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A STUDY OF SELECTED FACTORS OF PUBLIC SCHOOL  
BUS TRANSPORTATION IN A FOUR COUNTY AREA

by

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B. S. Missouri University, 1940

Presented in partial fulfillment of the requirements for the degree of  
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1955

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TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION . . . . .	1
The Problem . . . . .	2
Statement of the problem . . . . .	2
Problem background . . . . .	2
Delimitation of the problem . . . . .	2
Method of Research . . . . .	3
Treatment of data . . . . .	5
Definitions of Terms Used . . . . .	6
District-owned busses . . . . .	6
Combustion heaters . . . . .	6
All-purpose tread . . . . .	6
Bar type tread . . . . .	6
Bus driver's report . . . . .	6
Commercial garage equipment . . . . .	6
School transportation policy . . . . .	7
Speedometer reading . . . . .	7
Sedan type school bus door . . . . .	7
Split type school bus door . . . . .	7
Sliding type school bus door . . . . .	7
Organization of the Remainder of the Report . . . . .	8
II. THE SCHOOL BUS ROUTE . . . . .	9
Road Conditions . . . . .	10
III. THE SCHOOL BUS. . . . .	14
Pupil Capacities, Year Models, and Speedometer Readings	16

CHAPTER	PAGE
Most Common Bus Repairs . . . . .	18
Bus Door Styles and Emergency Equipment . . . . .	18
Rear Tire Styles . . . . .	21
The School Bus Garage . . . . .	23
IV. THE SCHOOL BUS DRIVER . . . . .	25
Other Jobs Held by Drivers . . . . .	26
Age, Experience, and Compensation . . . . .	28
Duties . . . . .	28
V. SCHOOL BUS TRANSPORTATION POLICY . . . . .	31
Speed Limits and Pupil Patrols . . . . .	31
Purchasing of Supplies . . . . .	33
Repair of Busses . . . . .	33
Financing Bus and Driver Expenses for Extra- curricular Trips . . . . .	33
VI. INTERVIEW ITEMS THAT DID NOT LEND THEMSELVES TO TABULAR STRUCTURING . . . . .	37
The Bus Route . . . . .	37
The School Bus . . . . .	37
The Bus Driver . . . . .	38
School Bus Transportation Policy . . . . .	39
VII. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS . . . . .	40
BIBLIOGRAPEY . . . . .	43
THE INTERVIEW FORM . . . . .	44
SCHOOLS REPORTING . . . . .	47

LIST OF TABLES

TABLE	PAGE
I. Total Miles in District Bus Routes and Quality of Road	11
Maintenance . . . . .	13
II. Causes of Failure of Busses to Meet the Normal Schedule and Days Missed Due to Adverse Weather . . . . .	13
III. Capacities, Ages, and Speedometer Readings of District- owned Busses in Eleven Montana School Districts . .	17
IV. Frequency of Most Common Repairs on Thirty-eight District-owned School Busses . . . . .	19
V. Bus Door Styles and Frequency of Emergency Equipment in Forty-three District-owned School Busses . . . . .	20
VI. Frequency of Bus Rear Tire Styles and Chain Use During School Year 1954-1955 . . . . .	22
VII. The School Bus Garage and Equipment . . . . .	24
VIII. Jobs Held Other Than Driving School Bus . . . . .	27
IX. Age, School Bus Driving Experience, and Compensation of Thirty-eight Drivers . . . . .	29
X. Duties of Thirty-eight School Bus Drivers . . . . .	30
XI. Speed Limits and Method of Control; Use of Pupil Patrols	32
XII. How Eleven School Districts Purchased Supplies for School Busses . . . . .	34
XIII. How Eleven School Districts Repaired School Busses . .	35
XIV. How School Bus and Driver Expenses for Extra-curricular Trips Were Paid in Eleven School Districts . . . . .	36

## CHAPTER I

### INTRODUCTION

Inequalities in educational opportunities tend to be prevalent in sparsely settled areas; particularly where public school bus transportation is lacking or inadequate. For many years most communities have seen the need for and have provided efficient transportation to school. Montana has been acutely aware of this need. According to K. W. Bergan:

Montana may be called a pioneer in the use of school transportation. The first law on the statute books in Montana pertaining to school transportation was passed in 1903. Not one-third of the states had school transportation laws at that time.<sup>1</sup>

School transportation provides wider attendance areas and thus greater enrollment in schools that employ it. Greater enrollment contributes both to the benefit of those transported and to those who live near the school. Some of the effects of larger school populations are:

1. More funds are made available.
2. Better physical plants and equipment.
3. Usually the fields of subject matter and activities are wider.

In some areas the increase in enrollment due to public school transportation determines whether small towns shall be able to operate a school.

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<sup>1</sup>Montana State Department of Public Instruction, Annual Report School Transportation (Helena, Montana, 1953-1954), p. 45. (Mimeographed.)

## I. THE PROBLEM

Statement of the problem. The main purpose of this study was to determine what the current practices were in public school bus transportation in an area that included Toole, Glacier, Pondera, and Teton Counties of north-central Montana.

The factors selected for study were:

1. The school bus route
2. The school bus
3. The school bus driver
4. Policies involved in school bus transportation

Problem background. In all progressive communities there was a desire to know how their procedures and policies compare with those of their neighboring communities. They wonder how others solve certain common problems. Those concerned with the operation of school busses like to compare the mechanical features and performance of their equipment with those of other districts where the general topography is similar and other physical similarities exist. Administrators and school boards are curious about how situations that involve policy are met by others who are beset with similar problems.

Delimitation of the problem. This study was limited to statistical information gathered from the Montana Highway Patrol reports and forms and to responses secured from school district personnel by interviews.

The area has a few contracted school busses and only those that are district-owned were considered in this report.



This particular geographical area was selected for convenience and for other reasons which are:

1. The economy of each school district generally includes ranching, grain farming, oil, or a combination of two or more of these industries.

