✓	✓			✓	4 WEEKS - GREASE & OIL EACH WEEK - ONE TRUCK IS PULLED OFF ROUTE FOR FULL CHECK, EVERY 15 WEEKS FLEET IS COVERED		✓	USED TO FARM WORK OUT. ONLY DEFECTIVE ITEM WAS FIXED. NEW PROGRAM BEGAN - 1963	
17		✓	DEFECT REPORT ONLY	✓	✓			✓		✓			GREASED, OILED, BRAKES CHECKED AT REGULAR INTERVALS BY CHEVROLET & FORD DEALERS		✓	———	
15b		✓	✓		✓			✓	✓		✓	✓	EVERY 8 WEEKS OR 2000 P.M. INSPECTION	✓			
15a		✓	✓		✓		✓		✓		✓	✓	8 WEEKS OR 2,000 P.M INSPECTION	✓			
15	✓			✓	✓			✓	✓		✓	✓	8 WEEKS OR 2,000 P.M. INSPECTION	✓			
12	✓		DEFECT REPORT ONLY	✓	✓			✓	✓		✓	✓	5,000 - TUNE-UP, WHEEL, BRAKE, BEARING, LIGHTS CHECK STEERING	✓			
7	✓		DEFECT REPORT ONLY	✓	✓		✓		✓			✓	ONCE A MONTH OR AS TIME PERMITS -- OIL, GREASE, VISUAL CHECK	✓			
8	✓		DEFECT REPORT ONLY	✓	✓			✓	✓		✓	✓	1 MONTH OR 2,000 -- LUBRICATION & OIL -- SPOTTY MAINTENANCE - NO REAL P.M.	✓			

VEHICLE MAINTENANCE - PART IV

COMPANY CODE NUMBER	PRE-TRIP VEHICLE INSPECTION REQUIRED		DAILY VEHICLE PERFORMANCE SHEETS REQUIRED		VEHICLES REPAIRED ON BASIS OF DRIVER REPORTS		ONLY WRITTEN ITEM REPAIRED	ITEM REPAIRED VEHICLE AND CHECKED	REGULAR SCHEDULED PM PROGRAM		IF YES, ON BASIS OF		DESCRIBE PREVENTIVE MAINTENANCE PROGRAM	HAS PM PROGRAM REMAINED THE SAME 1955-1964		IF NO, DESCRIBE CHANGE
	YES	NO	YES	NO	YES	NO			YES	NO	MILEAGE	TIME		YES	NO	
9		✓	DEFECT REPORT ONLY ✓		✓			✓	✓		✓	✓	3 MONTHS OR 8,000 MILES TUNE UP, ENGINE COMPONENTS, BRAKES, BEARING, STEERING CHECKED	✓		
10	✓			✓	✓			✓	✓		✓	✓	6 MONTHS OR 5,000 MILES P.M. INSPECTION.	✓		
6	✓		DEFECT REPORT ONLY ✓		✓			✓	✓		✓	✓	2 MONTHS OR 2,000 - OIL, GREASE, TUNE UPS, BRAKES, CHECKED GENERAL OVERHAUL - WHEN NEEDED	✓		
14	✓		DEFECT REPAIRED ONLY ✓		✓			✓	✓		✓	✓	1,000 OR 30 DAYS - OIL, GREASE, VISUAL INSPECTION 10,000 - ENGINE TUNE UP 30,000 - ENGINE COMPONENTS, BRAKES, BEARINGS		✓	HAD OWN PM SHOP UP TO 1960. SINCE THEN, RENTING TRUCKS & PM IS PULLED BY RENTAL COMPANY
11		✓	✓		✓			✓	✓		✓	✓	———		✓	CHANGED IN 1963 ?
5	✓		DEFECT REPAIRED ONLY ✓		✓		✓		✓		✓		1,500 — LUBRICATION 2,500 — OIL 5,000 OR 13 WKS. - TUNE UP, BRAKES, GREASE LIGHTS, CLUTCH, ETC.	✓		