2. The general topography and climatic conditions are nearly homogeneous.

3. Roads and road maintenance programs are much the same with one possible exception. One district has the services of another agency in addition to the county and state maintenance departments.

However, in homogeneous groups there tends to be some variation in the specific practices of any common operation. In school bus transportation there are so many variables that may not seem significant. For instance, in one locality there may be excellent repair service available which is so competitive that a school that operates three or four busses cannot afford to set up and maintain its own facilities exclusively for that purpose. In other districts, the opposite condition may prevail.

All statistics were taken from the records of the school years, 1953-1954 and 1954-1955.

## II METHOD OF RESEARCH

Collection of data. The information used in this study was obtained from two sources:

1. The Montana Highway Patrol School Bus Inspection records and reports from which the bus pupil capacities, year-models, speedometer

readings, drivers' ages, drivers' compensation, and driver experience were taken.

2. Personal interviews of responsible personnel including school administrators, school boards, bus foremen, mechanics, and school bus drivers from whom the remainder of the information was gathered.

The interviews were started June 6, 1955, with Mr. Walter Bourret of Sunburst. A copy of the interview form appears in Appendix B. After Mr. Bourret had answered all questions, he was asked if there was anything important omitted in the scope of the interview or if he had any problems involving school bus transportation that should be presented to the remaining ten school districts. He answered, "You have the field very well covered." Thereafter county school superintendents were first consulted. They had a part of the information. This information consisted of a copy of the Montana Highway Patrol School Bus Inspection report for each individual bus route in the county. This procedure was followed from county to county and from school to school.

The questions used in the interview were selected after the study of related literature which included:

1. State Department of Public Instruction reports.
2. Bus drivers' manuals from Montana and other states.
3. National Safety Council materials.
4. Research bulletins by the National Educational Association.
5. Articles on school bus transportation that occurred in periodicals.
6. Materials from the Operations Division of the American Transit Association.

Other valuable sources of questions for the interview were the mechanics' and bus drivers' knowledge of the mechanical components of the bus body and chassis. Several ideas concerning policy were gleaned from discussions with administrators and school boards.

Treatment of data. The study was divided into four specific areas:

1. The bus route which was broken down into; (a) Road classification, that is, what part of the route was paved and what portion was dirt and gravel; (b) the total length of the route by which was meant the total distance travelled per day; (c) the quality of road maintenance according to the opinions of the persons interviewed; (d) causes and frequencies of deviation from the normal bus schedule; and (e) bus days lost due to adverse weather.
2. The school bus which included the following: (a) pupil capacity which is computed on the basis of thirteen inches of seating space per pupil; (b) year-model; (c) speedometer reading; (d) the most common bus repairs as recorded or recalled; (e) rear tire type and frequency of tire chain use in 1954-1955; (f) emergency equipment consisting of combustion heaters and two-way radio; (g) bus door styles; and (h) the bus garage and its equipment.
3. The school bus driver area which was sub-divided into (a) duties; (b) age; (c) compensation; (d) experience driving school busses; and (e) jobs held other than school bus driving.
4. School bus transportation policy which included: (a) speed limits and their control; (b) procedure in purchasing supplies and services; and (c) use of busses by extra curricular groups and responsibility for compensation for bus and driver expense.

Medians, averages, totals, and ranges were derived and stated.

### III DEFINITIONS OF TERMS USED

District-owned busses. The busses that are owned and operated by public school districts.

Combustion heaters. Auxiliary heaters that usually operate on the regular gasoline supply. They do not depend upon the operation of the bus motor but draw current from the bus battery. Some heaters operate on charcoal, butane, or propane.

Two-way radio. Both a mobile receiver and transmitter in the bus and usually a home station at the school. Usually these are frequency modulated sets with a range of about twenty-five miles. They are assigned a frequency which is exclusive for that district.

Bar type tread. Tires with parallel cleats which angle to near the center and almost meet the bars on the opposite side to form V's. Some tires have the cleat divided, but the effect is the same.

All-purpose tread. This is a relatively new development in mud and snow tires. These tires usually have a zigzag pattern running around the tire tread parallel with the tire wall. The grooves are smaller than the cleats of the bar tread. One tire company names them "Town and Country."

Commercial garage equipment. Equipment required for the complete repair and maintenance of all school busses.

Bus driver's report. Any report either written or oral involving attendance of pupils, discipline problems or measures taken, the need for bus repairs, or any other factor.

School bus transportation policy. A stabilized course adopted and followed by a school board in all matters pertaining to school bus transportation.

Speedometer reading. That part of a speedometer on which is recorded the miles that the vehicle has rolled in its life thus far.

Sedan type school bus door. A solid door usually having both a pane of safety glass near the top and a curved transparent pane of plastic material near the bottom. The door is mounted near the front of the bus body. It is controlled by a short adjustable rod and spring near the bottom of the door. The adjustment of this rod limits the opening swing of the door. A longer, slightly curved rod extends horizontally from about the center of the dash to the vertical center of the door. This rod is provided with a handle which is within easy reach of the driver's right hand. The manipulation of the handle allows the door to swing outward about eighty-five degrees or close tightly.

Split type school bus door. A door of two equal pieces each of which contains a relatively small pane of safety glass near the top of each section. When the controlling handle is manipulated, the two sections swing inward about ninety degrees or close with a narrow overlapping of the two center edges.

Sliding type school bus door. A door that slides backward into a parallel channel of the bus body to open or is closed by sliding forward to meet the stationary door frame.

IV. ORGANIZATION OF REMAINDER OF THE REPORT

Chapter II. The School Bus Route

Chapter III. The School Bus

Chapter IV. The School Bus Driver

Chapter V. School Bus Transportation Policy

Chapter VI. Interview Items That Did Not Lend Themselves to  
Tabular Structuring

Chapter VII. Summary and Conclusions

.

## CHAPTER II

### THE SCHOOL BUS ROUTE

Many high school graduates and college alumni owe much to the school bus. Without convenient, dependable transportation to school, some would have given up the struggle to attend school.

Bus routes are planned to benefit the greatest number of pupils without undue hardship to the few who are more isolated.<sup>1</sup> The usual plan is to run the school bus as near the door of the patrons as possible, yet to keep the vehicle on the more dependable roads. Schools usually do not furnish "taxi" service to the very door unless weather conditions are such that safety demands such a service. Parents were interested in getting their offspring to the school bus on time. Additions to routes, advantageous changes, and new routes are continuously planned and put into effect. These changes or additions, as well as the resetting of established routes, are officially worked out every spring. Montana State Law provides for County School Transportation Committees to aid in the solution of school transportation controversies and problems. The Committee also must approve all school bus routes for the coming year.

The committee shall be selected as follows: County Superintendent of Schools, Chairman, one county commissioner, one representative from each high school district, and one representative from an elementary school district in each high school district.<sup>2</sup>

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<sup>1</sup>Montana State Department of Public Instruction, Annual Report 1953-1954 School Transportation, (Helena, Montana: p. 16. (Mimeographed.)

<sup>2</sup>Montana State Department of Public Instruction, Administration Manual: School Transportation, (Helena, Montana: 1955), pp. 3, 4, 13. (Mimeographed.)

The area of the four counties under study incorporates about 8 per cent of the total area of the state. The census data of the school year 1953-1954 show that the above four counties collectively had about 6 per cent of the total school population of the state between the ages of six and twenty-one years. Cascade, Silver Bow, and Yellowstone had greater populations for that age range.<sup>1</sup>

Road conditions. The operators of school bus routes in the area under study had one distinct disadvantage. They travelled comparatively long distances to transport a few pupils. Table I indicates that forty-three school busses travelled collectively 2,456 miles daily. Only three hundred ninety-three miles were paved. The remaining mileage was classified as graded. Since it was very difficult to reach an agreement on whether a piece of road was surfaced with gravel or just plain dirt, all roads unpaved were placed in the graded category. Less than 12 per cent of all the school bus routes in the area were paved.

In the appraisal of the quality of road maintenance in the several districts, the opinions of the persons interviewed were accepted as the best criteria available. Personnel of Schools "E" and "F" claimed that "road maintenance was good." The answers were emphatic. The data of Table I show that School "F" had nearly 41 per cent of its routes paved. According to Mr. Fisher, the bus foreman of School "E", this district had the advantage of an additional agency (Indian Agency) that also was engaged in road building and maintenance in that particular area.

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<sup>1</sup>Montana State Department of Public Instruction, Your Schools Today and Goals for Tomorrow: 1952-1954, Biennial Report of the Superintendent Of Public Instruction of Montana, (Butte, Montana: McKee Printing Company, 1954), p. 87.



TABLE I

TOTAL MILES IN DISTRICT BUS ROUTES AND QUALITY OF ROAD MAINTENANCE

School	Miles of pavement	Miles of graded road	Total miles in district routes	Quality of road maintenance
A	11	131	142	Fair
B	65	263	328	Fair
C	16	80	96	Fair
D	132	258	390	Fair
E	23	157	180	Good
F	70	102	172	Good
G	24	260	284	Fair
H	16	212	228	Fair
I	10	38	48	Fair
J	12	272	284	Fair
K	14	290	304	Fair
Totals	393	2063	2456	

As shown in Table II in all other districts the quality of road maintenance was judged to be "fair." Some of these answers were given reluctantly. There was a noticeable exaggeration in some answers. Perhaps the driver thought of the times when he almost lost the bus fenders or when thirty minutes were consumed in negotiating a stretch of road that he normally covered in five. In one school district a bus was late twice due to the tardiness of the driver. This is not a usual cause for late busses.

Some of the fourteen mechanical failures could have been prevented. However, the trouble-free days, mechanically speaking, amounted to about 99.8 per cent of the total. An average bus had a potential breakdown en route every three years.

Eighty-two collective bus trips missed due to adverse weather were probably lower than normal.

TABLE II

CAUSES OF FAILURE OF BUSES TO MEET THE NORMAL SCHEDULE AND DAYS  
MISSED DUE TO ADVERSE WEATHER\*

School	Mechanical failures	Driver late	Weather	Collective bus days missed due to adverse weather
A	2	0	10	1
B	2	0	11	5
C	0	0	7	5
D	4	0	0	20
E	2	2	3	7
F	0	0	0	2
G	1	0	8	9
H	0	0	5	3
I	0	0	2	2
J	2	0	24	12
K	1	0	12	12
Totals	14	2	82	76

\*All figures are collectively tabulated. For example, School "B" operated five busses. Five collective bus days were missed due to inclement weather. This is not to be interpreted as five busses missing five days each. If that were the case, the table would show twenty-five days missed.

## CHAPTER III

### THE SCHOOL BUS

The first school bus route in North America was planned during the summer of 1869. The following September the first school bus on the continent made its initial run in Quincy, Massachusetts. It jolted along the streets loaded with giggling children seated upon planks laid across a wagon box top.<sup>1</sup>

Public school transportation became legal in Montana in 1903. The first state-wide cost accounting record dates back to 1912 when \$26,636 was spent.<sup>2</sup> Forty-two years later the cost of all public school transportation had mushroomed to \$2,700,000.<sup>3</sup> To compare the ratio of cost to quantity and quality of service rendered in 1912 to that in 1954 would be absurd. The early horse-drawn vehicle had a normal range of not more than six or seven miles from school. Lap robes were carried for protection against the rugged Montana winters. The modern school bus has more than a hundred "horses" under the hood. It is safe, dependable, comfortable, and fast enough to make several stops for pupils and yet cover thirty miles of good country road in an hour. The older two-horse

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<sup>1</sup>Robert West Howard, "The School Bus System," Nations Schools. 37: pp. 52, 81, May, 1949.

<sup>2</sup>Montana State Department of Public Instruction, "Annual Report of School Transportation", (Helena, Montana, 1953-1954), p. 45. (Mimeographed.)