REPORTABLE ACCIDENTS

COMPANY CODE NUMBER	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	
13	9	8	8	2	7	6	2	2	3	4	
16	4	6	3	4	4	3	3	2	1	3	
19					2	5	4	7	5	3	
4				.		6	7	3	5	7	
3	5	5	5	5	5	5	5	5	7	3	ESTIMATED BY COMPANY THROUGH 1962, SAFETY PROGRAM BEGAN IN 1964.
17	5	6	5	6	5	6	5	6	5	6	COMPANY ESTIMATED AVERAGE NUMBER
15b											ONE COMPANY WITH THREE TERMINALS IN DETROIT -- ACCIDENT DATA NOT AVAILABLE
15a											
15											
12	28	27	15	15	18	17	19	18	11	17	
7											ACCIDENT DATA NOT AVAILABLE
8	30	22	20	13	29	27	22	21	28	37	

REPORTABLE ACCIDENTS

Company Code Number	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	
9	25	46	26	24	37	23	18	30	28	15	
10	64	70	77	50	32	25	26	29	27	24	
6	15	27	36	27	20	23	27	31	29	37	
14				20	27	31	29	33	33	7½ mon. 23	ONLY 7½ MONTHS ACCIDENT EXPERIENCE AVAILABLE FOR 1964
11									63	42	
5							42	39	33	51	

MILES

COMPANY CODE NUMBER	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
13	210,600	210,600	210,600	210,600	210,600	210,600	210,600	210,600	210,600	210,600
16	156,000	156,000	156,000	156,000	156,000	156,000	156,000	156,000	156,000	156,000
19					241,000	248,000	249,000	249,000	250,000	252,000
4						186,200	191,000	193,000	191,500	192,800
3	235,600	235,600	235,600	235,600	235,600	235,600	235,600	235,600	272,000	272,000
17	187,500	187,500	187,500	187,500	187,500	187,500	187,500	187,500	187,500	187,500
15b	125,000	125,000	125,000	125,000	125,000	130,000	134,000	134000	136,500	140,900
15a										
15										
12	795,460	812,240	805,450	797,630	819,780	897,370	927,210	929,550	985,770	1,004,370
7										
8	817,750	817,750	817,750	817,750	817,750	817,750	817,750	817,750	817,750	817,750

MILES

COMPANY CODE NUMBER	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
9	1,269,000	1,269,000	1,149,320	1,388,790	1,774,120	1,902,840	1,834,290	2,290,200	1,785,150	1,807,800
10	1,567,440	1,567,440	1,567,440	1,567,440	1,567,440	1,567,440	1,567,440	1,567,440	1,567,440	1,567,440
6	800,290	800,290	800,290	800,290	800,290	1,100,400	1,100,400	1,100,400	1,100,400	1,100,400
14				1,154,970	1,154,970	1,154,970	1,154,970	1,154,970	1,154,970	2/3 OF 1,154,970 769,980
11									2,968,150	3,244,120
5							2,178,000	2,186,200	2,298,530	2,251,000

ACCIDENT FREQUENCY RATE

COMPANY CODE NUMBER	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	
13	42.74	37.99	37.99	9.5	33.23	28.49	9.50	9.50	14.25	18.99	
16	25.64	38.46	19.23	25.64	25.64	19.23	19.23	12.82	6.41	19.23	
19					8.30	20.16	16.06	28.11	20.00	11.90	
4						32.22	36.65	15.54	26.11	36.31	
3	21.22	21.22	21.22	21.22	21.22	21.22	21.22	21.22	25.74	11.03	
17	26.67	32.00	26.67	32.00	26.67	32.00	26.67	32.00	26.67	32.00	
15b											ONE COMPANY 3 TERMINALS IN DETROIT DATA NOT AVAILABLE
15a											
15											
12	35.20	33.24	18.62	18.81	21.96	18.94	20.49	19.36	11.16	16.93	
7											DATA NOT AVAILABLE
8	36.69	26.90	24.46	15.90	35.46	33.02	26.90	25.68	34.24	45.25	

ACCIDENT FREQUENCY RATE

Company Code Number	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
9	19.70	36.25	22.62	17.28	20.86	12.09	9.81	13.10	15.68	8.26
10	40.83	44.66	49.12	31.90	20.42	15.95	16.59	18.50	17.23	15.31
6	18.74	33.74	44.98	33.74	24.99	20.90	24.53	28.17	26.35	33.62
14				17.32	23.38	26.84	25.11	28.57	28.57	29.87
11									21.23	12.95
5							19.28	17.84	14.36	22.66