<sup>3</sup>Montana State Department of Public Instruction, "Your Schools Today and Goals for Tomorrow", Biennial Report of the Department of Public Instruction: 1952-1954, (Butte, Montana: McKee Printing Company, 1954), p. 61. (Mimeographed.)

vehicle could carry only a handful of pupils. The bus of today may carry up to seventy-two.<sup>1</sup>

School busses now must meet very rigid, minimum standards.<sup>2</sup> Every single item incorporated in both the chassis and body must measure up to specifications laid down by state authorities. These standards have evolved over a long period of time. They are the result of much planning, research, and testing by school people, chassis and body manufacturers, and various organizations among which are: The National Safety Council, Underwriters' Laboratories, American Standards Association, Society of Automotive Engineers, and others.<sup>3</sup>

Most states have adopted regulations and standards governing public school busses. The basis for those in operation in Montana was approved in 1947. At least three more amendments have been added since.

Whereas, under the provisions of Chapter 183 of the Laws of the 30th Legislative Assembly of the State of Montana, the State Department of Public Instruction, by and with the advice of the Montana Highway Patrol and the Superintendent of Public Instruction were directed to adopt regulations to govern the design, construction, and operation of all school busses publicly and privately owned, not inconsistent with the Montana Vehicle Code and the Minimum Standards for School Busses adopted by the National Commission on Safety Education, . . .

It is further resolved that the Montana Highway Patrol is hereby requested to make inspection of all vehicles used as school busses in the State of Montana, . . .<sup>4</sup>

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<sup>1</sup>Montana Highway Patrol, School Bus Inspection Summary, (Helena, Montana: 1954.) (Mimeographed.)

<sup>2</sup>Montana State Department of Public Instruction, Montana School Bus Driver Manual (Butte, Montana: Allied Printing, 1953), pp. 64-80.

<sup>3</sup>Ibid., p. 90.

<sup>4</sup>Ibid., p. 63.

The Highway Patrol now inspects all school busses annually. Forty-eight items are checked. The general range of chassis items runs from the front bumper to the exhaust pipe. The bus body is checked for everything from the color to the rear identification. The driver must produce a valid chauffeur license and a Red Cross First Aid Certificate.<sup>1</sup>

Seven hundred sixty school busses were checked in 1954. Approximately 98.8 per cent of all items were found satisfactory.<sup>2</sup> In the area under study the percentage was higher.

Pupil capacities, year models, and speedometer readings. In the area under study, bus pupil capacities ranged from twenty-four to sixty pupils. The most common size was a forty-two passenger bus as indicated in Table III.

The years of service of an average school bus under average conditions have been estimated to be about ten.<sup>3</sup> In the area under study ten busses had been in operation seven or more years. One pre-war model that was used part of the school year was retired during the period under study. For budgeting purposes (regulated by Montana State Law) a bus may be depreciated one-eighth of its value annually for a period of eight years.<sup>4</sup> Some variation in the practice of how long to retain a bus was found.

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<sup>1</sup>Montana State Department of Public Instruction, Administration Manual School Transportation (Helena, Montana: 1955), p. 25. (Mimeographed.)

<sup>2</sup>Montana Highway Patrol, School Bus Inspection Summary. Op. cit. Title page.

<sup>3</sup>Burton K. Belknap, The School Bus (Minneapolis: Educational Publishers, Inc., 1950), p. 158.

<sup>4</sup>Montana State Department of Public Instruction, Administration Manual School Transportation, Op. cit., p. 55.

TABLE III

CAPACITIES, AGES, AND SPEEDOMETER READINGS OF DISTRICT-OWNED BUSES  
IN ELEVEN MONTANA SCHOOL DISTRICTS

School	Number busses operated	Median pupil capacities	Median age in years of service	Age range in years of service	Median speed- ometer read- ings in thous- and of miles
A	3	42	1.3	1-2	14
B	5	42	3.4	2-6	56
C	1	42	2.0	2	27
D	7	48	6.3	1-15	58
E	5	36	5.1	3-7	42
F	3	42	6.0	5-7	73
G	5	48	4.0	1-6	42
H	3	42	6.3	5-8	47
I	1	42	5.0	5	49
J	5	42	4.0	1-8	34
K	5	42	4.6	1-8	30
Totals and medians	43	42	4.4	4	42

One school which formerly practised keeping its equipment the full eight years planned at the time of the study to replace each unit every four to five years. The trade-in or sale value of a used school bus is practically nothing. Most schools, therefore, retained them the full eight years or longer if they were still serviceable.

The mileages accumulated on these busses varied from 4,500 to 96,000 with an average of about 42,000. One district practised disposing of a bus before it had run 60,000 miles. Others operated theirs much farther. The cost, availability, and quality of repair service were the most dominant factors in determining how far or how long to operate a bus.

Most common bus repairs. Table IV indicates that most common repairs were made on leaky radiators. Twice as many radiators needed repairing as any other single item that needed repairs. Fenders, lights, ignition, and burned valves were about even for the second most frequent cause. Otto Thompson, bus foreman at Oilmont, stated that "radiator trouble had diminished." He attributed the fewer repairs to radiators to shock absorbers which are now standard equipment of newer busses and to the practice of carrying less than the recommended air pressure in the front tires. He added that the Oilmont school busses carried a maximum of thirty-five pounds air pressure.

Bus door styles and emergency equipment. As indicated in Table V twenty-four of the forty-three school busses under study were equipped with the split type door. Ten persons interviewed expressed their opinion of this type of door. They agreed that the chief advantage of the split type door was its ease of opening and closing under all conditions and that its main liability was that it was forced inward by a strong wind blowing into



TABLE IV

FREQUENCY OF MOST COMMON REPAIRS ON THIRTY-EIGHT DISTRICT-OWNED  
SCHOOL BUSES\*

Brakes	Tires	Valves	Radiators	Fenders	Ignition	Lights	Other
7	6	8	20	10	8	10	7

\*Each school district named two of the most common repairs made on its fleet of busses and not on any one bus.

TABLE V

BUS DOOR STYLES AND FREQUENCY OF EMERGENCY EQUIPMENT IN FORTY-THREE  
DISTRICT-OWNED SCHOOL BUSES\*

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Number with split door	Number with sedan door	Number with sliding door	Number with combustion heaters	Number with two-way radio
24	17	2	3	7

---

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\*The two-way radios were installed on three of the busses near the end of the school year and had not been used.

it, thus allowing wintry blasts to over-ventilate the bus. The above ten persons included administrators of Schools "C" and "G," bus foremen for Schools "B," "E," and "J," and bus drivers from Schools "A," "B," "C," and "F."

Seventeen school busses were equipped with the sedan type door. All of these except two operated in Schools "A," "B," "E," "G," and "J." The administrators and bus foremen agreed that the main asset of the sedan type door was that it was tight under all conditions, and its main liabilities were difficulty in opening and closing on windy days and more repairs and adjustments needed than for the split type door.

Unlike their predecessors, the two horse vehicles, none of the busses carried lap robes nor blankets. Combustion heaters were carried by three busses and then only on long trips.

The two-way radio equipped busses operated in two schools in the same high school district. Since the cost of such equipment per unit was about four hundred dollars and higher, officials of eight districts decided they would get along without them. Representatives of Districts "J" and "K" explained that "they didn't particularly need them as their busses were never out of sight of farm homes equipped with telephones."

Rear tire styles. The data from Table VI show that twenty-nine busses in the area under study were equipped with mud and snow tires the tread of which is generally classified as the bar type. The remainder were equipped with rear tires which were classified as having all-purpose treads. In all districts reporting tire chains were used a total of seven times collectively during the school year 1954-1955.

TABLE VI

FREQUENCY OF BUS REAR TIRE STYLES AND TIRE CHAIN USE DURING SCHOOL  
YEAR 1954-1955\*

School	Number with bar type tread	Number with all-purpose tread	Number times chains used 1954-1955
A	1	2	0
B	0	5	1
C	0	1	2
D	7	0	0
E	5	0	0
F	2	1	0
G	5	0	0
H	3	0	2
I	1	0	1
J	0	5	0
K	5	0	1
Totals	29	14	7

\*The quantities are stated as the totals per district. Definitions of bar and all-purpose type tire treads are given on page six.

The school bus garage. Table VII shows that two districts which operated five busses each maintained well equipped garages where any type of repair service including major overhaul jobs was done. A mechanic was employed in each for a twelve-month year. His duties were to maintain all the busses in the district and to drive one of the routes. All except one of the districts had bus housing. Seven had washing facilities. The district that had no bus garage started its busses on extremely cold days by the use of head-bolt heaters.

TABLE VII

THE SCHOOL BUS GARAGE AND EQUIPMENT\*

School	Housing	Washing facilities	Washing and greasing	Air compressor and tire tools	Commercial garage equipment
A	x	0	0	0	0
B	x	x	x	x	x
C	x	0	0	0	0
D	x	x	0	0	0
E	x	x	x	x	0
F	x	x	0	0	0
G	x	x	0	0	0
H	x	x	0	0	0
I	x	0	0	0	0
J	x	x	x	x	x
K	0	0	0	0	0
Totals	10	7	3	3	2

\*x indicates the school district had the facility.

0 indicates the school district did not have the facility.

Washing facilities means that the district had the equipment to wash its busses. Commercial garage equipment is defined on page six.

## CHAPTER IV

### THE SCHOOL BUS DRIVER

The school bus driver is the key man in the greatest transportation business in the Treasure State. He is the first member of the school personnel to meet the pupil in the morning and the last to bid him good-by at the end of the school day. He has an excellent opportunity to gauge pupil attitudes both before and after school. Situations are present where he can teach tolerance, respect for others, cleanliness, neatness, promptness, the common courtesies, and good driving habits.<sup>1</sup> at times he may act as a buffer between the pupil and the faculty.

The school bus driver must be the kind of person who feels responsible for his priceless cargo. Some of his many responsibilities are:

1. To keep himself physically fit and mentally alert.
2. To maintain high moral standards.
3. To always be patient, considerate, kind, and courteous.
4. To be calm and have an even temperament.
5. To create a feeling of security under all conditions.
6. To exercise extreme caution while driving and loading or discharging passengers.
7. To maintain order and discipline on the bus.
8. To maintain a regular schedule.

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<sup>1</sup>Ward G. Reeder, A Manual for the School Bus Driver (Columbus, Ohio: The Educators' Press, 1939), p. 6.

9. To see that the bus is in good mechanical condition and ready to go.

10. To make reports to the proper authorities.

11. To create and maintain good relations between the school and community.<sup>1</sup>

Since driving a school bus requires only about two hours per day, and the compensation is obviously less than for a full time job, it is often difficult to secure well qualified men. Some schools have furnished other tasks for a few employees, but to do so is impossible for all drivers where several routes are to be run. The next best plan has been to get men from other vocations where they can be free in the morning and afternoon to run the school bus routes. According to a New York writer, Burton K. Belknap:

Certain farm operatives may find it possible to share their time between bus driving and farming. . . . Again garages and service stations are many times so staffed as to welcome taking on the driver jobs and filling in with garage or service station employment.<sup>2</sup>

Other jobs held by drivers. Table VIII indicates that in the school districts under study the bus drivers were engaged in a variety of occupations. Although the area under study is far from New York, the drivers were drawn from similar occupations. About 33 per cent of the forty-three drivers were farmers. Six school janitors and six service station attendants accounted for another 28 per cent. The remaining 39 per cent was divided among teachers, bus mechanics, odd job men, and others.

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<sup>1</sup>Montana State Department of Public Instruction, Montana School Bus Driver Manual (Butte, Montana: Allied Printing, 1953), pp. 8-18, 58.

<sup>2</sup>Burton K. Belknap, The School Bus (Minneapolis: Educational Publishers, Inc., 1950), p. 107.



TABLE VIII

JOBS HELD OTHER THAN DRIVING SCHOOL BUS\*

Number drivers	Farmers	School janitor	Service station	Teacher	Bus mechanic	Odd jobs	Other
43	14	6	6	3	2	2	9

\*Other jobs held included insurance agent, motel operator, tire repair shop owner, minister, grain elevator operator, lumber yard employee, realtor, retired business man, truant officer, and bulk plant owner.

Age, experience, and compensation. The bus drivers' ages ranged from twenty-three to sixty-four years. For convenience the statistics in Table IX were tabulated as averages for the individual districts. The median driver wage per month was one hundred thirty dollars as compared to one hundred twenty-three for the entire state.<sup>1</sup>

Duties. As indicated in Table X of thirty-eight bus routes studied, all drivers were held responsible for sweeping their busses. All were required to make reports on any discipline measures administered. About 30 per cent of the districts had washing facilities and the drivers of these districts were required to wash their busses. One of the schools that employed a full time driver-mechanic did not hold its drivers responsible for inspecting the busses and making a report on the need for repairs.

No children were injured in a school bus accident in the area under study during the school year 1954-1955. Montana ranked first in safety of school bus transportation among the ten western states according to a National Safety Council Rating.<sup>2</sup>

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<sup>1</sup>R. Duane Peterson, "A Study of the Physical Requirements, Compensation, Training and Responsibilities of School Bus Drivers," (unpublished Professional Paper, Montana State University, Missoula, 1953), p. 37.

<sup>2</sup>Montana State Department of Public Instruction, "Annual Report of School Transportation, (Helena, Montana, 1953-1954), p. 45. (Mimeographed.)

TABLE IX

AGE, SCHOOL BUS DRIVING EXPERIENCE, AND COMPENSATION OF THIRTY-EIGHT  
DRIVERS

School	Number drivers	Age range	Average age	Average years experience	Compensation per month in dollars
A	3	26-46	38	4	100
B	5	32-64	42	4.4	130
C	1	57	57	2.0	170
D	7	32-64	46	4.1	130
E	5	25-43	33	2.6	115
F	3	24-50	40	3.0	125
G*					
H	3	26-41	35	3.0	125
I	1	46	46	6.0	110
J	5	24-52	46	4.0	142
K	5	24-37	31	5.2	150 plus experience increment
Medians	4		39	4.0	130

\*Unable to get this information for School "G".

TABLE X

DUTIES OF THIRTY-EIGHT SCHOOL BUS DRIVERS\*

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<u>Bus Maintenance</u>				<u>Reports</u>		
Number sweep- ing	Number wash- ing	Number greas- ing	Number inspect- ing	Need for repairs	Attend- ance	Discipline measures taken
38	11	5	33	33	14	38

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\*The reports were either written or oral. See definition on page six.

## CHAPTER V

### SCHOOL BUS TRANSPORTATION POLICY

Public school bus transportation requires competent management. Definite policies and procedures are the prerequisites for efficient service. There are certain problems common to all districts that operate school busses. There are other problems peculiar to certain districts.

Speed limits and use of pupil patrols. Speed of school busses in Montana is no more regulated than is the speed of privately owned public carriers. The recommended maximum limit is forty-five miles per hour.<sup>1</sup> Districts are free to impose their own limits. Statistics from Table XI show that four districts out of the eleven under study had speed limits which ranged from thirty-five to forty-five miles per hour. However, there were no mechanical devices to control the speed. The drivers of school busses in those districts agreed to drive under the limits when they accepted employment. The remaining districts imposed no speed limits. Schools "A," "B," "C," "E," "G," and "J" left speed to the discretion of the individual drivers when long trips were made.

Pupil patrols may be of value, especially in congested areas.

It is desirable to organize school bus patrols to assist the driver in maintaining discipline in the school bus, to flag the school bus across all dangerous railroad crossings and to direct pupils across highways after such pupils have alighted from the school bus.<sup>2</sup>

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<sup>1</sup>Montana State Department of Public Instruction, Montana School Bus Driver Manual (Butte, Montana; Allied Printing Company, 1953), p. 59.

<sup>2</sup>Oregon State Department of Education, Transportation Handbook for School Administrators and School Boards (Salem, Oregon: State Printing, 1952), p. 19.

TABLE XI

SPEED LIMITS AND METHOD OF CONTROL: USE OF PUPIL PATROLS ON FORTY-THREE SCHOOL BUSES\*

School	Speed Limit		How controlled	Pupil Patrols	
	None	Miles per hour		Yes	No
A	x				x
B	x				x
C	x				x
D		35	voluntary		x
E		40	voluntary		x
F		45	voluntary	x	
G	x				x
H	x				x
I	x				x
J	x				x
K		35			x

\*The use of pupil patrols refers only to those used on school busses. Voluntary control of the speed limit was a verbal agreement between the school administration and the driver. No mechanical devices were employed to control the school bus speed limits.

Only one school in the area under study employed student patrols. It is notable that this district had over 40 per cent of its routes paved.

Purchasing of supplies. Table XII provides data which show that six of the eleven districts purchased their gasoline and oil from bulk dealers. There were two advantages in buying gasoline in this manner:

1. There was a saving of six or seven cents per gallon, which is normally the retailers' profit.

2. A supply at the school garage was convenient.

Repair of busses. The two districts that made all their mechanical repairs purchased their parts direct from wholesalers. One school made a few minor repairs on its busses but engaged private garages to make the remainder. The remaining eight schools arranged for all their bus repair work with private local garages. The above information pertaining to bus repairs is shown on Table XIII.

Financing bus and driver expenses for extra curricular trips.

Table XIV indicates that in the area under study one school district paid for all gasoline consumed by the school busses when they were used on extra curricular trips. The school activity groups in that district compensated the drivers. There were seven schools that assumed all transportation costs when activity groups went on trips. In the remaining three schools, the activity groups that used the busses for trips were responsible for the gasoline used by the busses and the drivers' compensation.

TABLE XII

HOW ELEVEN SCHOOL DISTRICTS PURCHASED SUPPLIES FOR SCHOOL BUSESSES

School	<u>Gasoline and Oil</u>		<u>Accessories and Repair Parts</u>	
	Bulk plant	Service station	Wholesale	Retail
A		x		x
B	x		x	
C		x		x
D	x			x
E	x			x
F		x		x
G	x			x
H		x		x
I		x		x
J	x		x	
K	x			x
Totals	6	5	2	9



TABLE XIII

HOW ELEVEN SCHOOL DISTRICTS REPAIRED SCHOOL BUSES

School	Did all	Made minor repairs	Most done by private garages	All done by private garages
A		x	x	
B	x			
C				x
D				x
E				x
F				x
G				x
H				x
I				x
J	x			
K				x
Totals	2	1	1	8

TABLE XIV

HOW SCHOOL BUS AND DRIVER EXPENSES FOR EXTRA-CURRICULAR TRIPS WERE  
PAID IN ELEVEN SCHOOL DISTRICTS

School	School assumed all	School paid for gasoline	Activity paid driver	Activity paid driver and gasoline
A	x			
B	x			
C	x			
D				x
E				x
F				x
G	x			
H	x			
I	x			
J		x	x	
K	x			
Totals	7	1	1	3

## CHAPTER VI

### INTERVIEW ITEMS THAT DID NOT LEND THEMSELVES TO TABULAR STRUCTURING

Several of the questions asked on the interview form were not used for various reasons. The items and the reasons they were not used are given below. Each item appears under the area heading to which it belongs.

The bus route. Item seven in the interview form, the overlapping of bus routes, was left out because the interviewee either did not have complete information or if he had some knowledge of it, he was vague in his answers. For example, persons interviewed said, "I suppose we overlap as our routes enter town or I suppose we do some dual routing, but how can it be avoided?" This problem could be better handled by the County Transportation Committee and the State Department of Public Instruction.

On items ten and twelve, "policy on feeder roads" and "waiting for pupils late at the bus stop," the answers were as indefinite as the weather because the weather probably had the most influence upon how long some drivers waited. In order to understand the policies on feeder roads, it would be necessary to know every individual route and the estimating ability and philosophy of everyone of whom the question was asked.

The school bus. Items four to seven in the school bus category seem inconsequential to this study. Since they are in the engineering field, they might better be left to school bus chassis manufacturers or to the Society of Automotive Engineers.

The information regarding items fifteen, sixteen, seventeen, and nineteen was either indefinite or inconclusive for most of the districts under study. Some common replies were: "Sometimes we use recap tires." "We don't use recaps since our school board changed." Gasoline mileages were mostly guesses. There was no set practice within a school district on how waste paper was disposed of. Those questioned thought it a problem for each individual driver since he swept the bus. Before this study was begun there was a belief that specific underlying causes might be found for the variation of factors in this study. For example, there might be a relation between extremely high air pressures in the front tires and the frequency of radiator repair. Without definite information and probably a larger sampling, conclusions would be of little value.

The bus driver. Before the interview was half finished, the writer learned that most of the information concerning the school bus driver had been collected by R. Duane Peterson in 1953.<sup>1</sup> Duane Peterson's study involved seven of the eleven districts under study in this discussion. Over 75 per cent of the drivers involved in this study were reported on in Peterson's study.

Many of the replies regarding the school bus driver's uniform were too humorous to mention. Since the writer doesn't care to be considered a crackpot, the question was eliminated.

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<sup>1</sup>R. Duane Peterson, A Study of the Physical Requirements, Compensation, Experience, Training, and Responsibilities of School Bus Drivers (unpublished Professional Paper, Montana State University, Missoula, 1953.) pp. 9-36.

School bus transportation policy. The use of school busses by groups not directly involved in school functions question proved "touchy." Answers were vague. The purpose of this discussion was not to "dig" any secret information; therefore the few results obtained were considered inadequate for this study. Obviously, all school districts in the area under study required that the busses be parked parallel on the school grounds. That fact was gleaned from the interview. No exact records were available on the frequency of motorists passing school busses when the busses were loading or discharging pupils.

## CHAPTER VII

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The Bus Route. In the area under study the average bus travelled fifty-seven miles per day. Less than 11 per cent of this route was paved. Approximately 1,900 miles of the graded route in nine of the eleven school districts were kept in a "fair" state of maintenance. Mechanical breakdowns of busses in operation on the routes were practically non-existent. Fourteen such events occurred in 7,740 collective bus trips. Due to the mild winter of 1954-1955, the busses operated about 99 per cent of the school year.

The School Bus. Twenty-four to sixty passenger school busses operated in the area, with a forty-two passenger the most common. A little less than one-fourth of all busses in the area had been in service seven or more years. The average bus had accumulated 42,000 miles on its speedometer and had been in service four and four-tenths years. About 57 per cent of all school busses in the area were equipped with the split type door. One sixth had two-way radios. Tire chains were used a total of seven times collectively during the entire year. All except one school district had housing for school busses. The equipment of two garages enabled mechanics to repair any mechanical breakdown that occurred to school busses in those districts. Leaky radiators led all other causes for the repair of school busses in the area under study.

The School Bus Driver. The youngest school bus driver in the area was twenty-three and had one year experience in school bus driving, the oldest sixty-four with eleven years experience. The average driver was thirty-nine and had four years experience. All drivers were held responsible for sweeping their busses and making reports on any discipline measures needed or taken. Fourteen of the forty-three school bus drivers in the area who drove district-owned busses were farmers. No other occupational group furnished half as many.

School Bus Transportation Policy. About 55 per cent of the schools under study purchased gasoline from bulk dealers. Approximately 22 per cent bought repair parts and accessories exclusively from wholesalers. Four districts imposed speed limits that were controlled voluntarily by verbal agreements. All except two of the eleven districts arranged for the repair of their school busses with private, local garages. Seven of the eleven districts assumed all transportation costs incurred on extra-curricular trips. In three districts, the activity group sponsoring the trip compensated the driver and purchased the gasoline consumed by the bus. One district in the area employed pupil patrols on the school bus routes.

Concluding Statements.

1. There were no significant differences in the physical characteristics of the school bus routes in the area.
2. Some school had much older busses than others.
3. The range in the compensation of school bus drivers was not significant. The median salary in the area compared favorably with the state average.
4. There was considerable difference in policy in the eleven districts which may be accounted for by differences in enrollment.

Recommendations. Some of the schools under study probably should examine their timing of new bus purchases. Possibly the cost of maintaining older busses may be greater than the cost of new equipment.

Chassis manufacturers should devise longer-lived radiators or provide mountings that are more capable of absorbing the shocks of rural Montana roads.

School bus body manufacturers should build a bus door that would be more satisfactory in the high wind areas of the country.



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## BIBLIOGRAPHY

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**APPENDIX A**

APPENDIX A

THE INTERVIEW FORM

School reporting \_\_\_\_\_

Response by \_\_\_\_\_; Title \_\_\_\_\_

The Bus Route

1. Length \_\_\_\_\_
2. Terrain \_\_\_\_\_
3. Miles of pavement \_\_\_\_\_
4. Miles gravelled \_\_\_\_\_
5. Miles dirt \_\_\_\_\_
6. Miles graded up \_\_\_\_\_
7. Overlapping of routes \_\_\_\_\_
8. Number of times late due to: (1) weather \_\_\_\_\_ (2) mechanical failure \_\_\_\_\_ (3) driver \_\_\_\_\_.
9. Days missed due to weather \_\_\_\_\_. Who determines whether to go or to stay in garage \_\_\_\_\_
10. Policy on feeder roads \_\_\_\_\_
11. Maintenance of roads \_\_\_\_\_
12. Wait for late students \_\_\_\_\_
13. Anticipate changes or additions to route \_\_\_\_\_
14. Special problems \_\_\_\_\_

The Bus

1. Speed limit \_\_\_\_\_ How controlled \_\_\_\_\_
2. Most common repairs \_\_\_\_\_
3. Type of tire \_\_\_\_\_
4. Type of differential \_\_\_\_\_
5. Types of transmissions \_\_\_\_\_
6. Combustion heaters \_\_\_\_\_
7. Blankets \_\_\_\_\_

The bus continued.

- 8. Mileage on speedometer \_\_\_\_\_
- 9. Type of door \_\_\_\_\_ 10. Type preferred \_\_\_\_\_
- 11. Recap tires \_\_\_\_\_ Opinion \_\_\_\_\_
- 12. Approximate miles per gallon \_\_\_\_\_
- 13. Tire inflation \_\_\_\_\_
- 14. How often used chains, 1954-1955 \_\_\_\_\_
- 15. Provision for waste paper \_\_\_\_\_
- 16. Maintenance
  - (a) Where and how gas and oil were purchased \_\_\_\_\_
  - (b) Parts, grease, antifreeze, etc. \_\_\_\_\_
  - (c) Mechanic do, or contracted repairs \_\_\_\_\_
  - (d) Garage equipment \_\_\_\_\_
- 17. Spare bus \_\_\_\_\_ Frequency of use \_\_\_\_\_

The driver

- 1. How selected \_\_\_\_\_
- 2. Examination \_\_\_\_\_ (a) Performance \_\_\_\_\_ (b) Written \_\_\_\_\_
- 3. Tenure \_\_\_\_\_
- 4. Wage \_\_\_\_\_ Monthly \_\_\_\_\_ Hourly \_\_\_\_\_ Wage for extra  
curricular driving (mile \_\_\_; included in salary \_\_\_; other \_\_\_)
- 5. Jobs other than bus driving \_\_\_\_\_
- 6. Uniform \_\_\_\_\_ Anticipate one \_\_\_\_\_ Opinion \_\_\_\_\_
- 7. Duties \_\_\_\_\_
- 8. Responsibilities \_\_\_\_\_
- 9. Reports \_\_\_\_\_ oral \_\_\_\_\_ written \_\_\_\_\_ attendance \_\_\_\_\_  
Need for repairs \_\_\_\_\_ Other \_\_\_\_\_
- 10. Discipline \_\_\_\_\_ How handled \_\_\_\_\_

The driver continued

11. Meetings \_\_\_\_\_ scheduled \_\_\_\_\_ personal conference \_\_\_\_\_
12. Marital status \_\_\_\_\_
13. Work attendance \_\_\_\_\_ Frequency of substitute use \_\_\_\_\_
14. Experience truck driving or bus driving \_\_\_\_\_
15. Age limit \_\_\_\_\_
16. Foreman \_\_\_\_\_
17. Mechanic \_\_\_\_\_ Mechanic Driver \_\_\_\_\_
18. Suggestions for improvement \_\_\_\_\_

School policies

1. Use of busses by other groups such as Boy Scouts, etc. \_\_\_\_\_
2. Notify patrons when school bus runs off schedule \_\_\_\_\_
3. Student patrols \_\_\_\_\_
4. Length of service of bus \_\_\_\_\_ age \_\_\_\_\_ mileage \_\_\_\_\_ other \_\_\_\_\_
5. Purchasing of supplies \_\_\_\_\_
6. Discipline \_\_\_\_\_
7. Responsibility for administration \_\_\_\_\_
8. Responsibility for maintenance \_\_\_\_\_
9. Planning routes \_\_\_\_\_
10. Pupils getting off bus other than their regular stop \_\_\_\_\_
11. Method of parking bus on school ground \_\_\_\_\_
12. Use of bus for extra curricular trips \_\_\_\_\_ Chaperones \_\_\_\_\_

Miscellaneous

- Frequency of motorists passing bus while loading or unloading \_\_\_\_\_
- Accidents \_\_\_\_\_ Causes \_\_\_\_\_

APPENDIX B

LIST OF SCHOOLS REPORTING

Browning	Kevin
Bynum	Oilmont
Conrad	Power
Cutbank	Sunburst
Fairfield	Valier
Greenfield	